



Employment differences in services: the role of wages, productivity and demand

Andrew GLYN

Corpus Cristi College, Oxford University, United Kingdom

Wiemer SALVERDA

Department of Economics/AIAS, Universiteit van Amsterdam, The Netherlands

Joachim MÖLLER

Wirtschaftswissenschaftliche Fakultät, Universität Regensburg, Germany

John SCHMITT

Economic Policy Institute, United States

Michel SOLLOGOUB

University Paris I Pantheon Sorbonne, France

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Andrew Glyn, Wiemer Salverda, Joachim Möller,

John Schmitt and Michel Sollogoub

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Authors

Andrew GLYN
Corpus Cristi College, Oxford University
OXI 4JF Oxford
UNITED KINGDOM

E-mail: andrew.glyn@ccc.ox.ac.uk

Wiemer SALVERDA
Department of Economics/AIAS, Universiteit van Amsterdam
Plantage Muidergracht 4, 1018 TV, Amsterdam
NETHERLANDS

E-mail: w.salverda@uva.nl

Joachim MÖLLER
Wirtschaftswissenschaftliche Fakultät, Universität Regensburg
Universitätsstr. 31 D-93040 ,Regensburg
GERMANY

E-mail: joachim.moeller@wiwi.uni-regensburg.de

John SCHMITT
Economy Policy Institute
2034 17th Street NW Washington
UNITED STATES

E-mail: jt.schmitt@verizon.net

Michel SOLLOGOUB
University Paris I Pantheon Sorbonne
106-112 Bd de L'Hopital, 75647, Paris-Cedex
FRANCE

E-mail: michel.sollogoub@univ-paris1.fr

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Address:

Amsterdam Institute for Advanced Labour Studies AIAS

University of AMSTERDAM

Plantage Muidersgracht 4

1018 TV AMSTERDAM

telephone +31 20 525 4199

fax +31 20 525 4301

email aias@uva.nl

ABSTRACT

The paper shows that the growing employment gap between Europe and the USA over recent decades reflected the failure of services-employment rates in Europe to converge to American levels whilst European employment rates in goods production were falling rapidly towards those of the USA. The services-employment gap is concentrated in distribution (retail and hotels and catering) and community and personal services. To explain this, attention has been focussed, first, on the role of labour market rigidities in inhibiting the growth of the low-wage services, particularly in the distribution sector as a major and private employer of low-wage labour. Detailed examination of the wages and employment in retailing suggests that wage penalties are not more important in the USA, certainly not for the low skilled and at the bottom end of the wage distribution. Instead, American retail has kept down wage costs more by the composition of its work force, e.g. part-time workers – but also this composition effect was surpassed by some European countries. A second explanation is sought at the more macroeconomic level. European distribution did suffer from a rapid growth in product wages and a profit squeeze back in the 1970s, but in the 1990s productivity grew considerably faster in American distribution and European product wages grew relatively slowly. Thirdly, it is shown that the much higher level of goods consumption per head of the population as compared to Europe was the dominating influencing in explaining the much higher levels of employment in American distribution. This suggests that the lower level of services employment in Europe may be more importantly explained by the economy-wide influences explaining low levels of aggregate hours worked and thus aggregate consumption rather than specific labour-market constraints on the service sector itself.

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INTRODUCTION

Between 1970 and 2001 employment rose by 55 millions in the USA, a 67% rise. In the EU15 the rise was 31 millions, an underlying increase of just 17% once the absorption of the GDR is discounted. This comparison underlines the strength of the American “jobs machine”, but it exaggerates Europe’s jobs problem since the potential labour force, as measured by the population of working age, also grew much slower than in the USA (18 % excluding the GDR as compared to 45% in the USA). Even when population growth is allowed for, however, Europe still lagged substantially behind in job creation. The employment rate, that is employment divided by population of working age, was actually slightly higher in Europe than in the USA in 1970 but some nine percentage-points less in 2001.

Figure 1. US - Europe employment gap, 1970-2001

Employment-to-population (aged 15-64) ratios for the USA and five European countries: Germany, France, United Kingdom, Spain and Netherlands

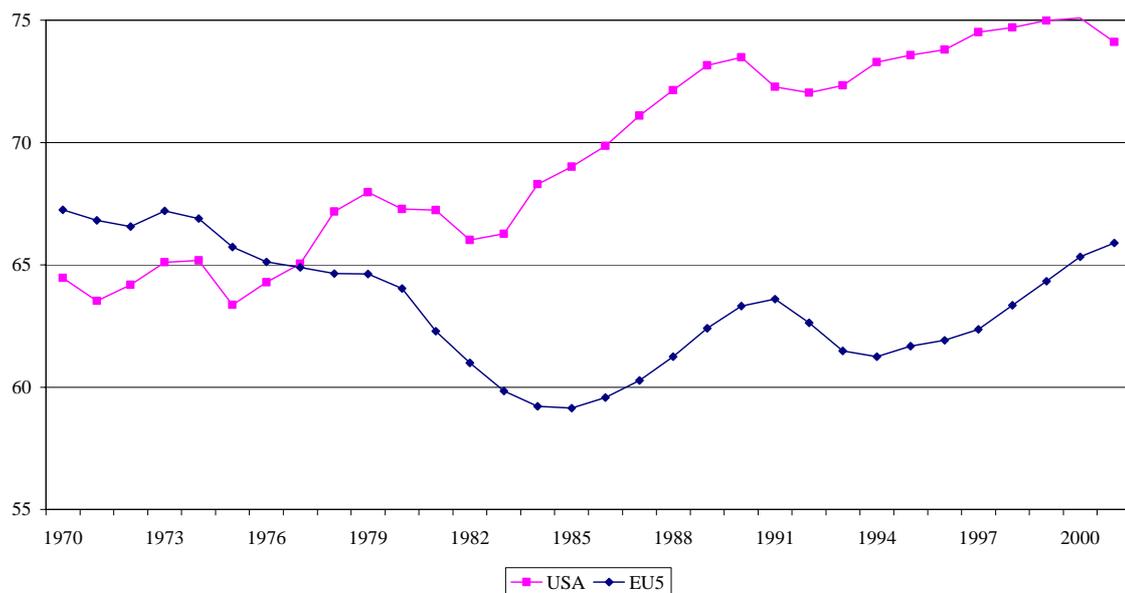


Figure 1 shows the evolution of the combined employment rate for Europe comprising the five European countries covered by our study. The European countries fell behind the USA by the late 1970s and the employment gap widened till the mid-1990s, with much of the increase occurring by the mid-1980s. This gap, which is frequently blamed on labour market rigidities in Europe, is the focus of this paper.

In Section I, we analyse further the evolution of the employment gap. We cover the differing experience of men and women and the role of structural change. The decline in employment in agriculture and industry is set out and, in line with the Dempatem approach, the

contribution of the various parts of the service sector to employment differences between Europe and the USA is shown. Section 2 presents some typical explanations of the employment gap including lack of wage flexibility in Europe reflected in lack of low-productivity jobs, regulations in the product market and the overall level of demand. We single out the distribution sector¹ for particular analysis as the quintessential private service industry, heavily dependent on the bottom end of the labour market. The contending hypotheses about employment differences should show up starkly in that sector. In Section 3, we will analyse the distribution sector in detail, examining in particular whether the employment, wage and productivity patterns we uncover, particularly in retail trade, support the labour-market flexibility argument. Finally we analyse the role of aggregate consumer spending and productivity levels in distribution in generating the employment differences in distribution between the USA and Europe.

¹ The distribution sector comprises wholesale trade, retailing and hotels and catering (eating and drinking places). The three are often lumped together in statistics of production, employment and earnings.

I DISSECTING THE EMPLOYMENT GAP

I.1 COUNTRIES, PERIODS, EMPLOYMENT STATUS AND HOURS

The comparison in Figure 1 between Europe and the USA ignores the very considerable diversity across European countries, as emphasised in the discussion of European unemployment (see Nickell 1997). In this overview section it is impossible to treat each aspect country-by-country so we have to concentrate on the aggregate for the five countries addressed by our research (indicated as EU5 in the graphs and tables²), mentioning country differences only when they seem especially significant. However the country diversity within Europe in employment rates is important to bear in mind. In 2001 Dutch and UK employment rates were within 3.5% points of the US level (74.1%), whereas the German and French rates were 7-10% points less and Spain 16% less. Most of Europe's employment gap is concentrated in the four large countries of continental Europe. Three of these (Germany³, France, and Spain) are combined with the UK and Netherlands in our EU5 aggregate, which consequently covers some 70% of Europe's population.

The focus of this paper is on employment rather than the various forms of non-employment. Nevertheless it is important to record that rising unemployment in Europe absorbed only one-third of the growing employment gap compared to the USA (Table 1 panel 2). Inactivity fell more for European men and rose less for European women than for their US counterparts and this contributed twice as much to the expanding employment gap as did the much better known rise in European unemployment.

It was already apparent from Figure 1 that the European jobs deficit reached its peak in the 1990s. The third panel of Table 1, shows the gap growing strongly in the 1970s and 1980s, but much less so in the 1990s. Indeed in the period 1995-2001, often singled out for "New Economy" tendencies in the US, the employment gap actually declined, with the employment rate growing strongly in Europe, and hardly at all in the USA (once the 2001 slowdown is included). The faster employment-rate growth in Europe than in the USA in the later 1990s applies to each of the five countries (even in Germany it rose by 0.24% points per year as compared to 0.09% for the USA). These results are based on the OECD's labour force survey data which provide important gender detail used below which is lacking in other datasets as, e.g., STAN. However, given breaks in the LFS head-count series⁴, we confirmed

² We sometimes also refer to EU4, meaning the UK, Germany, France and the Netherlands, when data for Spain is lacking. See Table A.4 for country detail.

³ Germany refers to West Germany up to 1990 and unified Germany from 1991 (which leads to some discontinuities in the series in the latter year).

⁴ Cf. Salverda, forthcoming. We adjusted for these as best we could using STAN.

this broad picture using the STAN jobs series (compare Table A5). It is striking, given much policy discussion comment, that Europe's jobs gap has been tending to shrink in the most recent period.

Table I. Employment and non-employment rates for all workers, 1970-2001
Percentages of population of working age

| | EU5 | USA | USA – EU5 |
|---|-------|-------|-----------|
| 1. Levels (percentages) | | | |
| Employment rate, 1970 | 67.2 | 64.5 | -2.8 |
| Employment rate, 2001 | 65.9 | 74.1 | 8.2 |
| 2 Labour Market Status 1970-2001 (% point changes per year) | | | |
| Employment | -0.04 | 0.31 | 0.35 |
| Unemployment | 0.13 | 0.01 | -0.12 |
| Inactivity | -0.09 | -0.33 | -0.24 |
| Average hours per worker (%pa) | -0.70 | -0.16 | 0.53 |
| Self-employment | -0.14 | -0.03 | 0.11 |
| 3. Period breakdown) | | | |
| Employment | | | |
| 1970-1979 | -0.29 | 0.39 | 0.68 |
| 1979-1990 | -0.12 | 0.50 | 0.62 |
| 1990-2001 | 0.23 | 0.06 | -0.18 |
| 1995-2001 | 0.70 | 0.09 | -0.61 |

Source: OECD LFS website database, with some additions from STAN, and national data for NL

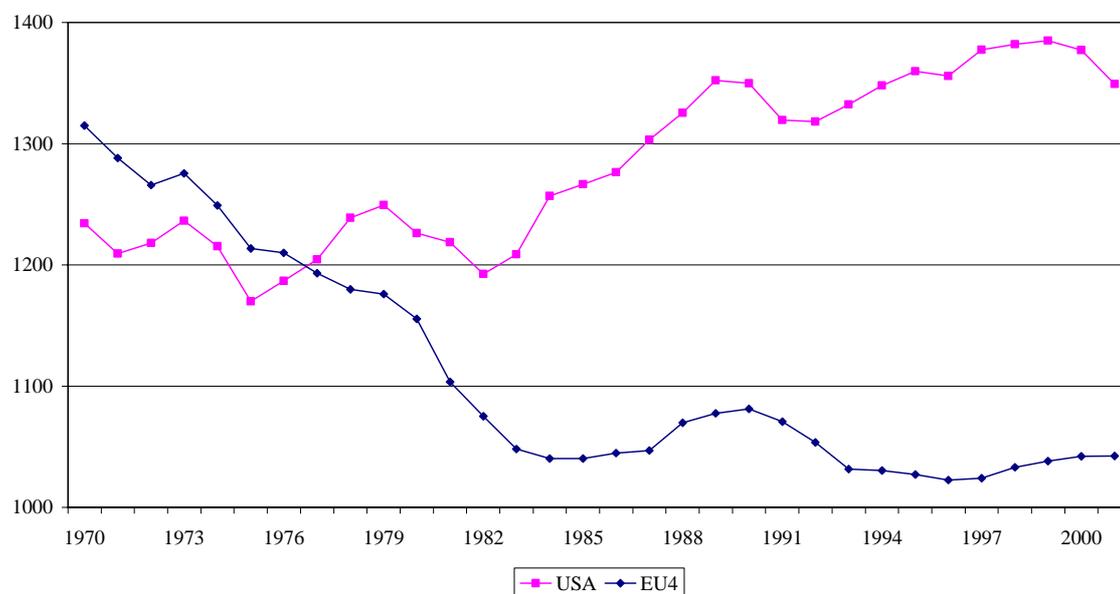
Note: For more detail see Appendix Table A1

The data for hours are not very reliable⁵ but suggest a much faster decline in average hours worked per worker in Europe (Table I). Europe and the USA seem to have started the 1970s with similar working time (around 1900 hours in USA, France, Germany and UK with Netherlands somewhat less). Hours then fell gradually in all countries but stopped doing so at the end of the 1970s in both the USA and UK, where they subsequently stagnated around 1825 and 1750 respectively. In continental Europe, by contrast, the downward trend continued reaching 1500 in France and Germany by the end of the century and some 1350 in the Netherlands, reflecting both a general reduction in working hours and the rapid growth of part-time employment. The effects of a lower employment rate and the shorter hours of work can be combined to show annual hours worked per head of the working age population (Figure 2). Work done per head of the population in Europe declined strongly up to 1985 and remained roughly stable since then. By the 1990s the average American person of working age was working one-third more per year than in Europe, roughly double the gap in employment rates. The hours gap continued to grow until the end of the New Economy boom, albeit at a much slower pace than before. The much greater volume of work

⁵ Bruyère and Chagny, 2002

undertaken in the USA has profound implications for per capita income as will be noted later in Section 3 below.

Figure 2. The hours worked gap, 1970-2001
Hours worked per head of the working-age population (aged 15-64) for the USA and four European countries: Germany, France, United Kingdom, and Netherlands⁶

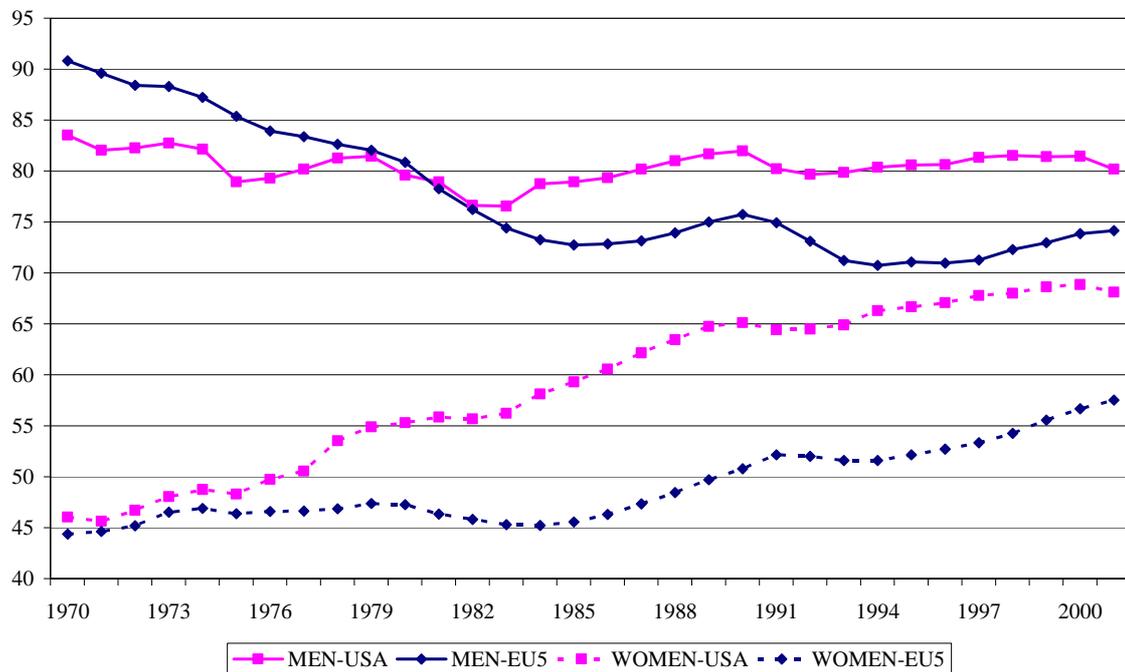


1.2 EMPLOYMENT GAPS BY GENDER

By the end of the century the shortfall in Europe’s employment rate behind that of the USA was very substantial for both men and women. However, this reflected quite different evolutions (Figure 3). Men’s employment in Europe was initially considerably higher than in the USA but fell very sharply till the mid-1980s, whilst in the USA it fluctuated with a slight tendency to decline leading to a 6 percentage-points gap in 2001 (detail is given in Table A2). Beginning from very similar levels in 1970, women’s employment grew steadily and faster in the USA until the early 1990s. Here cross-country diversity is especially striking with British women working only slightly less frequently in 2001 than American women, whilst in Spain women’s employment rate was 25 percentage-points less.

⁶ Unfortunately no hours data is available for Spain before 1977. Dutch hours: authors’ calculation from Dutch Statistics Tijdsrekenen hours for employees and labour years for employees and self-employed.

Figure 3. Employment gaps by gender, 1970-2001
 Employment-to-population (aged 15-64) ratios for the USA and five European countries:
 Germany, France, United Kingdom, Spain and Netherlands



By 2001 European women lagged 11 percentage-points behind the USA. Although the gap for women was greater in 2001 than for men, the *change* in the gap since 1970 has been very similar. Actually, the gender gap has narrowed more in Europe (-30 pcpt) than in the USA (-25 pcpt). Thus the lagging behind of European employment was experienced somewhat more by men than by women. Conversely since the mid-1990s both men and women did better in terms of rising employment rates in Europe than in the USA.

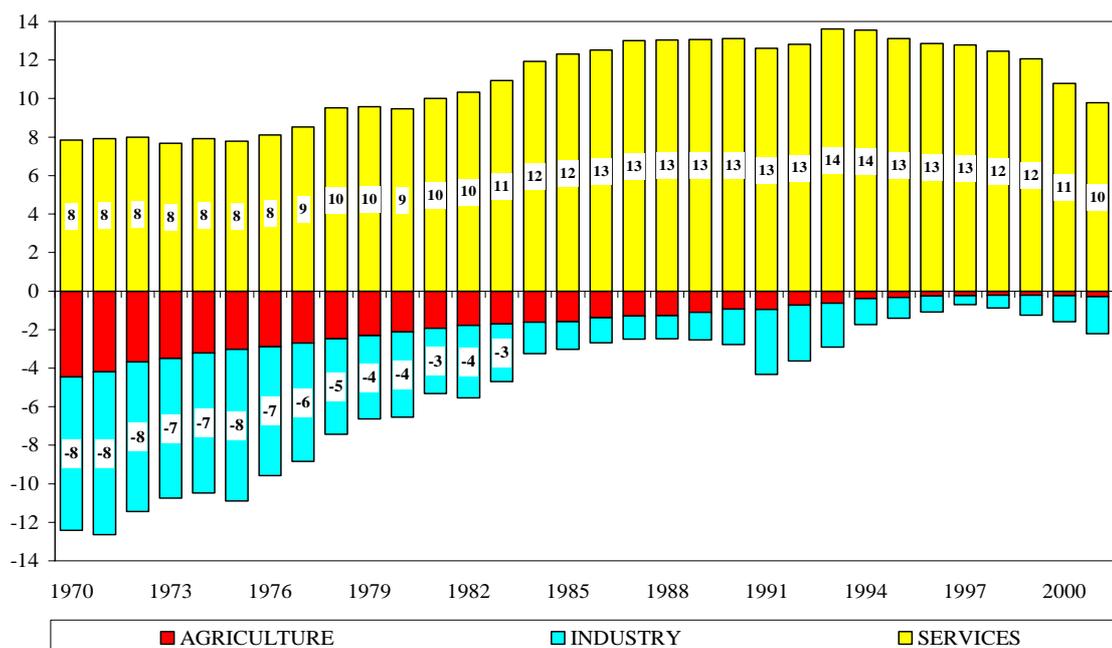
1.3 SECTORS AND STRUCTURAL CHANGE

To relate employment growth to patterns of product demand we are particularly interested in employment change at the level of sectors and industries. It is sometimes suggested that Europe's employment problem revolves around incapacity to expand services. Figure 4 disentangles the overall jobs gap into the portions represented by agriculture, industry and services.

In 1970 agriculture provided far more jobs in Europe than in the USA. However agricultural employment fell sharply in Europe (by 5% of the working population) and by the end of the period agriculture only contributed 1% more jobs for the working population than in the USA. The loss of agricultural work was especially important for men (the counting of agricultural employment for women is based on varying conventions across countries about

the inclusion of family members) and particularly important in Southern Europe. Even in France jobs for men in agriculture fell by some 8% points of the male population of working age between 1970 and 2000. The much faster fall in self-employment in Europe than in the USA (see Table 1 panel 2) mainly reflects the decline in agriculture.

Figure 4. The sectoral employment gap, 1970-2001.
 Employment-to-population (aged 15-64) ratios for the USA minus five European countries:
 Germany, France, United Kingdom, Spain and Netherlands



Deindustrialisation has been the most discussed feature of post-war structural change. In 1970 employment rates in industry were far higher in Europe than in the USA, but the subsequent period showed a strong convergence toward the US level for the industrial employment rate and by 2000 the differential rate had virtually disappeared (Figure 4). This deindustrialisation contributed some 6% points to the rise in the employment gap. The fall in industrial employment (mainly employees) in Europe was most important for men, representing around 17% of the male working age population (24% in the UK). As noted by the OECD (2000) it is essential to set any conclusions about the weaknesses of European services in the context of declining goods production.

Services employment has provided all the extra jobs since 1970 (almost all in the case of the USA) and Europe's shortfall in the level of the services-employment rate is of very long standing, being no larger in 1973 than in 1913 (Glyn and Erdem 2000 Appendix tables 1,4)⁷. It seems, therefore, that the lower level of service employment in Europe may well reflect

⁷ Piketty (1998) shows that the employment gap between French and US distribution was already substantial in 1900.

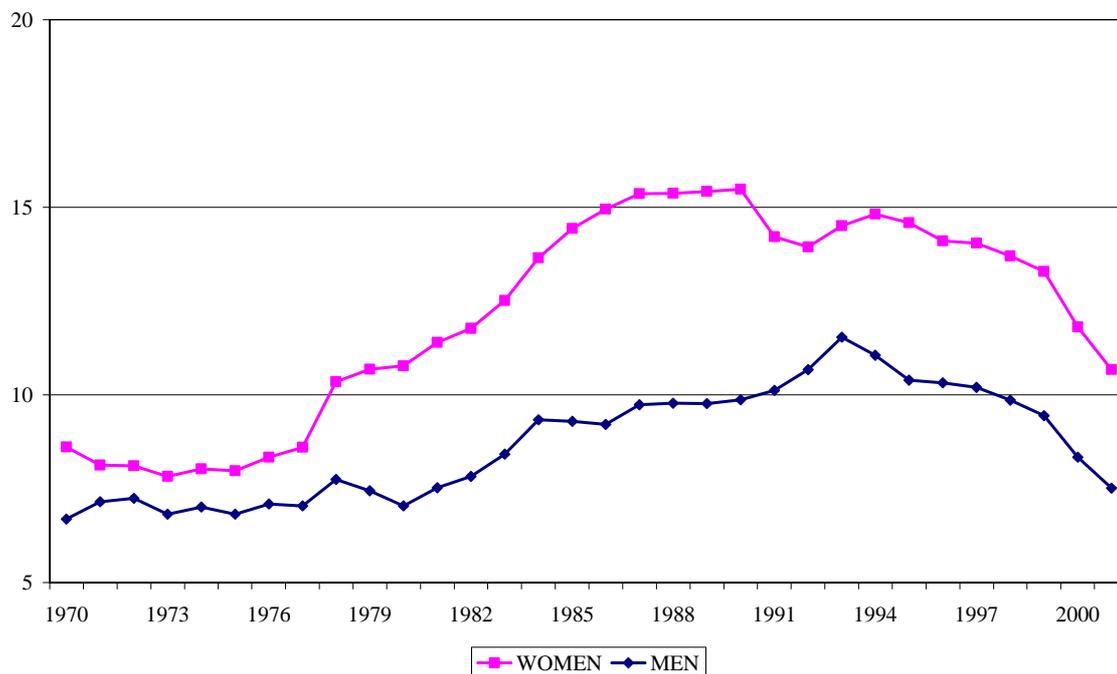
deep structural factors in the economy, rather than much more recent features of the labour market. The services job gap has increased since 1970 but only from 8% points to 10% points (Figure 4), having fallen back relatively rapidly from a maximum of 14% points in the early 1990s. The rapid expansion of European services in the most recent period applies to all five countries⁸ and the STAN data confirm this picture though with a slightly smaller edge for Europe.

In the early 1970s there were more men employed in services than women in both the EU and USA, but the subsequent rise was faster for women so that by 2000 more women were employed in services than men. The gender distribution is much the same in Europe and the USA. Service jobs for American women outpaced those in Europe substantially during the 1980s, but this was reversed in the 1990s; by the second half of the 1990s service jobs for men also were growing faster in Europe than in the USA (Figure 5). Thus the services-employment gaps grew only moderately over the period.

So for European women, employment opportunities in services increased rapidly but not fast enough to drag participation rates up to the US level given declining job opportunities in goods production. Likewise the problem with men's service employment was not stagnation, but rather a failure to rise fast enough to absorb the huge loss of jobs in industry and to a lesser extent in agriculture. Between 1973 and 2001 the employment of European men in goods production (agriculture and industry) fell from 52% to 31% of population of working age. The comparable fall in the USA took nearly twice as long – from 1950 to 2001 the US male employment rate in goods fell from 49% to 28% (updated from Glyn and Erdem 2000).

⁸ 1995-2001: UK 0.73 (0.75), Germany 0.63 (West: 0.87), France 0.96 (0.79), Spain 1.38 (0.86), and the Netherlands 1.35 (1.42) in comparison with USA 0.38 (0.50). STAN-figures between brackets.

Figure 5. The gender employment gap for services, 1970-2001
 Employment-to-population (aged 15-64, by gender) ratios for the USA minus five European countries: Germany, France, United Kingdom, Spain and Netherlands



Of course the gap has widened more in terms of hours worked in services reflecting the economy-wide decline in hours of work in Europe compared to the USA. The proportion of self-employment in total employment in European services fell from 15% to 11%, a very similar fall to that in the USA (from 10% to 7%).

But before exonerating European services on account of the extra burden of coping with the rapid decline in goods production, surely US services did a much more effective job of coping with the comparable challenge of rapid population growth (but such growth may partly sustain employment growth⁹). There are particular problems involved with absorbing the outflow from declining sectors however. Goods production tends to be geographically concentrated, and the workers concerned often have skills and expectations poorly adapted to work in service sectors. This makes shifting workers from goods to services more difficult than absorbing new entrants to the labour force (especially immigrants). Indeed the faster population growth in the USA eased structural change as it could be accommodated with much less actual job loss¹⁰. Over the period 1970 to 2001 male jobs in goods production in Europe fell by more than 13 million whilst they rose by almost 3 million in absolute terms in the USA.

⁹ Cf. Krueger and Pischke, 1997.

¹⁰ The US population grew by 39 % while EU5 increased by 11 % (1970-2001).

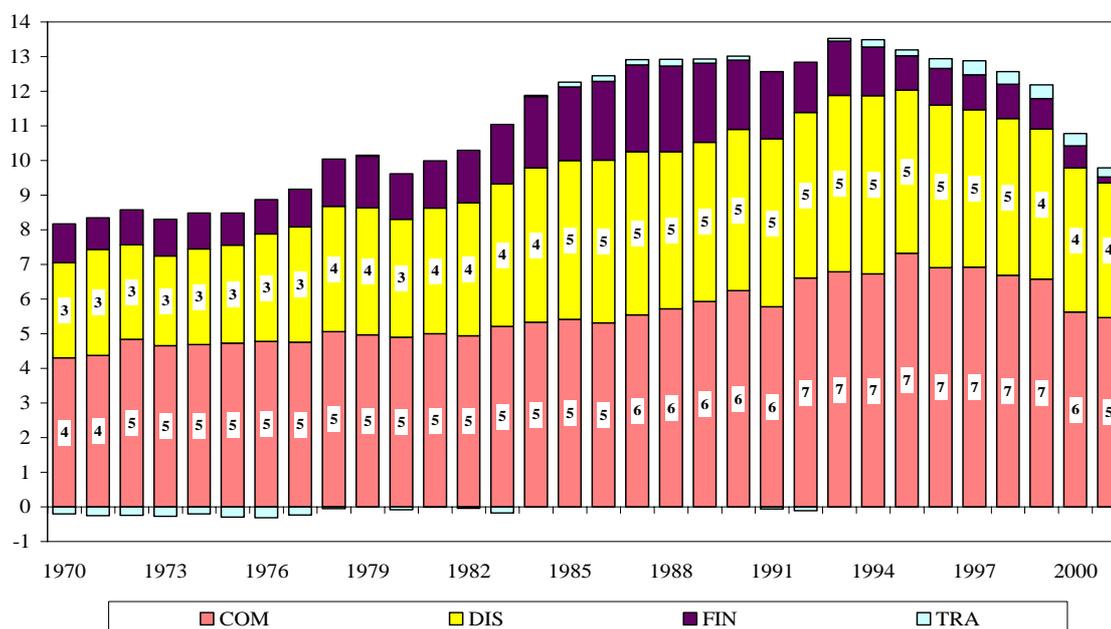
Summarising these structural changes in the EU and USA across the 30-year period, the fundamental point is that the declines in agriculture and industry in Europe are more important in “accounting for” the weaker employment performance compared to the US than is the weaker performance of the service sector which only lagged marginally behind the US in terms of increasing jobs per head of the population. European services would have had to grow exceptionally fast to offset the rapid contraction of male employment in goods production, towards the point where it provided few more jobs than in the US, and to allow women’s employment to converge towards US levels. Instead European services grew a little slower than in the US in relation to the population, so that the long-standing services gap became reflected in overall lower employment rates as the European advantage in numbers of jobs in goods was eroded. The result for Europe was rising unemployment and rising inactivity for men and a slower fall in inactivity for women than in the USA. The rise in male inactivity has been a central feature of Europe’s employment trends and the rapid increase in participation in tertiary education in Europe is part of the story. However it appears also to be closely linked to the rapid structural change discussed above as ex-industrial workers, or their sons in industrial areas, were unable to find suitable work¹¹. The period ended more optimistically with services employment growing faster (relative to the population) than in the USA.

1.4 THE SERVICE INDUSTRIES

The service sector is not only important for its contribution to job growth and the employment gap but also for its sheer size, comprising between two-thirds and three-quarters of all employment. It is a very broad and heterogeneous category including widely diverging industries ranging from the lowest paid to the best paid and encompassing a sizeable public sector. Therefore it is essential to disaggregate and Figure 6 shows how the four component parts of services have contributed to Europe’s jobs deficit (more detail is in Appendix Table A3).

¹¹ Glyn and Erdem (2000) show that across countries rising male inactivity was associated with the rate of deindustrialisation.

Figure 6. The service-industries employment gap, 1970-2001
 Employment-to-population (aged 15-64) ratios for the USA minus five European countries:
 Germany, France, United Kingdom, Spain and Netherlands



The transportation sector is the smallest of the four industries, and it appears to be of similar size and stagnating in terms of contribution to employment in both the USA and Europe. Finance and business services grew rather faster in the USA until the 1990s, after which Europe caught up strongly and hardly left a gap in 2001. The biggest and also fastest growing provider of jobs is community and personal services (including health care, education and public administration as well as hairdressing and the like)¹². It is substantially larger in the US as compared to Europe and its contribution to the jobs deficit grew until the end of the 1990s. Finally the distribution sector is the scapegoat industry in much of the debate about the employment gap. Indeed its contribution to the employment gap has always been large and has increased as much as it did in community and personal services.

1.5 CONCLUSIONS

The employment gap that has emerged between Europe and the USA has affected men and women to a similar extent and has been reflected more in inactivity (rising for men in Europe and falling less fast for European women) than in rising unemployment. A European services-employment gap with the USA is of very long standing and although services employment has risen in relation to population of working age less rapidly in Europe than in the USA, this has contributed less to the emerging employment gap than has the rapid decline of agricultural and industrial employment. Thus the real problem for Europe has

¹² According to STAN Financial and business services made a larger contribution to growth.

been the failure of services employment to converge towards US levels as fast as goods employment has been falling towards US levels. From the mid-1990s, however, the employment gap has declined a little as services employment grew rapidly in Europe. The services employment gap has been concentrated in distribution and in community and personal services, both largely dependent on consumer demand, though these two have decreased in the most recent period. The next section considers a number of explanations for the services-employment gap, which will be evaluated in the final section.

2 EXPLAINING THE EMPLOYMENT GAP

In the preceding section, we saw that Europe has a long-standing service-sector employment gap with respect to the United States and that over recent decades the decline in goods employment in Europe has meant that this shortfall in services has shown up in a growing gap in the overall employment rate – something that plausibly be with us for the next future. Academic and policy discussions of the gap have emphasized four possible explanations. This section briefly sketches the general lines of these positions with respect to the service sector as a whole. Section 3 examines the evidence for and against these positions by analysing the particular case of the distribution sector and, within distribution, retail trade, which the theoretical discussion suggests, should exemplify the role of European labour markets in explaining the lower employment rates.

The first and probably most influential explanation in the current debate over the service-sector employment gap is the view that common features of European labour markets – including powerful unions, generous unemployment benefits, strict employment protection legislation, high minimum wages, and other labour-market institutions – keep wages in European services “too high” thereby pricing less-skilled workers out of employment. According to this view, lowering the effective wage floor, by reducing statutory minimum wages, the power of unions, lowering access to or generosity of unemployment benefits, loosening employment protections, or taking similar steps, would increase employment in European services by allowing employers to hire less-skilled workers at wages that match their lower productivity. Substitution effects in production (more “beggars” in supermarkets) or in consumption (cheaper meals in restaurants as labour costs were reduced) would result in higher employment.

A second possible explanation for the service-sector employment gap is that productivity levels and growth rates in European services are “too high” to absorb workers. In many respects, this argument flows from the first view – that an effective wage floor prices less-skilled workers out of service-sector employment. Since firms in Europe face high wages for less-skilled workers, employers there substitute capital for labour, raising the productivity level in services. If the effective wage floor rises over time, this will drive further investments in labour-saving technology and work organization and the resulting productivity growth will slow employment expansion even as overall demand for services rises. A closely related possibility is that firms facing high effective wage floors will skimp on the quality of services in ways that are difficult to measure. This will give the appearance of high productivity levels or growth rates in services (hotel nights per hour worked, for example), but only because

aspects of quality (sheets not turned down before bedtime) or labour inputs (guests gather their own food for breakfast) are not properly measured.

A third, related explanation for lower service-sector employment in Europe points to features of European product markets rather than labour markets. It is suggested that especially restricted opening hours and local zoning laws, may limit retailers' demand for workers. According to estimates produced by the McKinsey Global Institute, for example, modern food stores are open an average of about 130 hours per week in the United States, compared to just 72 hours in France and 65 hours in Germany (McKinsey, TK, p. 14). Obviously, longer store-opening hours require more employee hours for staffing. Local zoning laws have often been cited as an obstacle to employment creation in retail in France in particular. Zoning laws restrict the ability of large general merchandise retailers from locating large stores in the outskirts of cities and towns. To the extent that these regulations lower the number of stores, they inadvertently restrict employment (as well as raise productivity in the sector as a whole). The McKinsey analyses of retailing place some weight on this factor in explaining low employment, but also note for example that liberalised opening hours would probably have a "small net effect" on employment (McKinsey 2002b p 29). We do not pursue this issue further in this paper.

A final potential explanation for the employment gap in services is that the lower per capita incomes in Europe than in the United States leads to lower demand for services and service employment in Europe. The logic here works through two channels. The first channel is a pure income effect. A large body of research has demonstrated over time and across countries that many services are "luxury" goods whose share in consumption rises faster than total income. The consumption part of the Dempatem project has demonstrated that again, with proper detail. Since most of Europe has a per capita income that is only about 70-75% of the level in the United States, this suggests that Europe should consume a significantly smaller share of service-sector output. Much lower savings rates in the United States (in the low single digits as a percentage of GDP) compared to Europe would reinforce this tendency for a lower share of consumer services. Even if Europeans had the same level of per-capita GDP, Europeans would probably still trail behind the United States with respect to service consumption because Europeans have typically chosen to save a much larger share of their income.

The parallel channel linking per capita GDP to service-sector consumption operates through home production. The most important factor contributing to lower GDP per capita in Europe is European workers' tendency to work far fewer hours than their American

counterparts. Productivity levels per hour worked in many European country (Belgium, France, the Netherlands, Norway, and West Germany, for example) are similar to that of the United States, but GDP per capita levels are much lower because workers in these countries work many fewer hours. In other countries, the US productivity lead is larger, but per capita GDP differences are also much increased by shorter hours worked. With smaller incomes and more time on their hands, European households may engage in household production of many services that would be marketed in the richer, more time-harried, United States (cf. Freeman and Schettkat, 2002). Whilst not linked to the labour market specifically, the lower level of hours worked in Europe is often linked to the relatively high average rates of taxation (see for example OECD 2003).

It should be noted that the hypotheses about wages and productivity to be examined in Section 3 relate specifically to the position in services rather than to the economy as a whole. At the macroeconomic level rapid productivity growth would only tend to be reflected in lower employment rates if the economy was subject to constraints on the growth of aggregate demand – for example if slow growth of world trade and thus exports acted as an effective fetter on macroeconomic expansion. This is certainly possible – indeed OECD has recently noted “the cross-country correlation between the increase in the employment-population ratio during the 1990s and the increase in labour productivity is weakly negative suggesting that a weak trade off may exist between gains in employment and productivity” (2003, p.4). Of course to the extent that this pattern applies, services employment would take its share of the lower employment overall but the problem would not be specific to services. Similarly the issue in relation to wages concerns relative wages in services and the bottom end of the labour market not the issue of overall wage restraint. The latter was of major importance in Europe in the 1970s, but the position has been reversed over the past two decades with real labour costs growing more slowly in aggregate than productivity in many European countries. By 2001 the change in the balance between the two (in favour of productivity) since 1970 in Europe was just as large as in the USA (see chart 1.6 in OECD, 2003).

Given the discussion of the evolution of the employment gap in Section I and the contending hypotheses discussed above, the rest of this paper will focus on the distribution sector. This is based on the following considerations.

- (i) Distribution is a major contributor to the gap between European and US employment rates.

- (ii) Distribution is the major services sector most clearly related to household consumption. Community and Personal Services are differentially supplied by the market and state sectors across countries, which make it extremely difficult to analyse in a comparative framework. Distribution is purely private sector and thus reflects market pressures more directly.
- (iii) Distribution is the most important site of low-skill employment. If European rigidities inhibit the employment at the lower end of the labour market then distribution should exemplify this problem. The OECD (2001, Table 3.8) has shown that more than one half of the employment gap between the EU and USA for low-wage jobs (lowest third of the US wage distribution) was located in distribution and this accounted for over one quarter of the total jobs deficit.
- (iv) Finally, it is possible – as we will see – to make plausible attempts at measuring both productivity growth in distribution over time within an economy and, a much more difficult task, productivity levels across countries. This is important for understanding employment differences.

3 EMPLOYMENT IN DISTRIBUTION

This section engages with the explanations for the employment gap between Europe and the USA discussed in the previous section. The first part describes pay and employment in the retail sector and reports on a detailed econometric analysis of these national data sets covering pay and employee characteristics. The object is to pin down the extent to which these employment and pay patterns are consistent with the notion that employment in this sector in Europe is substantially constrained by labour market rigidities. Section 3.2 widens the analysis to compare productivity and capital accumulation in distribution in the USA and our group of European economies to verify whether these patterns support the rapid wage increase? capital intensification? fast productivity growth? low employment growth picture of European services. Section 3.3 examines the role of the lower level and /or slower growth of consumption demand in limiting employment in distribution in Europe as compared to the USA.

3.1 THE EMPLOYMENT AND WAGE STRUCTURE

In this section we attempt to evaluate the claim that European labour market rigidities are responsible for the employment gap, taking the case of distribution as a sector that should demonstrate the effects of lack of flexibility best. To approach this we have compared the patterns of employment and wages for the USA and four of our European countries using microdata sets¹³. Distribution comprises wholesale trade, retail trade, and hotels and catering¹⁴. Wholesale has a very different character from the other two sub-sectors, being closer to manufacturing in terms of wages, employment patterns etc. To focus as sharply as possible on the segment of the labour market where the impact of rigidities should be most apparent wholesale is left out of the detailed analysis that follows when data allow. To keep the presentation manageable we will present the results mainly for retailing which is the larger sector in terms of employment and which has also been the object of a number of important internationally comparative studies.

The national microdata cover three individual years, chosen at the end of the 1970s, the end of the 1980s and the mid to late 1990s. These microdata sets are either establishment-based

¹³ The data sets are: Current Population Survey (CPS), Beschäftigtenstichprobe, Enquête Emploi (EE), General Household Survey (GHS), Loonstructuuronderzoek (LSO). It has proved impossible to carry out a comparable analysis of Spain due to limitations in the available data.

¹⁴ LFS, STAN and the National Accounts do not have systematic long runs of data for the components of the distribution sector.

(Germany, Netherlands) or household-based and the variables (measures of wages for example) are not always exactly comparable across countries as we note below. The German data consistently concern West Germany unless mentioned otherwise. Accordingly the detailed results are presented for the individual countries without attempts at aggregation.

Table 2. Employment rates for employees in retail, selected years*
Percentages of population of working age

| | EU4 | USA | USA-EU4 |
|--------------|-----|-----|---------|
| end of 1970s | 4.5 | 5.8 | 1.3 |
| end of 1980s | 4.6 | 6.1 | 1.5 |
| mid of 1990s | 4.5 | 6.2 | 1.7 |

*) End of 1970s: UK, US, NL 1979, Germany 1978, France 1982; end of 1980s UK, US 1990, NL and Germany 1989, France 1991; mid of 1990s: France and Germany 1995, NL 1996, US 1997 and UK 1998.

In Section I we showed that distribution plays an important role in the employment gap between the USA and Europe on the basis of LFS data. Based on the microdata evidence the share of retail in distribution was some 45 per cent in Europe¹⁵ in the mid-1990s, being somewhat larger than in the US (41%). It had declined since the end of the 1970s on both sides (Table 2), mainly to the advantage of hotels and catering. European employment in retail was relatively steady as a proportion of the population of working age whereas it continued to expand in the USA. Thus the employment gap in retail (for employees only), already considerable at the end of the 1970s, grew over the period¹⁶.

Table 3 below shows how employment in retail in each country differs in composition – gender, age, part-time working and skill levels – from the national average. The three skill levels are measured using the international ISCED classification’s levels 0-2, 3-4 and 5-7 respectively. Skills are notoriously difficult to compare across countries since the educational systems from which they are derived differ so widely; however these problems are less worrying for the comparisons of retail to the national average.

¹⁵ There are international differences, with wholesale trade playing a more important role in Germany and the Netherlands, countries geared to goods exports and imports.

¹⁶ Part of this gap is compensated for by a higher level of self-employment in European retailing, 1.8% (of the working population) as against 1.0% for the US in 2001. However, the stronger decline in self-employment, particularly in France and the Netherlands, meant that the employment gap including the self-employed grew over the period even more than the employee gap shown in Table 2.

Table 3. Employment characteristics in retail, selected years
*Percentages of national average, dependent employment, full-time equivalents**

| | | women | youth 15-24 | older 51+ | part-time <35hrs | skill | | |
|------|------|---------------|----------------|--------------|---------------------|-------|--------|------|
| | | | | | | low | middle | high |
| USA | 1979 | 106 | 158 | 90 | 210 | 105 | 114 | 50 |
| | 1990 | 107 | 178 | 84 | 197 | 113 | 118 | 49 |
| | 1997 | 105 | 178 | 88 | 180 | 117 | 118 | 54 |
| DE-W | 1978 | 183 | 146 | 98 | 237 | 67 | 120 | 27 |
| | 1990 | 184 | 136 | 82 | 223 | 65 | 118 | 27 |
| | 1995 | 174 | 135 | 98 | 206 | 69 | 116 | 28 |
| FR | 1982 | 113 | 177 | 78 | 120 | 94 | 120 | 32 |
| | 1991 | 117 | 200 | 74 | 129 | 82 | 125 | 34 |
| | 1995 | 113 | 215 | 70 | 117 | 74 | 124 | 42 |
| UK | 1979 | not available | | | | | | |
| | 1990 | 151 | 164 | 78 | 177 | 130 | 115 | 24 |
| | 1998 | 138 | 200 | 85 | 178 | 124 | 130 | 42 |
| NL | 1979 | 124 | 186 | 54 | 223 | 128 | 66 | 9 |
| | 1985 | 147 | 213 | 52 | 183 | 134 | 102 | 13 |
| | 1996 | 143 | 241 | 57 | 164 | 130 | 119 | 28 |

*) FTE except Germany where data is for head count

Sources: Current Population Survey (CPS), Beschäftigtenstichprobe, Enquête Emploi (EE), General Household Survey (GHS), Loonstructuuronderzoek (LSO)

As a broad generalisation, the specific characteristics of retail employment tend to be more constant over time within countries than equal between countries. For example, in every country women are over represented in retail employment as compared to the average for all the industries and the extent to which this is true in a particular country tends to be pretty stable (see USA for example). However in the USA this overrepresentation is minor (less than one tenth in terms of ratio of shares) whereas in Germany the proportion of women employed in retail is nearly twice that in the economy as a whole. In Germany there is much less than average over-representation of young people in retail, in Holland extreme under-representation of older workers, in France less over-representation of part-timers. In terms of age and gender composition of employment US retailing does not seem to be an extreme case – for each characteristic shown in the table either France or Germany (often taken to exemplify “old-Europe’s” excessive regulation) is not so dissimilar from the USA.

When it comes to skills, however, there is a striking difference. In the USA, together with the UK and the Netherlands, the least skilled are over-represented in retail, while in Germany and France there is a smaller proportion of the least qualified than in the economy

as a whole. The USA and France present a striking contrast over the twenty year period – the US moving towards increasing over-representation of the least qualified whereas in France there was increasing under representation. As the proportions of least qualified were declining in the economy, retail seems to have been one of their last US strongholds, whereas in France their share in retail jobs was declining faster than in the economy as a whole. This seems consistent with the notion that regulation was increasingly holding back the employment of the low skilled in this industry which internationally (if not in France) appears as archetypically low skilled. In Germany also the least skilled were strongly under-represented in retail, but in this case without a strong trend. xx

Table 4 presents a similar analysis of the comparative position of retail for some key dimensions of the wage structure. The simplest comparison – average wages – gives the most striking result. Here there seems remarkable uniformity across our five countries – workers in retailing are on average paid around two-thirds to three-quarters of the national average and these ratios are rather stable across time. This seems inconsistent with the over-regulation/wage-compression view of Europe, since in such labour markets employers should have less opportunity to pay below the national average.

For a number of countries the retail wage at the first decile is a considerably higher ratio to the national DI wage than is the case for average wages. This would seem to suggest an effective wage floor even in retail and so it is not surprising to find France in this position. However, this was not true for Germany whilst the USA more closely resembled France. The column for the concentration of workers in the retail sector who are in the bottom third of the pay distribution seems to show France with a greater concentration than does the USA. The right-hand panel focuses on the low skilled (ISCED 0-2) in retailing. In France their wages are pretty close to the national average for the low skilled, whereas in the USA they have been considerably below. However the low skilled in retail have suffered a much bigger penalty still in supposedly over-regulated Germany than in the USA (and bigger still in Netherlands as well as the more liberalised UK). The worst paid amongst the low-skilled were no worse off in retail than they were elsewhere in USA and France, but appear to have been far worse off in retail in Germany and the UK¹⁷.

¹⁷ The fact that the German pay data is monthly and does not include hours worked limits the value of the comparisons involving Germany as it must exaggerate the width of the distribution as numbers of the worst paid also work shorter hours. This problem can be sidestepped more effectively in the regression analysis which follows.

Table 4. Concentrations of pay characteristics in retail by skill levels, selected years
 Percentage of national average, dependent employment, full-time equivalents*

| | | All Workers | | | Low Skill Workers | |
|------|------|--------------|---------|------|-------------------|---------|
| | | average wage | DI wage | <1/3 | average wage | DI wage |
| USA | 1979 | 80 | 97 | 160 | 84 | 98 |
| | 1990 | 74 | 89 | 167 | 83 | 100 |
| | 1997 | 76 | 94 | 162 | 90 | 100 |
| DE-W | 1978 | 74 | 68 | 167 | 74 | 67 |
| | 1990 | 77 | 74 | 157 | 81 | 71 |
| | 1995 | 79 | 77 | 152 | 83 | 78 |
| FR | 1982 | 81 | 98 | 187 | 94 | 99 |
| | 1991 | 80 | 89 | 159 | 94 | 97 |
| | 1995 | 78 | 93 | 183 | 97 | 103 |
| UK | 1979 | | | | | |
| | 1991 | 65 | 76 | 185 | 76 | 85 |
| | 1998 | 62 | 86 | 182 | 74 | 93 |
| NL | 1979 | 73 | 73 | 216 | 79 | 73 |
| | 1985 | 71 | 55 | 210 | 75 | 60 |
| | 1996 | 70 | 67 | 204 | 78 | 66 |

*) FTE and hourly wages, except Germany: head count and monthly wage (median instead of average). No correction for hours worked was possible; consequently average wages in retail may be underestimated in comparison with the average while wage inequality D9:DI may be overestimated relative to the rest.

Sources: Current Population Survey (CPS), Beschäftigtenstichprobe, Enquête Emploi (EE), General Household Survey(GHS) and New Earnings Survey, Loonstructuuronderzoek (LSO)

The picture of retailing employment above derived from this analysis is far from straightforward. Retail in France and Germany does not have the concentration on low skill workers that is typical of the sector in the USA and UK; however, wages are well below the average in the economy on both sides of the Atlantic and the least skilled seem to be much worse off in retail than elsewhere in Germany and the UK but not in France and the USA. The patterns seem in some important respect at odds with the wage compression versus deregulated markets distinction between the USA and Europe. To try and get behind this rather bewildering picture we turn to a more detailed analysis of differences in employment and wage structure.

Econometric analysis of wage and employment structures

If retailing were severely inhibited by labour-market rigidities in Europe we would anticipate that it would be paying wages that were on average much closer to those in the rest of the economy than in the USA. This would be because higher relative wages for the unskilled in general would push up wage costs in this low-skill sector. Minimum wages or welfare-state floors would prevent employers in this sector from taking advantage of slack labour markets

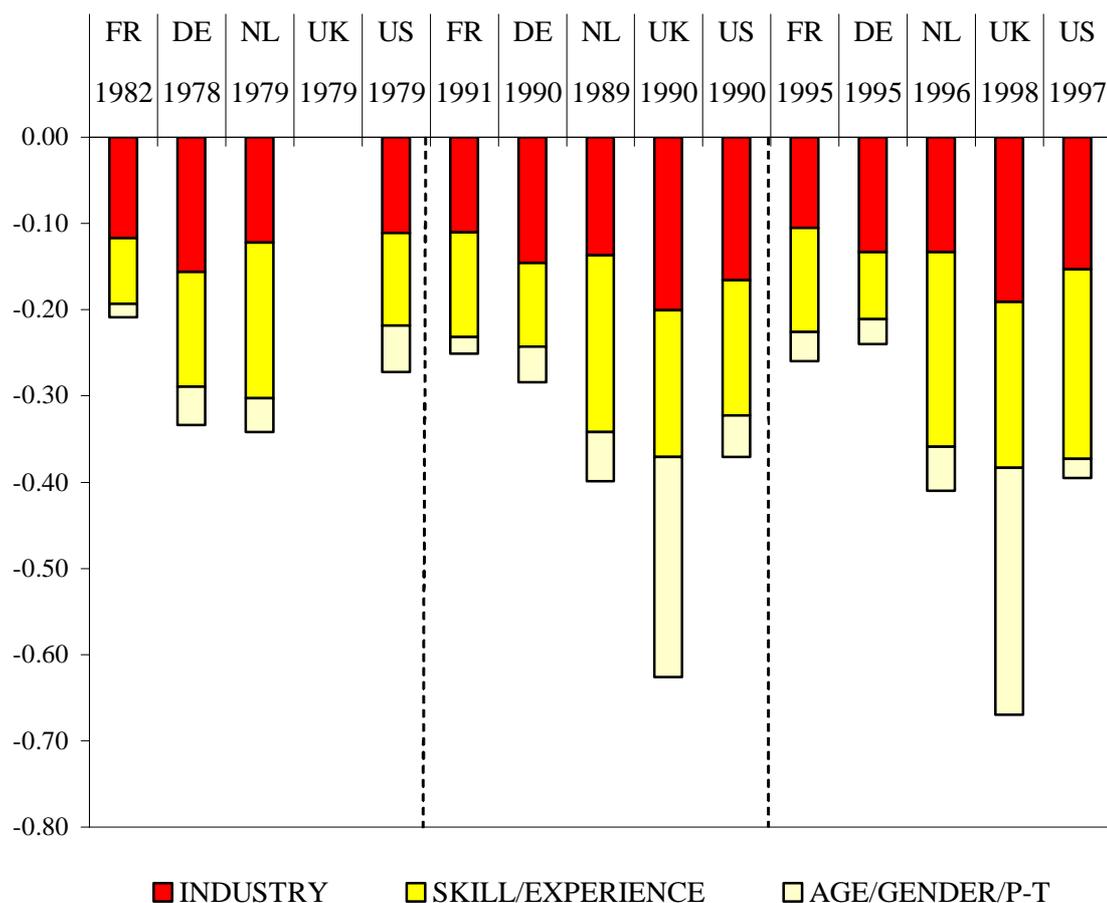
at the bottom end of the pay scale to further economise on wage costs by paying below the going rate for given skill categories (a wage “penalty” for working in retail). Wage compression would also lead to “employment-structure compression” – less opportunity for retail to take advantage of low pay for certain groups (youth for example) who may be quite suitable for work in that sector.

To try and disentangle the wage and employment patterns presented briefly in the descriptive statistics of the previous section we have estimated the wage structure of retail trade relative to the rest of the economy in three successively more complex ways.

The first set of estimates involves a standard wage equation covering all sectors. The results are built up from an initial estimation involving simply a dummy for retail (and another for hotels and catering not reported here), which gives the “raw” industry wage differential. The addition of successive groups of controls (gender, youth and working part-time, experience and skills) whittle away at the industry differential because retail usually employs more of the low-wage categories. The result is an estimate of the retail pay penalty – the average extent to which an individual working in retail is earning less than somebody with the same characteristics working elsewhere¹⁸ These estimates will be refined below with more elaborate estimations, but Figure 7, which reports the results of the first set of regressions, shows that the pure wage penalty for working in retail is substantial and does not differ much between the countries or over time, with the notable exception of the UK. There are also substantial composition effects on the wage bill, to which we return, below. The fundamental point from this simple exercise is that the USA does not appear as clear outliers in retail pay as compared to the European countries.

¹⁸ It should be noted that the latter will still comprise effects for which we could not uniformly control for such a firm size. For Germany and the Netherlands we could establish that this still has a considerable effect. Strictly speaking the comparison is with people outside retail or hotels and catering

Figure 7. Wage differentials to the rest of the economy (excluding hotels and restaurants) for retail trade
To rest of the economy except hotels and restaurants



The above estimates followed the usual route of OLS regression. However the lack of labour market flexibility is supposed to bolster wages, and thus discourage employment, particularly at the bottom end of the wage distribution. Quantile regressions allow an assessment of whether the impact on pay of particular factors, such as industry, varies at different points in the relevant distribution (in this case deciles of the wage distribution). Accordingly a broadly similar wage equation to that used above was re-estimated using quantile methods, at the second (D2), fifth (D5) and eighth (D8) deciles¹⁹. If retailers in the USA were really able to take advantage of greater flexibility at the bottom end of the pay scale to pay very low wages one would expect the “retail penalty” to be greater at D2 in the USA than in Europe even if the average penalty over the distribution was similar.

Table 5 presents the penalties for the retail industry that remain after controlling for worker characteristics. Two features of the US results are striking. Firstly the pay penalties are

¹⁹ Experience was brought in more comprehensively and youth was left out. See Table A6 for the estimated equations at D2 and D5.

consistently *smaller* at the bottom of the pay distribution (D2) than they are higher up. It appears that workers higher up the organisation in US retail take a larger pay hit by working in that sector, as compared to those similarly qualified in other sectors, than do those in the most menial jobs. In this respect the USA is not dissimilar to the other countries where penalties increase the higher is the point in the distribution²⁰. Secondly the size of the pay penalties in US retail, even for those at the bottom of the distribution, are not out of line with those in Europe. After an increase since 1979 in the USA and a decrease in Germany, their D2 retail penalties were very similar at the end of the 1990s (though it was smaller in France, the magnitude of the difference would hardly have a big effect on costs).

Table 5. Pay penalties (%) of retailing by level in the wage distribution

| | USA | | | DE-W | | | UK | |
|----|--------|--------|--------|--------|--------|--------|---------|---------|
| | 1979 | 1990 | 1997 | 1979 | 1990 | 1997 | 1989/90 | 1998/01 |
| D2 | -0.083 | -0.154 | -0.125 | -0.168 | -0.144 | -0.117 | -0.138 | -0.138 |
| D5 | -0.125 | -0.179 | -0.180 | -0.167 | -0.147 | -0.128 | -0.197 | -0.194 |
| D8 | -0.132 | -0.181 | -0.192 | -0.150 | -0.151 | -0.150 | -0.217 | -0.235 |
| | FR | | | NL | | | | |
| | 1982 | 1991 | 1995 | 1979 | 1989 | 1996 | | |
| D2 | -0.079 | -0.088 | -0.076 | -0.121 | -0.144 | -0.187 | | |
| D5 | -0.118 | -0.114 | -0.123 | -0.143 | -0.156 | -0.178 | | |
| D8 | -0.138 | -0.111 | -0.143 | -0.159 | -0.148 | -0.162 | | |

Note: Estimated from national microdata, wage coefficients turned into percentage pay differentials. Controlled for hotels and restaurants, female, three skills levels, 5 experience categories

The third stage in the analysis probes the differentials even further by estimating the pay penalties in retail for different characteristics and at different points in the distribution. There is no reason to suppose that the retail penalty for being low skilled for example will be the same as for the high skilled, and it may be that the low skilled at the bottom of the distribution are the most vulnerable to very low pay. Instead of running regressions with a dummy for retail this involves separate wage equations for retail and for the whole economy. Then the differences in average wages between retail and the rest of the economy are decomposed into impact of the retail pay penalties suffered by each group (such as the least skilled) and the impact of the various composition differences in the workforce (larger number of unskilled in retail and so forth). Again, since these effects can all vary between different points in the distribution, these regressions were estimated for different decile

²⁰ Dutch retailing in 1996 seems an exception, but it also had a particularly low share of high skilled.

points. The equation involved a number of interactions²¹, and a Blinder-Oaxaca decomposition was made to determine the contributions of the elements of employment structure on the one hand and of the array of retail pay penalties for the various worker characteristics on the other hand.

Table 6 presents the results of the Blinder-Oaxaca decomposition of the wage differentials between retail trade and the whole economy for the earliest and latest years. The results refer to regressions at the median wage level, but those at the level of the second decile are very similar and lead to comparable conclusions (see Table A7).

²¹ The basic equation for the estimation was:

$$\ln w_i^{\theta} = \alpha_0 + \alpha_1 EXP_i + \alpha_2 EXP_i^2 + \alpha_3 PT_{1i} + \alpha_4 PT_{2i} + \alpha_5 \sum_{n=2}^6 DSKILL_{n,i}$$

+ interactions of part-time with gender and skills
+ interactions of experience and experience squared
with gender and skills + error

Table 6. Decomposition of the retail wage differential at the median wage level, 1979 and 1997

| | Rewards Differ- ence | Compo- sition | Inter- actions | Total | Rewards Differ- ence | Compo- sition | Inter- actions | Total |
|---------------|-------------------------------------|--------------------------|---------------------------|---------------|-------------------------------------|--------------------------|---------------------------|---------------|
| | USA 1979 | | | | Germany 1979 | | | |
| Skill-Effect | -0.084 | -0.051 | 0.015 | -0.120 | -0.200 | -0.062 | 0.016 | -0.246 |
| <i>Low</i> | 0.009 | -0.010 | 0.000 | -0.018 | -0.081 | -0.001 | 0.034 | -0.048 |
| <i>Medium</i> | -0.042 | -0.008 | -0.004 | -0.054 | -0.111 | -0.045 | -0.024 | -0.180 |
| <i>High</i> | -0.033 | -0.034 | 0.019 | -0.048 | -0.008 | -0.015 | 0.006 | -0.017 |
| Part-Time | 0.009 | -0.123 | 0.009 | -0.105 | 0.012 | -0.068 | 0.017 | -0.039 |
| Experience | -0.053 | -0.068 | 0.006 | -0.115 | 0.078 | -0.033 | -0.055 | -0.011 |
| Total | -0.129 | -0.241 | 0.030 | -0.340 | -0.110 | -0.163 | -0.023 | -0.295 |
| | USA 1997 | | | | Germany 1997 | | | |
| Skill-Effect | -0.074 | -0.084 | 0.025 | -0.133 | -0.110 | -0.034 | 0.012 | -0.117 |
| <i>Low</i> | -0.003 | -0.015 | -0.001 | -0.019 | -0.010 | 0.009 | 0.010 | 0.009 |
| <i>Medium</i> | -0.016 | -0.014 | -0.002 | -0.032 | -0.086 | -0.014 | 0.006 | -0.094 |
| <i>High</i> | -0.055 | -0.056 | 0.028 | -0.082 | -0.015 | -0.029 | 0.012 | -0.032 |
| Part-Time | 0.001 | -0.101 | 0.001 | -0.099 | 0.017 | -0.083 | 0.018 | -0.049 |
| Experience | -0.097 | -0.065 | 0.014 | -0.148 | -0.031 | -0.047 | -0.032 | -0.110 |
| Total | -0.170 | -0.251 | 0.040 | -0.380 | -0.125 | -0.164 | 0.014 | -0.276 |
| | France 1982 | | | | Netherlands 1979 | | | |
| Skill-Effect | 0.00 | -0.044 | 0.004 | -0.040 | -0.110 | -0.083 | -0.037 | -0.230 |
| <i>Low</i> | 0.006 | -0.000 | 0.005 | 0.011 | -0.113 | -0.041 | -0.028 | -0.182 |
| <i>Medium</i> | -0.008 | -0.006 | 0.001 | -0.013 | -0.011 | -0.001 | 0.003 | -0.009 |
| <i>High</i> | 0.001 | -0.037 | -0.002 | -0.038 | 0.014 | -0.040 | -0.013 | -0.039 |
| Part-Time | -0.015 | -0.013 | 0.002 | -0.026 | 0.002 | -0.119 | 0.003 | -0.113 |
| Experience | -0.078 | -0.039 | -0.007 | -0.124 | 0.013 | -0.089 | 0.017 | -0.060 |
| Total | -0.093 | -0.096 | -0.001 | -0.189 | -0.094 | -0.291 | -0.017 | -0.403 |
| | France 1995 | | | | Netherlands 1996 | | | |
| Skill-Effect | -0.055 | -0.068 | 0.016 | -0.106 | -0.228 | -0.083 | 0.006 | -0.305 |
| <i>Low</i> | -0.009 | 0.004 | 0.004 | 0.000 | -0.076 | -0.025 | -0.034 | -0.135 |
| <i>Medium</i> | -0.024 | -0.017 | -0.002 | -0.042 | -0.077 | -0.003 | -0.016 | -0.096 |
| <i>High</i> | -0.022 | -0.055 | 0.014 | -0.064 | -0.075 | -0.054 | 0.056 | -0.075 |
| Part-Time | -0.015 | 0.004 | -0.003 | -0.014 | -0.023 | -0.159 | -0.017 | -0.198 |
| Experience | -0.064 | -0.055 | -0.001 | -0.119 | 0.088 | -0.143 | 0.003 | -0.052 |
| Total | -0.134 | -0.119 | 0.013 | -0.239 | -0.162 | -0.385 | -0.008 | -0.555 |
| | UK 1989/90 | | | | | | | |
| Skill-Effect | -0.135 | -0.076 | 0.026 | -0.185 | | | | |
| <i>Low</i> | -0.047 | -0.016 | 0.001 | -0.062 | | | | |
| <i>Medium</i> | -0.049 | -0.003 | -0.004 | -0.056 | | | | |
| <i>High</i> | -0.039 | -0.057 | 0.029 | -0.067 | | | | |
| Part-Time | -0.012 | -0.191 | 0.010 | -0.193 | | | | |
| Experience | 0.030 | -0.236 | -0.019 | -0.225 | | | | |
| Total | -0.117 | -0.503 | 0.017 | -0.603 | | | | |
| | UK 1998/2001 | | | | | | | |
| Skill-Effect | -0.138 | -0.095 | 0.025 | -0.209 | | | | |
| <i>Low</i> | -0.023 | -0.022 | -0.002 | -0.047 | | | | |
| <i>Medium</i> | -0.042 | -0.023 | -0.012 | -0.078 | | | | |
| <i>High</i> | -0.073 | -0.050 | 0.039 | -0.084 | | | | |
| Part-Time | 0.002 | -0.251 | 0.008 | -0.242 | | | | |
| Experience | -0.037 | -0.083 | 0.010 | -0.110 | | | | |
| Total | -0.173 | -0.429 | 0.042 | -0.561 | | | | |

In 1997 USA retail workers at the median wage were paid some 38% less on the whole than workers in the economy overall (the bold figures) and this raw differential was bigger than in Germany (28%)²² and France (24%). In the UK and the Netherlands on the other hand this raw differential was substantially larger (both 56%). The mutual differences are explained primarily by the composition effects, which range from 12 % in France to 43 % in the UK, while the rewards differentials – the pure pay effects – are unexpectedly in a much narrower band internationally (between 13 in France and Germany to 16-17% in the USA, the UK and the Netherlands).

Turning first to the details of the rewards differences the combined contribution of skills is remarkably smaller in the USA than in Europe, except for France. It is particularly striking that the contribution of low skills is generally smaller than at higher levels – it is of any substance only in the Netherlands. As we found before, the high skilled are also facing a pay penalty in retailing; in the USA and the UK in mid-1990s it was only the most qualified who received distinctly lower pay through working in retail. The movements over time for skills are tiny in the UK and USA while a substantial widening occurred in the Netherlands and France and a narrowing in Germany. In spite of this the contribution of skills in Germany was still larger in the 1990s than in the USA. Part-time workers generally contribute little to the pay penalty. Experienced workers have a bigger retail penalty in the USA and France than in Germany, France and the Netherlands²³. The total impact of rewards increased in all five countries, putting retail workers at a greater distance to the average.

The composition effects span a wide range but the combined contribution of skills to this is quite comparable for France, the Netherlands and the USA but smaller in Germany and larger in the UK. The role of the least skilled in this is generally very small and, again, the higher levels of skill play a more important role, for the high skilled mainly through their absence in retailing²⁴. The contribution of part-time workers is particularly important for explaining the international variation in the composition effects as it varies from virtually nil in France to 25% in the UK. Finally, the role of experience is strongly negative in the Netherlands and moves within a restricted band for the other countries of 5 to 8 %. Although the specific effects vary somewhat over the period, the total impact of composition

²² Lack of detailed hours data for Germany means that the estimations refer to monthly wages for the countries. To the extent that workers in retailing work shorter hours this raw differential is exaggerated (and the effect may vary across countries). Some part of this hours effect is caught in the compositional effect for part-time workers which has a rather similar impact in Germany and the US.

²³ The Dutch case, remarkably enough, has a positive experience effect that may compensate for the substantial skills effect; it also goes together with a substantial composition effect for experience.

²⁴ It may seem puzzling that all three skill categories can contribute negatively to the composition effect; the large negative effect for the intermediate category in Germany reflects the concentration there of women who are paid nationally less than average and an underrepresentation of intermediate-skill men who nationally are paid slightly above the average. It must be remembered that the composition effects are all reckoned using national differences in wages of the group from the average wage.

seems really rather stable with the exception of the Netherlands. The third type of effects in the decomposition, the interactions, contributes little to the raw differentials though they can explain the slight narrowing for Germany.

The results of the second-decile regressions (see Table A.7) are generally very close to the results at the median discussed above. If flexibility particularly affects the bottom end of the pay distribution then one might expect greater pay penalties in a low-paying sector at the bottom of the pay distribution. Indeed the American raw differential is a bit larger than elsewhere, with the exception of the Netherlands, but again the variation in composition effects contributes more than the rewards differences. In addition it can be observed that the raw differentials are always smaller at the second decile than at the median, with the exception of Germany in 1979. In the breakdown both the rewards and the composition effects are always smaller, with the exception of both in Germany in 1979, rewards alone in the UK in 1979 and composition alone in the Netherlands in 1996. At the same time rewards effects are much smaller now for the Netherlands in 1996 and composition effects are particularly much smaller for the UK than at the median, bringing the country more in line with the rest. The rewards effect decreases substantially over time in Germany and less in the UK while it grows in the other three countries. For the least skilled the outcomes are virtually the same as at the median and again the higher levels contribute more. The pictures for part-time work and experience are also basically unchanged.

According to the flexibility hypothesis one would have expected a substantial retail penalty for the low skilled in the USA as they are sorted into those with low ability and employed in low-productivity tasks in that sector. But it turns out that the low skilled, even those at the bottom of the distribution, suffer a retail penalty in the USA which may be even lower than in the EU-countries and is certainly less important than for the better skilled. German retailers (and to a lesser extent French retailers) are roughly equally able to benefit from paying lower than average wages for particular types of workers. Retailers in the USA, but particularly in the Netherlands and the UK, gain more by focussing their labour force on particular categories that are paid less across the board, but these have been the inexperienced and particularly part-time workers rather than the least skilled. It may be that non-wage labour market regulation (but perhaps also firm behaviour regarding quality (Germany) or organisation of working time (France)) has played a role in preventing French and German employers from following suit, but this cannot be the whole story – not even the dominant story – and so, in the final analysis, other explanations have to be taken into account such as product market regulations of opening hours for example (see Section 2).

This section has sought to discover whether retailing has been inhibited in Europe, as compared to the USA, by not being able to employ a relatively low-waged work force as compared to the rest of the economy. This does not appear to be the case in general, as those advantages which the USA do have (cheap part-time workers for example) are compensated by other effects (such as lower than average pay for medium skilled workers, often women, in Germany especially). We are not suggesting that labour market regulations play no role²⁵, they seem to do, but the employment and wage patterns analysed here do suggest that they cannot have been the only and presumably not the dominant influence on employment differences.

3.2 PRODUCTIVITY AND CAPITAL ACCUMULATION

If distribution employment was being inhibited by labour market inflexibilities this should be reflected in labour productivity being too high or having grown too fast. More flexible wages should have resulted in less substitution of capital for labour and less substitution of skilled labour for unskilled labour. Both of these would have reduced the growth of labour productivity and increased employment. Comparing such trends in Europe and the USA should provide evidence for what is constraining employment.

Changes in the volume of distribution output within countries are typically measured by deflating measures of current-price sales by retail-price indices to obtain sales volumes. Indices for different types of stores are then weighted by the average gross margin (assuming that differences in margin at a point in time reflect differences in the output produced by the store). The index for total real sales is linked to base-year current-price value added to obtain value added at constant prices as published in National Accounts. This in turn is used with employment data to construct labour productivity etc.

²⁵ The very informative McKinsey report on retailing notes "US retailers provide services with a low value-added (such as checkout baggers), which are not provided in Europe.....the input required for these extra services accounts for 8 percent of the labour volume...The checkout baggers in the US are paid less than the French minimum wage. Although data availability for Germany is limited, we believe that the minimum wage has the same effect as in France. The minimum wage, therefore, may restrict the kind of services provided. If French retailers were to provide bag-packing services compensated at the current minimum wage, the increase in cost would outweigh customers' willingness to pay for the service... Europeans are expected to be less willing to pay for low value-added services due to their lower income levels." (McKinsey 2002 pp 17-30)

Table 6. Hourly labour productivity growth
Annual average (%)

| | Manu- facturing | Distri- bution | Wholesa le trade | Retail trade | Hotels & catering | Market Sector | Whole economy |
|--------------------------|----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------------|--------------------------|--------------------------|
| USA | | | | | | | |
| 1970-79 | 2.2 | 1.5 | 2.5 | 2.3 | -1.6 | 1.1 | 1.3 |
| 1979-90 | 2.3 | 2.1 | 3.7 | 2.5 | -0.4 | 1.0 | 1.2 |
| 1990-99 | 3.7 | 3.7 | 5.1 | 3.1 | 0.4 | 1.5 | 2.3 |
| UK | | | | | | | |
| 1970-79 | 3.0 | 1.5 | | 1.9 | -1.4 | 2.7 | 3.1 |
| 1979-90 | 4.5 | 2.0 | | 2.5 | -0.2 | 2.2 | 2.6 |
| 1990-99 | 2.3 | 1.9 | 4.4 | 1.8 | -1.3 | 2.1 | 2.1 |
| France | | | | | | | |
| 1970-79 | 5.3 | 3.2 | | | 1.9 | 4.4 | 4.6 |
| 1979-90 | 3.3 | 1.9 | | | -0.1 | 2.9 | 3.1 |
| 1990-99 | 2.9 | 0.6 | | | -1.3 | 1.3 | 1.1 |
| W.Germany/Germany | | | | | | | |
| 1970-79 | 4.8 | 3.4 | 3.7 | 4.2 | 1.4 | 3.4 | 3.8 |
| 1979-90 | 2.2 | 1.8 | 2.1 | 2.2 | 0.3 | 1.7 | 1.9 |
| 1990-99 | 3.5 | 0.5 | 0.9 | 0.7 | -3.9 | 2.4 | 2.5 |
| Netherlands | | | | | | | |
| 1970-79 | 4.5 | 3.7 | | | | | 3.0 |
| 1979-90 | 3.7 | 1.7 | | | | | 1.9 |
| 1990-99 | 2.8 | 1.4 | 1.7 | -0.4 | 1.4 | 1.1 | |

Source: Mary O'Mahony (2002), Netherlands author's calculations from STAN 2003 (Market sector excl. agriculture)

The underlying assumption (Fuchs, 1968, chapter 5) is that the quantity and quality of service per real dollar of sales remains constant over time, which is controversial (24 hour-shops, lack of informed assistants, time spent queuing etc. etc.). A more recent refinement in measurement (in the US at least) has been to apply double deflation to this sector, so that changes in the real use of intermediate inputs (but still not quality changes) are taken into account. This augmented measured productivity growth in US retailing in the 1980s very slightly, rather more in wholesale (Mohr 1992).

Table 7 below reports the data for the growth of labour productivity in distribution as calculated by Mary O'Mahony (2002).

In the 1970s continental Europe appeared to have distinctly higher productivity growth in distribution than did the USA. This was true also for the economy as a whole and included the final burst of "catch-up" of productivity to American levels. This was also the era of wage pressure, a rising NAIRU and a profit squeeze throughout Europe. These developments may very well have put pressure on employment in distribution as in other sectors.

This pattern did not persist into the 1980s when productivity in distribution grew at very comparable rates in Europe and USA. So there is no suggestion that distribution employment in Europe was being inhibited by “excessive” productivity growth as compared to the USA. In the 1990s the contrast is even stronger. Productivity in US distribution steamed ahead, 2–3% per year faster than in France, Germany and Netherlands, under the pressure of Wal-Mart and aided by the introduction of new technologies (see Nordhaus 2002, McKinsey 2002, Basker 2002). French and German productivity growth was also distinctly slower than in the UK where labour market deregulation had proceeded far down the US road. In Europe labour productivity growth in distribution has also been distinctly slower than in manufacturing, which is not the case in the USA (or in the UK in the 1990s). If inflexible labour markets were preventing the employment of low-wage labour in Europe this would be expected to have a stronger impact in distribution than manufacturing. This should then show up in distribution productivity performing more strongly in Europe relative to manufacturing than was the case in the more flexible USA and UK – the opposite of the observed pattern. Obviously many other factors influence productivity but this set of productivity data does not provide support for the view that rigid labour markets seriously inhibited employment growth in European distribution²⁶

Inflexible labour markets by raising labour costs could encourage capital/labour substitution and therefore labour-productivity growth. Was capital/labour substitution stronger in the low-paid service sectors in Europe than in the USA? The O’Mahony data set provides disaggregated capital series constructed around a common set of assumptions and we reproduce below (Table 8) data on the growth of the capital/labour ratio.

Table 7. Growth rate of capital/labour ratio
Annual average (%)

| | Manu- facturing | Distri- bution | Wholesale trade | Retail trade | Hotels & catering | Market Sector | Whole economy |
|------------|----------------------------|---------------------------|----------------------------|-------------------------|----------------------------------|--------------------------|--------------------------|
| USA | | | | | | | |
| 1970-79 | 2.3 | 1.5 | 4.5 | 1.9 | -2.1 | 1.3 | 0.4 |
| 1979-90 | 2.3 | 2.3 | 4.5 | 1.7 | 0.8 | 1.1 | 0.3 |
| 1990-99 | 2.9 | 3.1 | 4.8 | 2.8 | 1.6 | 1.6 | 1.1 |
| UK | | | | | | | |
| 1970-79 | 2.2 | 3.9 | 2.8 | 5.0 | 2.1 | 2.6 | 2.5 |

²⁶ The qualification about the data set is important. The O’Mahony data set is very carefully constructed from national and OECD sources (including STAN) and is specifically designed for productivity analysis. However the latest version of OECD’s STAN database yields a different pattern for productivity growth in distribution over the last two decades (France and USA were the only countries in our sample with hours data in STAN). The STAN results for the USA for the last period are very surprising and seem to conflict with the national data. But even if this STAN data for France was correct, productivity there was growing no faster than in the USA according to the O’Mahony data. The productivity data we have constructed based on goods consumption (see next section) shows the same pattern of acceleration in the USA and deceleration in France as O’Mahony (though it shows faster productivity growth in France in the 1980s). This variability of results across data sets underlines how tentative conclusions should be.

| | | | | | | | |
|--------------------------|-----|-----|-----|-----|------|-----|-----|
| 1979-90 | 3.8 | 4.1 | 3.5 | 5.1 | 2.6 | 2.7 | 2.4 |
| 1990-99 | 2.3 | 4.2 | 4.3 | 4.3 | 3.5 | 2.4 | 2.6 |
| France | | | | | | | |
| 1970-79 | 4.2 | 3.9 | 4.0 | 3.3 | 3.7 | 4.5 | 3.1 |
| 1979-90 | 5.4 | 3.2 | 2.9 | 3.5 | 3.0 | 3.6 | 2.4 |
| 1990-99 | 3.1 | 2.1 | 2.3 | 2.0 | 1.1 | 2.0 | 1.6 |
| W.Germany/Germany | | | | | | | |
| 1970-79 | 3.4 | 3.0 | 2.9 | 3.2 | 2.8 | 4.9 | 3.7 |
| 1979-90 | 1.8 | 1.3 | 1.7 | 1.7 | -0.4 | 1.6 | 1.7 |
| 1990-99 | 4.3 | 2.2 | 3.1 | 2.5 | 0.2 | 3.3 | 2.8 |

Source: calculated from Mary O'Mahony (2002)

In the 1970s the capital/labour ratio grew distinctly faster in distribution in Europe than in the USA (a similar pattern to that for labour productivity noted above). This trend continued in France in the 1980s, but not in Germany; even in France the rate of capital intensification was less than in the UK where deregulation was proceeding apace. In the 1990s the growth of capital intensity was less in France and Germany than in the USA and much less than in the UK. Labour input is measured in terms of employment rather than total hours worked because this is probably the better measure of the capital intensity of the production process²⁷. Given the faster decline in hours of work in Europe, measuring capital intensity in relation to total hours worked increased the sharpness of the rise in Europe in the 1970s especially. But by the 1990s adjusting for average hours makes little difference to these international comparisons and the conclusion stands of at least no faster increase in capital intensity in distribution in continental Europe than in the USA.

Comparisons of changes in capital intensity will typically be more robust than comparisons of levels, since levels are more dependent on assumptions about asset lives and in addition there is the complication of calculating Purchasing Power Parities for capital stocks. Bearing these provisos in mind, the O'Mahony data set allows the following comparisons (Table 9) for levels of capital intensity in distribution in total and in retail.

Table 8. Capital/labour ratios levels in 1999
x 1000 per person employed (1996 \$)

| | USA | Germany | France | UK |
|--|------|---------|--------|------|
| Distribution | 40 | 32 | 55 | 23 |
| Retail | 29 | 28 | 54 | 19 |
| Retail Capital/labour relative to manufacturing Capital/labour | 0.34 | 0.43 | 0.56 | 0.31 |

Source: Mary O'Mahony (2002)

According to these data the capital/labour ratio is no higher in German distribution and retail than it is in the USA despite much higher labour costs in Germany. The UK has lower

²⁷ This will be true to the extent that the utilisation of capital is correlated with average hours worked per employee (so that a declining working week is associated with declining hours of utilisation).

capital intensity as would be expected from its low-wage/low-investment reputation (and despite apparently heavy increases in capital intensity over the past 25 years). These data suggest very high capital intensity indeed in France. But if this were mainly a reflection of European-style labour market inflexibilities then a similar pattern would be expected for Germany. The only hint in the German data of capital intensification in low-wage services is that the ratio of capital intensity in retail relative to manufacturing is rather higher than in the USA and UK. If inflexibility in labour markets bears more heavily on low-wage services than on high-wage manufacturing (which is rather plausible) then some effect of this sort would be expected. Even so, there is no consistent picture of higher capital intensities in continental Europe nor (as we have seen earlier) the higher or faster growing labour productivity that should be associated with it.

Finally we examine the pattern of increases in real labour costs. These are measured in terms of “product wages”, that is money wages deflated by the price index for value added in the sector concerned.

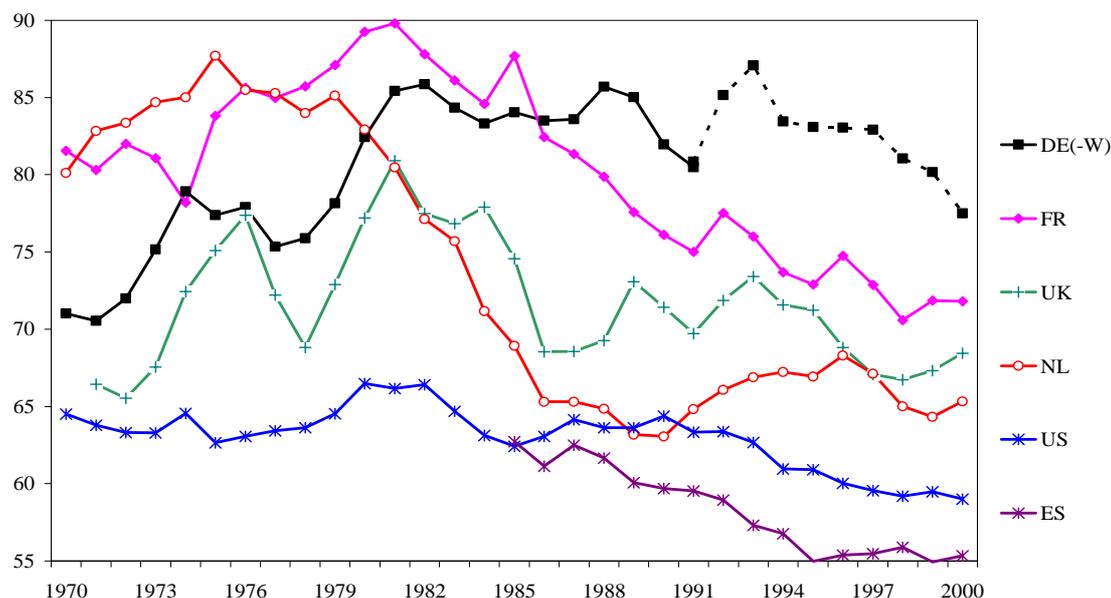
In parallel to the results for productivity and capital intensity, product wages in distribution rose rapidly in France and Germany in the 1970s and represented a substantial squeeze on profits as labour’s share rose strongly (in the UK and Netherlands as well – Figure 8). However in the 1980s product wage growth slowed down and was no faster than in the USA and UK. In the 1990s product wages hardly grew at all in Europe while moving up steadily in USA and UK.

Table 9. Growth of hourly product wages
Annual average (%)

| | <i>Manu- facturing</i> | <i>Distribu- tion</i> | <i>Wholesale Trade</i> | <i>Retail trade</i> | <i>Hotels & catering</i> | <i>Market sectors</i> | <i>Whole economy</i> |
|--------------------------|----------------------------|---------------------------|----------------------------|---------------------|----------------------------------|---------------------------|--------------------------|
| USA | | | | | | | |
| 1970-79 | 2.3 | 1.3 | 2.0 | 2.2 | -1.7 | 0.9 | 1.1 |
| 1979-90 | 1.6 | 2.1 | 4.3 | 1.9 | -0.5 | 0.8 | 0.9 |
| 1990-99 | 2.9 | 2.7 | 4.0 | 2.2 | -1.3 | 1.0 | 2.1 |
| UK | | | | | | | |
| 1970-79 | 3.8 | 1.7 | | | | 2.7 | 3.1 |
| 1979-90 | 4.0 | 1.7 | | | | 2.2 | 2.6 |
| 1990-99 | 2.4 | 2.1 | 4.4 | 1.8 | -1.3 | 1.8 | 2.0 |
| France | | | | | | | |
| 1970-79 | 5.7 | 4.6 | | | 2.7 | 5.1 | 5.4 |
| 1979-90 | 2.0 | 1.2 | | | -0.2 | 2.0 | 2.2 |
| 1990-99 | 2.5 | 0.4 | | | -1.8 | 1.6 | 1.3 |
| W.Germany/Germany | | | | | | | |
| 1970-79 | 5.8 | 4.6 | 3.7 | 4.2 | 1.4 | 4.1 | 3.6 |
| 1979-90 | 2.6 | 2.5 | 2.2 | 3.6 | 0.8 | 1.6 | 1.6 |
| 1990-99 | 3.7 | 0.1 | 0.9 | -0.5 | -3.9 | 2.1 | 1.9 |

Source: calculated from Mary O'Mahony 2002 as the sum of the growth rate of hourly labour productivity and the growth rate of labour's share in value added (adjusted for self-employment).

Figure 8. Labour share in value added in distribution
Corrected for the decline of self-employment



Labour's share tended to decline steadily in European distribution in the 1980s, with the exception of Germany. The fall continued for France in the 1990s to a level well below that of the early 1970s. Without the effect of unification the German labour share would have probably have declined like France in the 1990s²⁸. The USA stands out for its high profit share, but as we have seen above this does not seem to reflect a greater ability in the USA than Europe to pay much less than economy-average wages.

3.3 EMPLOYMENT IN DISTRIBUTION AND THE GROWTH OF CONSUMPTION

In comparing the evolution of employment across countries it is most helpful to have an internationally comparable measure of production. The national measures of productivity used in the previous section do not readily lend themselves to international comparison of levels. Attempts to measure sectoral productivity by value added deflated by a PPP for appropriate expenditure categories (see Barnard and Jones 1996, Dollar and Wolff 1993) are very seriously flawed. As argued in the appendix to our more detailed working paper such measures depend on productivity in the whole economy rather than measuring efficiency in the sector concerned (Glyn & Salverda, 2004). Sales of goods are the fundamental "throughput" into distribution and this suggests a natural if crude measure of productivity in

²⁸ The labour share was corrected for self-employment based on a count of heads instead of hours. This may have contributed to the Dutch increase of the 1990s.

distribution across countries – consumers expenditure on goods at international PPP prices, per person employed (or hour worked) in distribution. Moreover measuring productivity by “goods consumption per hour” facilitates a very simple decomposition of the determinants of employment in distribution into goods consumption on the one hand and labour productivity in distribution on the other:

$$\frac{\text{Hours Worked in Distribution}}{\text{Population of Working Age}} = \frac{\text{Consumption of Goods}}{\text{Pop of Working Age}} \times \frac{\text{Hours in Distribution}}{\text{Consumption of Goods}}$$

Consumption of goods per head of the working population can be thought of as representing the demand for distribution, in turn reflecting per capita incomes, taxation and savings, choices between goods and services etc. Consumption of goods per hour worked in distribution is a gross-output measure of labour productivity. It does not cope with the subtleties of different types of distribution. However this decomposition does allow us to see whether the “employment deficit” in European distribution is mainly due to low throughput (low consumption of goods) or to high productivity and how these factors have influenced comparative employment trends over time.

Before looking at the results of our analysis a word is in order about data construction. Our estimate of consumption of goods starts from the OECD’s 1999 figures at PPPs – we include consumption of goods strictly defined plus expenditure on hotels and restaurants (a procedure which is partly anticipated in the American national accounts which includes expenditure on restaurants in with goods sales, not services). Of course part of wholesale business is concerned with capital goods and exports but still consumption of goods appears to be a pretty comprehensive indicator of distribution output ²⁹. The 1999 data at PPPs are then linked to constant-price National Account series for goods consumption to derive time series at 1999 international prices (and the same is done for total consumption and GDP). The population measure is restricted to ages 15-64 to reflect our primary focus on employment but it implies that per capita consumption as used here differs from the conventional measure. Series for employment in distribution and hours worked are far from unproblematic and in this section we have relied primarily on the National Account series comparisons (the caveat entered above about variation across data sources applies here also). The necessary data were not available for Spain.

Figure 9 shows the number of hours worked in distribution in a year expressed per person aged 15-64 (so the figure represents how long each person of working age would be

employed in distribution if they were performing their share of total work done in that sector). The USA already had more employment in distribution 30 years ago but the differences have subsequently increased rather dramatically as work in distribution in the USA has grown rather steadily, whilst there has been little overall trend in Europe except in France where distribution work has declined. By 1999 work in distribution per head was 304 hours, 239 in UK, 217 in Germany and 175-180 in France and Netherlands. So the USA has around at least 25% more distribution work per head of the population than the UK and nearly 75% more than France and Netherlands (Figure 10) – truly enormous differences³⁰.

Figure 9. Hours worked in distribution per head of population aged 15-64

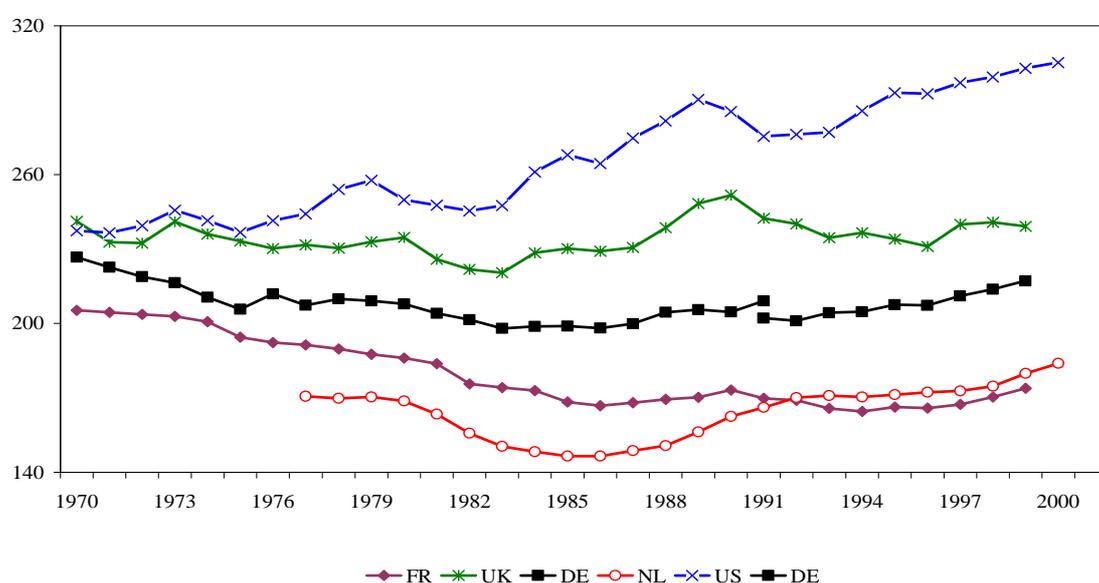


Figure 10. Hours worked in distribution per head of population aged 15-64
Relative to USA, USA = 1

²⁹ Annual changes in consumption of goods is actually more closely correlated over time with total hours worked in US distribution than is the official series for constant-price value added.
³⁰ By 1999 average annual hours worked by each worker in distribution were 1500-1600 other than in the Netherlands where the greater incidence of part-time work apparently pushed the figure down as low as 1200.

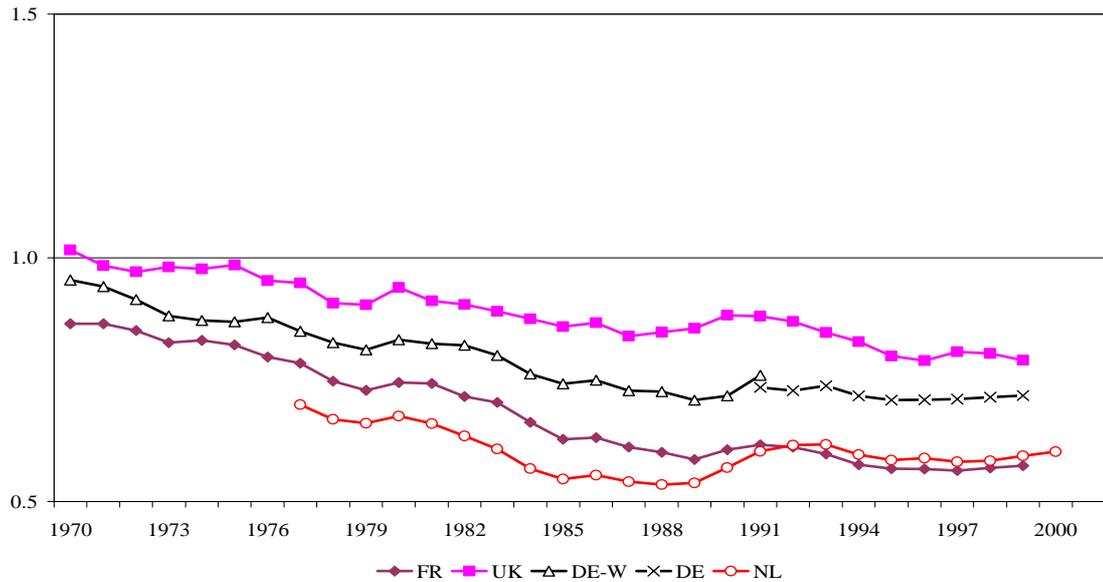
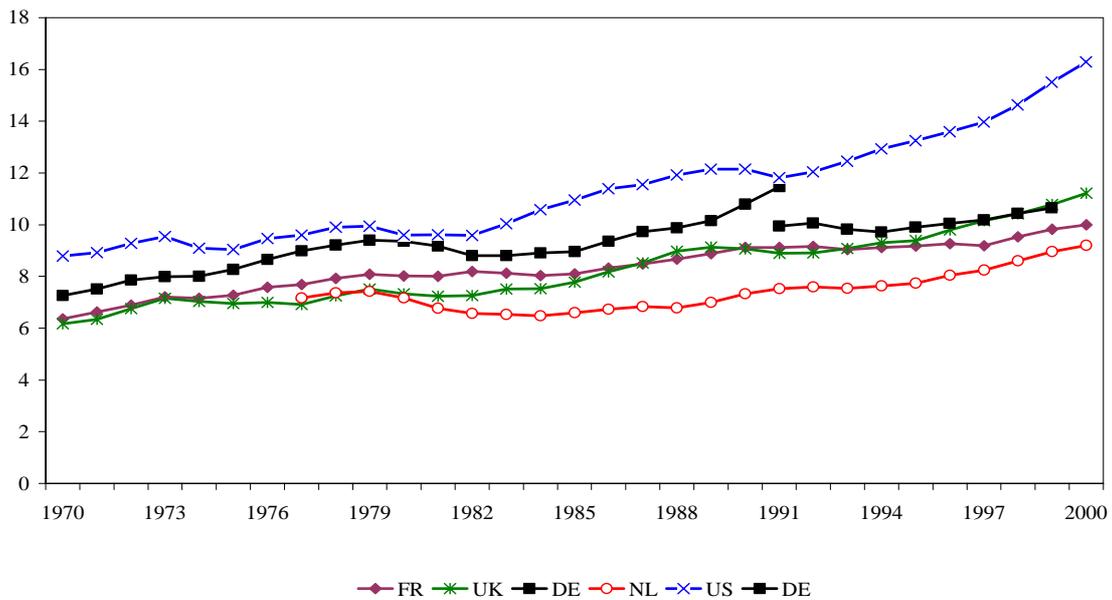


Figure 11. Consumer spending on goods per head of the population aged 15-64
x 1000, international prices ppp



The decomposition above focused on goods consumption per capita and productivity in distribution. Figure 11 shows per capita consumer expenditure on goods. American goods consumption per capita was around one half greater than the European level in 1970 and if anything the gap has increased. There was some catching up by Europe in the 1970s and again in the boom at the end of the 1980s, but Europe fell further behind when the USA boomed in the 1990s. There is an obvious impact of German unification in lowering per capita consumption. Differences between the four European countries are comparatively small though Dutch goods consumption has been rather consistently low according to these data. Figure 12 shows that differences between the USA and Europe in per capita

consumption of goods are really dramatic. If productivity in distribution in 1999 was the same in the USA and Europe there would have still have been 50-60% more hours worked in US distribution than in Europe to service the higher throughput of goods.

Figure 12. Consumption of goods (volumes, PPP) per person aged 15-64
Relative to USA, USA=1

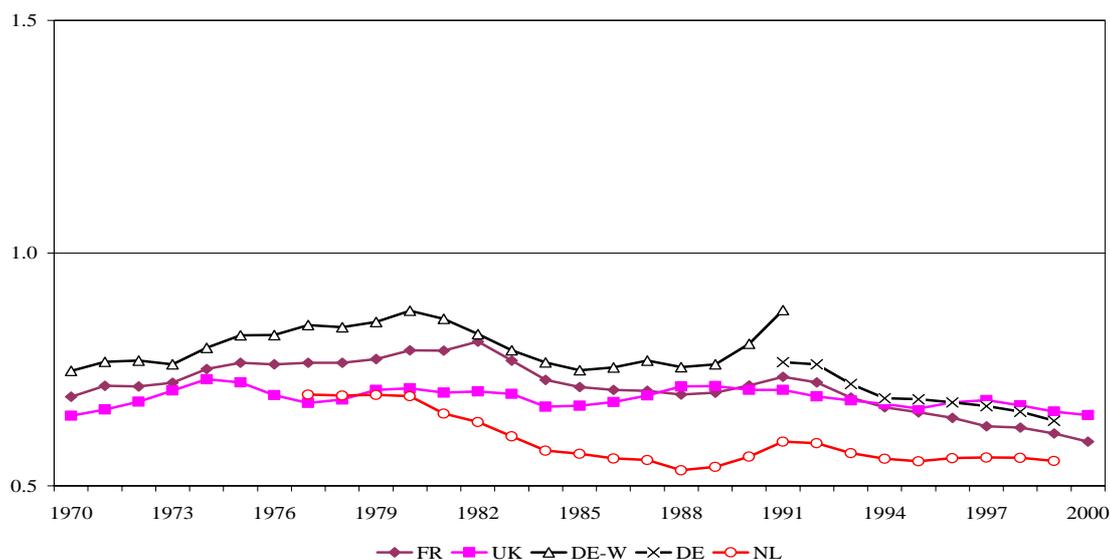
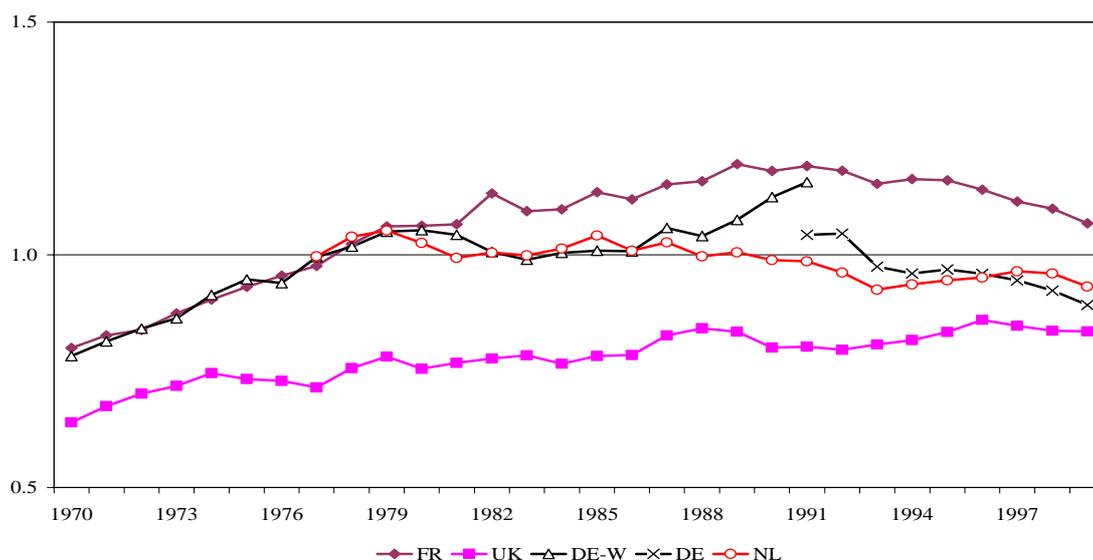


Figure 13. Labour productivity in distribution relative to USA, USA=1
Goods consumption (volume, ppp) per hour worked



Our internationally comparable measures of labour productivity, consumption of goods in PPP prices per distribution-hour worked, are shown relative to the American level in Figure 13. After some catching up in the 1970s it seems that productivity levels in Continental Europe were close to those in the USA by 1980 though still well below in UK³¹. French productivity then rose somewhat above the American level, but Europe fell back in the 1990s as productivity in distribution boomed in the USA³². German and Dutch labour

³¹ The broad pattern of productivity trends over time is consistent with that shown in Table 7 based on the standard measures of national productivity, which are not internationally comparable in terms of levels.

³² Nordhaus (2002) shows that about one half of the acceleration in American labour productivity growth in the “New Economy” period of 1995-2000 took place in wholesale and retail. Part of the explanation lies in the boom in the “volume” of computer sales (measured using hedonic price indices), but part probably does reflect “genuine” productivity gains reflecting very heavy IT spending in that sector.

productivity in distribution was similar to the American level by 1999: this implies that for these countries differences with the USA in work done in distribution must mainly reflect differences in consumption per head. High French productivity exacerbates the employment gap with the USA, whereas lower productivity in the UK offsets the impact of lower consumption per head.

Figures 14 and 14a show distribution employment, productivity and goods consumption relative to US levels for France and Germany. The influence of rising productivity relative to the US before 1990, and the persistent very low level of goods consumption stand out as the dominating influences on employment in distribution. In the period 1990-1999 consumption per head of the population of working age grew around 15% slower in both France and Germany than in the USA – it was only much slower growth of distribution productivity in Europe that prevented a major further widening in the distribution employment gap over that period.

Figure 14. Distribution in France, relative to USA, USA=1

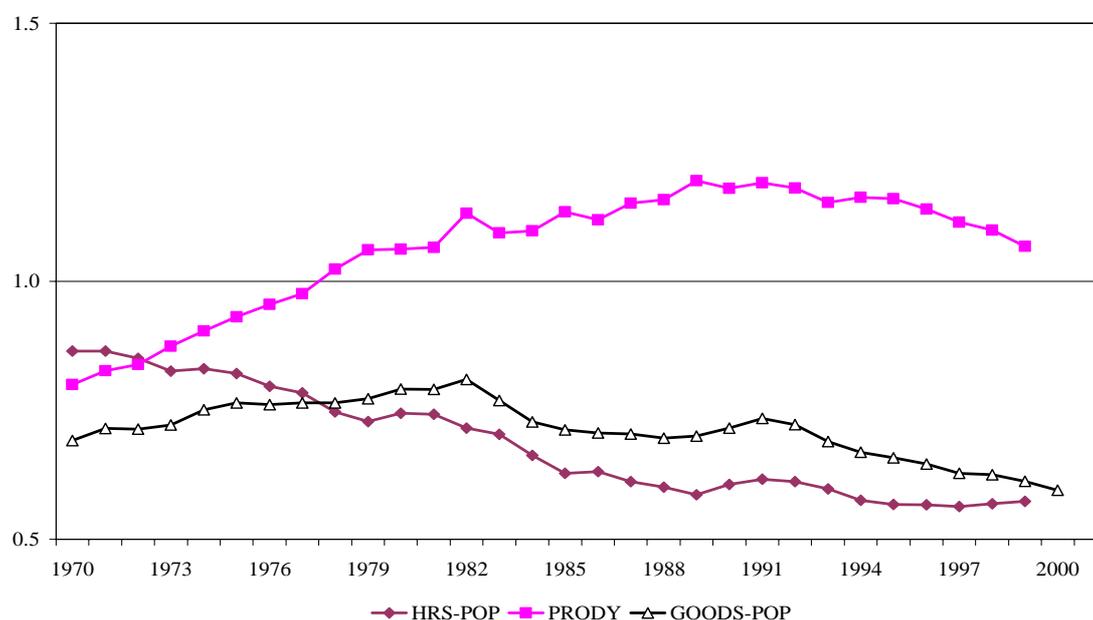
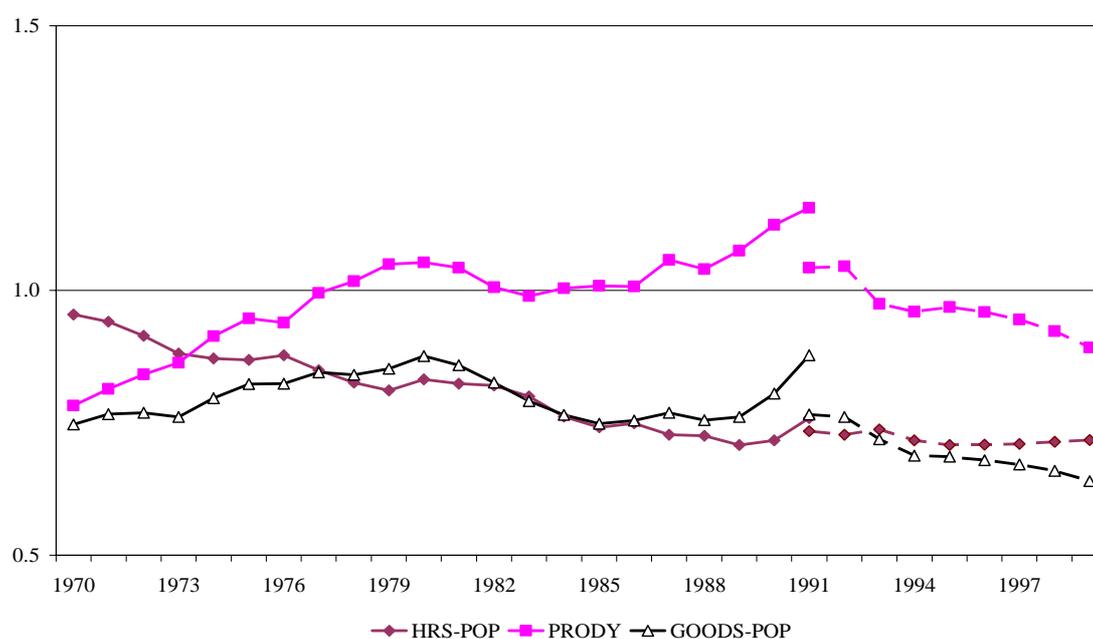


Figure 14a. Distribution in Germany, relative to USA, USA=1



If we separate out the period into the three decades (breaking at 1979 for cyclical reasons) Table 11 below confirms the closely similar trends in France and Germany, countries that exemplify the employment problems in Europe's core. France and Germany fell far behind the USA in growth of distribution employment in the 1970s and 1980s, reflecting first much faster increases in productivity and then both somewhat faster productivity growth and slower growth of goods consumption. In the 1990s both consumption and productivity grew more slowly than in the USA and comparative employment was more or less stabilised³³.

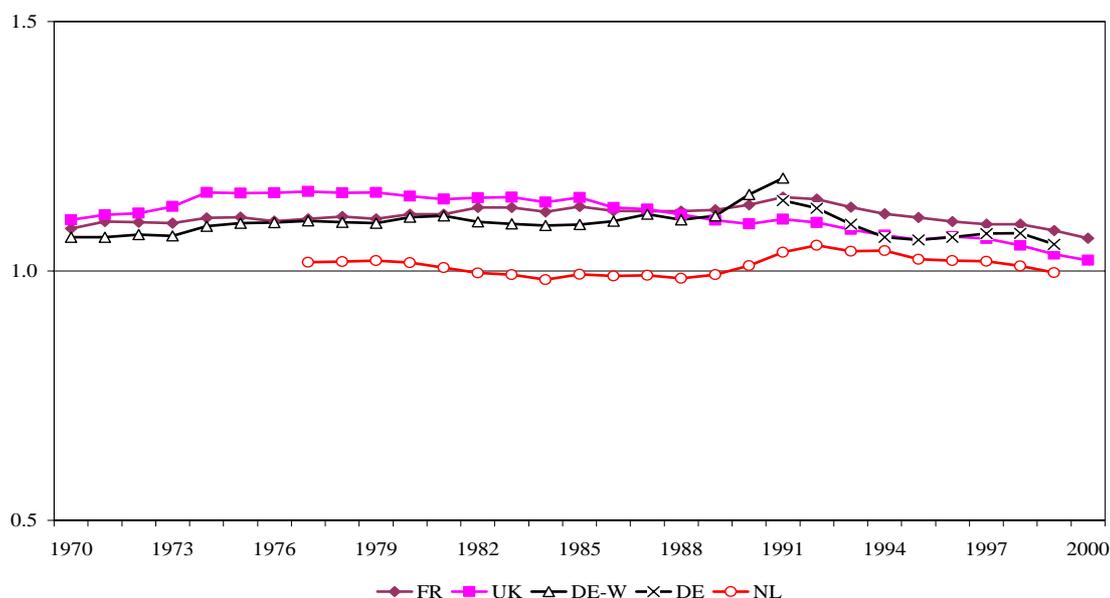
Table 10. Influences on distribution employment: France & Germany
Changes relative to USA

| | | Hours Worked in Dist/Pop | Cons of Goods/Pop | Productivity in Distribution |
|----------------|-------|-----------------------------|-------------------|---------------------------------|
| France | 70-79 | 0.84 | 1.12 | 1.33 |
| | 79-90 | 0.83 | 0.93 | 1.11 |
| | 90-99 | 0.95 | 0.86 | 0.90 |
| Germany | 70-79 | 0.85 | 1.14 | 1.34 |
| | 79-90 | 0.88 | 0.95 | 1.07 |
| | 90-99 | 0.98 | 0.84 | 0.86 |

Across the four European countries as a whole it is clear that goods consumption per capita is now the most important proximate factor behind lower employment in distribution. Does this just reflect lower per capita GDP, or a smaller consumption share or a bias within

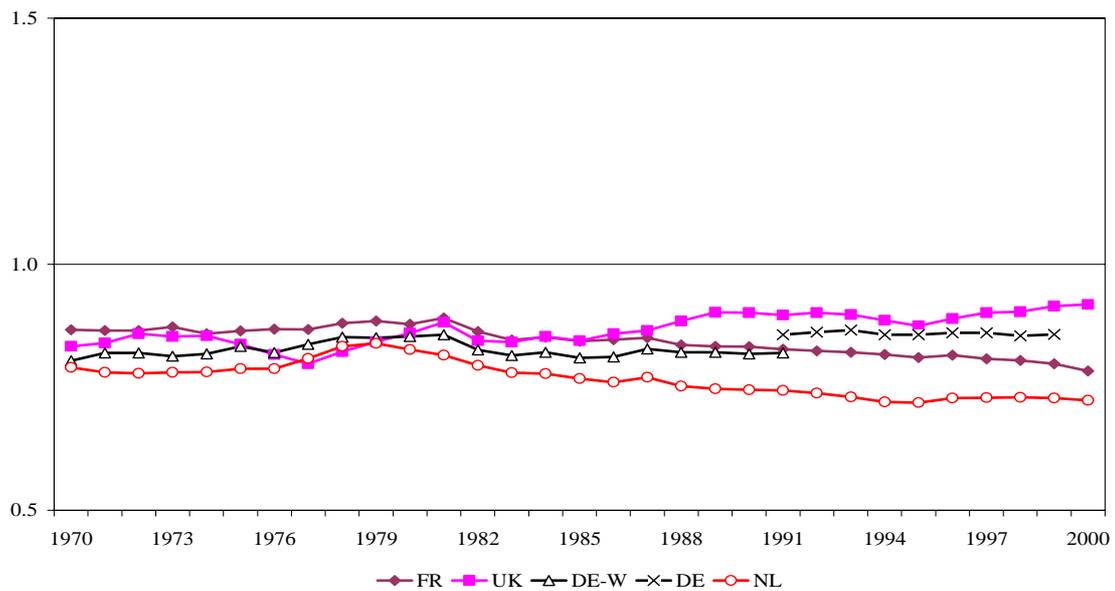
consumption against goods? The latter possibility can be dismissed immediately. Figure 15 shows a consistent tendency for goods to constitute a higher proportion of total consumption than in the USA. One likely explanation of the higher goods share in Europe is the greater provision of services by the state (which means that expenditure on such services is not part of household consumption). Some convergence towards the American level means that by the end of the period the impact of goods bias was pretty small. Turning to the second influence on goods consumption, the ratio of total consumption to GDP is distinctly smaller in Europe (Figure 16) and here the differences have fanned out with the UK moving towards USA during the consumer boom of the second half of the 1990s, whilst the Dutch share fell further.

Figure 15. Share of goods in personal consumption, relative to the USA, USA=1



³³ The productivity patterns are broadly comparable to those reported earlier in Table 7, in particular the sharply faster growth of productivity in France and Germany in the 1970s than the USA and the much slower growth in the 1990s is confirmed.

Figure 16. Consumption out of GDP (volume, ppp), relative to USA, USA=1



The twin influences of the consumption share and goods share of consumption can be helpfully combined into consumption of goods as a ratio of GDP – this combined measure makes sense since the effect of a high share of state provision of services will tend to both reduce the share of consumption in GDP and (as a partial offset) increase the share of goods in personal consumption (as some services are now financed by the tax system). The results are interesting (Figure 17): for Germany and the UK goods consumption is only a little lower as share of GDP than in the USA, whilst for France and especially the Netherlands the differences are large and contribute materially to low employment in distribution.

Figure 17. Goods consumption out of GDP (volume, ppp), relative to USA, USA=1

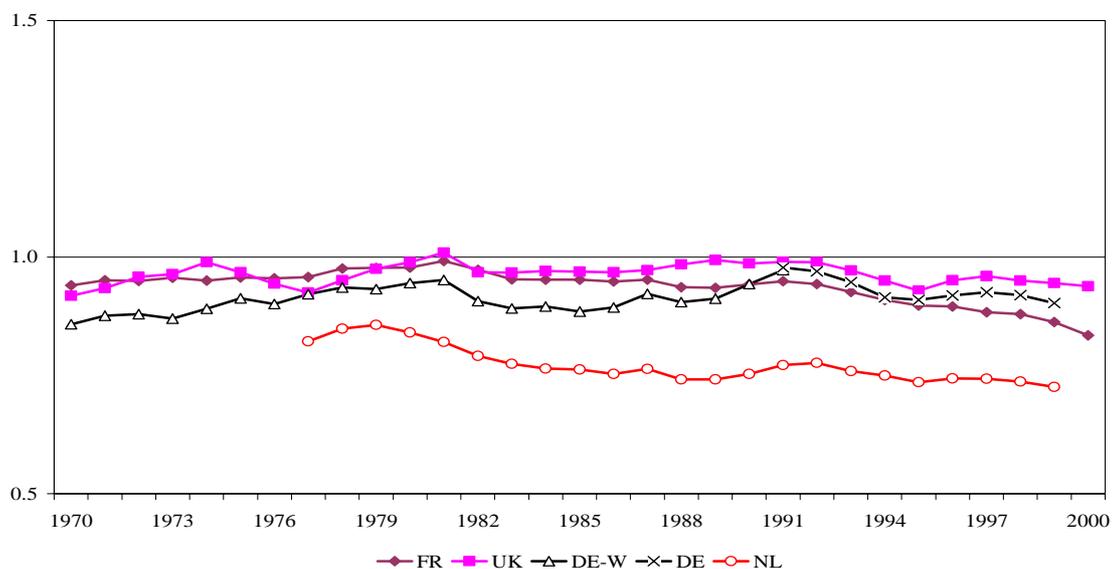
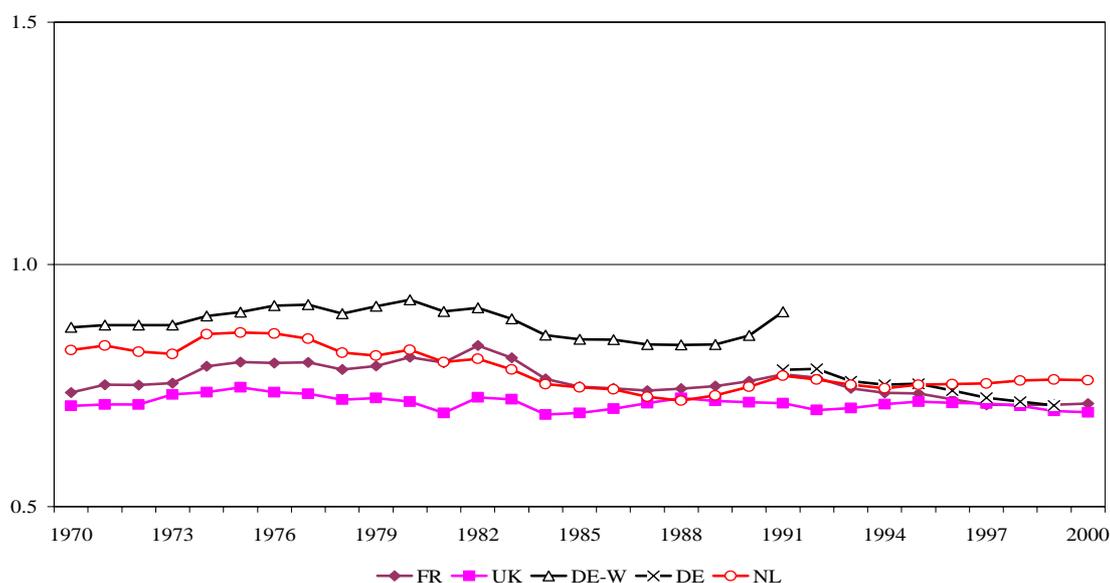


Figure 18. GDP per capita, relative to USA
 Constant ppp prices per head of population 15-64 USA = 1



This leaves per capita GDP as the final influence on goods consumption and therefore distribution employment. The decline in German GDP per capita with unification contributed to a convergence within Europe and by the end of the period American GDP per capita was about one-third above all the European countries (Figure 18). This was the dominant factor behind lower consumption of goods per head in Germany and UK, exacerbated by lower shares of consumption of goods in GDP in France and particularly in Netherlands. Obviously GDP per capita reflects many factors but the dominant ones in these cases are low employment rates and hours of work overall (with economy-wide productivity levels being fairly similar).

A simple way of summarising these results is to tabulate (Table 12) a decomposition of differences in distribution employment compared to the USA into differences in per capita GDP, goods consumption as a share of GDP and labour productivity

Table 11. Summary table on distribution work per head of population, compared to USA, 1999

| | <i>Hours + Worked in Distribution to population</i> | <i>GDP/Population</i> | <i>Goods Consumption to GDP</i> | <i>Distribution Productivity (US compared to country)</i> |
|--------------------|---|-----------------------|-------------------------------------|---|
| Germany | 0.717 | 0.709 | 0.903 | 1.121 |
| France | 0.574 | 0.710 | 0.863 | 0.937 |
| UK | 0.790 | 0.698 | 0.945 | 1.197 |
| Netherlands | 0.594 | 0.762 | 0.728 | 1.074 |

Distribution work particularly in Netherlands and France is held back by the low ratio of goods consumption, in France also by high productivity and throughout Europe by low per capita GDP, much the most important factor overall.

We noted earlier that our measure of labour productivity as goods consumption or “throughput” per hour worked is a rough one. More sophisticated measures, which mostly have severe conceptual limitations, can give rather different answers as the background working paper (Glyn and Salverda 2004) shows. They typically give France a bigger productivity lead over the US in distribution than that shown above. If such a measure (for example Van Ark’s double deflated estimate) were preferred, how would the above table be altered? Obviously the last column would be different (a lower number in the French row for example) and to complete the decomposition an extra column would have to be added to reflect “service added by distribution per consumption good sold” which would precisely offset the different productivity number (one could think of this “true productivity” as reflecting goods sold per hour plus the extra factor “service per good sold”). Even though such service differences may well exist, for reasons explained in the appendix to the working paper it is hard believe that it will be well captured in the measures available, and so it seems clearer to stick with the simpler analysis presented here.

All the analysis thus far has been directed to the question: why are so many more people employed in distribution in the USA than in Europe? Basically, the simple answer is that consumption of goods is so much higher in the USA, with productivity differences in distribution appearing to play a subsidiary role. But there is a slightly different question concerning the proportion of work in the economy that is carried out in distribution. Do European countries have a smaller share of work carried out in distribution and what are the proximate factors influencing it?

Table 12. Summary table on distribution work as share of total work done 1999

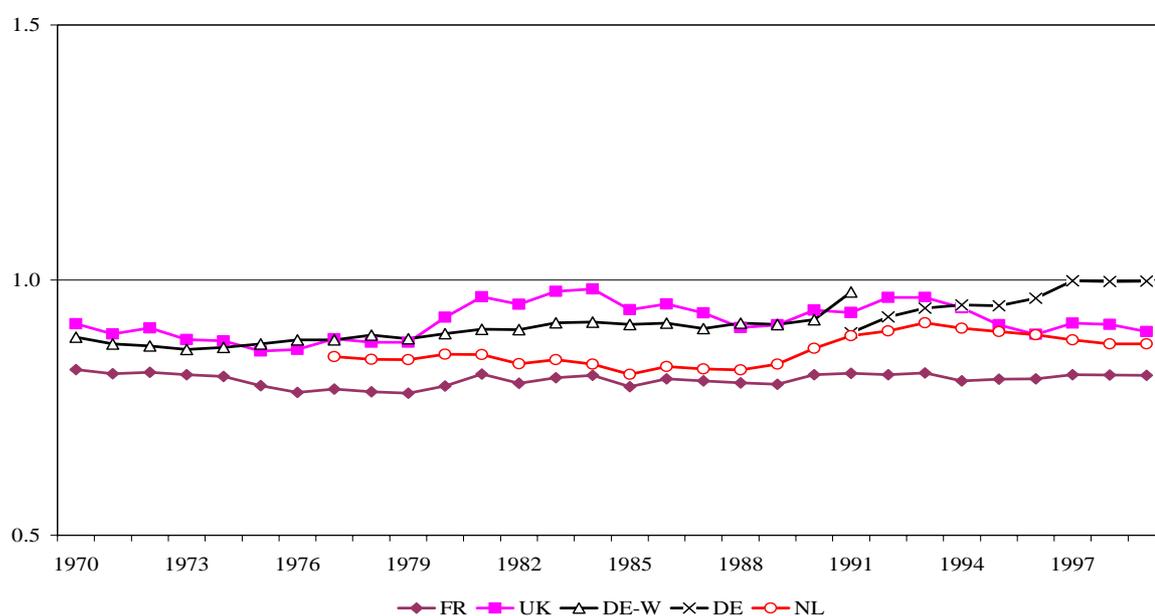
| | <i>Share of Distribution in Total Hours</i> | <i>Share of Distribution in Total Hours</i> | <i>Share of Goods Consumption in GDP</i> | <i>Productivity compared to US in Distribution / Productivity compared to US in Whole Economy</i> |
|--------------------|---|---|--|---|
| | <i>%</i> | <i>Relative to USA=1</i> | <i>Relative to USA=1</i> | |
| USA | 21.9 | 1 | 1 | 1 |
| UK | 19.7 | 0.90 | 0.90 | 1.0 |
| France | 17.8 | 0.81 | 0.86 | 1.06 |
| Germany | 19.3 | 0.88 | 0.94 | 1.07 |
| Netherlands | 19.2 | 0.88 | 0.73 | 0.83 |

The first two columns of Table 13 show that shortfalls between the European economies and the USA in the proportion of work done in distribution are quite small compared to the

gaps in total work done. A lower share would result either from a smaller share of goods consumption in GDP than in the USA or from productivity in distribution in the country being higher relative to the American level than is productivity in the whole economy. Shares of goods consumption are indeed typically lower in Europe, as noted already, and in France and Germany productivity as relative to US levels is a little higher in distribution than in the economy as a whole. In the Netherlands by contrast relative productivity in distribution seems particularly low and this has maintained jobs in distribution despite exceptionally low goods consumption.

It is clear that Europe has had a somewhat smaller proportion of work done in distribution than the US well before there was talk of inflexible labour markets (see Figure 19) and that the shortfall has not grown over time. A structural tendency in Europe towards a somewhat lower share of goods consumption in GDP would seem to be an important contributory explanation. The contrast to the growing discrepancy between Europe and the USA in the volume of work done in distribution (see Figures 9 and 10) is a very striking example of the key importance of the growing difference in aggregate work done in Europe and the USA.

Figure 19. Share of hours worked in distribution relative to USA, USA=1



Conclusions

This section highlighted the central importance of the level of consumption in shaping differences in distribution employment between the USA and Europe. The total volume of work in distribution per capita is much higher in the USA because per capita consumption is much higher (compare Gordon 2002). This discrepancy has grown as productivity in

distribution (as best we can measure it) caught up to American levels in the 1970s and consumption per capita in the USA drew further ahead in the 1990s. By contrast the gap in the share of employment in distribution was both smaller and much more stable and appears to reflect systematic structural features making for a low share of goods consumption in Europe with productivity levels in distribution relative to the national average, playing a relatively minor role.

4 OVERALL CONCLUSIONS

The first section of this paper showed that the growing employment gap between Europe and the USA over recent decades reflected the failure, until recently, of services-employment rates in Europe to converge to American levels whilst employment rates in goods production were falling rapidly towards those of the USA. The services-employment gap has been concentrated in distribution and community and personal services and particular attention has been focussed on the role of labour market rigidities in inhibiting the growth of the low-wage services. We have directed attention to the distribution sector as a major employer of low-wage labour. Our detailed examination of the wages and employment in retailing suggests that differences between the USA and Europe are not consistently in the direction anticipated by the rigidities/wage-compression hypothesis. The wage penalties for employment in retail are not much more important in the USA. By contrast, American retail has kept down wage costs more by the composition of its work force, e.g. part-time workers, not by paying them less than in other industries. But also this composition effect was surpassed by some European countries. At the more macroeconomic level European distribution did suffer from a rapid growth in product wages and a profit squeeze in the 1970s and this may have held back employment growth in France in particular, but in the 1990s productivity grew considerably faster in distribution in the USA and European product wages grew relatively slowly. Finally we showed that the much higher level of goods consumption per head of the population (the “throughput” in distribution) as compared to Europe was the dominating influencing in explaining the much higher levels of employment in American distribution. Even in France where it appears that labour productivity in distribution may be somewhat higher than in the USA this factor is much less important in explaining low employment than is low goods consumption. This suggests that the lower level of services employment in Europe may be more importantly explained by the economy-wide influences explaining low levels of aggregate hours worked and thus aggregate consumption rather than specific labour-market constraints on the service sector itself.

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APPENDIX A: DETAILED DATA AND RESULTS

Table A1. Employment rates for all workers, by sectors, 1970-2001
Ratios to population of working age

| | EU5 | USA | USA – EU5 |
|---|-------|-------|-----------|
| 1. Sector Levels | | | |
| Employment rate, 1970 | 67.2 | 64.5 | -2.8 |
| Agriculture | 7.3 | 2.8 | -4.5 |
| Industry | 29.2 | 21.3 | -8.0 |
| Services | 30.0 | 37.9 | 7.8 |
| Employment rate, 2001 | 65.9 | 74.1 | 8.2 |
| Agriculture | 2.1 | 1.8 | -0.3 |
| Industry | 18.3 | 16.4 | -1.9 |
| Services | 45.4 | 55.1 | 9.8 |
| Average % point changes per year | | | |
| 2. Aggregates | | | |
| Agriculture | -0.17 | -0.03 | 0.13 |
| Industry | -0.35 | -0.16 | 0.19 |
| Services | 0.50 | 0.56 | 0.06 |
| 3. Period breakdown | | | |
| Agriculture | | | |
| 1970-1979 | -0.29 | -0.05 | 0.24 |
| 1979-1990 | -0.15 | -0.03 | 0.12 |
| 1990-2001 | -0.08 | -0.05 | 0.06 |
| 1995-2001 | -0.06 | -0.05 | 0.01 |
| Industry | | | |
| 1970-1979 | -0.45 | -0.05 | 0.40 |
| 1979-1990 | -0.40 | -0.17 | 0.23 |
| 1990-2001 | -0.22 | -0.23 | -0.01 |
| 1995-2001 | -0.03 | -0.17 | -0.14 |
| Services | | | |
| 1970-1979 | 0.42 | 0.61 | 0.19 |
| 1979-1990 | 0.39 | 0.71 | 0.32 |
| 1990-2001 | 0.66 | 0.36 | -0.30 |
| 1995-2001 | 0.90 | 0.34 | -0.56 |

Source: OECD LFS website database, with some additions from STAN, and national data for NL

Table A2. Employment levels and changes by gender
Ratios to respective population of working age

| | EU5 | USA | USA – EU5 |
|---|-------|-------|-----------|
| 1. Levels | | | |
| Employment rate, 1970 | 67.2 | 64.5 | -2.8 |
| Men | 90.8 | 83.5 | -7.3 |
| Women | 44.4 | 46.0 | 1.7 |
| Employment rate, 2001 | 65.9 | 74.1 | 8.2 |
| Men | 74.1 | 80.2 | 6.1 |
| Women | 57.5 | 68.1 | 10.6 |
| Average % point changes per year | | | |
| 2. Aggregates | | | |
| Employment | -0.04 | 0.31 | 0.35 |
| Men | -0.54 | -0.11 | 0.43 |
| Women | 0.42 | 0.71 | 0.29 |
| 3. Period breakdown Employment | | | |
| Men | -0.54 | -0.11 | 0.43 |
| 1970-1979 | -0.98 | -0.23 | 0.74 |
| 1979-1990 | -0.57 | 0.05 | 0.62 |
| 1990-2001 | -0.14 | -0.16 | -0.02 |
| 1995-2001 | 0.51 | -0.06 | -0.58 |
| Women | 0.42 | 0.71 | 0.29 |
| 1970-1979 | 0.33 | 0.99 | 0.65 |
| 1979-1990 | 0.31 | 0.93 | 0.62 |
| 1990-2001 | 0.61 | 0.27 | -0.34 |
| 1995-2001 | 0.90 | 0.24 | -0.66 |
| 4. Industry breakdown | | | |
| Men | | | |
| Agriculture | -0.24 | -0.07 | 0.17 |
| Industry | -0.55 | -0.27 | 0.28 |
| Services | 0.29 | 0.35 | 0.06 |
| Distribution | 0.05 | 0.07 | 0.02 |
| Transport & communication | -0.02 | 0.01 | 0.03 |
| Financial & business services | 0.20 | 0.14 | -0.05 |
| Community & personal services | 0.09 | 0.13 | 0.04 |
| Women | | | |
| Agriculture | -0.10 | 0.00 | 0.10 |
| Industry | -0.17 | -0.05 | 0.12 |
| Services | 0.69 | 0.76 | 0.07 |
| Distribution | 0.08 | 0.14 | 0.05 |
| Transport & communication | 0.03 | 0.03 | 0.00 |
| Financial & business services | 0.18 | 0.17 | -0.01 |
| Community & personal services | 0.40 | 0.43 | 0.03 |
| 5. Employees only | | | |
| Men | -0.30 | 0.09 | 0.39 |
| Women | 0.52 | 0.69 | 0.17 |

Source: OECD LFS website database, with some additions from STAN, and national data for NL

Table A3. Employment rates for all workers, by service industries, 1970-2001
Ratios to population of working age

| | EU5 | USA | USA – EU5 |
|--|------|-------|-----------|
| I. Industry Levels | | | |
| Employment rate Services, 1970 | 30.0 | 37.9 | 7.8 |
| Distribution | 9.8 | 12.6 | 2.7 |
| Transport & communication | 3.9 | 3.7 | -0.2 |
| Financial and business services | 3.1 | 4.2 | 1.1 |
| Community and personal services | 13.0 | 17.3 | 4.3 |
| Employment rate Services, 2001 | 45.4 | 55.1 | 9.8 |
| Distribution | 12.0 | 15.9 | 3.9 |
| Transport & communication | 4.0 | 4.3 | 0.3 |
| Financial and business services | 8.9 | 9.0 | 0.2 |
| Community and personal services | 20.5 | 26.0 | 5.5 |
| Average % point changes per year | | | |
| | 0.50 | 0.56 | 0.06 |
| 2. Aggregates | | | |
| Distribution | 0.07 | 0.11 | 0.04 |
| Transport & communication | 0.00 | 0.02 | 0.02 |
| Financial and business services | 0.19 | 0.16 | -0.03 |
| Community and personal services | 0.24 | 0.28 | 0.04 |
| 3. Period breakdown | | | |
| Distribution | | | |
| 1970-1979 | 0.09 | 0.19 | 0.10 |
| 1979-1990 | 0.07 | 0.16 | 0.09 |
| 1990-2001 | 0.05 | -0.02 | -0.07 |
| 1995-2001 | 0.11 | -0.03 | -0.14 |
| Financial & business services | | | |
| 1970-1979 | 0.10 | 0.14 | 0.04 |
| 1979-1990 | 0.19 | 0.24 | 0.05 |
| 1990-2001 | 0.25 | 0.08 | -0.17 |
| 1995-2001 | 0.32 | 0.18 | -0.14 |
| Community and personal services | | | |
| 1970-1979 | 0.20 | 0.27 | 0.07 |
| 1979-1990 | 0.19 | 0.31 | 0.12 |
| 1990-2001 | 0.33 | 0.26 | -0.07 |
| 1995-2001 | 0.44 | 0.13 | -0.31 |

Source: OECD LFS website database, with some additions from STAN, and national data for NL

Table A4. Employment rates by country
Annual percentage-point change per year

| | UK | DE | FR | ES | NL | US |
|-------------------|-------|-------|-------|-------|-------|-------|
| Total | 0.02 | -0.06 | -0.06 | -0.04 | 0.16 | 0.37 |
| Agriculture | -0.04 | -0.13 | -0.20 | -0.44 | -0.05 | -0.03 |
| Industry | -0.52 | -0.39 | -0.33 | -0.12 | -0.28 | -0.16 |
| Services | 0.58 | 0.46 | 0.47 | 0.52 | 0.49 | 0.56 |
| 1970-1979 | 0.50 | 0.47 | 0.48 | 0.29 | 0.06 | 0.61 |
| 1979-1991 | 0.69 | 0.29 | 0.27 | 0.41 | 0.25 | 0.71 |
| 1991-2001 | 0.53 | 0.63 | 0.67 | 0.82 | 1.09 | 0.36 |
| 1991-1995 | 0.30 | 0.63 | 0.32 | 0.15 | 0.77 | 0.38 |
| 1995-2001 | 0.73 | 0.63 | 0.96 | 1.38 | 1.35 | 0.34 |
| Distribution | 0.08 | 0.05 | 0.01 | 0.18 | 0.11 | 0.11 |
| 1970-1979 | 0.19 | -0.05 | 0.02 | 0.35 | -0.07 | 0.19 |
| 1979-1991 | 0.12 | 0.08 | 0.00 | 0.09 | 0.10 | 0.16 |
| 1991-2001 | -0.06 | 0.09 | 0.01 | 0.13 | 0.26 | -0.02 |
| 1991-1995 | -0.12 | 0.12 | -0.12 | -0.04 | 0.26 | -0.01 |
| 1995-2001 | -0.01 | 0.07 | 0.12 | 0.28 | 0.27 | -0.03 |
| Transportation | 0.01 | -0.01 | 0.00 | 0.01 | 0.03 | 0.02 |
| Banking | 0.26 | 0.18 | 0.17 | 0.10 | 0.25 | 0.16 |
| Communal services | 0.23 | 0.24 | 0.30 | 0.21 | 0.23 | 0.28 |

Source: OECD LFS website database, with some additions from STAN, and national data for NL

Table A5. Employment rates for all workers, STAN data, 1970-2001
 Percentage of population of working age

| | EU4 | USA | USA – EU4 |
|----------------------------------|-------|-------|-----------|
| 1. Levels | | | |
| Employment rate, 1970 | 70.7 | 68.4 | -2.3 |
| Employment rate, 2001 | 70.2 | 81.0 | 10.8 |
| Average % point changes per year | | | |
| 2. Aggregates | | | |
| Employment | -0.02 | 0.41 | 0.42 |
| 3. Period breakdown | | | |
| Employment | | | |
| 1970-1979 | -0.22 | 0.37 | 0.59 |
| 1979-1990 | -0.04 | 0.57 | 0.61 |
| 1990-2001 | 0.16 | 0.28 | 0.12 |
| 1995-2001 | 0.61 | 0.35 | -0.26 |
| 4. Industry breakdown | | | |
| Agriculture | -0.12 | -0.02 | 0.09 |
| Industry | -0.40 | -0.15 | 0.25 |
| Services | 0.53 | 0.58 | 0.05 |
| Distribution | 0.08 | 0.16 | 0.08 |
| Transport & communication | 0.00 | 0.01 | 0.01 |
| Financial & business services | 0.23 | 0.26 | 0.03 |
| Community & personal services | 0.22 | 0.16 | -0.06 |
| 5. Employees only | | | |
| Total | 0.10 | 0.41 | 0.32 |
| Agriculture | -0.02 | 0.00 | 0.02 |
| Industry | -0.38 | -0.16 | 0.22 |
| Services | 0.52 | 0.58 | 0.06 |
| Distribution | 0.11 | 0.18 | 0.07 |
| Transport & communication | 0.00 | 0.01 | 0.01 |
| Financial & business services | 0.21 | 0.24 | 0.03 |
| Community & personal services | 0.23 | 0.15 | -0.08 |

Source: OECD STAN database (Source OECD website) 2003/2004

Table A6. Quantile regressions for retailing and the total economy separately
A. At the median wage

| | USA | | | | GERMANY | | | |
|-----------|--------|--------|--------|--------|-------------|--------|--------|--------|
| | 1979 | | 1997 | | 1979 | | 1997 | |
| | RET | AGG | RET | AGG | RET | AGG | RET | AGG |
| LS-MALE | -0,137 | -0,179 | -0,229 | -0,325 | -0,089 | -0,011 | -0,243 | -0,198 |
| S-MALE | 0,131 | 0,097 | 0,046 | -0,055 | 0,181 | 0,101 | 0,005 | 0,043 |
| HS-MALE | 0,409 | 0,398 | 0,435 | 0,458 | 0,539 | 0,486 | 0,415 | 0,502 |
| LS-FEMALE | -0,245 | -0,393 | -0,309 | -0,430 | -0,219 | -0,260 | -0,118 | -0,301 |
| S-FEMALE | -0,055 | -0,119 | -0,048 | -0,161 | -0,042 | -0,113 | 0,022 | -0,032 |
| HS-FEMALE | 0,068 | 0,250 | 0,250 | 0,377 | 0,521 | 0,396 | 0,342 | 0,373 |
| DPART1 | -0,793 | -0,834 | -0,822 | -0,848 | -0,804 | -0,977 | -0,936 | -1,136 |
| DPART2 | -0,340 | -0,319 | -0,397 | -0,376 | -0,344 | -0,464 | -0,355 | -0,481 |
| DPART_Q | -0,191 | -0,245 | -0,240 | -0,241 | -0,062 | -0,084 | -0,058 | -0,038 |
| DPART_M | -0,168 | -0,214 | -0,115 | -0,144 | -0,096 | -0,122 | -0,139 | -0,106 |
| EXPER | 0,040 | 0,043 | 0,035 | 0,030 | 0,047 | 0,029 | 0,037 | 0,036 |
| EXPERQ | -0,067 | -0,070 | -0,057 | -0,045 | -0,090 | -0,053 | -0,056 | -0,056 |
| EXPER_F | -0,029 | -0,025 | -0,022 | -0,016 | -0,025 | -0,003 | -0,023 | -0,011 |
| EXPERQ_F | 0,048 | 0,041 | 0,041 | 0,024 | 0,054 | 0,006 | 0,036 | 0,015 |
| EXPER_Q | 0,003 | 0,005 | 0,005 | 0,016 | 0,005 | 0,007 | -0,001 | -0,003 |
| EXPERQ_Q | -0,013 | -0,015 | -0,016 | -0,033 | -0,014 | -0,017 | -0,004 | 0,001 |
| Const | 3,790 | 3,910 | 3,737 | 3,871 | 8,306 | 8,630 | 8,927 | 9,087 |
| N | 19415 | 167674 | 17476 | 150383 | 14027 | 173615 | 14672 | 178377 |
| Pseudo-R2 | 0,531 | 0,436 | 0,531 | 0,436 | 0,301 | 0,411 | 0,305 | 0,396 |
| | FRANCE | | | | NETHERLANDS | | | |
| | 1982 | | 1995 | | 1979 | | 1996 | |
| | RET | AGG | RET | AGG | RET | AGG | RET | AGG |
| LS-MALE | -0,046 | -0,064 | -0,097 | -0,097 | 0,018 | -0,040 | -0,080 | -0,129 |
| S-MALE | -0,048 | -0,047 | -0,097 | -0,135 | 0,252 | 0,038 | 0,098 | -0,065 |
| HS-MALE | 0,431 | 0,508 | 0,478 | 0,448 | 0,906 | 0,451 | 0,356 | 0,311 |
| LS-FEMALE | 0,033 | -0,085 | 0,057 | -0,056 | -0,169 | -0,244 | -0,121 | -0,171 |
| S-FEMALE | -0,005 | -0,064 | 0,013 | -0,094 | -0,074 | -0,122 | 0,031 | -0,061 |
| HS-FEMALE | 0,527 | 0,350 | 0,400 | 0,436 | -0,169 | 0,211 | 0,188 | 0,236 |
| DPART1 | -0,956 | -1,015 | -0,868 | -0,924 | -1,028 | -1,016 | -1,058 | -0,943 |
| DPART2 | -0,368 | -0,446 | -0,412 | -0,388 | -0,464 | -0,476 | -0,320 | -0,328 |
| DPART_Q | 0,015 | 0,286 | 0,051 | 0,123 | 0,120 | 0,141 | 0,022 | 0,000 |
| DPART_M | 0,033 | 0,113 | -0,004 | 0,103 | -0,123 | -0,153 | -0,126 | 0,005 |
| EXPER | 0,026 | 0,022 | 0,033 | 0,028 | 0,049 | 0,040 | 0,071 | 0,051 |
| EXPERQ | -0,041 | -0,034 | -0,046 | -0,037 | -0,096 | -0,074 | -0,134 | -0,090 |
| EXPER_F | -0,026 | -0,012 | -0,023 | -0,014 | 0,022 | 0,017 | 0,001 | -0,005 |
| EXPERQ_F | 0,041 | 0,017 | 0,039 | 0,020 | -0,049 | -0,042 | -0,021 | -0,005 |
| EXPER_Q | 0,008 | 0,019 | 0,015 | 0,020 | -0,004 | 0,008 | -0,012 | 0,002 |
| EXPERQ_Q | -0,004 | -0,031 | -0,035 | -0,032 | 0,017 | -0,005 | 0,028 | 0,002 |
| const | 4,639 | 4,678 | 4,982 | 5,088 | 3,820 | 4,050 | 4,039 | 4,343 |
| N | 4136 | 49407 | 4152 | 49629 | 1468 | 23133 | 9599 | 140163 |
| Pseudo-R2 | | | | | 0,581 | 0,4832 | 0,4563 | 0,4041 |

| | UK | | | |
|-----------|---------|---------|-----------|--------|
| | 1989/90 | | 1998/2001 | |
| | RET | AGG | RET | AGG |
| LS-MALE | -0,1987 | -0,1649 | -0,041 | -0,076 |
| S-MALE | 0,0370 | -0,0586 | 0,108 | -0,011 |
| HS-MALE | 0,4035 | 0,2462 | 0,415 | 0,296 |
| LS-FEMALE | 0,0030 | -0,1552 | -0,144 | -0,281 |
| S-FEMALE | 0,0717 | -0,0561 | -0,054 | -0,174 |
| HS-FEMALE | 0,3498 | 0,5034 | 0,052 | 0,205 |
| DPART1 | -1,0758 | -1,2278 | -1,050 | -1,123 |
| DPART2 | -0,5457 | -0,5258 | -0,521 | -0,512 |
| DPART_Q | -0,1169 | 0,0739 | -0,067 | 0,005 |
| DPART_M | 0,0090 | 0,1299 | -0,027 | -0,170 |
| EXPER | 0,0727 | 0,0607 | 0,030 | 0,029 |
| EXPERQ | -0,1285 | -0,0993 | -0,062 | -0,053 |
| EXPER_F | -0,0493 | -0,0354 | -0,026 | -0,012 |
| EXPERQ_F | 0,0941 | 0,0607 | 0,070 | 0,020 |
| EXPER_Q | 0,0135 | 0,0136 | 0,023 | 0,015 |
| EXPERQ_Q | 0,0313 | 0,0315 | -0,070 | -0,039 |
| const | 2,5182 | 2,7330 | 3,311 | 3,519 |
| N | 867 | 8591 | 989 | 9280 |
| Pseudo-R2 | 0,4781 | 0,4246 | 0,4404 | 0,3832 |

Table A6. Quantile regressions for retailing and the total economy separately
 B. At the second-decile wage

| | USA | | | | GERMANY | | | |
|-----------|--------|--------|--------|--------|-------------|--------|--------|--------|
| | 1979 | | 1997 | | 1979 | | 1997 | |
| | RET | AGG | RET | AGG | RET | AGG | RET | AGG |
| LS-MALE | -0,107 | -0,160 | -0,191 | -0,271 | -0,105 | -0,098 | -0,531 | -0,282 |
| S-MALE | 0,086 | 0,061 | 0,049 | -0,051 | 0,162 | 0,119 | 0,072 | 0,103 |
| HS-MALE | 0,300 | 0,332 | 0,267 | 0,382 | 0,265 | 0,577 | 0,351 | 0,565 |
| LS-FEMALE | -0,161 | -0,245 | -0,239 | -0,337 | -0,235 | -0,248 | -0,321 | -0,418 |
| S-FEMALE | -0,031 | -0,093 | -0,026 | -0,128 | -0,022 | -0,108 | 0,041 | -0,067 |
| HS-FEMALE | 0,018 | 0,194 | 0,148 | 0,304 | 0,565 | 0,360 | 0,361 | 0,351 |
| DPART1 | -0,864 | -0,873 | -0,790 | -0,842 | -0,677 | -1,013 | -0,952 | -1,208 |
| DPART2 | -0,365 | -0,351 | -0,354 | -0,377 | -0,149 | -0,389 | -0,228 | -0,367 |
| DPART_Q | -0,157 | -0,231 | -0,213 | -0,256 | -0,059 | 0,068 | -0,044 | -0,038 |
| DPART_M | -0,118 | -0,172 | -0,116 | -0,127 | -0,573 | -0,315 | -0,482 | -0,327 |
| EXPER | 0,031 | 0,033 | 0,025 | 0,021 | 0,062 | 0,042 | 0,047 | 0,040 |
| EXPERQ | -0,056 | -0,057 | -0,043 | -0,035 | -0,124 | -0,077 | -0,075 | -0,061 |
| EXPER_F | -0,023 | -0,024 | -0,014 | -0,014 | -0,050 | -0,019 | -0,031 | -0,015 |
| EXPERQ_F | 0,040 | 0,041 | 0,027 | 0,025 | 0,107 | 0,037 | 0,051 | 0,015 |
| EXPER_Q | 0,002 | 0,009 | 0,001 | 0,014 | -0,001 | -0,002 | -0,021 | -0,010 |
| EXPERQ_Q | -0,006 | -0,021 | -0,006 | -0,029 | -0,003 | -0,002 | 0,030 | 0,011 |
| Const | 3,589 | 3,661 | 3,492 | 3,612 | 8,074 | 8,389 | 9,103 | 9,083 |
| N | 19415 | 167674 | 17476 | 150383 | 14027 | 173615 | 14672 | 178377 |
| Pseudo-R2 | 0,531 | 0,436 | 0,531 | 0,436 | 0,301 | 0,411 | 0,305 | 0,396 |
| | FRANCE | | | | NETHERLANDS | | | |
| | 1981 | | 1995 | | 1979 | | 1996 | |
| | RET | AGG | RET | AGG | RET | AGG | RET | AGG |
| LS-MALE | 0,012 | -0,063 | -0,064 | -0,055 | -0,005 | -0,059 | -0,094 | -0,189 |
| S-MALE | -0,037 | -0,053 | -0,244 | -0,160 | 0,144 | 0,078 | 0,138 | -0,007 |
| HS-MALE | 0,246 | 0,416 | 0,247 | 0,394 | 0,946 | 0,454 | 0,232 | 0,345 |
| LS-FEMALE | 0,023 | -0,091 | 0,309 | 0,021 | -0,085 | -0,226 | -0,155 | -0,296 |
| S-FEMALE | -0,013 | -0,039 | 0,109 | -0,074 | 0,003 | -0,080 | 0,061 | -0,042 |
| HS-FEMALE | 0,285 | 0,392 | 0,397 | 0,418 | 0,442 | 0,201 | 0,129 | 0,244 |
| DPART1 | -0,953 | -1,333 | -1,004 | -1,012 | -1,398 | -1,229 | -1,270 | -1,164 |
| DPART2 | -0,452 | -0,687 | -0,488 | -0,515 | -0,771 | -0,586 | -0,452 | -0,428 |
| DPART_Q | 0,000 | 0,378 | 0,083 | 0,116 | 0,087 | 0,174 | 0,048 | 0,030 |
| DPART_M | -0,082 | 0,210 | 0,020 | 0,060 | 0,171 | -0,135 | -0,099 | -0,028 |
| EXPER | 0,020 | 0,024 | 0,044 | 0,027 | 0,049 | 0,044 | 0,084 | 0,064 |
| EXPERQ | -0,033 | -0,040 | -0,075 | -0,038 | -0,101 | -0,084 | -0,167 | -0,115 |
| EXPER_F | -0,020 | -0,015 | -0,042 | -0,016 | 0,011 | 0,019 | 0,004 | 0,002 |
| EXPERQ_F | 0,033 | 0,025 | 0,082 | 0,024 | -0,024 | -0,057 | -0,025 | -0,020 |
| EXPER_Q | 0,013 | 0,014 | 0,030 | 0,023 | 0,000 | 0,003 | -0,015 | -0,007 |
| EXPERQ_Q | -0,020 | -0,024 | -0,071 | -0,044 | 0,011 | 0,004 | 0,028 | 0,014 |
| Const | 4,481 | 4,521 | 4,694 | 4,880 | 3,680 | 3,868 | 3,661 | 3,872 |
| N | 4136 | 49407 | 4152 | 49629 | 1468 | 23133 | 9599 | 140163 |
| Pseudo-R2 | | | | | 0,6122 | 0,5666 | 0,5175 | 0,4604 |

| | UK | | | |
|-----------|---------|---------|-----------|---------|
| | 1989 | | 1998/2001 | |
| | RET | AGG | RET | AGG |
| LS-MALE | -0,4470 | -0,2272 | -0,1058 | -0,0885 |
| S-MALE | 0,1460 | -0,0157 | 0,1002 | -0,0155 |
| HS-MALE | 0,4318 | 0,2844 | 0,2023 | 0,2467 |
| LS-FEMALE | -0,2191 | -0,2383 | -0,1415 | -0,2428 |
| S-FEMALE | 0,2135 | -0,0161 | -0,0086 | -0,1259 |
| HS-FEMALE | 0,1466 | 0,4762 | 0,0568 | 0,1674 |
| DPART1 | -1,0231 | -1,2379 | -1,1297 | -1,2078 |
| DPART2 | -0,4848 | -0,5104 | -0,5822 | -0,5539 |
| DPART_Q | -0,1614 | -0,1025 | -0,0795 | -0,0290 |
| DPART_M | -0,1651 | 0,0694 | -0,0657 | -0,1898 |
| EXPER | 0,0832 | 0,0681 | 0,0236 | 0,0298 |
| EXPERQ | -0,1314 | -0,1118 | -0,0393 | -0,0509 |
| EXPER_F | -0,0348 | -0,0276 | -0,0176 | -0,0124 |
| EXPERQ_F | 0,0529 | 0,0426 | 0,0438 | 0,0203 |
| EXPER_Q | -0,0107 | 0,0087 | 0,0208 | 0,0172 |
| EXPERQ_Q | 0,0042 | -0,0272 | -0,0726 | -0,0523 |
| Const | 2,1175 | 2,3681 | 3,0608 | 3,1935 |
| N | 867 | 8591 | 989 | 9280 |
| Pseudo-R2 | 0,4361 | 0,4694 | 0,3598 | 0,3993 |

Table A7. Decomposition of the retail wage differential at the second-decile wage level, 1979 and 1997

| | <i>Rewards Differ- ence</i> | <i>Compo- sition</i> | <i>Inter- actions</i> | <i>Total</i> | <i>Rewards Differ- ence</i> | <i>Compo- sition</i> | <i>Inter- actions</i> | <i>Total</i> |
|---------------|-------------------------------------|--------------------------|---------------------------|---------------|-------------------------------------|--------------------------|---------------------------|---------------|
| | USA 1979 | | | | Germany 1979 | | | |
| Skill-Effect | -0.048 | -0.040 | 0.015 | -0.072 | -0.285 | -0.056 | 0.028 | -0.313 |
| <i>Low</i> | -0.002 | -0.006 | 0.000 | -0.008 | -0.094 | 0.008 | 0.033 | -0.053 |
| <i>Medium</i> | -0.017 | -0.006 | -0.001 | -0.024 | -0.168 | -0.046 | -0.024 | -0.238 |
| <i>High</i> | -0.029 | -0.027 | 0.016 | -0.040 | -0.023 | -0.018 | 0.019 | -0.022 |
| Part-Time | 0.009 | -0.125 | 0.009 | -0.106 | 0.014 | -0.045 | 0.018 | -0.013 |
| Experience | -0.072 | -0.057 | 0.012 | -0.116 | 0.071 | -0.084 | -0.070 | -0.082 |
| Total | -0.110 | -0.221 | 0.037 | -0.294 | -0.200 | -0.185 | -0.024 | -0.409 |
| | USA 1997 | | | | Germany 1997 | | | |
| Skill-Effect | -0.083 | -0.069 | 0.032 | -0.119 | 0.012 | -0.050 | 0.058 | 0.019 |
| <i>Low</i> | -0.004 | -0.012 | -0.001 | -0.017 | -0.013 | 0.013 | 0.015 | 0.015 |
| <i>Medium</i> | -0.011 | -0.011 | -0.002 | -0.024 | 0.035 | -0.032 | 0.034 | 0.038 |
| <i>High</i> | -0.067 | -0.046 | 0.035 | -0.079 | -0.011 | -0.032 | 0.009 | -0.033 |
| Part-Time | 0.013 | -0.101 | 0.009 | -0.079 | 0.019 | -0.064 | 0.022 | -0.023 |
| Experience | -0.089 | -0.047 | 0.015 | -0.122 | -0.079 | -0.074 | -0.041 | -0.194 |
| Total | -0.158 | -0.217 | 0.055 | -0.321 | -0.048 | -0.189 | 0.039 | -0.198 |
| | France 1982 | | | | Netherlands 1979 | | | |
| Skill-Effect | -0.015 | -0.040 | 0.015 | -0.040 | -0.079 | -0.083 | -0.025 | -0.188 |
| <i>Low</i> | 0.018 | 0.000 | 0.001 | 0.019 | -0.081 | -0.039 | -0.009 | -0.128 |
| <i>Medium</i> | -0.010 | -0.004 | -0.002 | -0.016 | -0.027 | -0.005 | 0.010 | -0.022 |
| <i>High</i> | -0.022 | -0.036 | 0.016 | -0.042 | 0.029 | -0.040 | -0.026 | -0.038 |
| Part-Time | -0.003 | -0.019 | 0.009 | -0.013 | 0.007 | -0.139 | 0.009 | -0.124 |
| Experience | -0.064 | -0.036 | 0.000 | -0.099 | 0.002 | -0.086 | 0.006 | -0.078 |
| Total | -0.082 | -0.095 | 0.025 | -0.152 | -0.071 | -0.308 | -0.011 | -0.390 |
| | France 1995 | | | | Netherlands 1996 | | | |
| Skill-Effect | -0.158 | -0.063 | 0.034 | -0.187 | -0.150 | -0.109 | 0.047 | -0.212 |
| <i>Low</i> | -0.009 | 0.002 | 0.008 | 0.001 | -0.030 | -0.045 | -0.007 | -0.082 |
| <i>Medium</i> | -0.097 | -0.015 | -0.007 | -0.118 | -0.037 | -0.004 | -0.009 | -0.050 |
| <i>High</i> | -0.052 | -0.051 | 0.034 | -0.069 | -0.083 | -0.059 | 0.062 | -0.080 |
| Part-Time | -0.003 | 0.000 | 0.001 | -0.002 | -0.023 | -0.197 | -0.017 | -0.236 |
| Experience | 0.054 | -0.051 | -0.015 | -0.012 | 0.082 | -0.134 | 0.001 | -0.050 |
| Total | -0.107 | -0.114 | 0.021 | -0.201 | -0.091 | -0.439 | 0.031 | -0.498 |
| | UK 1989/90 | | | | | | | |
| Skill-Effect | -0.209 | -0.033 | 0.047 | -0.195 | | | | |
| <i>Low</i> | -0.134 | 0.003 | 0.018 | -0.114 | | | | |
| <i>Medium</i> | -0.031 | -0.002 | -0.003 | -0.036 | | | | |
| <i>High</i> | -0.043 | -0.034 | 0.032 | -0.046 | | | | |
| Part-Time | 0.001 | -0.015 | 0.005 | -0.009 | | | | |
| Experience | 0.033 | -0.078 | -0.012 | -0.057 | | | | |
| Total | -0.174 | -0.126 | 0.039 | -0.261 | | | | |
| | UK 1998/2001 | | | | | | | |
| Skill-Effect | -0.068 | -0.040 | 0.030 | -0.078 | | | | |
| <i>Low</i> | -0.015 | 0.004 | 0.006 | -0.005 | | | | |
| <i>Medium</i> | -0.011 | -0.019 | -0.003 | -0.032 | | | | |
| <i>High</i> | -0.042 | -0.026 | 0.026 | -0.042 | | | | |
| Part-Time | 0.000 | 0.004 | -0.008 | -0.004 | | | | |
| Experience | -0.075 | -0.031 | 0.009 | -0.098 | | | | |
| Total | -0.143 | -0.067 | 0.031 | -0.180 | | | | |

APPENDIX B: DECOMPOSITION OF QUANTILE-REGRESSION WAGE DIFFERENTIALS BETWEEN SECTORS

We are interested in the industry wage differential of retail services relative to the aggregate economy. The raw sector differential can partly be explained by specific characteristics of workers in this sector compared to the aggregate and partly by the fact that workers (observed) characteristics are priced differently in different sectors of the economy. In order to shed some light on the relative magnitude of these alternative explanatory factors a decomposition technique in the spirit of the well-known Blinder (1973) and Oaxaca (1973) approach is employed. In what follows, the raw retail differential is spread into three components: a rewards, a characteristics and an interaction effect.

Let the usual wage equation model be described for a specific sector of the economy as

$$\mathbf{y} = \mathbf{x}'\boldsymbol{\beta} + \boldsymbol{\varepsilon} \quad (1)$$

and correspondingly for the aggregate as

$$\mathbf{Y} = \mathbf{X}'\mathbf{B} + \mathbf{E}. \quad (2)$$

Then define

$$\Delta\hat{\boldsymbol{\beta}} := \hat{\boldsymbol{\beta}} - \hat{\mathbf{B}} \quad \text{and} \quad \Delta\bar{\mathbf{x}} := \bar{\mathbf{x}} - \bar{\mathbf{X}}, \quad (3)$$

where the vectors $\bar{\mathbf{x}}$ and $\bar{\mathbf{X}}$ contain average values of the regressor in the sector and in the aggregate, respectively. A sensible decomposition of the raw earnings differential is given by

$$\begin{aligned} \bar{y} - \bar{Y} &:= \bar{\mathbf{x}}\hat{\boldsymbol{\beta}} - \bar{\mathbf{X}}\hat{\mathbf{B}} \\ &= \underbrace{\bar{\mathbf{X}} \cdot \Delta\hat{\boldsymbol{\beta}}}_{\text{rewards effect}} + \underbrace{\Delta\bar{\mathbf{x}} \cdot \hat{\mathbf{B}}}_{\text{characteristics effect}} + \underbrace{\Delta\bar{\mathbf{x}} \cdot \Delta\hat{\boldsymbol{\beta}}}_{\text{interaction effect}} \end{aligned} \quad (4)$$

To illustrate the decomposition consider the simple case, where earnings are explained by a qualification dummy variable only, which takes a zero value for low skilled and one for skilled workers. Assume that remuneration of low-skilled workers is identical across sectors so that the regression constant can be disregarded for the ease of exposition. Assume further that, compared to the aggregate, the average worker in the sector is more qualified and the skill premium is higher in the sector, hence $\bar{x} > \bar{X} > 0$ and $\beta > B > 0$, respectively. It is evident that under these circumstances the wage differential is favourable to the sector. The situation is depicted in *figure 1*.

The total wage bonus of the sector is equivalent to the sum of the shaded areas. The total effect can be divided into

- the rewards effect (area A) or $\bar{X} \cdot \Delta\beta$; given our assumptions the rewards effect here indicates a pay bonus for the sector even if the share of qualified workers were the same as in the aggregate economy;
- the characteristics effect (area B) or $\Delta x \cdot B$; even if the group of qualified workers were paid the same as in the aggregate, there would be an advantage to the sector because of its favourable skill structure.
- the interaction effect (area C) or $\Delta x \cdot \Delta\beta$; in the context here, this effect indicates an earnings advantage for the sector because there are relatively more high-paid qualified workers in the sector and these workers are doing especially well compared to the aggregate.

In contrast to the example given here, the negative rewards and/ or the characteristics effect could lead to a negative wage differential, or a “wage penalty” for a specific sector. This is what can be expected for retail services.

Note that the sign of the rewards (characteristics) effect is determined by $\Delta\beta$ (or Δx , respectively) given that $\bar{X} > 0$ and $B > 0$ which has been assumed here. If the rewards and characteristics effects have equal signs the interaction effect is positive. Consider the case where both are negative, hence the sector has a relatively low educated work force and the skill premium is less than in the aggregate. Clearly this would lead to a wage penalty for the sector. The interaction effect, however, would be positive, since the sector penalty is “reduced” by the fact that the sector has a relatively low share of workers in the category with a negative differential compared to the aggregate. In other words, the interaction effects corrects for a double counting of the sector’s disadvantage that would otherwise occur.

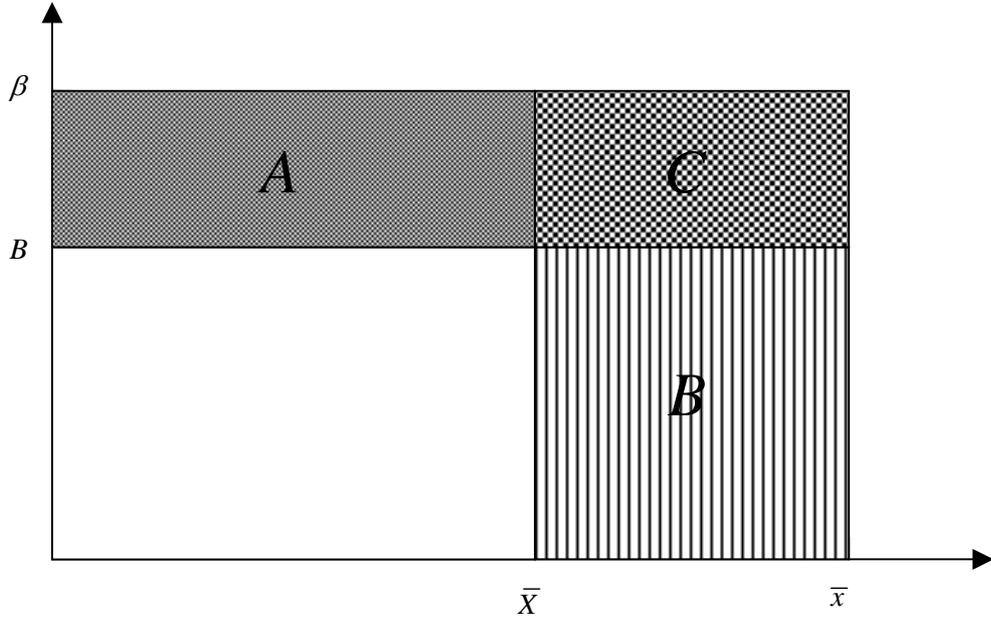


Figure 1. Decomposition of the raw sectoral differential

Application of the decomposition technique in case of standard OLS (or TOBIT) estimation is straightforward. In the context of quantile regressions, however, the approach requires some further clarifications.

Consider the quantile regression model

$$\begin{aligned}
 y_i &= \mathbf{x}_i' \boldsymbol{\beta}^\theta + \varepsilon_i^\theta & \text{with } Q_\theta(\varepsilon_i^\theta | \mathbf{x}_i) = 0 \\
 \text{and } Y_i &= \mathbf{X}_i' \mathbf{B}^\theta + E_i^\theta & \text{with } Q_\theta(E_i^\theta | \mathbf{x}_i) = 0 \quad ,
 \end{aligned} \tag{5}$$

where Q_θ is the θ -th quantile function, $\boldsymbol{\beta}^\theta$ and \mathbf{B}^θ are the quantile-specific vector of coefficients and ε^θ and E^θ denote error terms.³⁴ Replacing the vector of explanatory variables in eq. (5) by the corresponding sample means gives the expectation for the θ -quantile of dependent variable Y_i conditional to average characteristics

$$Q_\theta(y_i | \mathbf{x}_i = \bar{\mathbf{x}}) = \bar{\mathbf{x}}' \boldsymbol{\beta}^\theta \quad \text{and} \quad Q_\theta(Y_i | \mathbf{X}_i = \bar{\mathbf{X}}) = \bar{\mathbf{X}}' \mathbf{B}^\theta, \tag{6}$$

³⁴ In case of median regression ($\theta = 0.5$), the estimates $\hat{\boldsymbol{\beta}}$ and $\hat{\mathbf{B}}$ are obtained by minimizing $\sum_i |\varepsilon_i|$ and $\sum_i |E_i|$, respectively.

As an example consider the case with log wages as dependent variable and years of schooling as the only regressor. Assume that the average duration of schooling is \bar{x} in the sector and \bar{X} in the aggregate. Inserting these values into eq. (5) yields the expected median for workers with average years of schooling as $\bar{x}\hat{\beta}^{0.5}$ in the sector and $\bar{X}\hat{B}^{0.5}$ in the aggregate economy. Note that in general this expectation is not identical to the unconditional median:

$$Q_{\theta}(y_i) \neq Q_{\theta}(y_i | \mathbf{x}_i = \bar{\mathbf{x}}) \quad \text{and} \quad Q_{\theta}(Y_i) \neq Q_{\theta}(Y_i | \mathbf{X}_i = \bar{\mathbf{X}}).$$

By contrast, for standard (mean) regression the following relationship holds: $\bar{y} = E(y_i) = E(y_i | \bar{\mathbf{x}}) = \bar{\mathbf{x}}' \hat{\beta}_{OLS}$ (and similar for the aggregate).

To summarize these considerations, the decomposition approach can be applied to quantile estimation results as well. However, one has to stress the fact that the results are conditional to average characteristics, a restriction that is not necessary in the context of standard estimation like OLS.³⁵

Let us now define the conditional θ -th quantile wages in logs as

$$\bar{y}^{\theta} := Q_{\theta}(y_i | \mathbf{x}_i = \bar{\mathbf{x}}) \quad \text{and} \quad \bar{Y}^{\theta} := Q_{\theta}(Y_i | \mathbf{X}_i = \bar{\mathbf{X}}).$$

Then one can calculate the *conditional sector wage differential* at quantile θ as $CWD^{\theta} = \bar{y}^{\theta} - \bar{Y}^{\theta}$. For example, for $\theta = 0.5$ the indicator $CWD^{0.5}$ compares median wages of workers with typical (average) characteristics in the sector to median wages of a group of workers with typical characteristics in the aggregate.

By applying the same decomposition techniques as for the mean wage differential one obtains the breakdown that is used in our empirical study:

$$\begin{aligned} CWD^{\theta} &= \bar{y}^{\theta} - \bar{Y}^{\theta} := \bar{\mathbf{x}}\hat{\beta}^{\theta} - \bar{\mathbf{X}}\hat{B}^{\theta} \\ &= \underbrace{\bar{\mathbf{X}} \cdot \Delta\hat{\beta}^{\theta}}_{\text{rewards effect}} + \underbrace{\Delta\bar{\mathbf{x}} \cdot \hat{B}^{\theta}}_{\text{characteristics effect}} + \underbrace{\Delta\bar{\mathbf{x}} \cdot \Delta\hat{\beta}^{\theta}}_{\text{interaction effect}} \end{aligned} \quad (7)$$

References

- Blinder, Alan S. (1973): "Wage Discrimination: Reduced Form and Structural Estimates", *Journal of Human Resources*, 8, pp.436-455.
- Oaxaca, Ronald (1973): "Male-Female Wage Differentials in Urban Labor Markets", *International Economic Review*, 14, pp.673-709.

³⁵ In case of only minor differences between the conditional and unconditional quantiles, however, the specific restraints in the interpretation of the quantile regression approach can be neglected.

APPENDIX C: DATA DESCRIPTIONS

CI. GERMANY

IAB-REG (Regionalstichprobe des Instituts für Arbeitsmarkt- und Berufsforschung, Nürnberg) is a 1% random sample of all employees who contribute to the social security system in Germany. It covers the years 1975 to 1997 although the information for the first two or three years is not complete and some of the variables are missing. Due to its original source, the data set does not include self-employment, civil servants, those in marginal employment, students enrolled in higher education and family workers. Disregarding the public sector, the coverage of workers is generally high (typically more than 80% of total employment).

The data set was drawn on the basis of personal register numbers of employees in the social security system. Selecting a specific combination of the last two digits of the personal identification number a one percent sample was drawn from the pool of all identification numbers used in the time period 1975 to 1997. Due to this procedure every worker who paid social contributions during the selected time span had the same probability to enter the sample.

For all persons selected for the sample several personal characteristics (skill, age, gender, occupation, marital status and nationality) are available. In principle, all spells of employment and unemployment for all persons in the sample are recorded exactly from the day of entry to the day of exit. For each spell of employment the average daily earnings are reported. For spells beginning before 1st of January or ending after 31st of December of a given year an annual entry was generated in order to avoid spells overlapping the calendar year. For each spell some characteristics of the employer are included in the data set (regional location, size of the firm and industry affiliation, among others). Quantitative information on working hours is not available. Some information, however, is contained in a qualitative variable indicating whether a person has worked part-time or not and if so, with less or more than 50 percent of usual working hours.

The data set covers more than 5.7 million individual records. For the purpose here, we constructed a sub-sample drawing all spells including the 30th of June in the selected year.³⁶ The number of observations exceeds 200,000 per year.

³⁶ This cut-off date is typically used in many official statistics as well.

Being the basis for social security payments, the earnings information (daily gross earnings) in the data set is highly reliable. A certain drawback, however, is the fact that the data are top-coded. This is due to the ceiling for contributions in the German social security system. In 1997, for instance, about 5% of all observations were censored. If one restricts the sample to full-time workers in West Germany, the share of top-coded records increases to about 8%.

A further problem with the inter-temporal consistency of the data set is that there were several changes in the definition of earnings. Most of these changes were of minor importance, but a substantial one occurred in 1983. Before this date special gratifications were not included. Since these extra payments can be quite substantial and vary across different groups of workers, this re-definition caused a structural break, which has clearly to be considered in year-to-year analysis. Since the effects of the structural break are of minor importance in long-run comparisons, however, we did not attempt to correct for this possible structural break here.

The qualifications of workers in the sample can broadly be separated into three broad categories: (i) *low-skilled*: persons with a lower schooling level and no further occupational qualifications completed; this group includes lower and intermediate secondary school graduates who did not complete an apprenticeship or did not graduate from a full-time vocational school; (ii) *skilled*: persons with an occupational qualification, which might be either a completed apprenticeship or graduation from a vocational school; (iii) *high-skilled*: persons holding a secondary school leaving certificate and a degree for a university or a polytechnics type of higher education.

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For further information see also : http://www.gesis.org/en/data_service/iab/

Harmonization of the data [CPS and IAB-REG]

A sensible comparison of micro-data evidence for different countries requires a careful harmonization of variables. Since the German data set is the most restrictive one it was taken as basis. Several adjustments were necessary to render the U.S. data as similar as possible to the German data. First, minor employment and self-employment were excluded from the U.S. data since information on these groups of workers are not available for

Germany. Second, because IAB-REG contains qualitative information on working time only, all comparisons were based on earnings and not on hourly wages. To control for the effect of part-time, the two variables PT_1 and PT_2 that are available in the German data set were accordingly constructed from usual working hours information in the CPS survey.³⁷ Third, (potential) experience of workers was generated by applying the same principles for both countries.³⁸ Fourth, in both countries three skill levels were defined applying ISCED codes as far as possible.³⁹

C2. UNITED KINGDOM

Data: The data set used for the UK is the General Household Survey, provided by the UK Data Archive (Principal Investigator is UK Office for National Statistics Social Survey Division). Rounds used: 1979, 1989/90, 1998/99, 2000/01

General Description

The UK General Household Survey is a continuous national survey of people in private households conducted on an annual basis, by the Social Survey Division of the Office for National Statistics. The survey is carried out for a number of the UK government departments. It provides information for planning and policy purposes, covering aspects of housing, employment, education, health and social services, transport, population and social security, and is also used to monitor progress towards achieving targets. It is a continuous survey based on an achieved sample of about 9,000 households per year. Prior to 1988 the interviewing year was from 1st January - 31st December. In 1988 the interviewing year changed to 1st April - 31st March. There was no data collection for 1997-98.

In our analysis we have used three main rounds of GHS data: 1979, 1989/90, and 1998/99. The overall number of observations in each sample is 30705, 28631, and 20365, respectively. For quantile regression analysis and allocator tables only individuals aged 16-69 were considered. The data on earnings contains much smaller a number of observations. In addition, after having cleaned the data set (excluding missing observations, etc.) the sample sizes were reduced to 11326, 9062, 2907 observations for the years 1979, 1989/90 and 1998/99, respectively. Since the number of observations for 1998/99 is nearly 3-4 times

³⁷ The first variable indicates working hours with less or equal the half of usual full-time hours. The second variable describes working hours between half and full-time working hours.

³⁸ Experience (EXP) was defined as age minus average years of schooling and further qualification minus 6.

lower than for other rounds, we pooled the data from the GHS round 1998/99 and 2000/01 (the next available round of the GHS data) together, so that after having adjusted the sample its size is 9754.

Peculiarities of the data:

- 1) **Industry classification:** The UK standard industrial classification (SIC) changed twice during the period covered by our analysis (1980 and 1992). For some reason, the detailed data on industries was left out in the round for 1979 so that the only reliable information, comparable with the data for 1989/90 and 1998/2001, is available for 10 industries (**Agriculture, Fishing, Forestry** (corresponds to OECD-old classification codes: 1); **Energy and Water Supplies** (2,7,25); **Mineral** (incl. Extraction of non-fuels, Manufacturing of metals, Chemicals) (8-11); **Engineering** (incl. Metal goods & Vehicles industries) (12-23); **Other Manufacturing** (3-6, 24); **Construction** (26); **Distribution** (27,28); **Transport & Communications** (29,30); **Bank & Finance** (31); **Other Services** (32-35)). The data sets for 1989/90 and 1998/2001 contain all necessary information on detailed (2 and 3 digit) classification of industries.
- 2) **Earnings and hours data:** all three data sets contain detailed information on earnings and hours of work so that hourly earnings can easily be derived both for employees and the self-employed.

Bibliographic Citations:

Office for National Statistics Social Survey Division, General Household Survey, 1979 [Ghs79.sav], SN: 1831; 1989-1990 [Ghs89.sav], SN: 2832; 1998-1999 [ghs98ind2.sav], 2nd ed., 3 April 2001, SN: 4134; 2000-2001 [ghs00client1.sav], 16 July 2002. SN: 4518.
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We acknowledge the UK Data Archive, University of Essex, Colchester and Crown Copyright for UK GHS data 1979-2001. The authors of this report bear full responsibility for the analysis of the data and its interpretation.

C3. UNITED STATES

Description of US data

The US data are from the Current Population Survey (CPS), which is a monthly survey of 50,000-60,000 households, conducted by the Bureau of the Census for the Bureau of Labor

³⁹ Of course, a certain discrepancy remains in the definition of skills (see, Freeman, Schettkat (2002) for a closer inspection of equivalent definitions of skill variables in Germany and the U.S.

Statistics. The CPS asks individual household members (or proxies) detailed questions about their labour force status. The answers are the primary basis for many official US labour statistics, most notably the unemployment rate. The particular version of the CPS data analysed here is the Economic Policy Institute's (EPI) extract of the "Outgoing Rotation Group" (ORG) of the CPS (see Webster, 2000, and Gao, 2003, for more thorough descriptions). The ORG is a one-quarter subset of the CPS that, in addition to answering detailed questions about their labour market circumstances has, since 1979, also provided information on earnings from work.

The EPI extract of the ORG sample used here attempts to compensate for several problems with the raw CPS data. First, the hourly wage concept in the CPS is somewhat inconsistent within each annual survey. Hourly wages for "hourly workers" (those paid by the hour or who report their earnings on an hourly basis) exclude overtime, tips, and commissions. Hourly wages for "non-hourly workers," however, are calculated as usual weekly earnings (a variable constructed by the BLS from more detailed responses) by usual weekly hours, and includes overtime, tips, and commissions. Within a given cross-section, therefore, the hourly earnings concept is not consistent across hourly and non-hourly workers. Procedures designed to correct for this discrepancy in hourly earnings (by attempting to add overtime, tips, and commissions to hourly workers reported hourly wages) typically produce disappointing results before 1994, when the CPS underwent substantial revisions. The use of the same, somewhat flawed procedure over time, however, should ensure consistency of the overall hourly earnings concept across different years of the CPS data.

Second, the CPS "top-codes" weekly earnings of non-hourly workers, and the level of the top-code changes abruptly at two points during the 1979-2002. To adjust for the effects of top-coding of weekly earnings on the measured mean and variance of the sample, the EPI data use the Pareto distribution to estimate the mean wage above the top-code and then assign this mean to all top-coded observations. Separately, in order to eliminate the effects of measurement error that can lead to very low or very high hourly wages, all hourly wages below \$1 and above \$100 per hour (in constant 1989 dollars) have been excluded from the sample.

Third, from 1994, when the Census and BLS thoroughly redesigned the CPS, respondents were allowed to answer that their "usual weekly hours" at work varied, a response not previously permitted. Each year since 1994, about 6% of workers chose to report that their hours varied, making it impossible to calculate an hourly wage for these workers. The EPI extracts uses information on these workers' employment characteristics to impute their "usual weekly hours."

Finally, from 1992, the CPS changed its procedure for measuring education. Before 1992, the CPS asked respondents for the total years of education (and whether they had completed their last year or not). From 1992, however, the CPS focused on educational attainment, rather than years of schooling. The data here follow Jaeger's (1997) procedure for producing a broadly consistent education series across the two definitions.

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C4. NETHERLANDS

General Remarks

At present, the main official Dutch statistical source of data on earned wages is the Yearly Survey of Employment and Wages (EWL) that is carried out each year at the end of September/beginning of October. As the surveying of wages by Statistics Netherlands (CBS) has changed drastically over the last fifteen to twenty years and is also being changed since the last year (1994) for which data have been published, it is worthwhile to say a few words about the preceding and future surveys.

The EWL was established in 1991 to integrate two separate surveys on employment and wages: the Statistics on Employed Persons (SWP) and the Yearly survey of wage earnings (JLO). The latter survey had been carried out for the first time in 1984, replacing the former Half-yearly survey of wage earnings (HJLO) and the Structure of earnings survey (LSO). The HJLO, for its part, dated back to the 1940s; from 1947 to 1960 it was carried out once a year, in October, from 1961 to 1983 twice yearly, in April and October. The LSO was carried out about every six years (1962/65, 1972, 1979), for the last time in 1979 as part of Eurostat's 1978-79 Structure of Earnings Survey. The coverage of the economy by HJLO as well as LSO was incomplete, but from 1977 on agriculture was the only missing sector. Also, HJLO was restricted to the earnings and working hours of the survey period only, while the LSO included annual earnings.

The JLO, starting in 1984, had full coverage of the economy and covered the period's

earnings as well as annual earnings, but without the LSO's details on the educational attainment of employees. Two additional surveys were held (in 1985 and 1989) to cover the training aspect. The JLO also marked the end of the separate Minimum Wage Survey (MLO), carried out in 1971, 1974, 1976, 1979, 1981 and 1983. From 1984 on minimum wage employment has been derived from the general distribution of wages. Publication of JLO-data overlaps with EWL (1991-1993).

The EWL comprises two separate questionnaires, on employment and on wages. The latter is based on a sample of 24.000 employers including all those employing 100 employees or more. Many of the latter categories provide the data of all employees; since 1993 these have no longer been sampled by the CBS but fully taken into account. Consequently, the sample now counts slightly less than a million employees or about 18 percent of all employees. Before, the sample population numbered about 300.000 to 400.000 employees. In 1995, the automated supply of personnel files to the CBS that made possible the enlargement of the sample, was taken as the basis for a new approach to surveying. It aimed at further decreasing the administrative burden of respondents by integrating still more separate statistics (on a quarterly and annual basis) into the Survey of Employment and Wages (EWL). No information on the methods of this Survey has yet been published.

Generally, no micro-data are available outside the walls of the CBS. However, for a number of years "publication files" (based on a sample of the sample) have been provided to very few outside users such as the Central Planning Bureau. It regards the three years that question on training were asked (1979, 1985, 1989) and possibly a year in the 1990s. These are ad hoc, non-standardised files in a double sense: their technical specifications differ and also the size of their samples (and consequently the reliability of detailed results). Unfortunately, the users are not allowed to make their files available to third parties. Given the fact that in recent years the CBS has been radically reorganized the know-how about the files has almost disappeared. I have been promised, however, that they will be made available in the coming months. Consequently, I have filled out the checklist focusing on the tabulated data thus far available (differentiating as far as possible between the different surveys), and added a list of variables on the basis of the earnings questionnaire of the 1994-JWL and the description of the 1989 publication file, to indicate what these publication files might cover.

C5. FRANCE

The French data are extracted from the Enquête Emploi (Labour Force Survey) for the years from 1982 to 2002. There are sixty thousands households included in the LFS sample. The survey measures monthly earnings, net of employee payroll taxes but including employee income taxes and usual weekly hours. For the period from 1982 to 1989, the monthly

earnings are measured in 22 intervals of widths varying from 500F to 5000F. After 1990, the wages are given in a continuous form. The survey gives indications on the industry where the person is occupied, and on his socio economic characteristics.

APPENDIX D: PRODUCTIVITY COMPARISONS FOR SERVICES

Measuring productivity for service sectors is well-known to be problematic because of the difficulties in constructing meaningful volume data. Here we concentrate on the Distribution Sector (wholesale, retail plus hotels & restaurants) because of its role as a major employer of low-wage labour and in accounting for differences between EU and US employment rates.

Changes in the volume of distribution output within countries are typically measured by deflating measures of current price sales by retail price indices to obtain sales volumes. Indices for different types of stores are then weighted by the average gross margin (assuming that differences in margin at a point in time reflect differences in the output produced by the store). The index for total real sales is linked to base year current price value added to obtain VA at constant prices as published in National Accounts. This in turn is used with employment data to construct labour productivity etc.

The underlying assumption (Fuchs 1968 ch 5) is that the quantity & quality of service per real dollar of sales remains constant over time, which is controversial (24 hour-shops, lack of informed assistants, time spent queuing etc). A more recent refinement in measurement (in the US at least) has been to apply double deflation to this sector, so that changes in the real use of intermediate inputs (but not quality changes) are taken into account. This increased measured productivity growth in US retailing in the 1980s very slightly, rather more in wholesale (Mohr 1992).

Further problems arise when attempting to make international comparisons. Extending the national methodology would involve valuing the output of distribution at some common set of prices e.g. value of retail sales at international prices to secure a gross output measure, and then ideally applying the double deflation approach by subtracting inputs at international prices. The problems in doing this are obviously formidable, and we return to the published attempt to do this after considering some simpler approaches.

The OECD's international databases have calculated output at "international prices" by deflating value added in each sector by the general PPP deflator for GDP. This procedure was introduced with very little discussion of its conceptual basis, but the resulting estimates of relative productivity levels by sector have been quite widely used (Dollar and Wolff 1993,

Barnard and Jones 1996). However such a measure of labour productivity in a sector is very far conceptually from the normal understanding of productivity. For it literally measures the purchasing power (in terms of composite GDP) of incomes per head received in the sector. If we assumed for simplicity that there is a rough equalisation of income per head across sectors (adjusted for skill composition of the labour force and capital labour ratios) then VA per head deflated by the GDP PPP, depends not on labour productivity in the specific sector, but on labour productivity in the economy as a whole. If we measured labour productivity in construction in this way in the US and UK then the economy-wide higher level of productivity in the USA as a whole would inevitably show up as higher labour productivity in US construction since incomes in construction would buy more “real GDP” than in the UK (unless incomes per head in US construction were much below the national average). However interesting such comparisons might be, they convey no information about whether US construction firms build houses more or less efficiently than their UK counterparts, which is what relative productivity levels are supposed to measure.

It should be noted that this objection is not to the OECD’s STAN and other databases showing value added at constant prices (since these series are no better or worse than the national account volume measures from which they are derived). The problem comes with the suggestion that dividing these VA figures at constant *national* price by an overall PPP exchange rate makes them *internationally comparable* measures of the level of sector output.

Recently several writers, including Mary O’Mahony and her co-authors (O’Mahony, Oulton, Vass 1996), have refined this approach to comparative service productivity by replacing overall PPPs in the deflation of sectoral value added by a PPP for the sectors concerned (derived from the PPPs for detailed expenditure categories from which OECD assembles their aggregate PPPs)⁴⁰. Thus “price ratios for retail distribution were based on the PPP for consumer goods...”(O’Mahony 1999 p 36). This feels closer to what is normally understood as productivity. Labour productivity calculated in this way measures the volume of consumer goods which can be *purchased* by incomes per head in retailing (the analogous measure for restaurants measures volume of meals which can be purchased by incomes per head in the sector). But are these meaningful measures of productivity?

⁴⁰ Baily (1993) quotes McKinsey estimates of retailing productivity based on value added per employee deflated by the PPP for all consumption – an approach lying somewhere between OECD and O’Mahony

Consider a simple economy with 2 sectors, one of which manufactures widgets and the other (retail) sector sells them. In country A each manufacturing worker produces 100 widgets per year and each retailing worker can sell 200 per year so that there are half as many retailing workers as manufacturing workers. Average living standards (forgetting all other claimants) will be 67 widgets per year (including the associated retail services which are necessary for widget consumption). Assuming workers in the two sectors are paid the same, value added per head in retail in terms of consumer goods measures this level of real widget consumption per head.

Now consider economy B where manufacturing productivity is 200 per year, whilst retail productivity (sales per head) is the same as in A. So there must now be equal numbers of retailing & manufacturing workers. Incomes per head (again assuming equal wages) will be 100 widgets per year. According to O'Mahony's method the retailing workers are 50% more productive in B (their incomes can buy 50% more widgets). However they do exactly the same thing in both countries and their higher living standards are simply a reflection of higher manufacturing productivity, not their own productivity.

Finally consider economy C that like A has manufacturing productivity of 100 but where each retailing worker sells 400 per year. So now there is 1 retailing worker for 4 manufacturing workers and living standards (or value added per head in retailing deflated by the retail price index for widgets) will be 80 widgets per year. True, the higher genuine productivity in retailing is somewhat reflected in the measure, but only to a minor extent because the benefit of higher retailing productivity is not captured solely within retailing. The process of equalisation of incomes across sectors ensures (however imperfectly in practice) that the benefits of higher productivity in one sector are distributed throughout the economy (through Baumol's famous relative price effect). Conversely a real income within a sector benefit from rising productivity elsewhere, irrespective of what is happening within the sector itself. Table I summarises the example.

Table I

| | Economy A | Economy B | Economy C |
|---|-----------|-----------|-----------|
| Manufacturing Output per worker | 100 | 200 | 100 |
| Retail Sales per Worker: "Productivity" | 200 | 200 | 400 |
| Proportion of workers in Retailing (= Retailing Margin on Widget Sales) | 1/3 | 1/2 | 1/5 |
| Average Consumption Of Widgets = VA in Retail/Manufacturing deflated by retail price of widgets | 66 2/3 | 100 | 80 |

Our conclusion is that the purchasing power of real incomes within a sector, even when it is measured in terms of the gross output of the sector itself, cannot be taken as an indicator of the labour productivity in that sector. The example elaborated above is very simple because there are only two sectors and consumption of goods (gross sales of retailing) that constitute the whole of GDP. However exactly the same problem applies whenever there are substantial inputs into a sector, for then the purchasing power of incomes within a sector in terms of that sector (in effect the product wage) depend on prices and thus productivity in the supplying sectors. So deflating value added by gross output prices will only work as a measure of productivity *either* if there are no other inputs into production (valuing the incomes of roadside barbers in terms of the PPP for haircuts in India would be an appropriate measure of their productivity) *or* where comparative labour productivity in the two countries is the same across all sectors. In the latter case there are no differences across countries in the relative price of intermediate inputs and final outputs. This latter assumption is wholly unrealistic of course: indeed the whole point of measuring comparative productivity levels for particular sectors is precisely because these are likely to differ depending on the sector and thus relative prices of inputs and outputs will not everywhere be identical⁴¹.

What can be done? One obvious approach based on our simple examples would be to take real sales volume per retailing worker as our measure of gross productivity. This would show productivity of 200, 200, 400 in A, B and C respectively, reflecting the higher efficiency of retailing in C. This would require measuring widget sales at international prices, or more generally goods consumption at international prices, per person employed. So rather than deflating value added in distribution by the PPP for consumption goods it is sales of consumption goods which should be so deflated. A yet more sophisticated version would

⁴¹ So Sorensen's suggestion (2000) that deflation by a sector PPP is a satisfactory replacement for the GDP PPP for comparing productivity levels is unconvincing.

be to double deflate inputs and outputs, and one estimate along these lines is available as will be noted below.

Does this all make a difference in practice? We can illustrate this with four sets of calculations for hourly productivity in the distribution sector for UK, USA, Germany and France for 1999. Distribution covers retailing, wholesaling and restaurants etc.

The first columns of figures are directly from O'Mahony and involve deflating VA by PPPs for the output of the sector (consumer goods for retailing, consumer goods and machinery for wholesale, PPPs for restaurants, hotel etc for that part of distribution). The second deflates VA by overall PPPs (the OECD approach). The third column uses consumption of goods at PPP as a simple gross output indicator. The final column is based on van Ark and Trimmer's double deflation of inputs and outputs (crudely updated to 1999 to facilitate comparisons).

Table 2

| Estimates of Labour Productivity per Hour Worked in Distribution, 1999 | VA deflated by Sector PPPs | VA deflated by GDP PPP | Consumption of Goods, meals etc deflated by Sector PPPs | Double Deflated Value Added Retail/Wholesale Only |
|--|----------------------------|------------------------|---|--|
| UK | 100 | 100 | 100 | 100 |
| USA | 161 | 129 | 117 | 169 |
| Germany | 112 | 103 | 107 | 77 |
| France | 150 | 133 | 131 | 146 |
| | | | | |

Sources:

Column 1: O'Mahony 2002 Relative Labour Productivity Table

Column 2 Column 1 multiplied by (PPP for GDP/PPP for Cons of Goods) OECD 1999 PPPs,

Column 3 Consumption of Goods + Hotels etc OECD 1999 PPPs

Column 4 van Ark & Trimmer 2001 Table 5; updated from 1990 to 1999 using O'Mahony's series for labour productivity (original data for 1990 are 100,152,89,164)

Productivity differences between Europe and the USA are considerably greater when VA and sector PPPs (column 1) are used than when goods consumption (column 3) is used. This is what might be anticipated from the discussion above, given the generally higher level of goods productivity in the USA⁴². VA deflated by overall PPPs (column 2) reduces the differences between Europe and USA (as compared to column 1) which could reflect the greater advantage that the USA has in goods production as compared to services (the price of goods relative to services in 1999 was 30% lower in the EU than in the USA according to

⁴² Some of the difference between columns 1 and 3 may reflect the fact that column 1 used 1996 PPPs and column 3 used 1999 PPPs. It appears that consumption differences between the EU and USA were smaller on the latter basis (despite the intervening rapid US growth)

the OECD's 1999 PPP calculations). Finally the attempt at double deflation yields comparative productivity levels pretty close to those in column 1 except for Germany where the estimates seem extremely low. Theoretically double deflation is closer to the crude gross output series in column 3 (which in effect is single deflation). Single deflation involves the assumption that the relative volumes of inputs and outputs are similar across countries; differences are in principle corrected by double deflation. The approach in column 1 in effect assumes common relative prices for inputs and outputs across countries, which we know, must be inaccurate.

It is difficult to know which measure (if any) to rely on. The gross output indicator (column 3) has the virtue of simplicity, though consumption of goods plus meals etc is a very crude output indicator for distribution (there is no weighting of different categories of sales by relative margins, no attempt to include investment goods or government purchases which pass through wholesalers etc). On the other hand, the general susceptibility to measurement errors of double deflation (column 4), because it calculates the difference between two large numbers each of which are subject to substantial error, must be magnified when inputs and outputs have to be reckoned at international prices. Of course all the series depend on the employment numbers as well as output (and this could possibly account for the surprisingly high estimates for France). The main point of this paper, however, has been to stress the limitations of the attractive approaches, which involve deflating value added directly by PPPs (columns 1 and 2). Such measures have been sharply criticised already (see Jorgenson 1993), and the case for at least starting from gross output seems to have been rather widely accepted (see Van Ark and Trimmer 2001). The emphasis, here that deflation of VA by PPPs inevitably brings in productivity levels and thus real incomes in the broader economy, represents a rather different angle on the problem (the reply by Barnard and Jones to Sorensen's comment on their paper touches on the issue)

Perhaps a brief methodological conclusion is justified. There is a tension between the classical notion of productivity that is tied fiercely to production (after all value for Ricardo and Marx is the inverse of labour productivity) and the neoclassical view where productivity is measured by the appropriation of income. An early example of the problem is found in Adam Smith's contention that productivity was systematically higher in agriculture because incomes per head included a rent element, whilst it grew faster in manufacturing because of the greater opportunities for the division of labour there. Once it is appreciated that comparing productivity levels across industry can only be done in terms of incomes per head

(i.e. at current prices), the paradox was resolved by Smith's explanation that prices of manufacturing fell relative to agriculture. This is an early example of Baumol's relative price effect and ensures that faster growth in real productivity is not translated into faster growth of incomes per head in the sector.

When thinking about productivity growth within sectors or for the economy as a whole we still use a basically classical approach (though TFP has rather a mixed ancestry). In principle it is possible to apply this notion of output per unit of input across countries and this is what productivity comparisons for sectors or for the GDP purport to do. However, when comparing productivity across different sectors within a country, it is meaningless to compare measures of physical quantities (the apples and pears problem). The only possible measure is incomes per head (so saying that agriculture is a low productivity sector simply means that incomes per head are lower than in industry). But a major problem arises when this latter concept is used to measure productivity levels for the same sector across countries. For the purchasing power of incomes per head, either in terms of national output or in terms of the gross output of the sector depends on productivity in other sectors (all of them in the first case, sectors producing intermediate inputs in the second case). From a neoclassical perspective it may make perfectly good sense to say that if manufacturing productivity rises, and real incomes rise as a result of relative price changes, that real productivity in retailing has risen. But it is nothing directly to do with the productivity of the sector in the classical, productive efficiency, sense. Similarly comparisons across countries of the purchasing power of incomes within a sector are not appropriate measures of the comparative efficiency of production.

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LIST OF DEMPATEM PARTICIPANTS

COORDINATION:

Utrecht University, Ronald Schettkat
Amsterdam University, Wiemer Salverda

RESEARCH TEAMS:

Oxford University

| | |
|-------------------|----------------|
| Mary Gregory | (Input-output) |
| Andrew Glyn | (Employment) |
| Justin Vandeven | (Input-output) |
| Sarah Voitchovsky | (Employment) |
| Maxim Bouev | (Employment) |

Utrecht University

| | |
|--------------------|--------------------------|
| Ronald Schettkat | (Aggregate, Consumption) |
| Giovanni Russo | (Input-output) |
| Joep Damen | (Aggregate) |
| Marijke van Daelen | (Consumption) |
| Lara Yocarini | (Aggregate) |

Amsterdam University, Amsterdam Institute for Advanced Labour Studies AIAS

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|------------------|---------------------------|
| Wiemer Salverda | (Employment, Consumption) |
| Adriaan Kalwij | (Consumption) |
| David Hollanders | (Employment) |

University of Paris I, Sorbonne

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| Francois Gardes | (Consumption) |
| Michel Sollogoub | (Employment) |
| Christophe Starzec | (Consumption) |
| Robert Lantner | (Input-output) (withdrew for health reasons) |

University of Madrid, Carlos III

| | |
|-------------------------|---------------|
| Javier Ruiz-Castillo | (Consumption) |
| María Jose Luengo Prado | (Consumption) |

Washington. 17th Street Economics

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|--------------|---------------------------|
| John Schmitt | (Consumption, Employment) |
|--------------|---------------------------|

University College London

| | |
|-------------------------|---------------|
| Stephen Machin | Consumption) |
| Laura Blow (at the IFS) | (Consumption) |

Universität Regensburg

| | |
|-----------------|--------------|
| Joachim Moeller | (Employment) |
|-----------------|--------------|

OUTPUT:

Ronald Schettkat. and Lara Yocarini (Jan. 2003)

DEMPATEM in perspective State of the art in the analysis of structural changes:

Working Papers: (See list below)

Books in preparation:

The US-European gaps in Demand and Employment

Wiemer Salverda and Ronald Schettkat, ed.

LIST OF WORKING PAPERS

1. **John Schmitt**, Estimating Household Consumption Expenditures in the United States using the Interview and Diary Portions of the 1980, 1990, and 1997 Consumer Expenditure Surveys
2. **Laura Blow**, Household Expenditures Patterns in the UK
3. **Adriaan Kalwij & Wiemer Salverda**, Changing Household Demand Patterns in the Netherlands: Some Explanations
4. **Javier Ruiz-Castillo & María José Luengo-Prado**, Demand Patterns in Spain
5. **Marijke van Deelen & Ronald Schettkat**, Household Demand Patterns in West Germany:1978-1993*
6. **Francois Gardes & Christophe Starzec**, Household Demand Patterns in France 1980-1995
7. **Francois Gardes & Christophe Starzec**, Income Effects on Services Expenditures
8. **Adriaan Kalwij & Steve Machin**, Changes in Household Demand Patterns: A Cross-Country Comparison
9. **Laura Blow, Adriaan Kalwij & Javier Ruiz-Castillo**, Methodological issues on the analysis of consumer demand patterns over time and across countries
10. **Mary Gregory & Giovanni Russo**, The Employment Impact of Differences in Demand and Production Structures
11. **Ronald Schettkat (Research Assistance: Joep Damen)** Demand Patterns and Employment Structures, An Aggregate Analysis
12. **Andrew Glyn, Wiemer Salverda, Joachim Möller, John Schmitt, Michel Sollogoub** Employment differences in services the role of wages, productivity and demand
13. **Ronald Schettkat & Wiemer Salverda**, Demand Patterns and Employment Growth Consumption and Services in France, Germany, the Netherlands, the United Kingdom and the United States Concluding Summary