

Christopoulou, Rebekka; Vermeulen, Philip

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Markups in the euro area and the US over the period 1981-2004: a comparison of 50 sectors

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NO 856 / JANUARY 2008

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THE PERIOD 1981-2004**

**A COMPARISON
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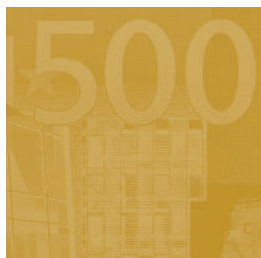
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MARKUPS IN THE EURO AREA AND THE US OVER THE PERIOD 1981-2004

A COMPARISON OF 50 SECTORS¹

Rebekka Christopoulou
and Philip Vermeulen²



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Any remaining errors are our own.

² Both authors: DG-Research, European Central Bank, Kaiserstrasse 29, D-60311 Frankfurt am Main, Germany; e-mail: rebekka.christopoulou@ecb.int; philip.vermeulen@ecb.int

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Address

Kaiserstrasse 29
60311 Frankfurt am Main, Germany

Postal address

Postfach 16 03 19
60066 Frankfurt am Main, Germany

Telephone

+49 69 1344 0

Website

<http://www.ecb.europa.eu>

Fax

+49 69 1344 6000

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Abstract

This paper provides estimates of price-marginal cost ratios or markups for 50 sectors in 8 euro area countries and the US over the period 1981-2004. The estimates are obtained applying the methodology developed by Roeger (1995) on the EU KLEMS March 2007 database. Five stylized facts are derived. First, perfect competition can be rejected for almost all sectors in all countries; markup ratios are generally larger than 1. Second, average markups are heterogeneous across countries. Third, markups are heterogeneous across sectors, with services having higher markups on average than manufacturing. Fourth, services sectors generally have higher markups in the euro area than the US, whereas the pattern is the reverse for manufacturing. Fifth, there is no evidence that there is a broad range change in markups from the eighties to the nineties.

Keywords: price, marginal cost, markup

JEL Classification Number: D43,L11

Non technical Summary

This paper provides estimates of price-marginal costs ratios, or markup ratios, for 8 Euro area countries (Germany, France, Italy, Spain, Netherlands, Belgium, Austria, Finland) and the US. The markups are estimated for 50 sectors per country over the period 1981-2004 using the EUKLEMS database.

Markup ratios measure the degree of competition in a sector. A markup ratio bigger than 1 implies that prices are larger than marginal costs and are, therefore, evidence of market power in a sector. Thus, estimating the degree of competition in a sector or entire economy is important for regulators, competition authorities and policy-makers. Regulators would like to know whether current regulation is conducive to competition. Likewise, competition authorities might gauge the current competitive situation in a sector. Finally, as mark-up estimates of different sectors and different countries allows cross-sector and cross-country comparison of the degree of competition, they should help in identifying which sectors and/or countries would benefit most from changes in legislation or regulation that affect competition.

The estimated mark-up values in this paper are plausible. From the results, we extract five stylized facts. First, perfect competition is widely rejected across most industries and all countries; markup-ratios are generally larger than 1. Second, average markups are heterogenous across countries. Third, markups are heterogeneous across sectors, with services having higher markups on average than manufacturing. Fourth, services sectors have generally higher markups in the Euro area than the US, whereas the pattern is reversed for manufacturing. Fifth, there is no evidence that there is a broad range change in markups from the eighties to the nineties.

1 Introduction

This paper provides estimates of price-marginal costs ratios, or markup ratios, for 8 Euro area countries (Germany, France, Italy, Spain, Netherlands, Belgium, Austria, Finland) and the US. The markups are estimated for 50 sectors per country over the period 1981-2004 using the EUKLEMS database.

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The estimated size of the markup ratios in this paper are quite plausible. The average markup ratio in the Euro area is 1.37, in the US it is 1.32. The average, however, masks a great degree of dispersion across sectors. For instance, when only considering manufacturing and construction industries the average markup ratios are 1.18 for the Euro area and 1.28 for the US.

From the estimates a set of stylized facts are extracted. First, perfect competition is rejected for most sectors and all countries; markup-ratios are generally larger than 1. Second, average country markups are heterogeneous. Third, markup-ratios differ widely across sectors with some individual sectors having systematically higher markup ratios than other sectors across all countries. Markups are generally higher in services sectors than manufacturing industries. Fourth, services sectors generally have larger markups in the Euro area than in the US, whereas manufacturing sectors generally have lower markups in the Euro area than in the US. Fifth, there is no systematic change in markups from 1981-1992 to 1993-2004.

Overall, these stylized facts are not surprising: barriers to entry (either legal or technological ones), product differentiation, exposure to international competition, etc. influence the degree of competition, causing a different effect in different countries and industries. However, it is very difficult to

identify what exactly influences the degree of competition for each single industry within each country.

The rest of the paper is structured as follows. Section two explains the methodology and discusses the related literature; section three presents the data; section four discusses the estimates and derives the stylized facts; and, finally, section five concludes.

2 Methodology and related literature

Roeger's method

The estimation methodology follows closely Roeger (1995). Roeger's method cleverly uses the two ways to measure the Solow residual: the one in terms of quantities (from profit maximization) and the one in terms of prices (from cost minimization).

The Solow residual as derived from profit maximization is traditionally defined as the difference between output growth and a weighted sum of input growths, where the weights are the input shares in revenue. Under constant returns to scale, perfect competition, and Hicks neutral technological change, this difference is identical to technological change (Solow, 1957).

Hall (1988) shows that under imperfect competition, the Solow residual as traditionally defined does not any longer measure technological change but, instead, it measures the weighted sum of technological change and the growth rate of the output-capital ratio. The weights are a function of the markup of price over marginal cost. Thus:

$$\begin{aligned} \Delta Q_t - \alpha_{Nt}\Delta N_t - \alpha_{Mt}\Delta M_t - (1 - \alpha_{Nt} - \alpha_{Mt})\Delta K_t \\ = \left(1 - \frac{1}{\mu_t}\right)(\Delta Q_t - \Delta K_t) + \left(\frac{1}{\mu_t}\right)\theta_t \end{aligned} \quad (1)$$

where ΔQ_t is output growth, ΔN_t is labour input growth, ΔK_t is capital input growth, ΔM_t is intermediate input growth, μ_t denotes the price-cost markup ratio, and α_{Jt} ($J = N, K, M$) is the input shares in revenue. The lefthandside is the definition of the traditional Solow residual ($SR_t \equiv \Delta Q_t -$

$\alpha_{Nt}\Delta N_t - \alpha_{Mt}\Delta M_t - (1 - \alpha_{Nt} - \alpha_{Mt})\Delta K_t$). In case the markup ratio is equal to 1, the Solow residual becomes equal to technological change θ_t .¹

Roeger develops the dual equation of the above derived from the price-based Solow residual equation, i.e. based on the dual problem of cost minimization, constant returns to scale and Hicks neutral technological change. This dual equation, in prices rather than quantities, is:

$$\begin{aligned} \Delta p_t - \alpha_{Nt}\Delta w_t - \alpha_{Mt}\Delta m_t - (1 - \alpha_{Nt} - \alpha_{Mt})\Delta r_t \\ = (1 - \frac{1}{\mu_t})(\Delta p_t - \Delta r_t) - (\frac{1}{\mu_t})\theta_t \end{aligned} \quad (2)$$

with Δp_t denoting the output price change, Δw_t the wage change, Δm_t the intermediate input price change, and Δr_t the user cost change.²

The lefthandside is now defined to be the (negative of) price-based Solow residual ($-SRP_t \equiv \Delta p_t - \alpha_{Nt}\Delta w_t - \alpha_{Mt}\Delta m_t - (1 - \alpha_{Nt} - \alpha_{Mt})\Delta r_t$). Again, in case the markup ratio is equal to 1, the price-based Solow residual becomes equal to technological growth θ_t .

Roeger observed that by subtracting the traditional Solow residual SR_t from the price based Solow residual SRP_t technological growth θ_t drops out of the equation. Thus, adding equations (1) and (2) and rearranging, one gets an equation solely in terms of nominal observable variables:

$$\begin{aligned} (\Delta p_t + \Delta Q_t) - \alpha_{Nt}(\Delta w_t + \Delta N_t) - \alpha_{Mt}(\Delta m_t + \Delta M_t) \\ - (1 - \alpha_{Nt} - \alpha_{Mt})(\Delta r_t + \Delta K_t) \\ = (1 - \frac{1}{\mu_t})[(\Delta p_t + \Delta Q_t) - (\Delta r_t + \Delta K_t)] \end{aligned} \quad (3)$$

with nominal output growth denoted by $\Delta p_t + \Delta Q_t$ (note that $\Delta(p_t Q_t) = \Delta p_t + \Delta Q_t$; $\Delta(w_t N_t) = \Delta w_t + \Delta N_t$; etc.), nominal wage bill growth denoted by

¹A derivation of this equation can be found in the Appendix. We use the following conventional notation for the rate of change over time: $\Delta X_t = (\frac{\partial X_t}{\partial t} / X_t)$, so that the terms in this equation can be reshuffled to be equal to equation (9) in Hall (1998) or equation (1) in Roeger (1995). Note that Hall (1988) and Roeger (1995) use a value added concept of output so that only capital and labour enter the equation. We use a gross output concept so that our equation also includes intermediate inputs.

²We use capital letters for quantities and lowercase for prices.

$\Delta w_t + \Delta N_t$, growth in intermediate input costs denoted by $\Delta m_t + \Delta M_t$, and growth in capital costs denoted by $\Delta r_t + \Delta K_t$. In other words, subtracting the price based Solow residual from the quantity based Solow residual one gets a *nominal* Solow residual. Under the above assumptions of constant returns to scale, imperfect competition and Hicks neutral technological change, this nominal Solow residual is a function of the markup and the difference between nominal output growth and nominal capital cost growth.

For estimation purposes μ_t is assumed constant over time and an error ε_t is added to the equation. This yields the simple regression:

$$SR_t - SRP_t = \beta[(\Delta p_t + \Delta Q_t) - (\Delta r_t + \Delta K_t)] + \varepsilon_t \quad (4)$$

or

$$y_t = \beta x_t + \varepsilon_t \quad (5)$$

with $y_t = (\Delta p_t + \Delta Q_t) - \alpha_{Nt}(\Delta w_t + \Delta N_t) - \alpha_{Mt}(\Delta m_t + \Delta M_t) - (1 - \alpha_{Nt} - \alpha_{Mt})(\Delta r_t + \Delta K_t)$, $x_t = (\Delta p_t + \Delta Q_t) - (\Delta r_t + \Delta K_t)$ and $\beta = (1 - \frac{1}{\mu})$. A consistent estimate of β can now be obtained by a simple OLS regression of y_t on x_t . An estimate of the markup is then simply $\frac{1}{1-\beta}$.

Hall's method

It is useful to recall the alternative method to estimate markups that was developed earlier by Hall (1988). The method by Hall to estimate markups is based on equation (1) rather than equation (3). Hall rewrites equation (1) as:

$$\begin{aligned} & (\Delta Q_t - \Delta K_t) - \alpha_{Nt}(\Delta N_t - \Delta K_t) - \alpha_{Mt}(\Delta M_t - \Delta K_t) \\ & = (\mu_t - 1)\alpha_{Nt}(\Delta N_t - \Delta K_t) + (\mu_t - 1)\alpha_{Mt}(\Delta M_t - \Delta K_t) + \theta_t \end{aligned} \quad (6)$$

In his seminal paper he does not use data on material inputs and, hence, estimates a version of this equation using a value added based concept of the output rather than gross output, which leads to the following equation:

$$(\Delta Q_t - \Delta K_t) - \alpha_{Nt}(\Delta N_t - \Delta K_t) = (\mu_t - 1)\alpha_{Nt}(\Delta N_t - \Delta K_t) + \theta_t \quad (7)$$

In contrast to the equation by Roeger (1995) this equation can only be estimated using instrumental variables, as technological growth θ_t will generally be correlated with the growth in the labour-capital ratio ($\Delta N_t - \Delta K_t$). Hall applies the instrumental variables (IV) method on this equation to obtain estimates of μ_t , using as instruments the petroleum price, the rate of growth of military purchases, and a dummy variable indicating whether the president is a Democrat or a Republican. However, this IV estimation generally leads to very large, sometimes implausible, estimates of the markup ratios. This is related to two problems. The first problem is to find good instruments; it is difficult to find instruments that are correlated with the labour-capital ratio but uncorrelated to technology. The second problem is specifically related to the use of value added rather than gross output. Waldmann (1991) argues that the data Hall uses on real value added can not be used reliably to estimate this equation. His argument is that for some sectors, especially for services, there is measurement error in real value added that is correlated with one of the instruments (price of petroleum). This measurement error is induced by the use of a direct-deflation method of constructing real value added; that is, by deflating nominal value added by the output price index. Clearly, the method of Hall itself is fully valid. The problem is in finding good instruments that are correlated with the labour-capital ratio but uncorrelated to technology and in using value added when measured with considerable error. Note that, for the same reasons, Roeger too refrains from estimating his equation for services sectors, since he also uses value added rather than nominal output.

Measurement error

Roeger develops further where the error term ε_t in equation (4) comes from. He rightfully argues that if all variables adjust instantaneously and are measured without error, there should be no error term in equation (4) and β (and hence the markup) could be calculated (year by year) rather than estimated. He argues in favour of a measurement error in labour input. As this would imply measurement error in y_t but not in x_t this would just effect efficiency but not consistency. However, it remains the case, as in any econometric exercise, that any measurement error in x_t would lead to biased estimates. In our case, bias could arise from any measurement error in nominal output growth or capital cost growth. Regarding nominal output growth, we think that significant measurement error is unlikely. For capital

costs, this possibility is higher. In any case, it is useful to know the direction of the bias these two types of measurement errors would induce. We use subscript d to indicate data (no subscript indicates true variable).

So imagine capital costs and nominal output are measured with error, i.e. $(\Delta r_t + \Delta K_t)^d = \Delta r_t + \Delta K_t - v_t$ and $(\Delta p_t + \Delta Q_t)^d = \Delta p_t + \Delta Q_t - u_t$ with $v_t \text{ iid}(0, \sigma_v^2)$ and $u_t \text{ iid}(0, \sigma_u^2)$. (And imagine for simplicity that α_{Nt} and α_{Mt} are constant over time, so can be written without subscript t) Then we have that:

$$y_t^d = (\Delta p_t + \Delta Q_t)^d - \alpha_N(\Delta w_t + \Delta N_t) - \alpha_M(\Delta m_t + \Delta M_t) - (1 - \alpha_N - \alpha_M)(\Delta r_t + \Delta K_t)^d \quad (8)$$

and

$$x_t^d = (\Delta p_t + \Delta Q_t)^d - (\Delta r_t + \Delta K_t)^d \quad (9)$$

The true regression becomes:

$$y_t^d = \beta x_t^d + (\beta - 1)u_t + [-\beta + (1 - \alpha_N - \alpha_M)]v_t + \varepsilon_t \quad (10)$$

where the error $(\beta - 1)u_t + [-\beta + (1 - \alpha_N - \alpha_M)]v_t + \varepsilon_t$ is correlated with the regressor x_t^d . It is now straightforward to show that b , the OLS estimator of β , would be biased.

$$b = \frac{\frac{1}{n} \sum x_t^d y_t^d}{\frac{1}{n} \sum x_t^d x_t^d} = \frac{\frac{1}{n} \sum (x_t + v_t - u_t)(\beta x_t - u_t + (1 - \alpha_N - \alpha_M)v_t)}{\frac{1}{n} \sum (x_t + v_t)^2} \quad (11)$$

So that

$$p \lim b = \beta + \frac{\alpha_K \frac{\sigma_v^2}{Q_x}}{1 + \frac{\sigma_v^2}{Q_x}} + \frac{\frac{\sigma_u^2}{Q_x}}{1 + \frac{\sigma_v^2}{Q_x}} \quad (12)$$

with $Q_x = p \lim \frac{1}{n} \sum x_t^2$.

So measurement error in capital costs and nominal output cause b unambiguously to be an upward biased estimator of β and hence bias upward the



estimate of the markup μ . Note also that the upward bias is more severe the higher the capital share is.

Returns to scale, sunk costs and other sources of bias

The constant returns to scale assumption is crucial to identifying the markup ratio μ . One can show that under returns to scale λ , the coefficient $(1 - \frac{1}{\mu_t})$ becomes $(1 - \frac{\lambda}{\mu_t})$.³ Thus, in this case, one cannot identify returns to scale separately from the markup: the estimates of $\frac{1}{1-\beta}$ provide a measure of $\frac{\mu}{\lambda}$ and not of μ . When there are increasing returns to scale, markups would be wrongly interpreted to be smaller than they are, while in the case of decreasing returns to scale the opposite would happen.

Regarding sunk costs, these lead to measurement error in capital cost and, therefore, their influence on the estimated mark-ups should materialize in the same way as any other measurement error in capital cost, in the way described above.

Additional issues that might lead to biases in the estimated markups, such as labour hoarding, overhead labour etc. are discussed in detail by Roeger (1995) and Hall (1988).

Constancy of the markup-ratio

Equation (4) leads to consistent estimates of the markup if the markup is constant over the time period of estimation. Hylleberg and Jorgensen (1998) argue that it is unlikely that the markup remains constant over longer time periods, but that it rather has the form of some constant γ plus some iid noise. For this case they show that the error term becomes heteroskedastic and autocorrelated and correlated with the regressor. A first best in this case would be to use instrumental variables. They argue that it is very difficult to obtain reliable instruments. They instead argue for a constant term in the regression (which corrects for some of the endogeneity under certain conditions (see for detail Hylleberg and Jorgensen (1998))). We do two things to allow for non-constancy. We estimate equation (4) over two subperiods and test for change in the markups. We also test for robustness by regressing (4) with a constant term included and using heteroskedasticity and autocorrelation consistent (HAC) standard errors.

³See Oliveira Martins et al, 1996.

Related literature

The method by Roeger (1995) has been used in a number of related studies to estimate industry markups. Being the first, Roeger (1995) uses it to estimate the markups for the manufacturing sector of the US economy on the two digit level for the period 1953-84. Oliveira Martins et al. (1996) uses it to estimate markups in the manufacturing industries for 14 OECD countries over the period 1970-1992 using the STAN database. In the text below we compare our estimates with theirs. Oliveira Martins and Scarpetta (1999) estimate markups in manufacturing industries in the US, Japan, Germany, France and the UK. Recently, a small literature has developed that uses the methodology on firm level data. Konings et al. (1995) use firm level data to estimate markups in manufacturing sectors in Bulgaria and Rumania for the period 1994-1998. Konings and Vandenbussche (2005) use a panel of 4000 European firms and test whether markups change in the face of anti-dumping trade measures. Görg and Warzynski (2006) estimate markups in UK manufacturing using a panel of firms over the period 1987-1997.

3 Data

The data used in this paper is from the EU KLEMS data base (March 2007 Release). The database construction and methodology is described in Timmer et al. (2007). The database was developed to create measures of economic growth, productivity, employment creation, capital formation and technological change at the sector level for all European Union members and the US from 1970 onwards. The paper uses the data from 1981 to 2004. It contains, with a few exceptions, the necessary input and output data at the detailed sector level (Nace 2 digit, Rev 1.1). For those few sectors in the few countries that do not have data available over the whole period, the estimations are done on shorter periods. The Appendix provides detail. The specific variables from the EU KLEMS data base that are used in this paper are the following: gross output (at basic current prices), compensation of employees, intermediate inputs at current purchasers prices, and capital services (volume) indices. The database does not contain a price series for capital. Therefore, to construct r_t , a user cost of capital is calculated using the Hall and Jorgensen(1967) method,

$$r_t \equiv P_I[(i - \pi_e + \delta)] \quad (13)$$

with P_I the investment deflator, $i - \pi_e$ the real interest rate, and δ the depreciation rate. For P_I we use the fixed capital deflator for the total economy and for $i - \pi_e$ the real interest rate, both from the AMECO database. The depreciation rate is fixed at 8% throughout.

4 Results

4.1 Markups over the period 1981-2004

Equation (5) was estimated for 50 sectors in each of the 8 Euro area countries and the USA for the period 1981-2004. Unfortunately, not enough data was available for the remaining Euro area members (Portugal, Luxembourg, Greece, Ireland). However, the included 8 countries together have a weight of over 90% of Euro area output.

The estimated coefficient β is an estimate of $(1 - \frac{1}{\mu})$. So, an estimate of the markup μ is equal to $1/(1 - \beta)$. Table A1 in the Appendix provides detailed markup estimates per sector and country. The corresponding standard errors (reported in Table A2 in the Appendix) are generally small. Hylleberg and Jorgensen (1998) argue that if the markup is not truly constant over the period of estimation one should add a constant term to the regression and correct the standard errors for heteroskedasticity and autocorrelation. Roeger also uses heteroskedasticity robust (White) standard errors. As a robustness check we report the markup estimates when a constant term is added to the regression and the standard errors are corrected for heteroskedasticity and autocorrelation in Tables A6 and A7. This has very little influence on the results. The average difference between the markups estimated by OLS and OLS with a constant term in the regression is 0.01. The average difference between the OLS and the robust standard errors is 0.006.

A certain amount of caution is needed in interpreting the estimated markups. As indicated above, the first reason for caution is possible deviations from the assumptions of profit maximization, constant returns to scale, sunk costs, etc., that would lead to biases in the estimates. A second

reason is measurement error which as shown above would lead to upward biased estimates. A further reason is that the output in certain sectors (nace 75, 80, 85, 90, 91) is produced to a significant extent by non-market producers (i.e. government or other non-profit sector firms). Therefore, estimates of the markup for those sectors might not be always meaningful. This is compounded with the fact that the fraction of non-market producers in these sectors will differ a lot across countries, which makes cross-country comparison difficult. Furthermore, in some of these sectors, due to the absence of true markets, output series might be constructed using inputs, at least partially (e.g. in the Public administration & Defence, Compulsory Social Security sector and Health and social Work sector). Given these issues, we do not take into account non-market services when calculating aggregate country mark-ups. We do, however, provide the markup estimates of the individual non-market services sectors in the tables in the appendix.

A special note should be made for Real Estate Activities (sector 70). This sector appears as an outlier with a markup ratio of 4.33 in the Euro area and 3.77 in the US. We think that this is possibly due to statistical specificities leading to large measurement errors. First, the sector does not only include the services produced by rented dwellings, but also those provided by owner-occupied dwellings. Owner-occupied rent is an imputed output, also likely measured with measurement error leading to upward bias of the markup. Since the percentage of owner-occupied dwellings in different countries varies, this also leads to difficulties in comparing countries. Further, measurement problems in the growth rate of capital costs are likely more important for this sector, for the reason that it has one of the lowest labour and material input share, so that even small errors in capital costs would lead to large biases (as shown in equation 12).⁴ Therefore, sector 70 is also excluded from the calculations of aggregate country mark-ups along with non-market services.

Stylized Fact 1: Perfect competition is widely rejected

A first stylized fact that can be derived is that perfect competition is widely rejected. Across all sectors in all countries markup-ratios are generally statistically significantly larger than 1. There are only a few sectors in which perfect competition cannot be rejected. Table A1 reports the estimated markups that are statistically significantly larger than one in bold.

⁴For most countries, average $(1 - \alpha_{Nt} - \alpha_{Mt})$ in sector 70 is above 0.60.

Stylized Fact 2: Average markups are heterogenous across countries

Country average markups are constructed from the sectoral estimates using sectoral gross output in the year 2000 as sector weights. The average weighted markups of each country are reported in Table 1. A second stylized fact that can be established from the evidence of this table is that markup ratios differ across countries. France has the lowest average weighted markup at 1.21, whereas Italy has the highest at 1.61. Note, though, that Italy is a bit of an outlier; without Italy the difference between the country with the lowest average weighted markup (i.e. France) and the highest average weighted markup (i.e. Germany at 1.33) would only be 0.12. The average markup in the Euro area is 1.37, while it is 1.32 in the US.

Table 1. Weighted average markup, 1981-2004

Country	Manufacturing & Construction		Market Services		All (Manufacturing, Construction & Market Services)	
	Markup	Standard Error	Markup	Standard Error	Markup	Standard Error
Germany	1.16	(0.01)*	1.54	(0.03)*	1.33	(0.01)*
France	1.15	(0.01)*	1.26	(0.02)*	1.21	(0.01)*
Italy	1.23	(0.01)*	1.87	(0.02)*	1.61	(0.01)*
Spain	1.18	(0.00)*	1.37	(0.01)*	1.26	(0.01)*
Netherlands	1.13	(0.01)*	1.31	(0.02)*	1.22	(0.01)*
Belgium	1.14	(0.00)*	1.29	(0.01)*	1.22	(0.01)*
Austria	1.20	(0.02)*	1.45	(0.03)*	1.31	(0.02)*
Finland	1.22	(0.01)*	1.39	(0.02)*	1.28	(0.01)*
Euro Area	1.18	(0.01)*	1.56	(0.01)*	1.37	(0.01)*
USA	1.28	(0.02)*	1.36	(0.03)*	1.32	(0.02)*

Notes: The Euro area group constitutes the 8 EU countries in the analysis. Weights are gross output levels by sector, 2000. Numbers in parentheses are standard errors. * indicates statistical significance at the 5% level. Standard errors per sector are calculated as $s.e(1/1-\beta)=s.e(\beta)/(1-\beta)^2$ using the delta method. For i indicating a sector and w_i the respective weight, standard errors corresponding to the weighted average markups are $s.e(\sum w_i(1/1-\beta_i)/\sum w_i)=\sqrt{\sum w_i^2 s.e(1/1-\beta_i)^2/(\sum w_i)^2}$. The table excludes real estate activities (sector 70), and non-market services (sectors 75, 80, 85, 90, 91 & 92).

Stylized Fact 3: Markups are heterogenous across sectors, with services having on average higher markups than manufacturing

Table A1 in the appendix further illustrates that markups differ widely across industries with some industries systematically having higher markup ratios than other industries across all countries. Specifically, industries where monopolies or quasi monopolies or strong network effects play a role seem to have higher markups. For example, the average Euro area markup for Post and Telecommunications is 1.48. This markup, estimated over the period 1981-2004, will not reflect very recent deregulation in that industry. In the US, where telecommunications have been deregulated earlier, the respective markup remains high, lower though than in the Euro area at 1.38. In manufacturing, the two industries with the highest markup are the Tobacco industry and the Electricity and Gas industry, and this in both the Euro area and the US. Clearly, the (quasi) monopolies in the overall energy sector has drawn a lot of (warranted) attention of the regulators.

The highest markups in the Euro area (all higher than 1.60) are found in Water Transport; Air transport; Real estate; Renting; Computer and related activities; R&D; Activities of Membership Organizations; and Other Service Activities. The lowest markups in the Euro area (lower than 1.15) are found in Food and Beverages; Coke, Refined Petroleum & Nuclear Fuel; Machinery, nec.; Motor Vehicles, Trailers & Semi-Trailers; Other Transport Equipment; and Education.

Interestingly, markup ratios are on average higher in services industries than manufacturing industries. This is true for all individual countries. This is not surprising as manufacturing is likely to be exposed to more (international) competition than services. The average markup in manufacturing and construction in the Euro area is 1.18, whereas it is 1.56 in market services. For the US the markups are 1.28 in manufacturing versus 1.36 in market services. The difference between manufacturing and market services sectors is larger in the Euro area (0.38) than the US (0.08). This is further illustrated in Figure A1 in the Appendix. In Figure A1, sectors in the Euro area and the US are sorted by magnitude of the markup, from smallest (left) to largest (right). Evidently, many more services sectors end up at the right in the Euro area than in the US. The dichotomy manufacturing versus services is therefore larger in the Euro area than in the US.

Averages, of course, hide differences at the country-sector level. An interesting example is the Retail Trade sector. Observers traditionally describe the US retail trade to be much more competitive than the average Euro area,

with the exception of Germany where the retail trade is traditionally seen to be very competitive (Other evidence of that is that the US giant Walmart had to withdraw from the German market after many years of losses. It had trouble competing with the German deep discounters as Aldi, Penny and Lidl (Knorr and Arndt, 2003)). This story is clearly born out in the data as well. The markup ratio in retail for the US is 1.19, where it is 1.42 in the Euro area. The respective German markup is below the US one at 1.12. The highest markup is found in Italy, a country with traditionally many small local shops, at 1.95.

Stylized Fact 4: Services sectors generally have larger markups in the Euro area than in the US, whereas manufacturing sectors generally have lower markups in the Euro area than in the US.

Comparing the Euro area with the US, sector by sector, reveals that Euro area services generally have higher markups than US services, whereas the pattern is reversed for the manufacturing sector. This is clearly demonstrated in Figure A2, where markups of individual services and manufacturing industries in the Euro area (vertical axis) are plotted against those of the US (horizontal axis). As is evident from the figure, service industries are generally above the 45 degree line, indicating higher markups in the Euro area than in the US. Manufacturing industries are generally below the 45 degree line, indicating lower markups in the Euro area than the US. Notably, the difference in the manufacturing sectors between the euro area and the US is less marked than in the services sectors. Services sectors that have especially higher markups in the Euro area than in the US are: Other Water Transport; Other Air Transport; Real Estate Activities; R&D; Sewage & Refusal Disposal, Sanitation and Similar Activities; and Other Service Activities.

4.2 Markups over the periods 1981-1992 and 1993-2004

Overall the estimated magnitudes of the markups estimated over the entire period 1981-2004 are quite plausible. For the manufacturing sector there exist comparable estimates for earlier periods based on the STAN database by the OECD. Oliveira Martins et al. (1996) estimate markups for 36 manufacturing industries in 14 OECD countries over the period 1970-1992 and also

provide some estimates for the two periods 1970-1979 and 1980-1992, using the same estimation methodology. The last period is roughly a subperiod of the period considered here 1981-2004 (except for the starting year). To make a direct comparison of the average markup in the eighties, i.e. over the period 1980-1992 estimated by Oliveira Martins et al. (1996) with our estimates of the period 1981-1992, we split the sample in two periods (1981-1992 and 1993-2004). As both the STAN database by the OECD and the EUKLEMS database are ultimately derived from the same national accounts data, one would expect similar estimates for the eighties. And indeed this is the case. Our estimated markups for the eighties for all Euro area countries are rather close to the ones by Oliveira Martins et al (1996). The average absolute difference is 0.03.

Table 2. Weighted average markup in manufacturing, 1970-2004

Country	1970-1979*	1980-1992*	1981-1992**	1993-2004**
Germany	1.20	1.21	1.18	1.16
France	n.a.	1.16	1.17	1.15
Italy	n.a.	1.18	1.20	1.27
Spain	n.a.	n.a.	1.18	1.17
Netherlands	1.24	1.21	1.13	1.13
Belgium	1.13	1.18	1.16	1.13
Austria	1.17	1.20	1.13	1.35
Finland	1.13	1.23	1.24	1.22
Euro area	n.a.	n.a.	1.20	1.20
USA	1.18	1.14	1.21	1.26

Note: * Numbers from Oliveira et al. (1996), derived from Figure 1(a); ** our estimates. The Euro area group constitutes the 8 EU countries in the analysis. Weights are gross output levels, 2000. Sector 35 (Other Transport Equipment) is excluded from the calculations for reasons of comparison with Oliveira et al. (1996), who do not provide estimates for this sector for the US.

Stylized Fact 5: There is no systematic change in markups from 1981-1992 to 1993-2004

Comparing our estimates over the period 1981-1992 with 1993-2004, there do not seem to exist large movements in markups, with the exception of

Austria where markups have risen from 1.14 to 1.30. Folk wisdom has it that the competitive forces of globalization have led to a widescale increase in competition in many sectors across the globe. If this is true, increased competition should show up as a decrease in markups over the period. Again, averages can mask differences at the sectoral level. Therefore, we perform a test of significant difference between the markups of the two periods 1981-1992 and 1993-2004 on each pair of sector-country estimates. The estimated markups for all sectors for both sub-periods are provided in the appendix in Tables A3 and A4, while the difference of the markups that are significantly lower or higher in the second period is provided in Table A5. Table 3 below offers a summary of these results. It is clear that there are no industries that consistently see a change in markup across the countries. If globalization works to change mark-ups this is likely country and sector-specific.

In the majority of sectors, markups are not significantly different in the two sub-periods. Also, there is no clear direction of markup changes either up or down in the Euro area: 45 sectors saw significantly lower markups and 49 significantly higher markups in the second period.

Table 3. No. of industries by country with statistically significantly different markups between 1981-1992 and 1993-2004.

Country	Significantly smaller in 93-04	Significantly higher in 93-04	Insignificant	Dropped (missing data)	Total
Germany	2	1	39	8	50
France	9	9	32	0	50
Italy	5	7	15	23	50
Spain	3	5	41	1	50
Netherlands	3	3	44	0	50
Belgium	14	2	34	0	50
Austria	4	12	34	0	50
Finland	5	10	35	0	50
Euro area	45	49	274	32	400
US	3	8	36	3	50

5 Conclusion

The estimates of markups in the paper support the claim that prices generally exceed marginal cost in the Euro area and the US. Markups are generally higher in services than manufacturing and some countries, notably Italy, show generally higher markups. They also reveal that markups are on average not that different in the Euro area than in the US. However, the average masks large differences that occur at the sector level. While in manufacturing the Euro area has the lower markups, in services the US has the lower markups. Moreover, certain services industries in the Euro area have much higher markups than in the US.

What remains an open question is what determines relative magnitudes of markups across different sectors and countries; in other words, what are the exact determinants of these markups. It is likely that very specific reasons at the sector-country level are at work. One possible factor, for example, could be differences in barriers to entry, either legal or technological. Are there barriers to entry? And if there are, what form do they take? Are they technological or legal? Analyzing differences across countries might also be helpful in finding the ultimate causes of the differences in sector-country markups. A difficulty is finding good measures at the sector-country level. The authors of this paper will take this up in future research.

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Appendix A: Data availability

The paper uses the data from 1981 to 2004 available in EU KLEMS database (March 2007 release). It contains, with a few exceptions (for the purposes of this paper) the necessary input and output data at the detailed industry level (Nace 2 digit Rev 1.1). For those few industries in countries that do not have data available over the whole period, the estimations are done on shorter periods. Out of a total of 450 country-industry pairs, 396 are estimated over the period 1981-2004; 18 are estimated over the period 1988-2004; 1 over the period 1991-2004; 8 over the period 1992-2004; 23 over the period 1993-2004; 1 over the period 1996-2004; and 3 are not estimated. For Germany, industries 27, 28, 36, 37, 60, 61, 62, 63 have data available for the period 1992-2004 only. For Italy, necessary data is available only for 23 industries and from 1993 onwards. So, for those industries the period of estimation is 1993-2004. These industries are 15, 16, 17, 18, 21, 22, 27, 28, 30, 31, 32, 33, 34, 35, 60, 65, 66, 67, 74, 90, 91, 92, 93. For Spain, industry 37 has data availability only for the period 1996-2004. For the Netherlands, data is available over the period 1988-2004 for the following industries: 17, 18, 19, 30, 31, 32, 33, 34, 35, 36, 37, 71, 72, 73, 74, 90, 91, 93. For Finland, industry 37 is available only over the period 1991-2003. Finally, for the US, no sufficient data is available and so no estimate is obtained for the industries 37, 41 and 67.

Appendix B: Derivation of equations 1 & 2

The derivation of equations 1 and 2 for a production function with capital and labour can be found respectively in Hall (1988) and Roeger (1995). For convenience we give a sketch of the proof for our equations 1 and 2 including intermediate inputs.

Derivation of equation 1

Consider the production function under the assumption of Hicks neutral technological change:

$$Q_t = A_t f(N_t, K_t, M_t)$$

Differentiate the production function totally with respect to time (using notation $\Delta X = \frac{\partial X}{\partial t} / X_t$) and divide by Q_t . It follows that:

$$\Delta Q_t = \Delta A_t + A_t \frac{\partial f}{\partial N_t} \frac{N_t}{Q_t} \Delta N_t + A_t \frac{\partial f}{\partial K_t} \frac{K_t}{Q_t} \Delta K_t + A_t \frac{\partial f}{\partial M_t} \frac{M_t}{Q_t} \Delta M_t$$

Assume profit maximization under imperfect competition (and price taking on input markets).

$$\max P(Q_t) A_t f(N_t, K_t, M_t) - w_t N_t - r_t K_t - m_t M_t$$

The FOCs of this problem can be written as:

$$\frac{\partial Q_t}{\partial N_t} \frac{N_t}{Q_t} = \left[\frac{\partial P_t}{\partial Q_t} \cdot \frac{Q_t}{P_t} + 1 \right]^{-1} \alpha_{Nt}$$

$$\frac{\partial Q_t}{\partial K_t} \frac{K_t}{Q_t} = \left[\frac{\partial P_t}{\partial Q_t} \cdot \frac{Q_t}{P_t} + 1 \right]^{-1} \alpha_{Kt}$$

$$\frac{\partial Q_t}{\partial M_t} \frac{M_t}{Q_t} = \left[\frac{\partial P_t}{\partial Q_t} \cdot \frac{Q_t}{P_t} + 1 \right]^{-1} \alpha_{Mt}$$

Where α_{Jt} ($J = N, K, M$) are the input shares in revenue. Note that $A_t \frac{\partial f}{\partial N_t} \frac{N_t}{Q_t} = \frac{\partial Q_t}{\partial N_t} \frac{N_t}{Q_t}$; and so on. Plug these FOCs into the differentiated production function above. One gets:

$$\Delta Q_t = \left[\frac{\partial P_t}{\partial Q_t} \cdot \frac{Q_t}{P_t} + 1 \right]^{-1} (\alpha_{Nt} \Delta N_t + \alpha_{Mt} \Delta M_t + \alpha_{Kt} \Delta K_t) + \Delta A_t$$

From the FOCs we have that $\left[\frac{\partial P_t}{\partial Q_t} \cdot \frac{Q_t}{P_t} + 1 \right]^{-1}$ is price over marginal cost:

$$\left[\frac{\partial P_t}{\partial Q_t} \cdot \frac{Q_t}{P_t} + 1 \right]^{-1} = \frac{P_t}{w_t \frac{\partial N_t}{\partial Q_t}} = \frac{P_t}{r_t \frac{\partial K_t}{\partial Q_t}} = \frac{P_t}{m_t \frac{\partial M_t}{\partial Q_t}} = \mu_t$$

One gets:

$$\Delta Q_t = \mu_t (\alpha_{Nt} \Delta N_t + \alpha_{Mt} \Delta M_t + \alpha_{Kt} \Delta K_t)$$

Assume now CRS, this implies that by homogeneity of degree one:

$$1 = \frac{\partial Q_t}{\partial N_t} \frac{N_t}{Q_t} + \frac{\partial Q_t}{\partial K_t} \frac{K_t}{Q_t} + \frac{\partial Q_t}{\partial M_t} \frac{M_t}{Q_t}$$

Note that together with the assumptions above (i.e. using the FOCs above and summing them), this implies that:

$$1 = \mu\alpha_N + \mu\alpha_K + \mu\alpha_M$$

Plugging that in $\Delta Q_t = \mu_t(\alpha_{Nt}\Delta N_t + \alpha_{Mt}\Delta M_t + \alpha_{Kt}\Delta K_t)$ one gets equation (1) in the text.

Derivation of equation 2

Start with a cost function for a CRS production technology in N_t, K_t, M_t .

$$G(w_t, r_t, m_t) \frac{Q_t}{A_t} = C(w_t, r_t, m_t, Q_t, A_t)$$

Marginal cost, MC_t , is defined as $\frac{\partial C}{\partial Q_t}$.

$$\frac{G(w_t, r_t, m_t)}{A_t} = \frac{\partial C(w_t, r_t, m_t, Q_t, A_t)}{\partial Q_t} = MC_t$$

Take logs of the above equation and differentiate totally w.r.t. time:

$$\frac{\frac{\partial G}{\partial w_t} w_t \Delta w_t}{G_t} + \frac{\frac{\partial G}{\partial r_t} r_t \Delta r_t}{G_t} + \frac{\frac{\partial G}{\partial m_t} m_t \Delta m_t}{G_t} - \Delta A_t = \Delta MC_t$$

Now use Shepard's lemma for cost functions: i.e. $\frac{\partial C(w_t, r_t, m_t, Q_t, A_t)}{\partial w_t} = N_t$ and so on, so that:

$$\frac{\partial G(w_t, r_t, m_t)}{\partial w_t} = \frac{N_t A_t}{Q_t}, \quad \frac{\partial G(w_t, r_t, m_t)}{\partial r_t} = \frac{K_t A_t}{Q_t}, \quad \frac{\partial G(w_t, r_t, m_t)}{\partial m_t} = \frac{M_t A_t}{Q_t}$$

Plugging this in the above we get:

$$\frac{w_t N_t A_t \Delta w_t}{Q_t G_t} + \frac{r_t K_t A_t \Delta r_t}{Q_t G_t} + \frac{m_t M_t A_t \Delta m_t}{Q_t G_t} - \Delta A_t = \Delta MC_t$$

Using the cost function $C_t = G_t \frac{Q_t}{A_t}$ and $C_t = w_t N_t + r_t K_t + w_t M_t$ one can write this as:

$$\frac{w_t N_t \Delta w_t}{C_t} + \left(1 - \frac{w_t N_t}{C_t} - \frac{m_t M_t}{C_t}\right) \Delta r_t + \frac{m_t M_t \Delta m_t}{C_t} - \Delta A_t = \Delta MC_t$$

From the FOC of the profit maximization problem:

$$\max_Q P(Q_t)Q_t - C(w_t, r_t, m_t, Q_t, A_t)$$

where C is the cost function. It follows that:

$$\frac{1}{\mu_t} P_t = \frac{\partial C}{\partial Q_t}$$

with μ_t defined as above. Note that the rate of change of prices is identical to the rate of change of marginal cost if one assumes that μ_t is constant over time; that is if $\frac{\partial P}{\partial Q} \frac{Q}{P}$ is not a function of t .

$$\Delta p_t = \Delta MC_t$$

By cost minimization and CRS we have that:

$$\mu_t C_t = p_t Q_t$$

So now we take again the above equation and plug in $\mu_t C_t = p_t Q_t$ and $\Delta p_t = \Delta MC_t$ and use α_{Jt} ($J = N, K, M$) the input shares in revenue. One then obtains equation (2) in the text.

$$\begin{aligned} \Delta p_t - \alpha_{Nt} \Delta w_t - \alpha_{Mt} \Delta m_t - (1 - \alpha_{Nt} - \alpha_{Mt}) \Delta r_t \\ = (1 - \frac{1}{\mu_t}) (\Delta p_t - \Delta r_t) - (\frac{1}{\mu_t}) \theta_t \end{aligned}$$

Appendix C: Tables and graphs

Table A1.a. Estimated mark-ups by sector and country

Code	Sector	Germany	France	Italy	Spain
15	Food & Beverages	1.11	1.13	1.18	1.11
16	Tobacco	1.32	1.33	1.33	1.23
17	Textiles	1.15	1.09	1.20	1.17
18	Wearing Apparel, Dressing & Dying of Fur	1.04	1.12	1.18	1.34
19	Leather, leather and footwear	1.11	1.11	1.20	1.14
20	Wood & of Wood & Cork	1.10	1.13	1.28	1.25
21	Pulp, Paper & Paper	1.25	1.07	1.34	1.25
22	Printing, Publishing & Reproduction	1.18	1.16	1.34	1.14
23	Coke, Refined Petroleum & Nuclear Fuel	1.23	1.09	1.06	1.17
24	Chemicals & Chemical Products	1.21	1.10	1.12	1.25
25	Rubber & Plastics	1.19	1.23	1.18	1.14
26	Other Non-Metallic Mineral	1.20	1.14	1.30	1.24
27	Basic Metals	1.19	1.05	1.29	1.36
28	Fabricated Metal	1.05	1.17	1.28	1.20
29	Machinery, nec.	1.09	1.14	1.18	1.18
30	Office, Accounting & Computing Machinery	1.13	1.11	1.29	1.40
31	Electrical Machinery & Apparatus, nec.	1.18	1.14	1.28	1.09
32	Radio, Television & Communication Equipment	1.10	1.12	1.33	1.16
33	Medical, Precision & Optical Instruments	1.09	1.13	1.41	1.14
34	Motor Vehicles, Trailers & Semi-Trailers	1.13	1.08	1.15	1.16
35	Other Transport Equipment	1.18	1.01	1.19	1.03
36	Manufacturing, nec.	1.16	1.27	1.21	1.16
37	Recycling	1.14	1.24	1.21	1.04
40	Electricity & Gas	1.41	1.41	1.13	1.30
41	Water Supply	1.72	1.02	1.13	1.30
45	Construction	1.20	1.25	1.32	1.13
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	1.45	1.46	1.45	1.24
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	1.38	1.12	1.51	1.42
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	1.12	1.24	1.95	1.53
55	Hotels & Restaurants	1.10	1.25	1.40	1.25
60	Other Inland Transport	1.13	1.27	1.54	1.51
61	Other Water Transport	1.70	1.06	1.85	1.04
62	Other Air Transport	1.13	1.10	1.84	1.14
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	1.11	1.36	1.66	1.30
64	Post & Telecommunications	1.51	1.54	1.37	1.62
65	Financial Intermediation, except Insurance & Pension Funding	1.88	1.43	1.42	1.29
66	Insurance & Pension Funding, except Compulsory Social Security	1.12	1.14	2.19	1.03
67	Activities Related to Financial Intermediation	1.52	1.39	1.61	1.62
70	Real Estate Activities	3.27	3.76	9.20	3.57
71	Renting of Machinery & Equipment	2.99	2.10	2.41	1.80
72	Computer & Related Activities	1.85	1.18	2.17	1.37
73	Research & Development	1.11	1.11	2.40	2.14
74	Other Business Activities	1.82	1.14	1.55	1.24
75	Public Administration & Defence; Compulsory Social Security	1.11	1.18	1.17	1.21
80	Education	1.10	0.97	1.05	1.12
85	Health & Social Work	1.25	1.18	1.20	1.19
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	1.43	1.65	1.68	1.24
91	Activities of Membership Organizations, nec.	1.05	1.22	2.00	1.08
92	Recreational, Cultural and Sporting Activities	1.52	1.24	1.83	1.36
93	Other Service Activities	2.37	1.51	1.90	1.66

Notes: Mark-ups in bold are statistically significantly different from 1 at the 5% level.

Table A1.b. Estimated mark-ups by sector and country

Code	Sector	Netherlands	Belgium	Austria	Finland
15	Food & Beverages	1.07	1.09	1.07	1.10
16	Tobacco	1.48	1.06	1.70	1.11
17	Textiles	1.08	1.08	1.14	1.20
18	Wearing Apparel, Dressing & Dying of Fur	1.09	1.09	1.17	1.08
19	Leather, leather and footwear	1.12	1.09	1.22	1.09
20	Wood & of Wood & Cork	1.20	1.10	1.16	1.21
21	Pulp, Paper & Paper	1.13	1.12	1.28	1.34
22	Printing, Publishing & Reproduction	1.16	1.16	1.19	1.16
23	Coke, Refined Petroleum & Nuclear Fuel	1.05	1.07	1.14	1.14
24	Chemicals & Chemical Products	1.20	1.19	1.15	1.24
25	Rubber & Plastics	1.07	1.13	1.13	1.20
26	Other Non-Metallic Mineral	1.25	1.15	1.25	1.30
27	Basic Metals	1.39	1.13	1.29	1.17
28	Fabricated Metal	1.14	1.12	1.16	1.18
29	Machinery, nec.	1.10	1.16	1.14	1.17
30	Office, Accounting & Computing Machinery	1.03	1.56	1.37	1.06
31	Electrical Machinery & Apparatus, nec.	1.09	1.12	1.15	1.19
32	Radio, Television & Communication Equipment	1.11	1.06	1.16	1.28
33	Medical, Precision & Optical Instruments	1.26	1.17	1.19	1.24
34	Motor Vehicles, Trailers & Semi-Trailers	1.08	1.06	1.19	1.06
35	Other Transport Equipment	1.05	1.05	1.13	1.04
36	Manufacturing, nec.	1.12	1.05	1.10	1.22
37	Recycling	1.18	1.11	1.73	1.33
40	Electricity & Gas	1.13	1.53	1.37	1.65
41	Water Supply	1.66	1.41	2.01	2.48
45	Construction	1.10	1.17	1.22	1.14
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	1.27	1.25	1.64	1.40
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	1.39	1.21	1.39	1.25
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	1.41	1.21	1.39	1.29
55	Hotels & Restaurants	1.31	1.23	1.36	1.10
60	Other Inland Transport	1.24	1.26	1.42	1.52
61	Other Water Transport	1.36	1.07	2.04	1.31
62	Other Air Transport	1.26	1.04	1.41	1.40
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	1.25	1.30	1.40	1.53
64	Post & Telecommunications	1.28	1.59	1.29	1.48
65	Financial Intermediation, except Insurance & Pension Funding	1.39	1.45	1.58	1.72
66	Insurance & Pension Funding, except Compulsory Social Security	1.41	1.55	2.13	2.28
67	Activities Related to Financial Intermediation	1.37	1.31	1.61	1.65
70	Real Estate Activities	2.95	3.81	3.43	2.23
71	Renting of Machinery & Equipment	2.04	1.63	2.41	1.74
72	Computer & Related Activities	1.22	1.17	1.32	1.26
73	Research & Development	1.05	0.94	1.18	1.07
74	Other Business Activities	1.15	1.31	1.23	1.18
75	Public Administration & Defence; Compulsory Social Security	1.19	1.12	1.14	1.07
80	Education	1.08	1.09	1.12	1.09
85	Health & Social Work	1.22	1.23	1.24	1.10
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	1.39	1.26	1.53	1.47
91	Activities of Membership Organizations, nec.	1.10	1.06	1.12	1.06
92	Recreational, Cultural and Sporting Activities	1.27	1.41	1.34	1.24
93	Other Service Activities	1.49	1.38	1.28	1.43

Notes: Mark-ups in bold are statistically significantly different from 1 at the 5% level.

Table A1.c. Estimated mark-ups by sector, US vs. EA

Code	Sector	US	EA Weighted average	EA Unweighted average
15	Food & Beverages	1.12	1.12	1.11
16	Tobacco	1.61	1.33	1.32
17	Textiles	1.07	1.16	1.14
18	Wearing Apparel, Dressing & Dying of Fur	1.14	1.16	1.14
19	Leather, leather and footwear	1.21	1.18	1.14
20	Wood & of Wood & Cork	1.15	1.18	1.18
21	Pulp, Paper & Paper	1.21	1.24	1.22
22	Printing, Publishing & Reproduction	1.30	1.19	1.19
23	Coke, Refined Petroleum & Nuclear Fuel	1.09	1.12	1.12
24	Chemicals & Chemical Products	1.31	1.17	1.18
25	Rubber & Plastics	1.19	1.18	1.16
26	Other Non-Metallic Mineral	1.26	1.22	1.23
27	Basic Metals	1.10	1.21	1.23
28	Fabricated Metal	1.20	1.16	1.16
29	Machinery, nec.	1.25	1.13	1.15
30	Office, Accounting & Computing Machinery	1.19	1.17	1.24
31	Electrical Machinery & Apparatus, nec.	1.20	1.19	1.16
32	Radio, Television & Communication Equipment	1.29	1.20	1.17
33	Medical, Precision & Optical Instruments	1.35	1.17	1.20
34	Motor Vehicles, Trailers & Semi-Trailers	0.98	1.12	1.12
35	Other Transport Equipment	2.79	1.09	1.08
36	Manufacturing, nec.	1.21	1.19	1.16
37	Recycling		1.20	1.25
40	Electricity & Gas	1.44	1.31	1.37
41	Water Supply		1.22	1.59
45	Construction	1.31	1.21	1.19
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	1.02	1.41	1.40
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	1.31	1.35	1.34
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	1.19	1.42	1.39
55	Hotels & Restaurants	1.15	1.26	1.25
60	Other Inland Transport	1.43	1.35	1.36
61	Other Water Transport	1.29	1.78	1.43
62	Other Air Transport	1.16	1.64	1.29
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	1.32	1.43	1.36
64	Post & Telecommunications	1.38	1.48	1.46
65	Financial Intermediation, except Insurance & Pension Funding	1.39	1.56	1.52
66	Insurance & Pension Funding, except Compulsory Social Security	1.14	1.33	1.61
67	Activities Related to Financial Intermediation		1.49	1.51
70	Real Estate Activities	3.77	4.33	4.03
71	Renting of Machinery & Equipment	3.21	2.45	2.14
72	Computer & Related Activities	1.78	1.86	1.44
73	Research & Development	1.62	2.11	1.38
74	Other Business Activities	1.26	1.44	1.33
75	Public Administration & Defence; Compulsory Social Security	1.79	1.15	1.15
80	Education	0.98	1.06	1.08
85	Health & Social Work	1.16	1.21	1.20
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	1.10	1.58	1.46
91	Activities of Membership Organizations, nec.	1.05	1.63	1.21
92	Recreational, Cultural and Sporting Activities	1.25	1.50	1.40
93	Other Service Activities	1.35	1.95	1.63

Notes: Mark-ups in bold are not statistically significantly different from 1 at the 5% level. EA countries considered are: Austria, Belgium, Finland, France, Germany, Italy, Netherlands & Spain. For the weighed average, weights are gross output levels, 2000.

Table A2.a. Standard errors corresponding to the mark-up estimates by sector and country

Code	Sector	Germany	France	Italy	Spain
15	Food & Beverages	0.02	0.01	0.03	0.01
16	Tobacco	0.17	0.12	0.04	0.05
17	Textiles	0.02	0.01	0.02	0.01
18	Wearing Apparel, Dressing & Dying of Fur	0.02	0.01	0.03	0.03
19	Leather, leather and footwear	0.03	0.01	0.01	0.02
20	Wood & of Wood & Cork	0.03	0.02	0.02	0.02
21	Pulp, Paper & Paper	0.04	0.01	0.06	0.02
22	Printing, Publishing & Reproduction	0.05	0.01	0.11	0.02
23	Coke, Refined Petroleum & Nuclear Fuel	0.11	0.01	0.03	0.04
24	Chemicals & Chemical Products	0.05	0.01	0.01	0.02
25	Rubber & Plastics	0.03	0.03	0.01	0.01
26	Other Non-Metallic Mineral	0.03	0.02	0.02	0.02
27	Basic Metals	0.05	0.02	0.07	0.03
28	Fabricated Metal	0.05	0.02	0.05	0.02
29	Machinery, nec.	0.02	0.02	0.01	0.02
30	Office, Accounting & Computing Machinery	0.06	0.03	0.19	0.07
31	Electrical Machinery & Apparatus, nec.	0.06	0.01	0.07	0.01
32	Radio, Television & Communication Equipment	0.07	0.02	0.07	0.02
33	Medical, Precision & Optical Instruments	0.05	0.01	0.10	0.03
34	Motor Vehicles, Trailers & Semi-Trailers	0.04	0.02	0.05	0.02
35	Other Transport Equipment	0.06	0.04	0.09	0.01
36	Manufacturing, nec.	0.03	0.02	0.01	0.01
37	Recycling	0.07	0.06	0.01	0.10
40	Electricity & Gas	0.08	0.06	0.04	0.05
41	Water Supply	0.17	0.05	0.04	0.08
45	Construction	0.02	0.02	0.01	0.01
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	0.09	0.05	0.02	0.01
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	0.08	0.03	0.01	0.02
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	0.03	0.03	0.06	0.02
55	Hotels & Restaurants	0.03	0.02	0.02	0.02
60	Other Inland Transport	0.06	0.03	0.08	0.05
61	Other Water Transport	0.13	0.02	0.03	0.03
62	Other Air Transport	0.15	0.05	0.03	0.04
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	0.06	0.03	0.03	0.03
64	Post & Telecommunications	0.11	0.22	0.04	0.08
65	Financial Intermediation, except Insurance & Pension Funding	0.23	0.05	0.15	0.05
66	Insurance & Pension Funding, except Compulsory Social Security	0.06	0.07	0.71	0.04
67	Activities Related to Financial Intermediation	0.08	0.09	0.12	0.04
70	Real Estate Activities	0.31	0.24	1.19	0.10
71	Renting of Machinery & Equipment	0.19	0.09	0.07	0.04
72	Computer & Related Activities	0.13	0.04	0.06	0.03
73	Research & Development	0.06	0.03	0.07	0.19
74	Other Business Activities	0.05	0.02	0.11	0.02
75	Public Administration & Defence; Compulsory Social Security	0.00	0.01	0.02	0.02
80	Education	0.01	0.01	0.01	0.01
85	Health & Social Work	0.03	0.03	0.01	0.01
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	0.05	0.07	0.11	0.02
91	Activities of Membership Organizations, nec.	0.03	0.06	0.14	0.01
92	Recreational, Cultural and Sporting Activities	0.04	0.03	0.11	0.03
93	Other Service Activities	0.13	0.08	0.11	0.04

Notes: Reported standard errors are calculated as $s.e(1/1-\beta)=s.e(\beta)/(1-\beta)^2$ using the delta method.

Table A2.b. Standard errors corresponding to the mark-up estimates by sector and country

Code	Sector	Netherlands	Belgium	Austria	Finland
15	Food & Beverages	0.01	0.01	0.03	0.02
16	Tobacco	0.09	0.03	0.20	0.04
17	Textiles	0.03	0.01	0.05	0.03
18	Wearing Apparel, Dressing & Dying of Fur	0.04	0.04	0.07	0.03
19	Leather, leather and footwear	0.07	0.02	0.08	0.02
20	Wood & of Wood & Cork	0.04	0.01	0.06	0.04
21	Pulp, Paper & Paper	0.04	0.03	0.07	0.04
22	Printing, Publishing & Reproduction	0.04	0.02	0.06	0.01
23	Coke, Refined Petroleum & Nuclear Fuel	0.02	0.01	0.11	0.05
24	Chemicals & Chemical Products	0.04	0.01	0.04	0.04
25	Rubber & Plastics	0.03	0.01	0.05	0.02
26	Other Non-Metallic Mineral	0.03	0.02	0.06	0.04
27	Basic Metals	0.07	0.02	0.08	0.02
28	Fabricated Metal	0.02	0.01	0.05	0.02
29	Machinery, nec.	0.03	0.02	0.07	0.02
30	Office, Accounting & Computing Machinery	0.03	0.17	0.09	0.07
31	Electrical Machinery & Apparatus, nec.	0.03	0.02	0.05	0.03
32	Radio, Television & Communication Equipment	0.12	0.03	0.05	0.06
33	Medical, Precision & Optical Instruments	0.07	0.04	0.08	0.05
34	Motor Vehicles, Trailers & Semi-Trailers	0.03	0.01	0.03	0.04
35	Other Transport Equipment	0.05	0.03	0.04	0.05
36	Manufacturing, nec.	0.04	0.02	0.07	0.02
37	Recycling	0.05	0.02	0.10	0.08
40	Electricity & Gas	0.04	0.08	0.09	0.09
41	Water Supply	0.13	0.09	0.24	0.25
45	Construction	0.02	0.01	0.06	0.02
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	0.05	0.02	0.16	0.04
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	0.05	0.05	0.08	0.03
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	0.05	0.02	0.09	0.04
55	Hotels & Restaurants	0.03	0.01	0.04	0.01
60	Other Inland Transport	0.05	0.03	0.13	0.04
61	Other Water Transport	0.05	0.03	0.23	0.04
62	Other Air Transport	0.08	0.02	0.12	0.05
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	0.05	0.04	0.13	0.03
64	Post & Telecommunications	0.09	0.10	0.15	0.05
65	Financial Intermediation, except Insurance & Pension Funding	0.15	0.09	0.16	0.12
66	Insurance & Pension Funding, except Compulsory Social Security	0.09	0.09	0.31	0.40
67	Activities Related to Financial Intermediation	0.07	0.04	0.16	0.21
70	Real Estate Activities	0.43	0.27	0.53	0.10
71	Renting of Machinery & Equipment	0.17	0.05	0.17	0.06
72	Computer & Related Activities	0.04	0.03	0.08	0.06
73	Research & Development	0.05	0.04	0.12	0.02
74	Other Business Activities	0.03	0.02	0.05	0.03
75	Public Administration & Defence; Compulsory Social Security	0.01	0.04	0.01	0.00
80	Education	0.02	0.01	0.02	0.00
85	Health & Social Work	0.03	0.03	0.10	0.00
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	0.10	0.04	0.11	0.04
91	Activities of Membership Organizations, nec.	0.02	0.02	0.01	0.00
92	Recreational, Cultural and Sporting Activities	0.06	0.04	0.11	0.02
93	Other Service Activities	0.04	0.04	0.09	0.04

Notes: Reported standard errors are calculated as $s.e(1/(1-\beta))=s.e(\beta)/(1-\beta)^2$ using the delta method.

Table A2.c. Standard errors corresponding to the mark-up estimates by sector for the US and the Euro Area

Code	Sector	US	EA Weighted average	EA Unweighted average
15	Food & Beverages	0.02	0.01	0.01
16	Tobacco	0.14	0.04	0.04
17	Textiles	0.02	0.01	0.01
18	Wearing Apparel, Dressing & Dying of Fur	0.05	0.01	0.01
19	Leather, leather and footwear	0.09	0.01	0.01
20	Wood & of Wood & Cork	0.03	0.01	0.01
21	Pulp, Paper & Paper	0.03	0.02	0.02
22	Printing, Publishing & Reproduction	0.06	0.03	0.02
23	Coke, Refined Petroleum & Nuclear Fuel	0.02	0.03	0.02
24	Chemicals & Chemical Products	0.04	0.02	0.01
25	Rubber & Plastics	0.04	0.01	0.01
26	Other Non-Metallic Mineral	0.03	0.01	0.01
27	Basic Metals	0.03	0.02	0.02
28	Fabricated Metal	0.04	0.02	0.01
29	Machinery, nec.	0.03	0.01	0.01
30	Office, Accounting & Computing Machinery	0.04	0.04	0.04
31	Electrical Machinery & Apparatus, nec.	0.04	0.03	0.01
32	Radio, Television & Communication Equipment	0.04	0.03	0.02
33	Medical, Precision & Optical Instruments	0.09	0.03	0.02
34	Motor Vehicles, Trailers & Semi-Trailers	0.04	0.02	0.01
35	Other Transport Equipment	0.58	0.03	0.02
36	Manufacturing, nec.	0.03	0.01	0.01
37	Recycling	0.00	0.01	0.03
40	Electricity & Gas	0.08	0.03	0.02
41	Water Supply	0.00	0.04	0.05
45	Construction	0.05	0.01	0.01
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	0.06	0.03	0.03
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	0.04	0.02	0.02
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	0.04	0.02	0.02
55	Hotels & Restaurants	0.03	0.01	0.01
60	Other Inland Transport	0.09	0.03	0.02
61	Other Water Transport	0.06	0.03	0.03
62	Other Air Transport	0.07	0.03	0.03
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	0.07	0.02	0.02
64	Post & Telecommunications	0.08	0.06	0.04
65	Financial Intermediation, except Insurance & Pension Funding	0.08	0.08	0.05
66	Insurance & Pension Funding, except Compulsory Social Security	0.09	0.07	0.11
67	Activities Related to Financial Intermediation	0.00	0.04	0.04
70	Real Estate Activities	0.24	0.23	0.18
71	Renting of Machinery & Equipment	0.30	0.06	0.04
72	Computer & Related Activities	0.32	0.04	0.02
73	Research & Development	0.25	0.05	0.03
74	Other Business Activities	0.07	0.03	0.02
75	Public Administration & Defence; Compulsory Social Security	0.12	0.00	0.01
80	Education	0.06	0.01	0.00
85	Health & Social Work	0.02	0.01	0.01
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	0.18	0.06	0.03
91	Activities of Membership Organizations, nec.	0.05	0.08	0.02
92	Recreational, Cultural and Sporting Activities	0.06	0.03	0.02
93	Other Service Activities	0.06	0.07	0.03

Notes: Reported standard errors are calculated as $s.e(1/(1-\beta))=s.e(\beta)/(1-\beta)^2$ using the delta method. EA countries considered are: Austria, Belgium, Finland, France, Germany, Italy, Netherlands & Spain. For the weighed average, weights are gross output levels, 2000.

Table A3.a. Estimated mark-ups by sector and country, 1981-1992

Code	Sector	Germany	France	Italy	Spain
15	Food & Beverages	1.12	1.13		1.11
16	Tobacco	1.41	1.12		1.21
17	Textiles	1.15	1.08		1.17
18	Wearing Apparel, Dressing & Dying of Fur	1.03	1.12		1.35
19	Leather, leather and footwear	1.07	1.11	1.21	1.15
20	Wood & of Wood & Cork	1.10	1.11	1.28	1.26
21	Pulp, Paper & Paper	1.31	1.07		1.26
22	Printing, Publishing & Reproduction	1.15	1.17		1.14
23	Coke, Refined Petroleum & Nuclear Fuel	1.30	1.09	1.05	1.18
24	Chemicals & Chemical Products	1.26	1.11	1.11	1.26
25	Rubber & Plastics	1.22	1.26	1.17	1.15
26	Other Non-Metallic Mineral	1.23	1.11	1.30	1.25
27	Basic Metals		1.05		1.35
28	Fabricated Metal		1.17		1.19
29	Machinery, nec.	1.08	1.19	1.19	1.18
30	Office, Accounting & Computing Machinery	1.22	1.10		1.43
31	Electrical Machinery & Apparatus, nec.	1.29	1.18		1.09
32	Radio, Television & Communication Equipment	1.07	1.16		1.15
33	Medical, Precision & Optical Instruments	1.08	1.16		1.14
34	Motor Vehicles, Trailers & Semi-Trailers	1.11	1.06		1.16
35	Other Transport Equipment	1.01	1.04		1.02
36	Manufacturing, nec.		1.31	1.22	1.16
37	Recycling		1.15	1.22	
40	Electricity & Gas	1.44	1.41	1.10	1.29
41	Water Supply	1.65	1.09	1.10	1.29
45	Construction	1.20	1.27	1.32	1.13
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	1.38	1.44	1.45	1.24
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	1.37	1.09	1.51	1.42
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	1.14	1.22	1.99	1.52
55	Hotels & Restaurants	1.11	1.24	1.40	1.24
60	Other Inland Transport		1.29		1.50
61	Other Water Transport		1.06	1.86	1.04
62	Other Air Transport		1.13	1.84	1.14
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies		1.37	1.67	1.31
64	Post & Telecommunications	1.69	1.64	1.31	1.63
65	Financial Intermediation, except Insurance & Pension Funding	1.80	1.40		1.25
66	Insurance & Pension Funding, except Compulsory Social Security	1.12	1.10		0.99
67	Activities Related to Financial Intermediation	1.38	1.44		1.59
70	Real Estate Activities	3.25	3.39	9.28	3.59
71	Renting of Machinery & Equipment	3.09	2.13	2.49	1.81
72	Computer & Related Activities	1.95	1.11	2.25	1.37
73	Research & Development	1.19	1.09	2.47	1.84
74	Other Business Activities	1.80	1.11		1.24
75	Public Administration & Defence; Compulsory Social Security	1.11	1.17	1.16	1.22
80	Education	1.10	0.94	1.03	1.12
85	Health & Social Work	1.24	1.15	1.19	1.20
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	1.44	1.60		1.26
91	Activities of Membership Organizations, nec.	1.07	1.32		1.07
92	Recreational, Cultural and Sporting Activities	1.48	1.27		1.39
93	Other Service Activities	2.28	1.40		1.67

Table A3.b. Estimated mark-ups by sector and country, 1981-1992

Code	Sector	Netherlands	Belgium	Austria	Finland
15	Food & Beverages	1.07	1.11	1.06	1.07
16	Tobacco	1.34	1.27	1.87	1.36
17	Textiles	1.30	1.09	1.07	1.21
18	Wearing Apparel, Dressing & Dying of Fur	1.24	1.09	1.11	1.07
19	Leather, leather and footwear	1.13	1.10	1.05	1.06
20	Wood & of Wood & Cork	1.09	1.09	1.12	1.19
21	Pulp, Paper & Paper	1.17	1.14	1.17	1.30
22	Printing, Publishing & Reproduction	1.12	1.19	1.16	1.15
23	Coke, Refined Petroleum & Nuclear Fuel	1.05	1.06	1.02	1.09
24	Chemicals & Chemical Products	1.25	1.21	1.14	1.27
25	Rubber & Plastics	1.08	1.14	1.11	1.24
26	Other Non-Metallic Mineral	1.28	1.19	1.21	1.34
27	Basic Metals	1.43	1.11	1.17	1.16
28	Fabricated Metal	1.16	1.15	1.05	1.22
29	Machinery, nec.	1.05	1.11	1.05	1.21
30	Office, Accounting & Computing Machinery	1.01	1.96	0.90	2.30
31	Electrical Machinery & Apparatus, nec.	1.14	1.13	1.10	1.22
32	Radio, Television & Communication Equipment	1.03	1.10	1.14	1.31
33	Medical, Precision & Optical Instruments	1.06	1.17	1.12	1.32
34	Motor Vehicles, Trailers & Semi-Trailers	1.07	1.07	1.23	1.13
35	Other Transport Equipment	1.06	1.04	1.07	0.94
36	Manufacturing, nec.	1.12	1.08	1.07	1.27
37	Recycling	1.13	1.09	1.58	1.00
40	Electricity & Gas	1.18	1.68	1.33	1.65
41	Water Supply	1.59	1.39	1.84	1.99
45	Construction	1.09	1.18	1.10	1.17
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	1.25	1.33	1.72	1.35
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	1.36	1.35	1.41	1.23
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	1.39	1.22	1.41	1.25
55	Hotels & Restaurants	1.32	1.25	1.35	1.11
60	Other Inland Transport	1.15	1.27	1.32	1.38
61	Other Water Transport	1.29	1.08	2.41	1.31
62	Other Air Transport	1.26	1.08	1.42	1.39
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	1.27	1.27	1.24	1.40
64	Post & Telecommunications	1.31	1.85	1.70	1.36
65	Financial Intermediation, except Insurance & Pension Funding	2.02	1.56	1.52	1.23
66	Insurance & Pension Funding, except Compulsory Social Security	1.30	1.53	1.59	1.45
67	Activities Related to Financial Intermediation	1.18	1.37	1.76	2.01
70	Real Estate Activities	2.76	4.00	4.22	2.09
71	Renting of Machinery & Equipment	2.23	1.71	2.24	1.67
72	Computer & Related Activities	1.25	1.12	1.22	1.23
73	Research & Development	1.28	0.93	1.12	1.07
74	Other Business Activities	1.04	1.35	1.24	1.13
75	Public Administration & Defence; Compulsory Social Security	1.19	1.17	1.15	1.07
80	Education	1.06	1.11	1.12	1.08
85	Health & Social Work	1.18	1.30	1.10	1.11
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	1.91	1.27	1.53	1.47
91	Activities of Membership Organizations, nec.	1.07	1.07	1.12	1.06
92	Recreational, Cultural and Sporting Activities	1.17	1.40	1.33	1.20
93	Other Service Activities	1.52	1.45	1.31	1.48

Table A3.c. Estimated mark-ups by sector, US vs. EA, 1981-1992

Code	Sector	US	EA Weighted average	EA Unweighted average
15	Food & Beverages	1.09		
16	Tobacco	1.80		
17	Textiles	1.07		
18	Wearing Apparel, Dressing & Dying of Fur	1.10		
19	Leather, leather and footwear	1.15	1.18	1.11
20	Wood & of Wood & Cork	1.11	1.17	1.15
21	Pulp, Paper & Paper	1.18		
22	Printing, Publishing & Reproduction	1.26		
23	Coke, Refined Petroleum & Nuclear Fuel	1.08	1.13	1.10
24	Chemicals & Chemical Products	1.30	1.19	1.20
25	Rubber & Plastics	1.17	1.20	1.17
26	Other Non-Metallic Mineral	1.24	1.23	1.24
27	Basic Metals	1.07		
28	Fabricated Metal	1.16		
29	Machinery, nec.	1.24	1.13	1.13
30	Office, Accounting & Computing Machinery	1.21		
31	Electrical Machinery & Apparatus, nec.	1.21		
32	Radio, Television & Communication Equipment	1.23		
33	Medical, Precision & Optical Instruments	1.28		
34	Motor Vehicles, Trailers & Semi-Trailers	1.01		
35	Other Transport Equipment	4.41		
36	Manufacturing, nec.	1.20		
37	Recycling			
40	Electricity & Gas	1.36	1.32	1.38
41	Water Supply		1.19	1.49
45	Construction	1.31	1.21	1.18
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	0.95	1.39	1.39
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	1.29	1.35	1.34
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	1.18	1.43	1.39
55	Hotels & Restaurants	1.16	1.26	1.25
60	Other Inland Transport	1.49		
61	Other Water Transport	1.27		
62	Other Air Transport	1.05		
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	1.36		
64	Post & Telecommunications	1.28	1.57	1.56
65	Financial Intermediation, except Insurance & Pension Funding	1.44		
66	Insurance & Pension Funding, except Compulsory Social Security	1.12		
67	Activities Related to Financial Intermediation			
70	Real Estate Activities	3.73	4.26	4.07
71	Renting of Machinery & Equipment	3.36	2.53	2.17
72	Computer & Related Activities	3.00	1.90	1.44
73	Research & Development	1.77	2.17	1.37
74	Other Business Activities	1.17		
75	Public Administration & Defence; Compulsory Social Security	1.92	1.15	1.16
80	Education	0.94	1.05	1.07
85	Health & Social Work	1.14	1.20	1.18
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	1.03		
91	Activities of Membership Organizations, nec.	1.07		
92	Recreational, Cultural and Sporting Activities	1.24		
93	Other Service Activities	1.37		

Table A4.a. Estimated mark-ups by sector and country, 1993-2004

Code	Sector	Germany	France	Italy	Spain
15	Food & Beverages	1.10	1.14	1.18	1.09
16	Tobacco	1.21	2.11	1.33	1.26
17	Textiles	1.15	1.12	1.20	1.12
18	Wearing Apparel, Dressing & Dying of Fur	1.06	1.13	1.18	1.27
19	Leather, leather and footwear	1.14	1.11	1.17	1.11
20	Wood & of Wood & Cork	1.11	1.16	1.30	1.20
21	Pulp, Paper & Paper	1.18	1.07	1.34	1.22
22	Printing, Publishing & Reproduction	1.23	1.13	1.34	1.10
23	Coke, Refined Petroleum & Nuclear Fuel	1.18	1.09	1.11	1.12
24	Chemicals & Chemical Products	1.13	1.06	1.15	1.20
25	Rubber & Plastics	1.15	1.15	1.22	1.11
26	Other Non-Metallic Mineral	1.14	1.15	1.19	1.16
27	Basic Metals	1.19	1.04	1.29	1.43
28	Fabricated Metal	1.08	1.15	1.28	1.33
29	Machinery, nec.	1.11	1.07	1.15	1.13
30	Office, Accounting & Computing Machinery	1.07	1.12	1.29	1.30
31	Electrical Machinery & Apparatus, nec.	1.06	1.12	1.28	1.13
32	Radio, Television & Communication Equipment	1.17	1.11	1.33	1.22
33	Medical, Precision & Optical Instruments	1.11	1.11	1.41	1.17
34	Motor Vehicles, Trailers & Semi-Trailers	1.16	1.12	1.15	1.16
35	Other Transport Equipment	1.38	0.92	1.19	1.06
36	Manufacturing, nec.	1.17	1.17	1.17	1.15
37	Recycling	1.16	1.44	1.17	1.04
40	Electricity & Gas	1.40	1.40	1.42	1.35
41	Water Supply	1.82	0.95	1.42	1.38
45	Construction	1.20	1.24	1.41	1.13
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	1.55	1.53	1.57	1.24
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	1.39	1.19	1.47	1.44
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	1.11	1.27	1.62	1.58
55	Hotels & Restaurants	1.10	1.25	1.46	1.35
60	Other Inland Transport	1.16	1.16	1.54	1.58
61	Other Water Transport	1.71	1.09	1.81	1.09
62	Other Air Transport	1.14	0.95	1.82	1.20
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	1.12	1.29	1.65	1.21
64	Post & Telecommunications	1.39	1.41	1.73	1.54
65	Financial Intermediation, except Insurance & Pension Funding	2.00	1.59	1.42	1.74
66	Insurance & Pension Funding, except Compulsory Social Security	1.11	1.46	2.19	1.40
67	Activities Related to Financial Intermediation	1.62	1.15	1.61	1.82
70	Real Estate Activities	3.32	4.40	8.62	3.40
71	Renting of Machinery & Equipment	2.76	2.03	2.06	1.72
72	Computer & Related Activities	1.70	1.29	1.83	1.39
73	Research & Development	0.98	1.14	2.07	2.53
74	Other Business Activities	1.86	1.22	1.55	1.24
75	Public Administration & Defence; Compulsory Social Security	1.11	1.19	1.26	1.15
80	Education	1.09	1.07	1.17	1.07
85	Health & Social Work	1.27	1.37	1.29	1.14
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	1.41	1.70	1.68	1.20
91	Activities of Membership Organizations, nec.	1.02	1.04	2.00	1.12
92	Recreational, Cultural and Sporting Activities	1.57	1.20	1.83	1.18
93	Other Service Activities	2.49	1.79	1.90	1.48

Table 4A.b. Estimated mark-ups by sector and country, 1993-2004

Code	Sector	Netherlands	Belgium	Austria	Finland
15	Food & Beverages	1.07	1.07	1.08	1.13
16	Tobacco	1.63	1.04	1.61	1.05
17	Textiles	1.07	1.07	1.35	1.19
18	Wearing Apparel, Dressing & Dying of Fur	1.07	1.10	1.39	1.10
19	Leather, leather and footwear	1.12	1.09	1.47	1.14
20	Wood & of Wood & Cork	1.29	1.11	1.25	1.23
21	Pulp, Paper & Paper	1.11	1.10	1.51	1.36
22	Printing, Publishing & Reproduction	1.20	1.13	1.31	1.18
23	Coke, Refined Petroleum & Nuclear Fuel	1.04	1.08	1.69	1.20
24	Chemicals & Chemical Products	1.18	1.13	1.18	1.22
25	Rubber & Plastics	1.06	1.12	1.21	1.18
26	Other Non-Metallic Mineral	1.23	1.08	1.35	1.27
27	Basic Metals	1.34	1.19	1.52	1.17
28	Fabricated Metal	1.11	1.11	1.33	1.15
29	Machinery, nec.	1.14	1.20	1.27	1.14
30	Office, Accounting & Computing Machinery	1.03	1.38	1.42	0.95
31	Electrical Machinery & Apparatus, nec.	1.09	1.11	1.39	1.17
32	Radio, Television & Communication Equipment	1.11	1.04	1.20	1.27
33	Medical, Precision & Optical Instruments	1.30	1.17	1.29	1.20
34	Motor Vehicles, Trailers & Semi-Trailers	1.08	1.06	1.12	1.02
35	Other Transport Equipment	1.05	1.07	1.21	1.10
36	Manufacturing, nec.	1.11	1.03	1.24	1.18
37	Recycling	1.19	1.13	1.76	1.33
40	Electricity & Gas	1.07	1.44	1.42	1.65
41	Water Supply	1.72	1.42	2.17	2.98
45	Construction	1.11	1.15	1.51	1.10
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	1.29	1.21	1.55	1.44
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	1.41	1.14	1.35	1.27
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	1.43	1.20	1.36	1.33
55	Hotels & Restaurants	1.30	1.22	1.38	1.10
60	Other Inland Transport	1.31	1.25	1.64	1.64
61	Other Water Transport	1.44	1.07	1.29	1.32
62	Other Air Transport	1.26	1.00	1.39	1.40
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	1.24	1.33	1.70	1.61
64	Post & Telecommunications	1.26	1.46	0.97	1.59
65	Financial Intermediation, except Insurance & Pension Funding	1.04	1.33	1.71	2.01
66	Insurance & Pension Funding, except Compulsory Social Security	1.53	1.66	2.78	2.60
67	Activities Related to Financial Intermediation	1.55	1.27	1.55	1.44
70	Real Estate Activities	3.08	3.65	2.05	2.34
71	Renting of Machinery & Equipment	2.01	1.54	3.11	1.88
72	Computer & Related Activities	1.22	1.20	1.50	1.29
73	Research & Development	1.03	0.95	2.16	1.08
74	Other Business Activities	1.16	1.27	1.19	1.26
75	Public Administration & Defence; Compulsory Social Security	1.19	1.07	1.11	1.08
80	Education	1.10	1.07	1.12	1.09
85	Health & Social Work	1.24	1.17	1.50	1.09
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	1.29	1.25	1.52	1.47
91	Activities of Membership Organizations, nec.	1.10	1.06	1.12	1.07
92	Recreational, Cultural and Sporting Activities	1.33	1.41	1.35	1.26
93	Other Service Activities	1.49	1.36	1.18	1.38

Table A4.c. Estimated mark-ups by sector, US vs. EA, 1993-2004

Code	Sector	US	EA Weighted average	EA Unweighted average
15	Food & Beverages	1.19	1.12	1.11
16	Tobacco	1.51	1.34	1.41
17	Textiles	1.10	1.16	1.16
18	Wearing Apparel, Dressing & Dying of Fur	1.21	1.16	1.16
19	Leather, leather and footwear	1.36	1.16	1.17
20	Wood & of Wood & Cork	1.24	1.20	1.21
21	Pulp, Paper & Paper	1.28	1.23	1.24
22	Printing, Publishing & Reproduction	1.39	1.21	1.20
23	Coke, Refined Petroleum & Nuclear Fuel	1.09	1.13	1.19
24	Chemicals & Chemical Products	1.32	1.13	1.16
25	Rubber & Plastics	1.26	1.16	1.15
26	Other Non-Metallic Mineral	1.37	1.17	1.20
27	Basic Metals	1.20	1.23	1.27
28	Fabricated Metal	1.29	1.18	1.19
29	Machinery, nec.	1.28	1.12	1.15
30	Office, Accounting & Computing Machinery	1.17	1.14	1.19
31	Electrical Machinery & Apparatus, nec.	1.15	1.14	1.17
32	Radio, Television & Communication Equipment	1.37	1.21	1.18
33	Medical, Precision & Optical Instruments	1.51	1.17	1.22
34	Motor Vehicles, Trailers & Semi-Trailers	0.89	1.15	1.11
35	Other Transport Equipment	1.36	1.11	1.12
36	Manufacturing, nec.	1.26	1.16	1.15
37	Recycling		1.19	1.28
40	Electricity & Gas	1.52	1.38	1.40
41	Water Supply		1.44	1.74
45	Construction	1.29	1.23	1.23
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	1.24	1.48	1.42
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	1.40	1.35	1.33
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	1.19	1.35	1.36
55	Hotels & Restaurants	1.11	1.30	1.27
60	Other Inland Transport	1.28	1.36	1.41
61	Other Water Transport	1.36	1.74	1.35
62	Other Air Transport	1.35	1.62	1.27
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	1.21	1.42	1.39
64	Post & Telecommunications	1.62	1.45	1.42
65	Financial Intermediation, except Insurance & Pension Funding	1.29	1.65	1.60
66	Insurance & Pension Funding, except Compulsory Social Security	1.15	1.47	1.84
67	Activities Related to Financial Intermediation		1.49	1.50
70	Real Estate Activities	3.83	4.37	3.86
71	Renting of Machinery & Equipment	2.98	2.17	2.14
72	Computer & Related Activities	1.07	1.66	1.43
73	Research & Development	1.40	1.85	1.49
74	Other Business Activities	1.44	1.47	1.34
75	Public Administration & Defence; Compulsory Social Security	1.48	1.16	1.15
80	Education	1.04	1.10	1.10
85	Health & Social Work	1.19	1.29	1.26
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	1.33	1.57	1.44
91	Activities of Membership Organizations, nec.	1.00	1.62	1.19
92	Recreational, Cultural and Sporting Activities	1.29	1.49	1.39
93	Other Service Activities	1.25	2.00	1.63

Notes: EA countries considered are: Austria, Belgium, Finland, France, Germany, Italy, Netherlands & Spain. For the weighed average, weights are gross output levels, 2000.

Table A5.a. Statistically significant difference of 1993-2004 mark-up from 1981-1992 mark-up by sector and country

Code	Sector	Germany	France	Italy	Spain
15	Food & Beverages				
16	Tobacco		0.99		
17	Textiles				
18	Wearing Apparel, Dressing & Dying of Fur				
19	Leather, leather and footwear				
20	Wood & of Wood & Cork				
21	Pulp, Paper & Paper				
22	Printing, Publishing & Reproduction				
23	Coke, Refined Petroleum & Nuclear Fuel				
24	Chemicals & Chemical Products		-0.05		
25	Rubber & Plastics				
26	Other Non-Metallic Mineral				
27	Basic Metals				
28	Fabricated Metal				
29	Machinery, nec.		-0.12		
30	Office, Accounting & Computing Machinery				
31	Electrical Machinery & Apparatus, nec.	-0.22			
32	Radio, Television & Communication Equipment				
33	Medical, Precision & Optical Instruments				
34	Motor Vehicles, Trailers & Semi-Trailers				
35	Other Transport Equipment	0.36			
36	Manufacturing, nec.		-0.13		
37	Recycling		0.30		
40	Electricity & Gas			0.32	
41	Water Supply			0.32	
45	Construction			0.10	
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel				
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles				
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods			-0.37	
55	Hotels & Restaurants				
60	Other Inland Transport				
61	Other Water Transport				
62	Other Air Transport				
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies				
64	Post & Telecommunications			0.42	
65	Financial Intermediation, except Insurance & Pension Funding				0.49
66	Insurance & Pension Funding, except Compulsory Social Security				0.41
67	Activities Related to Financial Intermediation				
70	Real Estate Activities		1.01		
71	Renting of Machinery & Equipment			-0.43	
72	Computer & Related Activities			-0.42	
73	Research & Development			-0.41	
74	Other Business Activities		0.11		
75	Public Administration & Defence; Compulsory Social Security			0.10	
80	Education		0.12	0.13	
85	Health & Social Work		0.23	0.10	
90	Sewage & Refuse Disposal, Sanitation & Similar Activities				
91	Activities of Membership Organizations, nec.		-0.28		
92	Recreational, Cultural and Sporting Activities				-0.21
93	Other Service Activities		0.39		

Notes: Differences presented are statistically significant at the 5% level (two-sided t-test, critical value ± 2.074).

Table A5.b. Statistically significant difference of 1993-2004 mark-up from 1981-1992 mark-up by sector and country

Code	Sector	Netherlands	Belgium	Austria	Finland	USA
15	Food & Beverages		-0.04			
16	Tobacco		-0.24		-0.31	
17	Textiles			0.28		
18	Wearing Apparel, Dressing & Dying of Fur					
19	Leather, leather and footwear			0.42		
20	Wood & of Wood & Cork	0.20				
21	Pulp, Paper & Paper			0.34		
22	Printing, Publishing & Reproduction					
23	Coke, Refined Petroleum & Nuclear Fuel			0.68		
24	Chemicals & Chemical Products		-0.08			
25	Rubber & Plastics					
26	Other Non-Metallic Mineral		-0.12			
27	Basic Metals		0.08	0.34		
28	Fabricated Metal			0.27		
29	Machinery, nec.					
30	Office, Accounting & Computing Machinery			0.52	-1.35	
31	Electrical Machinery & Apparatus, nec.			0.29		
32	Radio, Television & Communication Equipment					
33	Medical, Precision & Optical Instruments					
34	Motor Vehicles, Trailers & Semi-Trailers					
35	Other Transport Equipment					-3.05
36	Manufacturing, nec.				-0.09	
37	Recycling					
40	Electricity & Gas					
41	Water Supply				0.99	
45	Construction			0.41		
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel		-0.11			0.28
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles		-0.22			
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods					
55	Hotels & Restaurants					
60	Other Inland Transport				0.26	
61	Other Water Transport			-1.12		
62	Other Air Transport					0.30
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies				0.21	
64	Post & Telecommunications			-0.73	0.23	
65	Financial Intermediation, except Insurance & Pension Funding	-0.98			0.79	
66	Insurance & Pension Funding, except Compulsory Social Security					
67	Activities Related to Financial Intermediation	0.36				
70	Real Estate Activities			-2.17		
71	Renting of Machinery & Equipment					
72	Computer & Related Activities					-1.93
73	Research & Development					
74	Other Business Activities				0.14	
75	Public Administration & Defence; Compulsory Social Security					
80	Education		-0.04		0.01	
85	Health & Social Work		-0.13		-0.02	
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	-0.61				
91	Activities of Membership Organizations, nec.					
92	Recreational, Cultural and Sporting Activities					
93	Other Service Activities					

Notes: Differences presented are statistically significant at the 5% level (two-sided t-test, critical value ± 2.074).

Table A6.a. Estimated mark-ups by sector and country (when the regression includes a constant)

Code	Sector	Germany	France	Italy	Spain
15	Food & Beverages	1.11	1.13	1.19	1.11
16	Tobacco	1.32	1.43	1.34	1.23
17	Textiles	1.16	1.10	1.21	1.16
18	Wearing Apparel, Dressing & Dying of Fur	1.05	1.14	1.20	1.34
19	Leather, leather and footwear	1.11	1.11	1.20	1.14
20	Wood & of Wood & Cork	1.10	1.15	1.28	1.26
21	Pulp, Paper & Paper	1.25	1.08	1.37	1.26
22	Printing, Publishing & Reproduction	1.19	1.16	1.35	1.14
23	Coke, Refined Petroleum & Nuclear Fuel	1.24	1.09	1.06	1.16
24	Chemicals & Chemical Products	1.21	1.09	1.12	1.25
25	Rubber & Plastics	1.19	1.19	1.18	1.14
26	Other Non-Metallic Mineral	1.20	1.16	1.29	1.24
27	Basic Metals	1.19	1.06	1.32	1.36
28	Fabricated Metal	1.05	1.17	1.33	1.20
29	Machinery, nec.	1.09	1.13	1.18	1.18
30	Office, Accounting & Computing Machinery	1.12	1.12	1.29	1.43
31	Electrical Machinery & Apparatus, nec.	1.18	1.13	1.31	1.09
32	Radio, Television & Communication Equipment	1.10	1.11	1.35	1.15
33	Medical, Precision & Optical Instruments	1.09	1.12	1.47	1.14
34	Motor Vehicles, Trailers & Semi-Trailers	1.13	1.10	1.20	1.18
35	Other Transport Equipment	1.18	0.98	1.23	1.02
36	Manufacturing, nec.	1.16	1.27	1.21	1.16
37	Recycling	1.23	1.27	1.21	1.04
40	Electricity & Gas	1.41	1.40	1.14	1.30
41	Water Supply	1.72	1.02	1.14	1.30
45	Construction	1.20	1.26	1.32	1.13
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	1.45	1.45	1.45	1.24
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	1.39	1.15	1.50	1.43
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	1.12	1.25	1.90	1.52
55	Hotels & Restaurants	1.10	1.24	1.40	1.26
60	Other Inland Transport	1.13	1.27	1.52	1.50
61	Other Water Transport	1.68	1.08	1.84	1.07
62	Other Air Transport	1.16	1.06	1.83	1.15
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	1.09	1.35	1.66	1.30
64	Post & Telecommunications	1.52	1.55	1.38	1.62
65	Financial Intermediation, except Insurance & Pension Funding	1.89	1.47	1.46	1.29
66	Insurance & Pension Funding, except Compulsory Social Security	1.12	1.19	4.66	1.04
67	Activities Related to Financial Intermediation	1.51	1.38	1.70	1.61
70	Real Estate Activities	3.29	3.86	9.15	3.50
71	Renting of Machinery & Equipment	2.94	2.03	2.41	1.77
72	Computer & Related Activities	1.87	1.22	2.17	1.37
73	Research & Development	1.11	1.10	2.40	2.18
74	Other Business Activities	1.82	1.17	1.60	1.24
75	Public Administration & Defence; Compulsory Social Security	1.11	1.19	1.17	1.20
80	Education	1.09	0.96	1.05	1.12
85	Health & Social Work	1.25	1.20	1.20	1.18
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	1.44	1.65	1.72	1.24
91	Activities of Membership Organizations, nec.	1.06	1.20	2.06	1.07
92	Recreational, Cultural and Sporting Activities	1.52	1.24	1.87	1.34
93	Other Service Activities	2.33	1.54	1.94	1.63

Notes: Mark-ups in bold are statistically significantly different from 1 at the 5% level.

Table A6.b. Estimated mark-ups by sector and country (when the regression includes a constant)

Code	Sector	Netherlands	Belgium	Austria	Finland	USA
15	Food & Beverages	1.07	1.09	1.07	1.11	1.12
16	Tobacco	1.45	1.07	1.70	1.10	1.62
17	Textiles	1.08	1.08	1.13	1.20	1.08
18	Wearing Apparel, Dressing & Dying of Fur	1.10	1.09	1.20	1.08	1.14
19	Leather, leather and footwear	1.12	1.09	1.22	1.09	1.22
20	Wood & of Wood & Cork	1.20	1.10	1.17	1.21	1.15
21	Pulp, Paper & Paper	1.13	1.12	1.34	1.34	1.22
22	Printing, Publishing & Reproduction	1.17	1.16	1.20	1.16	1.30
23	Coke, Refined Petroleum & Nuclear Fuel	1.05	1.07	1.14	1.13	1.09
24	Chemicals & Chemical Products	1.20	1.19	1.15	1.24	1.31
25	Rubber & Plastics	1.07	1.13	1.13	1.20	1.19
26	Other Non-Metallic Mineral	1.25	1.15	1.25	1.30	1.25
27	Basic Metals	1.39	1.13	1.28	1.17	1.10
28	Fabricated Metal	1.14	1.12	1.15	1.18	1.19
29	Machinery, nec.	1.10	1.16	1.13	1.17	1.25
30	Office, Accounting & Computing Machinery	1.03	1.49	1.35	1.07	1.19
31	Electrical Machinery & Apparatus, nec.	1.09	1.12	1.15	1.19	1.20
32	Radio, Television & Communication Equipment	1.09	1.05	1.17	1.27	1.29
33	Medical, Precision & Optical Instruments	1.26	1.17	1.19	1.24	1.37
34	Motor Vehicles, Trailers & Semi-Trailers	1.07	1.06	1.20	1.06	0.97
35	Other Transport Equipment	1.05	1.05	1.13	1.04	2.79
36	Manufacturing, nec.	1.12	1.05	1.13	1.22	1.21
37	Recycling	1.21	1.11	1.77	1.35	0.00
40	Electricity & Gas	1.13	1.54	1.38	1.65	1.46
41	Water Supply	1.65	1.41	2.07	2.48	0.00
45	Construction	1.10	1.17	1.18	1.14	1.31
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	1.27	1.25	1.65	1.40	1.01
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	1.39	1.21	1.41	1.25	1.32
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	1.41	1.21	1.39	1.29	1.19
55	Hotels & Restaurants	1.31	1.23	1.36	1.11	1.15
60	Other Inland Transport	1.24	1.26	1.42	1.52	1.43
61	Other Water Transport	1.37	1.07	2.04	1.32	1.29
62	Other Air Transport	1.27	1.04	1.52	1.39	1.17
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	1.25	1.30	1.42	1.52	1.33
64	Post & Telecommunications	1.27	1.61	1.29	1.48	1.40
65	Financial Intermediation, except Insurance & Pension Funding	1.38	1.45	1.58	1.71	1.39
66	Insurance & Pension Funding, except Compulsory Social Security	1.42	1.55	2.13	2.28	1.14
67	Activities Related to Financial Intermediation	1.38	1.31	1.72	1.75	0.00
70	Real Estate Activities	3.02	3.88	3.40	2.23	3.80
71	Renting of Machinery & Equipment	2.03	1.63	2.63	1.73	2.93
72	Computer & Related Activities	1.22	1.16	1.32	1.26	1.89
73	Research & Development	0.98	0.93	1.36	1.07	1.59
74	Other Business Activities	1.15	1.31	1.29	1.20	1.27
75	Public Administration & Defence; Compulsory Social Security	1.19	1.13	1.15	1.07	1.80
80	Education	1.08	1.09	1.12	1.09	0.97
85	Health & Social Work	1.22	1.24	1.25	1.09	1.16
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	1.40	1.27	1.57	1.47	1.10
91	Activities of Membership Organizations, nec.	1.09	1.06	1.12	1.06	1.05
92	Recreational, Cultural and Sporting Activities	1.27	1.42	1.29	1.24	1.23
93	Other Service Activities	1.50	1.38	1.27	1.43	1.34

Notes: Mark-ups in bold are statistically significantly different from 1 at the 5% level.

Table A7.a. HAC standard errors corresponding to the mark-up estimates by sector and country of table A6.a.

Code	Sector	Germany	France	Italy	Spain
15	Food & Beverages	0.02	0.01	0.02	0.01
16	Tobacco	0.14	0.20	0.03	0.08
17	Textiles	0.02	0.02	0.02	0.01
18	Wearing Apparel, Dressing & Dying of Fur	0.02	0.01	0.02	0.03
19	Leather, leather and footwear	0.03	0.03	0.01	0.02
20	Wood & of Wood & Cork	0.02	0.03	0.01	0.03
21	Pulp, Paper & Paper	0.04	0.03	0.04	0.03
22	Printing, Publishing & Reproduction	0.03	0.02	0.04	0.02
23	Coke, Refined Petroleum & Nuclear Fuel	0.09	0.01	0.02	0.04
24	Chemicals & Chemical Products	0.05	0.01	0.01	0.02
25	Rubber & Plastics	0.03	0.02	0.01	0.02
26	Other Non-Metallic Mineral	0.04	0.02	0.01	0.03
27	Basic Metals	0.04	0.03	0.12	0.04
28	Fabricated Metal	0.04	0.03	0.07	0.01
29	Machinery, nec.	0.01	0.03	0.01	0.02
30	Office, Accounting & Computing Machinery	0.06	0.07	0.08	0.07
31	Electrical Machinery & Apparatus, nec.	0.07	0.02	0.04	0.01
32	Radio, Television & Communication Equipment	0.03	0.02	0.02	0.02
33	Medical, Precision & Optical Instruments	0.03	0.02	0.14	0.03
34	Motor Vehicles, Trailers & Semi-Trailers	0.03	0.02	0.05	0.02
35	Other Transport Equipment	0.08	0.07	0.09	0.01
36	Manufacturing, nec.	0.01	0.04	0.00	0.01
37	Recycling	0.05	0.05	0.00	0.05
40	Electricity & Gas	0.07	0.06	0.04	0.04
41	Water Supply	0.16	0.06	0.04	0.10
45	Construction	0.02	0.03	0.01	0.00
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	0.05	0.06	0.02	0.01
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	0.07	0.03	0.00	0.01
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	0.02	0.03	0.04	0.02
55	Hotels & Restaurants	0.03	0.02	0.02	0.02
60	Other Inland Transport	0.07	0.02	0.05	0.03
61	Other Water Transport	0.14	0.02	0.01	0.03
62	Other Air Transport	0.11	0.05	0.01	0.03
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	0.03	0.04	0.01	0.02
64	Post & Telecommunications	0.10	0.20	0.06	0.05
65	Financial Intermediation, except Insurance & Pension Funding	0.23	0.06	0.14	0.06
66	Insurance & Pension Funding, except Compulsory Social Security	0.04	0.07	3.58	0.06
67	Activities Related to Financial Intermediation	0.07	0.10	0.15	0.03
70	Real Estate Activities	0.22	0.25	0.51	0.09
71	Renting of Machinery & Equipment	0.11	0.09	0.08	0.03
72	Computer & Related Activities	0.14	0.06	0.07	0.03
73	Research & Development	0.06	0.03	0.07	0.30
74	Other Business Activities	0.06	0.03	0.17	0.02
75	Public Administration & Defence; Compulsory Social Security	0.00	0.01	0.02	0.02
80	Education	0.01	0.02	0.01	0.01
85	Health & Social Work	0.04	0.04	0.01	0.02
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	0.04	0.06	0.06	0.01
91	Activities of Membership Organizations, nec.	0.02	0.07	0.06	0.02
92	Recreational, Cultural and Sporting Activities	0.03	0.03	0.03	0.04
93	Other Service Activities	0.13	0.08	0.06	0.03

Notes: Reported standard errors are robust to autocorrelation and heteroskedasticity (Newey-West, maximum lag=3) and have been transformed as $s.e(1/(1-\beta))=s.e(\beta)/(1-\beta)^2$ using the delta method.

Table A7.b. HAC standard errors corresponding to the mark-up estimates by sector and country of table A6.b.

Code	Sector	Netherlands	Belgium	Austria	Finland	USA
15	Food & Beverages	0.01	0.01	0.03	0.01	0.02
16	Tobacco	0.08	0.04	0.13	0.05	0.14
17	Textiles	0.03	0.01	0.06	0.02	0.02
18	Wearing Apparel, Dressing & Dying of Fur	0.04	0.02	0.05	0.03	0.05
19	Leather, leather and footwear	0.04	0.01	0.11	0.03	0.08
20	Wood & of Wood & Cork	0.06	0.01	0.06	0.02	0.05
21	Pulp, Paper & Paper	0.03	0.03	0.09	0.03	0.04
22	Printing, Publishing & Reproduction	0.03	0.02	0.05	0.01	0.03
23	Coke, Refined Petroleum & Nuclear Fuel	0.02	0.01	0.16	0.04	0.01
24	Chemicals & Chemical Products	0.05	0.01	0.02	0.03	0.02
25	Rubber & Plastics	0.03	0.01	0.03	0.02	0.04
26	Other Non-Metallic Mineral	0.03	0.03	0.04	0.04	0.03
27	Basic Metals	0.05	0.02	0.10	0.02	0.03
28	Fabricated Metal	0.02	0.01	0.05	0.02	0.04
29	Machinery, nec.	0.03	0.04	0.04	0.03	0.02
30	Office, Accounting & Computing Machinery	0.02	0.19	0.09	0.11	0.02
31	Electrical Machinery & Apparatus, nec.	0.02	0.02	0.06	0.02	0.02
32	Radio, Television & Communication Equipment	0.08	0.03	0.03	0.06	0.05
33	Medical, Precision & Optical Instruments	0.07	0.03	0.09	0.04	0.10
34	Motor Vehicles, Trailers & Semi-Trailers	0.02	0.02	0.03	0.04	0.04
35	Other Transport Equipment	0.05	0.02	0.04	0.05	1.06
36	Manufacturing, nec.	0.02	0.02	0.05	0.03	0.02
37	Recycling	0.06	0.01	0.18	0.14	0.00
40	Electricity & Gas	0.03	0.08	0.09	0.05	0.05
41	Water Supply	0.12	0.06	0.27	0.34	0.00
45	Construction	0.02	0.01	0.07	0.02	0.04
50	Sale, Maint. & Repair of Motor Vehicles & Motorcycles; Retail Sale of Fuel	0.02	0.03	0.16	0.03	0.04
51	Wholesale Trade & Commission Trade, except of Motor Vehicles & Mot/cles	0.05	0.06	0.05	0.03	0.03
52	Retail Trade, except of Motor Vehicles & Mot/cles; Repair of Household Goods	0.04	0.02	0.05	0.03	0.03
55	Hotels & Restaurants	0.03	0.01	0.04	0.01	0.04
60	Other Inland Transport	0.05	0.04	0.14	0.05	0.11
61	Other Water Transport	0.05	0.04	0.28	0.03	0.04
62	Other Air Transport	0.09	0.03	0.08	0.03	0.10
63	Other Supporting & Auxiliary Transp. Activities; Activities of Travel Agencies	0.03	0.04	0.18	0.05	0.05
64	Post & Telecommunications	0.07	0.13	0.21	0.04	0.07
65	Financial Intermediation, except Insurance & Pension Funding	0.18	0.08	0.23	0.16	0.05
66	Insurance & Pension Funding, except Compulsory Social Security	0.09	0.13	0.32	0.59	0.06
67	Activities Related to Financial Intermediation	0.09	0.05	0.17	0.20	0.00
70	Real Estate Activities	0.31	0.11	1.12	0.07	0.19
71	Renting of Machinery & Equipment	0.09	0.06	0.23	0.06	0.26
72	Computer & Related Activities	0.05	0.03	0.07	0.06	0.60
73	Research & Development	0.04	0.02	0.14	0.01	0.30
74	Other Business Activities	0.02	0.02	0.05	0.03	0.07
75	Public Administration & Defence; Compulsory Social Security	0.01	0.03	0.01	0.00	0.13
80	Education	0.01	0.01	0.02	0.00	0.05
85	Health & Social Work	0.03	0.04	0.14	0.00	0.01
90	Sewage & Refuse Disposal, Sanitation & Similar Activities	0.12	0.02	0.09	0.04	0.13
91	Activities of Membership Organizations, nec.	0.03	0.03	0.01	0.00	0.03
92	Recreational, Cultural and Sporting Activities	0.09	0.03	0.07	0.02	0.04
93	Other Service Activities	0.03	0.06	0.09	0.04	0.06

Notes: Reported standard errors are robust to autocorrelation and heteroskedasticity (Newey-West, maximum lag=3) and have been transformed as $s.e(1/1-\beta)=s.e(\beta)/(1-\beta)^2$ using the delta method.

Figure A1. Sectoral mark-ups ordered by size

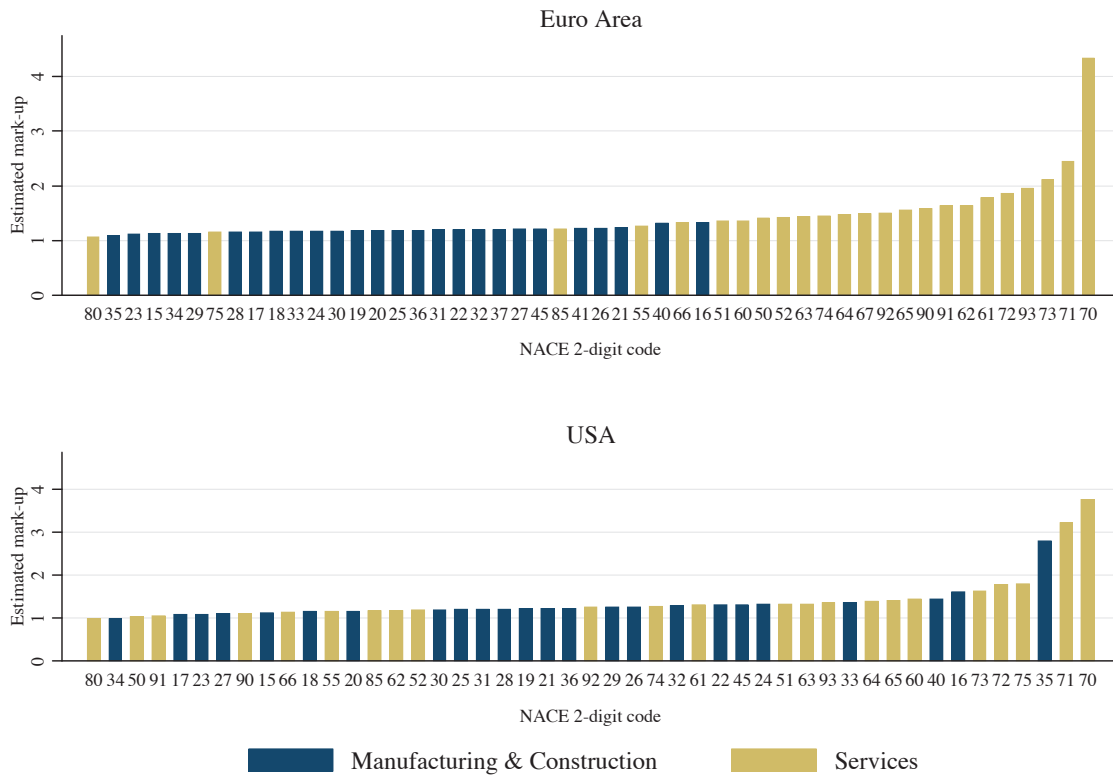
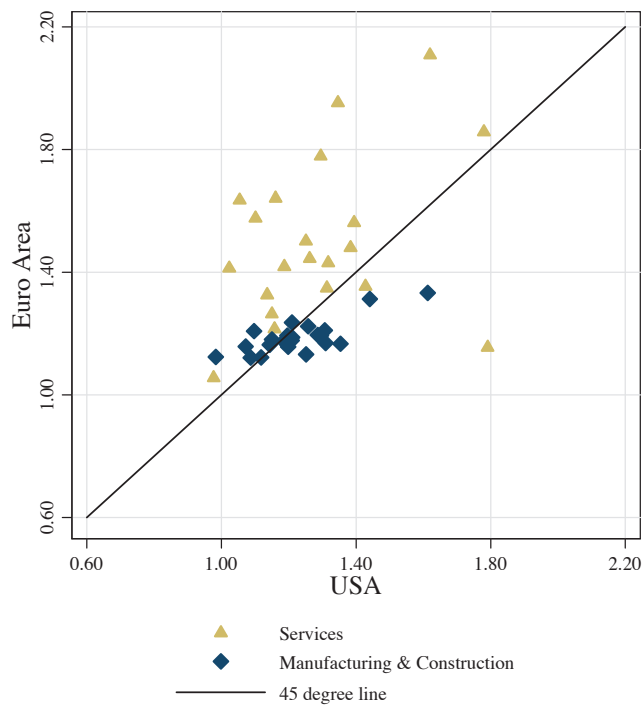


Figure A2. Sectoral mark-ups, Euro Area vs. the US



Note: Sectors 21, 70 & 71 are treated as outliers (mark-ups higher than 2.5) and are excluded.

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