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**Labor Costs and Employment
in the Service Economy**

**GIANNA GIANNELLI
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1. Introduction

A stylized fact of contemporary labor markets is the concomitant decline in employment in the traditional industrial sectors and the rise of service employment. This phenomenon has been well documented in many studies.⁽¹⁾ The causes behind service employment growth remain a disputed issue among both sociologists and economists.

A complete analysis of the growth of service employment would ideally require the investigation of the interaction of demand and supply factors in service markets, yet the existing literature has mainly emphasized the demand side. The causal emphasis on income per capita in the "stages of growth" model presented in the early studies in development economics by Fisher (1939) and Clark (1940), has remained influential in subsequent analyses. Thus, recent studies of the tertiary economy, even if abandoning the dated three-sector model, have focused on the structure of private consumption (as an expression of final demand) as it influences particular kinds of service employment growth.⁽²⁾

In contrast, Baumol's (1967; 1985) "unbalanced growth" model emphasizes predominantly supply factors. In his model, productivity grows unevenly between the economic sectors. But, since labor costs in services are likely to grow at the pace of the more productive manufacturing, the result is a potential cost disease. With the likely transfer of labor from manufacturing to services, the "cost-disease" implies that the macro-economy will bear an increasing cost for the production of services. However, the cost disease problem may also imply slack demand for service labor; government may, of course, compensate with public employment. Baumol's unbalanced-growth model has had considerable influence on

recent research, particularly on the behavior of the public sector; but it has also been subject to criticism.(3)

This study is not meant to address directly the Baumol model. Our objective is to trace the impact of supply factors on labor demand. To this end, we analyze the direct relationship between the cost of labor and employment in diverse service industries. In contrast to most existing studies, we assume that the tertiary sector is highly differentiated in terms of reactions to both supply and demand factors. It is, moreover, assumed that the service sectors are composed of firms that, in forming their own demand for labor, have to face both the supply and demand conditions of the economy. In services, of course, the cost of labor accounts for the lion's share of total production costs.

The relation between the cost of labor and employment is one of the leading subjects in the field of labor economics but has, surprisingly, never been investigated for services. Given their heterogeneity, any analysis is meaningful only if conducted at such a level of disaggregation that behavioral variations can be identified. For example, given demand, it is to be expected that labor costs will be much more influential in the growth of consumer services than in health services.

This study is doubly comparative. It compares across different types of service industries, and also across three countries (Germany, Sweden, and the United States) known to exhibit very different employment profiles over the past two decades. In terms of service industries, we have identified three general groups, each expected to behave uniquely in terms of the employment impact of labor costs: consumer-,

business- and social- (public and private) services. It is widely recognized that in Europe the growth of tertiary employment has been sluggish compared to the United States and Scandinavia. Germany stands as a typical example of slow overall service growth. In Sweden, service employment growth has been very strong, but almost entirely concentrated in public sector social and health services. The United States is unique in the sense that employment has grown tremendously in consumer, business, and social/health services, the latter however, predominantly in the private sector.

This paper addresses an issue which, in recent years, has provoked considerable controversy in European debates. While some argue that European employment has been stagnant due to tight demand policies (Blanchard, Dornbusch and Layard, 1986), others, such as Giersch (1983) and Bruno and Sachs (1985), suggest that Europe's poor employment performance is primarily a function of too rigid (and high) labor costs and compressed wage differentials. It is usually assumed, either explicitly or implicitly, that if Europe were to follow the American pattern of wage setting, a much more dynamic labor market would ensue.(4)

The model to be tested in this paper addresses this debate. The main argument is that the influence of labor costs on employment growth is far from being uniform across the service economy; indeed, we believe it to be restricted to only certain sections of the service economy, the consumer services in particular. In other words, our expectation is that the cost of labor is a significant variable in determining employment mainly in the sectors that rely on unskilled, and less unionised labor supply. Hence, this sector-specific relationship should be stronger

in countries, like the United States, where wage bargaining is de-centralized and trade unionism weak.

1. Employment and Labor Costs in Services.

The data sources for our comparisons of Germany, Sweden, and the United States are the national accounts statistics. These provide a comparable disaggregation for the United States and Sweden, whereas less detail is available for Germany (see table 1, and Appendix 2). The time-sample differs across the countries: for the United States, 1948-1986; for Sweden, 1963-1986; and for Germany, 1970-1986. Due to these differences in data availability, the study will first conduct a series of single country analyses, and then a comparative analysis of the three countries for 1970-1986.

As is usual in the national accounts, the data refer to private sector industries; public service sector activity is, unfortunately, lumped together with the class called "Government". Thus, this sector includes not only employment in public education, health, and social services, but also other government activities ranging from police to sanitation workers.(5)

The employment data is the number of full-time equivalent employees (see the Appendix 1); this choice was dictated by the growing weight in service employment of part-time workers, especially in Sweden. The cost of labor is derived by deflating the sectoral compensation per employee by the sectoral value added deflator. The differences in the characteristics of the patterns of employment and cost-of-labor growth of the three countries considered appear in Table 1.

From Table 1, it is first of all clear that American service employment growth has been much more pervasive than in either Sweden or Germany. The United States also stands out by the fact that this has, until recently, been accompanied by a continuous, albeit slower, growth in manufacturing employment. Both Sweden and Germany conform to the typical European pattern with a pronounced decline in manufacturing employment. After 1970, the American rate of manufacturing employment growth turns negative, but the decline is 1/4 of that of Sweden and Germany. The real cost of labor in manufacturing has been increasing by around 3 per cent annually in all sample periods and countries; since the early 1970s, Germany has registered the highest rate of increase.

Employment in consumer services (sectors 7-11 and, for the United States, also sector 3 in table 1) has grown very rapidly in the United States (since 1970, around 3 per cent annually), rather slowly in Germany, and has been largely stagnant in Sweden (where personal services and autorepair actually decline). Comparatively, the real cost of labor has risen slowest in the United States; in some sectors (hotels and personal services) it has been negative since 1970.

Business service employment (sectors 4-6) has been the most dynamic growth sector of all in the United States. In the other two countries, its growth has been slower, but still significant. The real cost of labor has been decreasing in the business services proper in the United States, and in finance in Sweden. This may seem counterintuitive, since the higher skill-levels --compared to, for example, consumer services --should be associated with a downward rigidity of wages. It is to be noted, however, that we are considering here the real cost of

labor, that is labor costs deflated by the price of the service produced. It is therefore reasonable to attribute the decline in the real cost of labor in some consumer service sectors to a downward flexibility of wages, and the decline in business services to an increase in the price of the service.

Employment in social services (sectors 12-15) must be divided into private (sector 12-14) and public (sector 15). In the United States, we observe high rates of growth in private education and health (around 3 and 5.5 percent, respectively) and a stagnant public sector. Sweden, instead, has the highest rate of growth in public employment (nearly 4 per cent a year from 1963). Private education and health may also be growing fast in Sweden, but their share in service employment is miniscule. In Germany, private health has grown remarkably, and public employment falls between the other two countries. The real cost of labor grows relatively slowly in all countries and, in some cases, it declines. An interesting case is Sweden, where the real labor cost declines over all sample periods. Since the value-added deflator in this sector is a good wage deflator, this tendency must be attributed to the decline of real wages.

2. The Econometric Analysis.

Our objective is to estimate a model for the service sectors that allows us to compare the coefficients of sectors and countries. To this purpose we set up a pooled model with dummy variables that allow for the intercept term to vary over time and cross-section units (the sectors). Our dependent variable is employment in services and our explanatory variables are the cost of labor (our supply

variable) and GDP per capita (our demand variable). We also allow the sector-specific cost of labor to have a variable coefficient over sectors, as well as the coefficient of the economy-wide demand variable. The analysis is conducted by pooling the time series and sectoral data. All the variables are in log-terms.

We have also estimated the model for the manufacturing sector. The negative and significant relation between the cost of labor and employment in manufacturing has become an established fact in the empirical literature on the subject. Having included manufacturing in our analysis, we can test the validity of our model to replicate this robust result and examine the differences of its cost of labor-employment relation as compared to services.

The specification of the equation is the following:

$$E_{it} = \mu + \gamma_i + \lambda_t + \alpha_i CL_{it} + \beta_i Y_t + \epsilon_{it}$$

where:

E : employment

CL : cost of labor

Y : income per capita

i : group index, with $i = 1, \dots, G$

t : time index, with $t = 1, \dots, T$

μ : mean intercept constant over groups

γ_i : deviation from intercept term that varies over

groups

λ_t : deviation from intercept term that varies over

time

α_i : slope coefficient that varies over groups

β_i : slope coefficient that varies over groups

ϵ_{it} : disturbance term

Note that the intercept term for each observation is:

$$\mu_{it} = \mu + \gamma_i + \lambda_t$$

In this pooled model the number of observations is $G \cdot T$ and the number of parameters to be estimated is $T+3G+1$. The textbook version of this model assumes fixed slopes (see Judge et al., 1985). We have assumed, instead group-varying parameters and that amounts to running separate OLS regressions. The reason we have adopted this pooled model is that we can, in this way, measure how much of the difference with the general mean intercept is due to particular characteristics of the sector considered and how much of this difference is due to the general macroeconomic conditions of the year considered.

We assume γ_i and λ_t to be fixed parameters and estimate the model by means of dummy variables. (6) The use of dummy variables allows to explain a substantial portion of error variation without obtaining any precise knowledge of the model. As usual with dummy variables, there is a trade-off between loosing degrees of freedom and reducing the probability of estimating biased coefficients because of misspecification.

We define the following dummy variables:

$$\begin{aligned} S_i &= 1 \quad \text{for sector } i \\ &= 0 \quad \text{otherwise} \end{aligned}$$

and

$$\begin{aligned} P_t &= 1 \quad \text{for time } t \\ &= 0 \quad \text{otherwise.} \end{aligned}$$

The equation to be estimated will therefore be the following:

$$E_{it} = m + \sum_{i=1}^{G-1} g_i S_i^* + \sum_{t=1}^{T-1} l_t P_t^* + \sum_{i=1}^G a_i S_i CL_{it} + \sum_{i=1}^G b_i S_i Y_t + e_{it}$$

where $S_i^* = S_i - S_G$ for $i=1,2,\dots,G-1$, and $P_t^* = P_t - P_T$ for $t=1,\dots,T-1$ and the restrictions $\sum \gamma_i = 0$ and $\sum \lambda_t = 0$ have been imposed. The parameters to be estimated are m that is the average intercept, g_i which measures the difference from m of employment in sector i , l_t which measures the difference from m for the period t , a_i and b_i that are the slope coefficients for the cost of labor and income per capita respectively. The number of parameters to be estimated is therefore $T+3G-1$. The estimated group and time coefficients for the G^{th} group and T^{th} observation are $-\sum_{i=1}^{G-1} g_i$ and $-\sum_{t=1}^{T-1} l_t$ respectively.

The estimation technique consists of the following steps:

- 1) We first estimate the pooled model by means of instrumental variables since the cost of labor and income per capita are endogenous to the system. In order to overcome the problems connected with the presence of heteroskedasticity, we have chosen the procedure by White (1982), which computes standard errors that are consistent even in the presence of unknown heteroskedasticity.
- 2) Having obtained consistent parameters, we test the residuals for first-order autocorrelation. We allow the autocorrelation coefficient to vary over groups.
- 3) We estimate the pooled model on the transformed variables.

We then proceed to test for the joint significance of group and time dummies by means of F-tests. The test on group dummies allows us to establish if there are other significant causes above the cost of labor and income per capita that induce a different behavior of employment in each sector. These causes, however, remain unspecified. The test on time dummies allows us to ascertain if the general macro-economic conditions of each year have affected the behavior of service employment.

In order to test our hypothesis that the three groups of services (consumer-, business-, social-) show a different behavioral relation between employment and the cost of labor, we have tested for the equality of coefficients of the sectors that form each group. Again, this is done by means of F-tests.

3. Single Country Analyses.

We have estimated the model for the United States from 1948 to 1986, for Sweden from 1963 to 1986 and for Germany from 1970 to 1986. Table 1 shows the sectors considered in our analysis and the aggregation criteria adopted to test for the validity of the equality of the cost of labor coefficients in our three macro-sectors of services. Table 2 summarizes the results.

The United States

We first note that the cost-of-labor coefficient is negative and significant in explaining employment in manufacturing in the United States. This coefficient has the highest absolute value of all significant cost-of-labor coefficients.

The retail trade sector in the United States includes employment in "Eating and Drinking Places" which is one of the sectors where employment has grown very rapidly during the 1980's.(7) In our classification of services, eating and drinking places fall in the category of consumer services. This sector shows a high and significant elasticity of employment with respect to the cost of labor, though lower than in manufacturing. The same thing is valid for nearly all sectors that we have grouped as consumer services.

Employment in business services, instead, is not explained by the cost of labor, and in social services it has a positive coefficient. The coefficients of income per capita are all positive and highly significant except for personal services.

The F-test on the group and time dummies (see table 3) shows that we can accept the hypothesis that employment varies according to sectoral (unspecified) characteristics, and that employment in services has been influenced by overall macroeconomic conditions common to all sectors. The F-test for pooling of cost of labor coefficients shows that there is a common behavioral pattern among the individual sub-groups that combine, respectively, into the three sectors (business-, consumer-, and social- services). In other words, these three macro-sectors are generally capable of summarizing the more detailed labor cost- employment growth relationships.

These results confirm our expectations about the behavior of employment in the service sectors of the United States. The sectors characterized by less skilled labor (i.e. consumer services) are the most sensitive to labor costs. Hence, the stability of real labor costs in this sector

explains why employers have chosen to augment their labor force. The results indicate that we can not ignore the role of demand, which is significant for all sectors with the one puzzling exception of the personal services.

In the United States, the enormous growth in business service employment is clearly not related to the cost of labor.(8) And, for the social services, we find that there is in effect a positive correlation between employment and labor costs. In this case, it may not be that labor costs are entirely irrelevant (when we turn to Sweden, we will in fact discover its relevance). While, it runs counter to prevailing theory, this positive correlation might be explained in two different ways: one, the particular skills demanded in social, educational and health services subverts the classical relation between prices and quantities; two, many of the professions (like doctors) engaged in these kinds of services may fit closer to an oligopolistic model of labor supply.

Hence, for the United States, consumer services are the only ones which follow the classical labor demand curve. But, note that the enormous growth in business and social services is, in our model, best attributed to income per capita (i.e. demand), and the dummy variables. The effect of the group dummies indicates that there are other sector-specific characteristics that remain unspecified in our analysis. To the degree that the time dummies capture overall macro-economic conditions, the effect was negative during the 1950s, neutral during the 1960s, and positive during the 1970s and 1980s.

Finally, within the American manufacturing sector, the results indicate that employment has been more labor cost

elastic than in services. This was to be expected since manufacturing real labor costs have grown faster than elsewhere, and since this sector is most likely to respond with capital deepening. In fact, the capital/labor ratio in services has been constant since 1975, while it has risen in manufacturing (OECD, 1987).

Sweden

A negative, albeit less powerful, relation between employment and the cost of labor obtains also for Swedish manufacturing. The cost of labor has a significant negative effect in three out of five consumer services and, unlike the United States, also in private social services and in government. The F-test for pooling of cost of labor coefficients shows that our grouping into consumer-, business- and social services is appropriate for Sweden as well.

These results indicate that Swedish private sector employers behave according to the labor demand curve. Manufacturing has been losing jobs in tandem with real labor cost growth; in consumer services, labor costs also rose strongly, and this suggests why, in Sweden, employment in consumer services has remained stagnant.

The results for the public sector are quite interesting. The contained but steady decrease in the level of the real labor cost reflects the increase in consumer price inflation in the 1970s, and the only partial response of wages to developments in the open sector. Contradicting the well-known Scandinavian (Aukrust) model, public sector wages have lagged behind the private sector, especially in recent years (OECD, 1989: p.68). This phenomenon must be understood in

light of the strong political commitment to avoid high unemployment. If Sweden's massive public sector employment expansion during the 1970's and 1980's had been accompanied by excessive wage increases, public expenditure growth would have reached intolerable levels. The highly significant negative relation between the real cost of labor and employment, is, therefore, the obvious outcome of a full-employment policy anchored in government employment growth.

It would, at first, appear contradictory that employment in consumer services is negatively correlated with income per capita. Aggregate employment studies for other countries show invariably a positive relation between the two variables. But, here we must consider the peculiar properties of the Swedish economy. We have seen that employment in the Swedish consumer services (especially personal services) has been declining over the period considered. From the mid-1970s, almost all net additional jobs were created by the public sector. Thus, even if income per capita has been rising constantly (albeit at a lower rate than the OECD average), the growth-dividend has been largely taxed away to finance government employment. As a consequence, the real growth of private consumption has been lower than in other countries, leading implicitly to a crowding-out effect in the private sector. Under such circumstances, it is evident why the growth of income is accompanied by a decline in consumer services.

Finally, the F-test for pooling rejects the hypothesis of a common intercept for all groups. The time dummies, instead, are not jointly significant. This means that macro-economic conditions have not influenced neither the overall trend, nor any time-specific structural changes. Hence, to

explain service employment in Sweden we must take into account the specific characteristics of each sector.

Germany

Since the German national accounts provide only short time series and a poor disaggregation, our results are bound to be less informative as compared to those of the other two countries. We note first that the coefficient for the cost of labor is negative and significant in explaining manufacturing employment. It is similarly negative for wholesale, retail, finance, government and "other" services. Income per capita is a significant explanatory variable for all sectors, except manufacturing and insurance. The F-test for pooling rejected the hypothesis of a common group intercept, but accepted the hypothesis of common time intercept.

During the 1980s, it has often been argued that real labor costs in Germany have been too high to secure full employment (Giersch, 1983). This argument has at least two implications. First, it implies the existence of the labor demand curve. Second, it confines the influence of aggregate demand factors to a marginal role. The first implication is confirmed by our results, since there is a negative employment-labor cost relationship in six out of the ten sectors considered. But its validity seems more dubious for the service sectors such as finance, and the class called "others" (which includes personal and business services).

The second implication, however, is partly contradicted by our results. Service employment is positively and significantly related to income per capita, which can be considered a proxy for aggregate demand factors. These

results are therefore consistent with those studies that emphasize the importance of aggregate demand in explaining the pattern of German employment (Franz and König 1986; Blanchard, Dornbush and Layard, 1986). According to these studies, the rise in German unemployment after the first oil-price shock is primarily the result of a sustained period of modest GNP growth. Our findings, however, suggest that the sectoral response to GNP growth varies. There is a significant and positive effect of GNP per capita on service employment growth, but not for manufacturing. Accordingly, we can impute the comparatively slower growth of German service employment to the stagnant growth of demand.

4. Some Comparative Observations.

In order to compare the results across our three countries, we have estimated the model starting from 1970 for Sweden and the United States (see table 4). Given the high number of regressors and fewer degrees of freedom, these estimates are of course less robust than those obtained with longer time series. With this in mind, our results nonetheless suggest some interesting comparative observations on the employment-labor costs relation, especially concerning manufacturing and services.

The United States exhibits the highest coefficient for the cost of manufacturing labor. And, for the service industries, the United States shows the highest number of significant negative relations; the negative relations are especially strong in the consumer services. The F-tests reject the hypothesis of equal coefficients within the groups of consumer, business and social services in all countries. The rejection of this hypothesis for the period after 1970 suggests that the service sectors are becoming

more heterogeneous as far as the relation of employment to labor costs is concerned.

These results, then, indicate that we must qualify the argument that the American economy's ability to create a large number of jobs is due to its comparatively greater wage flexibility -- an argument implying that the demand for labor is cost-elastic. If the argument had been correct, we should have observed a comparatively lower elasticity for U.S. manufacturing. But, in reality, the elasticity for manufacturing in the United States is higher than in the other two countries. Additionally, we note a high elasticity for the consumer service sectors in the United States, where the real cost of labor typically decreased, and where employment grew enormously.

Our estimates indicate that the "wage flexibility" argument holds only for the consumer service sectors. For manufacturing, the wage flexibility argument is inappropriate. Given that the elasticity is highest for American manufacturing (where employment decline has been the least), it is most probable that the employment behavior in manufacturing is caused by demand and sector-specific causes (such as technological innovation) rather than by greater wage flexibility. Conversely, the lower elasticity for Swedish and German manufacturing indicates that the cost of labor is not the main reason behind employment decline.

5. Conclusions

This study has explored the relative importance of labor costs and demand for the creation of employment in service sectors. The study confirms the crucial importance of disaggregated analysis for an understanding of contemporary

trends and shifts in the employment structure, particularly in the service economy.

The study suggests that we must reassess the relevance of demand factors, but it also confirms that the real cost of labor is a crucial determinant of service employment. Of particular interest are the results of the country comparisons. The comparative analyses have sensitized us to the fact that the relationship between employment and the cost of labor is far from being globally similar. Each country exhibits a behavioral logic according to the peculiarities of its labor market.

In the United States, it is predominantly in the consumer services that employment is significantly influenced by labor costs. The lower rate of growth in labor costs in this sector can, accordingly, explain why employment has grown so dramatically precisely in consumer services within the United States. But this kind of explanation cannot be invoked for employment in business and social services where, instead, a very rapid rate of employment growth is a function of demand and sector-specific factors. Hence, it is evident that the classical relation between prices and quantities applies only to the sections of the labor market that employ mostly unskilled labor. Where more specialized, technical or professional labor is required, such as in the social and business-related services, employers appear willing to shoulder higher labor costs in order to gain efficiency.

The results for Sweden reflect the peculiarity of a labor market that has been shaped by policy decisions. There as well employment in consumer services is negatively related to labor costs. Yet, the direction of change has been

opposite to the American. For Sweden, however, it is the behavior within the public sector which is most interesting. Its highly significant negative relation between labor costs and employment can obviously not be attributed to the rule of the market; instead, it is a function of government's commitment to sustained full employment and collective social services.

In Germany, the stagnation of service employment can best be attributed to rising labor costs, and to the slow growth of aggregate demand. For Germany, the market rule that produces an inverse correlation between labor costs and service employment seems to be more pervasive. While this is consistent with previous analyses, our results suggest that the effect also pertains to parts of the service sector.

Finally, our comparative analysis for the 1970s and 1980s allowed us to test the degree to which, in effect, greater wage flexibility explains the ability of the American economy to act as a "great job machine". In contrast to other studies, we show that this argument is not valid for the manufacturing sector, and that it really only pertains to those private services which primarily rely on unskilled labor and, therefore, do not face any labor supply constraint. It is also doubtful whether the American experience is transferable to other countries; in the United States, the labor force in these services is less unionised, and represents generally the competitive "segment" of the labor market.

Table 1. Employment and real labor costs
Sectoral average growth rates
(per cent)

		United States		Sweden		Germany
		1948-86	1970-1986	1963-86	1970-1986	1970-1986
Business services:	1 Manufacturing					
	employment	0.56	-0.30	-1.15	-1.24	-1.25
	real labor costs	2.97	2.91	3.49	2.41	3.25
	2 Wholesale					
	employment	2.05	2.31	0.37	-0.07 +	-0.05
	real labor costs	2.53	1.70	1.99	1.39	3.15
	3 Retail					
	employment	2.51	2.90 *			0.42
	real labor costs	1.25	0.29			2.96
	4 Finance					
	employment	3.53	3.52 **	2.64	1.78	2.25
	real labor costs	1.71	1.36	-0.25	-0.50	2.02
	5 Insurance					
	employment			0.90	0.95	0.66
	real labor costs			0.63	0.76	0.67
	6 Business					
	employment	6.58	6.46	1.52	2.72	n.a.
	real labor costs	-0.65	-0.86	3.94	1.94	n.a.
Consumer services:	7 Hotels and restaurants					
	employment	2.76	3.60	-0.37	0.02	2.66
	real labor costs	0.04	-0.98	-1.03	-1.58	0.46
	8 Personal services					
	employment	0.44	2.00 ***	-2.18	-2.53	n.a.
	real labor costs	0.62	-1.87	2.25	2.32	n.a.
	9 Amusement and recreation					
	employment	1.77	3.30	3.48	2.87	n.a.
	real labor costs	1.07	1.00	1.74	3.07	n.a.
	10 Autorepair					
	employment	3.42	4.82	-3.38	-4.52	n.a.
	real labor costs	0.88	0.02	3.51	3.36	n.a.
	11 Repair					
	employment	2.54	3.58	0.69	1.10	n.a.
	real labor costs	0.38	0.81	4.12	2.66	n.a.
Social services:	12 Health					
	employment	5.39	5.60	1.29	2.42	5.66
	real labor costs	1.84	1.37	0.99	0.20	1.70
	13 Education					
	employment	3.27	2.81	2.66	2.62	1.42
	real labor costs	-0.07	-0.35	0.09	0.96	0.76
	14 Social services					
	employment	3.59	2.15	2.04	2.27	n.a.
	real labor costs	0.19	0.34	-0.56	-0.14	n.a.
	15 Government					
	employment	2.51	0.88	3.87	3.38	1.87
	real labor costs	0.12	0.15	-0.36	-0.37	0.58
	16 Other services n.e.c.					
	employment					1.79
	real labor costs					1.07

* Includes restaurants.

** Finance and insurance

*** 1974-86

+ Wholesale and retail

Table 2. Estimated sectoral employment elasticities
w.r.t. a 1% point change of real labor cost
and income per capita

	United States 1948-86		Sweden 1963-86		Germany 1970-1986	
	real cost of labor	income per.cap.	real cost of labor	income per.cap.	real cost of labor	income per.cap.
1 Manufacturing	-1.54 (-9.43)	2.30 (8.37)	-0.62 (-3.95)	-0.27 (-0.550)	-0.65 (-2.47)	0.40 (0.808)
2 Wholesale	-0.49 (-5.80)	1.51 (10.0)	-0.26 (-1.76)	-0.08 (-0.187)	-1.03 (-4.44)	1.17 (2.77)
3 Retail	-0.59 (-6.07)	1.39 (11.6)			-1.15 (-2.95)	1.12 (2.15)
4 Finance	-0.15 (-1.30)	1.66 (11.3)	-0.66 (-1.55)	0.24 (0.607)	-0.26 (-4.16)	1.07 (4.20)
5 Insurance			0.04 (0.905)	0.15 (0.506)	0.23 (2.26)	0.57 (1.45)
6 Business	-0.57 (-1.92)	2.96 (17.7)	0.45 (1.53)	0.82 (2.17)		
7 Hotels and restaurants	-0.32 (-3.39)	1.61 (15.0)	-0.36 (-2.99)	-0.50 (-1.64)	0.88 (2.36)	1.14 (4.9)
8 Personal services	-0.62 (-3.1)	0.20 (1.20)	-0.26 (-2.44)	-1.38 (-3.78)		
9 Amusement and recreation	0.06 (0.261)	1.62 (10.3)	0.19 (1.24)	0.84 (1.96)		
10 Autorepair	-0.76 (-4.96)	2.45 (17.5)	-0.65 (-3.86)	-1.64 (-3.35)		
11 Repair	-1.58 (-1.45)	1.90 (8.77)	0.27 (1.77)	-0.18 (-0.431)		
12 Health	0.46 (3.04)	2.22 (11.7)	0.08 (1.00)	0.98 (2.59)	0.16 (0.753)	1.45 (3.24)
13 Education	0.95 (3.06)	1.72 (16.6)	0.06 (0.413)	0.82 (1.09)	-0.38 (-0.42)	0.80 (2.46)
14 Social services	-0.15 (-0.204)	0.97 (4.90)	-1.37 (-3.35)	0.62 (1.5)		
15 Government	0.29 (7.02)	0.69 (7.15)	-1.37 (-6.60)	1.60 (6.73)	-0.63 (-2.18)	0.74 (2.18)
16 Other services n.e.c.					-1.36 (-4.72)	1.63 (6.47)
	N.obs. 504 Adj.Rsq .99	DW 1.6	N.obs. 294 Adj.Rsq .99	DW 1.5	N.obs. 140 Adj.Rsq .99	DW 1.3

Note: in parentheses are t statistics.

Table 3 F tests for pooling

	United States		Sweden		Germany
	1948-86	1970-1986	1963-86	1970-1986	1970-1986
HO: common intercept *	F(48,427)=34 reject	F(26,141)=22 reject	F(33,232)=180 reject	F(26,141)=72 reject	F(22,97)=268 reject
HO: common intercept for all groups **	F(13,427)=42 reject	F(13,141)=18 reject	F(13,232)=192 reject	F(13,141)=24 reject	F(9,97)=268 reject
HO: common time pattern ***	F(35,427)=13 reject	F(13,141)=10 reject	F(20,232)=.37 accept	F(13,141)=.9 accept	F(13,97)=1.1 accept
HO: common coefficients +	F(9,427)=2 accept	F(9,141)=10 reject	F(8,232)=1 accept	F(8,141)=3 reject	++

* F test for joint sign. of time and group dummies.

** F test for joint sig. of group dummies.

*** F test for joint sign. of time dummies

+ F test for equality of coefficients of labor cost in grouped sectors

++ Not enough groups for meaningful pooling

Table 4. Estimated sectoral employment elasticities
w.r.t. a 1% point change of real labor cost
1970-1986 sample

	United States	Sweden	Germany
	real cost of labor	real cost of labor	real cost of labor
1 Manufacturing	-2.01 (-5.52)	-0.57 (-3.52)	-0.65 (-2.47)
2 Wholesale	-0.25 (-2.05)	-0.01 (-0.03)	-1.03 (-4.44)
3 Retail	-2.87 (-2.23)		-1.15 (-2.95)
4 Finance	-0.17 (-0.56)	-0.16 (-0.92)	-0.26 (-4.16)
5 Insurance		0.01 (0.11)	0.23 (2.26)
6 Business	-0.84 (-1.64)	0.74 (1.57)	
7 Hotels and restaurants	-1.01 (-4.04)	-0.02 (-0.14)	0.88 (2.36)
8 Personal services	-0.17 (-3.93)	-0.30 (-2.74)	
9 Amusement and recreation	0.44 (1.65)	-0.06 (0.44)	
10 Autorepair	-2.16 (-2.38)	-0.72 (-2.96)	
11 Repair	1.27 (1.38)	0.47 (3.50)	
12 Health	4.11 (7.51)	0.17 (2.26)	0.16 (0.753)
13 Education	-1.06 (0.56)	0.40 (5.40)	-0.38 (-0.42)
14 Social services	0.48 (-0.20)	-3.21 (-2.64)	
15 Government	0.34 (6.02)	-1.86 (-7.87)	-0.63 (-2.18)
16 Other services n.e.c.			-1.36 (-4.72)
	N.obs. 196 Adj.Rsq .9 DW 1.5	N.obs. 196 Adj.Rsq .9 DW 1.4	N.obs. 140 Adj.Rsq .9 DW 1.3

Note: in parentheses are t statistics.

Footnotes

- 1 The tertiarization of the labor force was already recognized by Fisher (1939) and Clark (1940). More recently, it has been documented in Stigler (1956), Kuznets (1957), Fuchs (1968), Singelmann (1974;1978), Browning and Singelmann (1975), and, most recently, in Elfring (1988). A principal problem in the sectorial approach to service employment, conceptual as well as empirical, is how to draw meaningful boundaries. In many cases, what we regard as service employment occurs within traditional manufacturing enterprises.
- 2 Gershuny (1978) and Gershuny and Miles (1983) propose a rather pessimistic scenario for service employment growth on the grounds that rising household purchasing power will primarily promote the purchase of "self-servicing" technologies (microwave ovens, video-recorders, etc). Clearly, this argument pertains to personal and recreational services, and not to business- or social and health services.
- 3 Pomerehne and Schneider (1980) suggest that the model performs poorly for the European economies. As Baumol himself suggests, service employment may continue to grow, despite the "cost disease" problem, where the public sector stimulates the expansion of services. To give an example, in Sweden the public sector accounts for more than 75 percent of all new net employment growth over the past two decades (Esping-Andersen, 1990).

In a recent study, Sharpf (1985) presents an explanation that stresses the interaction of government and inter-sectoral wage differentials. In summary, the argument is that private sector service jobs will fail to grow when inter-sectoral wage differentials are small; the government may, in this case, compensate with public employment but this, in turn, depends on its fiscal capacity.

- 4 Gordon (1987) has argued that wages in the United States are not more flexible.
- 5 That we are not able to distinguish public social/health/education employment from other activities is less problematic than might appear at first. By and large, it is the case that almost all public sector employment growth over the past two decades has occurred in the broad social services area, while traditional fields of public employment such as administration, law and order have been quite stagnant. Hence, when we monitor changes in "Government" employment, we are mainly identifying the rate of change in public social/health/ education.
- 6 For a discussion of random coefficients models, see Judge et.al (1985).

- 7 Most of the employment growth in retail can be attributed to the sharp increase in employment within eating and drinking places (Bureau of Labor Statistics, Employment and Earnings, various years; and Monthly Labor Review, August, 1986).
- 8 As noted earlier, the real cost of labor in business service within the United States has actually declined. As we argued, this is most probably the result of a rapid price increase for the services.

REFERENCES

BAUMOL, W. J., (1967), "Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis", American Economic Review, June, pp.415-26.

BAUMOL, W. J., (1985), "Unbalanced Growth Revisited: Asymptotic Stagnancy and New Evidence", American Economic Review, Sept., pp.806-817

BLANCHARD, O., DORNBUSCH, R. AND LAYARD, R. (1986), Restoring Europe's Prosperity. Cambridge, Mass: MIT Press

BROWNING, H. AND SINGELMANN, J. (1975), The Emergence of the Service Society: Demographic and Sociological Aspects of the Sectoral Transformation of the Labor Force in the United States. Springfield, VA: National Technical Information Service.

BRUNO M. and J. SACHS (1985), The Economics of Worldwide Stagflation. Oxford: Basil Blackwell.

BUREAU OF ECONOMIC ANALYSIS, (1986), "National Income and Product Accounts of the United States", supplements to the Survey of Current Business, various years.

BUREAU OF LABOR STATISTICS, "Employment, Hours and Earnings", various years.

CLARK, C., (1940), The Conditions of Economic Progress. London: MacMillan.

ELFRING, T. (1988), "Service Employment in Advanced Economies", unpublished doctoral dissertation, University of Rotterdam

ESPING-ANDERSEN, G. (1990), The Three Worlds of Welfare Capitalism. Cambridge: Polity Press.

FISHER, A.G.B. (1939), "Production, Primary, Secondary and Tertiary", *Economic Record*, June, pp.24-38.

FRANZ, W. and H. KÖNIG, (1986), "The Nature and Causes of Unemployment in the Federal Republic of Germany since the 1970s: An Empirical Investigation", *Economica*, 53, S219-S244.

FUCHS, V. (1968), *The Service Economy*. New York: National Bureau of Economic Research.

GERSHUNY, J.I. (1978), *After Industrial Society; The Emerging Self-Service Economy*. London: Macmillan.

GERSHUNY, J., I., I.D. MILES, (1983), *The New Service Economy: The Transformation of Employment in Industrial Societies*. London: P. Pinter.

GIERSCH, H., 1983, "Arbeit, Lohn und Produktivität. Probleme und Perspektiven der gegenwertigen Wirtschaftspolitik", Mannheim: Bibliographisches Institut.

GORDON, R.J., (1987), "Wage Gaps vs. Output Gaps: Is there a common Story for All Europe?", N.B.E.R. working paper, 2454 December.

HAUGEN, S. E., (1986), "The employment Expansion in Retail Trade", *Monthly Labor Review*, August, pp. 9-17.

JUDGE, G.G., W. E. GRIFFITHS, R. CARTER HILL, H. LUTKEPOHL, TSOUNG-CHAO LEE, (1985), *The Theory and Practice of Econometrics*, second edition. New York: Wiley and Sons.

KUZNETS, S. (1957), "Quantitative aspects of economic growth of nations, II: Industrial distribution of national product and labor force". *Economic Development and Cultural Change*, 5 (July). Supplement.

MONTHLY LABOR REVIEW, (1986), August.

OECD, (1986 and 1987), *Economic Survey: Germany*. Paris: OECD.

OECD (1988 and 1989), *Economic Survey: Sweden*. Paris: OECD.

OECD (1986 and 1987), *Economic Survey: The United States*. Paris: OECD.

POMEREHNE, W. and SCHNEIDER, F. (1980), "Unbalanced Growth between Public and Private Sectors". Paper presented at the IIPF Conference, Jerusalem (August).

SHARPF, F. (1985), "Beschaeftigungspolitische Strategien in der Krise". Leviathan, 13.

SINGELMANN, J. (1974), The Sectoral Transformation of the Labor Force in Seven Industrialized Countries, 1920-1960. Ph.D. dissertation, University of Texas - Austin.

SINGELMANN, J. (1978), "The Sectoral Transformation of the Labor Force in Seven Industrialized Countries, 1920-1970." American Journal of Sociology, 83, 5.

STIGLER, G. (1956), Trends in Employment in the Service Industries. New York: National Bureau of Economic Research.

WHITE, H, (1982), "Maximum Likelihood Estimation of Misspecified Models", Econometrica, 50, pp.1-26.

APPENDIX 1 Data Sources

United States

Data Sources by Industry: 1) The National Income and Product Accounts of the United States 1929-1982. U.S. Department of Commerce/Bureau of Economic Analysis, September 1986. 2) Survey of Current Business, B.E.A., July 1987 / Vol. 67 no.7.

Full-time equivalent employees (the number of employees on full-time schedules, plus the number of employees on part-time schedules converted to a full-time basis): table 6.7B; GNP in billions of dollars table 6.1; GNP in constant dollars: table 6.2; compensation of employees: table 6.4B. Income per capita: The Economic Report of the President 1988. Population, p.279; GNP, p.246.

Sweden

The Swedish National Accounts do not supply the full-time equivalent employment data. We have elaborated it dividing the total number of hours worked by the number of hours worked by a full-time employee. The industry data sources are: Employment and Compensation of employees, and Production and Factor Income, National Accounts Annual Reports, Statistiska Centralbyran, various years. Hours worked: table 5:8. Compensation of employees: table 5:11. For government tables 5:10, 5:12 and 5:13. GDP current prices: table 4:2. GDP constant 1980 prices: table: 4.4. Average weekly hours worked by a full-time male by industry: AKU Arsmedelstal (Labour Force Survey), various years.

Germany

The German National Accounts neither supply the full-time equivalent employment data nor the total number of hours

worked. We have therefore corrected the employment data given by the n.a. using the percentage of part-time employees by industry supplied by the Mikrozensus. The data sources are: National Accounts, tables by branch, 1960-1985, Statistisches Bundesamt, August 1987 and Konten und Standardtabellen fachserie 18, reihe 1, 1987.

The mikrozensus data are published in: Bevoelkerung und Erwerbstaetigkeit, reihe 4.1.1 , tables 13 and 14, various years.

APPENDIX 2

Tab. A SUMMARY STATISTICS: USA 1948-1986

		Mean	Std.Dev.	Minimum	Maximum
Manufacturing	fte	17731	1628	14368	20683
	cl	18692	5788	10173	30761
Wholesale	fte	3797	947	2528	5549
	cl	19557	5116	11282	28881
Retail	fte	9132	2683	5805	14866
	cl	13073	1600	9107	14897
Finance	fte	3381	1300	1635	6088
	cl	18075	3784	12588	24065
Business	fte	2367	1641	581	6451
	cl	23588	1272	20690	26596
Hotels	fte	692	254	428	1255
	cl	13414	1018	11226	14770
Personal services	fte	824	59	741	997
	cl	13204	1631	9899	15951
Amusement	fte	556	164	394	886
	cl	15570	1499	12415	18450
Autorepair	fte	377	173	189	779
	cl	15060	1810	12077	17488
Repair	fte	182	67	110	312
	cl	18376	931	16421	20383
Health	fte	2695	1692	825	6022
	cl	16346	3715	10785	21123
Education	fte	799	312	409	1381
	cl	14995	407	14135	15960
Social Services	fte	1558	584	669	2524
	cl	12699	303	12128	13264
Government	fte	12921	3006	6812	16992
	cl	22812	431	22033	23716

FTE: full-time equivalent employees; thousands

CL : real labour costs; thousands of dollars

APPENDIX 2

Tab. B SUMMARY STATISTICS: Sweden 1963-1986

		Mean	Std.Dev.	Minimum	Maximum
Manufacturing	fte	736	69	623	827
	cl	104	23	61	134
Wholesale and Retail	fte	324	15	293	349
	cl	102	14	76	119
Finance	fte	33	4	23	41
	cl	127	9	109	147
Insurance	fte	16	1	14	17
	cl	182	24	153	233
Business	fte	67	10	53	88
	cl	136	27	70	164
Hotels and rest.	fte	49	4	42	58
	cl	73	9	53	90
Personal services	fte	22	5	16	29
	cl	83	19	55	137
Amusement	fte	19	4	11	24
	cl	108	24	77	138
Autorepair	fte	29	10	18	43
	cl	79	21	49	137
Repair	fte	3	0	3	3
	cl	92	19	51	125
Health	fte	17	2	14	21
	cl	110	16	89	141
Education	fte	16	3	11	20
	cl	110	14	84	132
Social Services	fte	21	3	16	27
	cl	151	10	139	174
Government	fte	644	172	366	872
	cl	137	4	132	145

FTE: full-time equivalent employees; thousands

CL : real labour costs; thousands of Swedish kronas

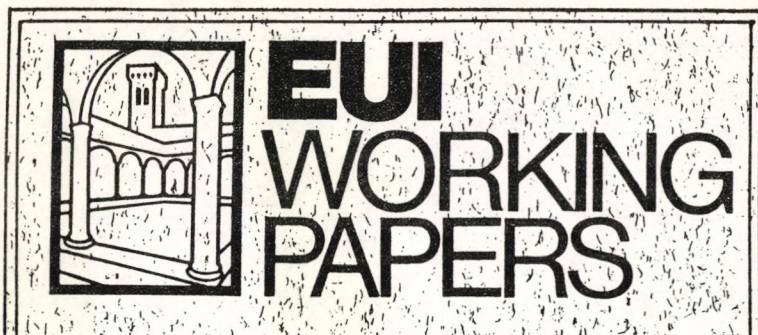
APPENDIX 2

Tab. C SUMMARY STATISTICS: Germany 1970-1986

		Mean	Std.Dev.	Minimum	Maximum
Manufacturing	fte	8422	646	7504	9460
	cl	35	6	25	42
Wholesale	fte	1096	35	1050	1169
	cl	35	5	26	43
Retail	fte	1425	65	1294	1531
	cl	27	4	20	32
Finance	fte	484	45	393	559
	cl	41	4	36	48
Insurance	fte	195	5	181	201
	cl	48	4	42	56
Hotels and rest.	fte	411	57	323	488
	cl	21	1	20	23
Health	fte	321	79	178	427
	cl	23	2	21	27
Education	fte	170	11	153	192
	cl	41	1	38	43
Other ser.	fte	975	92	872	1156
	cl	28	2	25	29
Government	fte	3460	298	2834	3805
	cl	44	1	42	46

FTE: full-time equivalent employees; thousands

CL: real labour costs; thousands of D-marks



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