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## Wage gaps, hysteresis and structural unemployment: The West German labour market in the seventies and eighties

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Working Paper No. 358

Wage Gaps, Hysteresis and Structural  
Unemployment. The West German ~~Labour Market~~  
in the Seventies and Eighties.\*

by

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## Contents

	<u>page</u>
I. Introduction	1
II. Stylized Facts 1960-87	3
III. The Emergence and Persistence of a Wage Gap	9
IV. Hysteresis - A Feature of Corporatism	31
V. Structural Unemployment	44
VI. Summary: Corporatist Inertia and Macroeconomic Performance	53
Appendix	56
References	58

## I. Introduction

In recent years, there has been an intense debate among economists about the causes of unemployment in Europe. Broadly speaking, the views can be grouped into two familiar camps: those with a more (neo-)classical outlook - stressing the importance of factor price movements, institutional rigidities and structural change<sup>1)</sup> - and those with a more Keynesian leaning, focusing on the restrictive fiscal policy stance in Europe or the long-term hysteresis effects of the worldwide recession of 1981-82.<sup>2)</sup> Lately, a new intermediate position has been added by Fitoussi, Phelps (1988), who point to the crowding-out of investment in Europe through the peculiar American policy mix of the eighties, thus making the United States the culprit of Europe's malaise. All major Keynesian positions (and also the one by Fitoussi, Phelps) rely on the tacit, but crucial assumption that - by and large - the unemployment of the eighties is an analytically new phenomenon to be explained separately from the experience of the seventies which is by now grudgingly admitted to have been a period of more classical than Keynesian unemployment.

It is the purpose of this paper to show that this assumption is not warranted so that, at least in some important respects, the eighties are simply the natural continuation and maybe culmination of developments which go back to the seventies. Empirically, we shall make our case for one country only, the Federal Republic of Germany, but similar lines of reasoning may apply to other EEC countries, of course with proper adjustments and qualifications.

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1) I.a. Artus (1984), Bruno, Sachs (1985), Burda (1988), Burda, Sachs (1987), Giersch (1983, 1985, 1987), Klodt (1985, 1988), Lindbeck, Snower (1986, 1988), Paqué (1988b, 1989a), Sachs (1986), Schatz et. al. (1988), Soltwedel, Trapp (1987), Vaubel (1987), von Weizsäcker (1988).

2) I.a. Basevi et. al. (1983), Bean et. al. (1986), Blanchard, Summers (1986a, b, c, 1988), Blinder (1988), Bruno (1986), Coen, Hickman (1988), Drèze (1987), Franz (1987a, b, c), Franz, König (1986), Gordon (1988), Layard (1986), Layard et. al. (1985), Solow (1986).

Our case rests on four pillars which are subsequently elaborated in four different sections of the paper. In Section II, we shall give some stylized facts on the state of the labour market, employment growth and structural change since 1960; as it will turn out, these facts look very similar for the seventies and eighties, but much different for the sixties, thus pointing to a fundamental regime shift sometime in the early seventies, but not in the early eighties. In Section III, we shall empirically analyse the extent and long-term consequences of the rise of labour costs which happened in the early seventies; as it will come out, the wage gap emerging at that time was never really closed until the very recent past, and the employment loss therefrom has been considerable. In Part IV, we shall show econometrically that hysteretic inertia of unemployment after an original level shift due to a recession has prevailed all throughout the seventies and eighties, with the share of long-term unemployment growing and the pattern of wage setting bound to lead to a dual labour market structure. This raises the more general question of whether corporatist collective bargaining German-style has proved to be a major force in cementing unemployment in the seventies and eighties and, conversely, overemployment in the sixties. In this light, hysteresis is not interpreted as a peculiar characteristic of the European experience of recent years, but rather as a general macroeconomic consequence of corporatism. In Section V, we shall demonstrate that, contrary to the received wisdom in the macroeconomic literature,<sup>3)</sup> there is good reason to see both the seventies and eighties as periods of growing structural - above all, regional - imbalances which may well figure as an additional force behind the hysteretic appearance of unemployment. In the final Section VI, we provide a summary of our main results and a brief outlook on how these results fit into a somewhat broader

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3) See, e.g., Burda, Sachs (1987), Franz (1987c), Franz, König (1986), Jackman, Roper (1987), Layard et. al. (1985).

theory of corporatist inertia and macroeconomic performance in Germany.<sup>4)</sup>

## II. Stylized Facts 1960-87

Table 1 summarizes annual averages of unemployment and vacancy statistics for three periods: 1960-73, 1974-80 and 1981-87, in the following simply called the "sixties", "seventies" and "eighties" respectively. The general message is unambiguous: the sixties were a period of acute labour shortage, with an unemployment rate of less than or equal to 1 % and the number of vacancies surpassing the number of unemployed by about 400,000. The picture shifts dramatically around 1973/74, with the unemployment rate rising to about 4 % and the labour surplus (defined here simply as unemployment minus vacancies) being around 700,000 people. At the beginning of the eighties, a second shift occurs, with a subsequent unemployment rate of 8-9 % and a labour surplus of about two million people. Clearly, this familiar pattern points to two structural breaks in the labour market record, each leading to a rise of labour surplus by 1 to 1.4 million people. Prima facie this supports the idea of two separate explanations of unemployment for the seventies and eighties.

The message conveyed by Table 1 is misleading in two respects. Firstly, all over the seventies (and particularly in the late 1979/80 boom) an inflationary environment prevailed so that - assuming at least some Phillips-curve trade-off to be exploited in the short and medium run - the labour surplus actually measured may well have been below the long-run equilibrium or natural level at no price inflation. This inflationary overhang was finally removed in the early eighties at the cost of a substantial rise of unemployment so that the wedge actually observed between

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4) Our thoughts on the matter run parallel to Mancur Olson's latest formulation of the macroeconomic effects of collective action (see Olson, 1988, pp. 64 ff.).

**Table 1:** Unemployment (U) and Vacancies (V) in Selected Periods

	Unemployment Level ('000)*	Rate (p.c.)*	Vacancies ('000)*	Labour Surplus U-V ('000)*
1960-73	220	1.0	553	- 333
1974-80	929	4.0	268	+ 661
1981-87	2056	8.4	130	+1926
1960-73 (excl. 67,68)	184	0.9	604	- 420
1974-80 (excl. 74,75)	970	4.2	264	+ 706
1981-87 (excl. 82,83)	2257	9.2	120	+2137

\* Annual averages

Source: Own calculations from National Labour Market Statistics.

**Table 2:** Average Annual Growth Rate of Population, Labour Force and Employment in Selected Periods (in p.c.)

	1960-73	73-80	80-87	1967-71	76-80	83-87
Population	+0.9	-0.1	-0.1	+0.8	0.0	-0.1
Labour Force	+0.2	0.0	+0.5	+0.6	+0.5	+0.6
Employment						
a) incl. self-empl.						
- total	+0.2	-0.3	-0.2	+0.9	+0.7	+0.6
- private sector	-0.2	-0.7	-0.4	+0.6	+0.5	+0.6
b) excl. self-empl.						
- total	+1.0	+0.1	-0.2	+1.9	+1.2	+0.7
- private sector	+0.6	-0.3	-0.4	+1.7	+1.1	+0.7

Source: Own calculations from National Accounts Statistics.



the seventies and eighties is likely to be biased upwards. Secondly, the more fundamental question arises whether unemployment is an adequate measure of the labour market performance in different periods. Clearly, this depends on the definition of performance: if one strictly means the ability of an economy to provide its labour force with jobs, the unemployment rate is in fact the relevant criterion. However, for many purposes of comparative evaluation it makes quite a difference whether the employment rise is mainly due to a slow-down of employment growth or to an accelerated increase of the active labour force. In the former case, the economy has increasingly failed to meet a fixed target; in the latter case, it has "only" failed to keep pace with an upward-moving target.

Table 2 shows that this distinction is quite relevant for the purpose at hand: the labour force grew faster in the eighties than in the two prior periods, mainly because the changing age structure of the population led to a rising participation ratio. Note that if one restricts the period to four recovery years after major cyclical troughs (1967-71, 1976-80 and 1983-87) the rates are almost equalized since (i) foreign labour was heavily used as a pro-cyclical buffer stock in the labour market in both the recessions of 1967 and 1974/75, but much less so in 1981/82, and (ii) the rise of the participation ratio already begins in the second half of the seventies. Looking at employment growth as a whole (including self-employed), the message of Table 1 is almost put upside down: while employment still grew in the sixties - mainly through the guest worker influx -, its annual growth rate becomes negative in the seventies and eighties, with the relative shrinkage being about equally strong in both periods. If we confine ourselves to the shorter recovery periods, the growth rates become positive, but the interperiod pattern remains. If government employment is excluded, the picture turns even more favourable for the eighties: private sector employment shrank at a lower rate in the eighties than in the seventies and it grew at about the same rate in the two recovery periods 1976-80 and 1983-87. If self-employment is excluded, the seventies fare relatively better than the eighties, independent of the measure used, but

the gap is much smaller than between the sixties and the two latter periods so that there is still no strong basis for postulating a structural break in employment growth somewhere at the beginning of the current decade.

This conclusion is strongly confirmed by Tables 3 and 4 which give some more detailed information on cyclical and structural developments of employment. Table 3 looks at the cyclical side by juxtaposing the absolute growth of private sector employment in both periods relative to the base years 1973 and 1980 which both mark the end of a prior boom. Apart from the general pattern which is quite similar for both periods - a deep recession at the beginning and a gradual recovery all throughout the rest of the period - two differences stand out: (i) In the seventies, both recession and boom were sharper and shorter than in the eighties which, again, indicates that sudden macroeconomic disturbances may have played a more prominent role in the earlier period. (ii) The final balances of both periods look strikingly similar for employment in the narrow sense (excluding self-employed): if the year 1988 is added with its estimated employment increase of about 200,000, both periods close with a net loss of 400,000 private sector jobs. However, it is quite different for employment in the broad sense (including self-employed), with about 500,000 more jobs lost in the seventies than in the eighties. Note that the loss of these jobs is concentrated in the early years of the first period, i.e., the recession 1974-75, when the number of self-employed was drastically reduced and never recovered afterwards.

Table 4 gives a brief summary of the structural dimension of the employment growth picture for the periods in question. The general pattern is again unambiguous: agriculture and forestry shrank dramatically in the sixties and seventies, but much less so in the eighties. As this shrinkage mainly involves a reduction of self-employment, a major reason for the divergence between employment growth measured including and excluding self-employed becomes evident: apparently, the labour supply reserve of agriculture had been dried up by the late seventies since, in the

Table 3: Development of Private Sector Employment in the Periods 1973-80 and 1980-87

	E1*	E2**		E1*	E2**
1973-74	- 478	- 387	1980-81	- 251	- 207
1973-75	-1312	-1092	1980-82	- 720	- 674
1973-76	-1587	-1223	1980-83	-1139	-1094
1973-77	-1652	-1154	1980-84	-1131	-1078
1973-78	-1584	-1003	1980-85	-1012	- 959
1973-79	-1331	- 699	1980-86	- 805	- 747
1973-80	-1107	- 410	1980-87	- 661	- 590

\* Employment (incl. self-employed); in '000.

\*\* Employment (excl. self-employed); in '000.

Source: Own calculations from National Accounts Statistics.

Table 4: Average Annual Growth Rate of Employment (incl. self-employed) in Selected Periods (in p.c.)

	1960-73	73-80	80-87	1967-71	76-80	83-87
Agric. & Forestry	-4.7	-4.1	-1.3	-5.2	-3.9	-1.5
Industry	+0.1	-1.3	-1.4	+1.4	+0.4	-0.1
incl. Energy, Mining	-2.8	-0.4	-0.5	-1.4	-0.3	-0.9
Manufacturing	+0.2	-1.3	-1.2	+1.6	+0.2	+0.4
Construction	+0.8	-1.6	-2.7	+1.1	+1.4	-2.3
Trade & Transport	+0.4	-0.1	-2.7	+0.8	+0.8	+0.2
Services	+2.2	+2.0	+2.0	+2.1	+2.3	+2.8
Government	+3.7	+2.1	+1.0	+2.8	+1.8	+0.9
Private non-profit	-0.7	+1.9	+3.3	+0.2	+2.4	+4.0
Northern States*	+0.5	0.0	-0.2	+1.1	+1.0	+0.5
Southern States**	+1.2	+0.5	+0.5	+1.8	+1.7	+1.3

\* Schleswig-Holstein, Hamburg, Lower Saxony, Bremen, Northrhine-Westfalia; employment in agriculture excluded; last periods: 1980-86 and 1983-86 resp.

\*\* Hesse, Rhineland-Paletine, Saar, Baden-Württemberg, Bavaria; employment in agriculture excluded; last periods: 1980-86 and 1983-86 respectively.

Source: Own calculations from National Accounts Statistics (for sectors) and microcensus data (for states).

given institutional framework with heavy subsidization of agriculture, a further rapid decline was not warranted or feasible.<sup>5)</sup> In all other major structural respects, the seventies and eighties look very much alike, but quite different from the sixties: industry and also trade and transport still grew until 1973 - especially in the boom period following the trough of 1967 - but they shrank after 1973, with about a constant rate in industry and a rising rate in trade and transport. Note that, within industry, manufacturing recovered faster from the recession in the eighties than in the seventies (although still much slower than after the 1967 recession) whereas construction boomed in the late seventies, but badly contracted in the eighties; energy and mining continued a moderate decline all throughout, with a slight relative improvement in the seventies due to the surge of energy prices. Private services and government grew in all three periods, services at an increasing and government at a decreasing rate, reaching a low of about 0.9 % p.a. in the period 1983-87. As to the broad regional pattern of structural change, the southern states persistently outperformed the northern ones in terms of the growth of employment (excluding agriculture).

To summarize, most indicators of the employment performance of the seventies and eighties suggest that the periods should be treated as one. The only major difference stems from the bottoming out of structural change away from the primary sector which was still a major labour supply source in the seventies, but not any more in the eighties. If one focuses on private sector employment - and this is justified since government expansion reflects more political preference and necessity than economic forces - it is hard to recognize any dramatic slow-down of growth from the seventies to the eighties which would justify a separate analytical treatment. If one further remembers that the seventies ended in an inflationary boom which was only subsequently

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5) Of course, this statement does not mean that, on normative efficiency grounds, a further shrinkage of agriculture would not have been desirable.

corrected, the intimate link between the two periods becomes all too evident.

### III. The Emergence and Persistence of a Wage Gap

The increase of unemployment in the mid-seventies was preceded by a hefty rise of the wage level which finds no parallel in the post-war history of West Germany (Table 5): in the period 1969-74, hourly compensation of employees grew at an average annual rate of 14.5 % as compared to 8.5 % in the prior years of the sixties, 7.5 % in the later years of the seventies and 4.3 % in the eighties. The standard wage per hour set by collective bargaining grew by 12 % p.a., a rate also much higher than in earlier and later periods. Note that the difference between the growth of compensation and the standard wage is not to be interpreted as a genuine wage drift since it also reflects the disproportionate rise of employers' social security contributions and, more importantly, the long list of increases of fringe benefits which were granted in this period and most of which are not covered by the measure of a standard wage.<sup>6)</sup> Value productivity grew at about 12 % p.a., with almost two-thirds of this increase being due to a rapidly rising value-added price index and a little more than one-third due to physical labour productivity improvements. Hence, for the German economy as a whole the early seventies were the only one of the four periods in the table where the rise of the wage level persistently outpaced the observed rise of the value productivity of labour. For manufacturing (Table 5b) the situation is slightly different since, in the late seventies, the wage push did not ebb away to the same extent as it did in other sectors; in addition, the terms of trade of manufacturing worsened relative to other sectors so that, despite a slightly more than average increase of physical labour productivity, value productivity could still not keep pace with wages in the second half

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6) See, e.g., Sachverständigenrat (1971), para. 78.

Table 5: Average Annual Wage and Labour Productivity Growth in Selected Periods (in p.c.)

	1960-69	69-74	74-80	80-87
a) All Sectors				
- compensation (1)	+8.5	+14.5	+7.5	+4.3
- standard wage (2)	+6.6	+12.0	+6.6	+3.9
- value productivity (3)	+9.0	+12.2	+7.9	+5.4
- physical productivity (4)	+5.6	+ 4.6	+3.5	+2.3
b) Manufacturing Industry				
- compensation (1)	+9.0	+13.5	+8.5	+5.1
- standard wage (2,5)	+6.7	+12.1	+6.6	+4.1
- value productivity (3)	+8.9	+11.2	+7.2	+6.2
- physical productivity (4)	+6.4	+ 4.9	+3.7	+2.5

Notes: (1) Average compensation per hour of work, including social security contributions of employers and fringe benefits ("Lohnnebenkosten"); (2) Index of hourly wage as fixed in collective bargaining; (3) Value added per hour of labour; (4) Value added at fixed prices per hour of labour; (5) Index of all industries.

Source: Own calculations from National Accounts and Industry Statistics.

Table 6: Productivity Equations, 1964-86

$$Q_t = \beta_0 + \beta_1 T_t + \beta_2 E_t + \beta_3 CU_t + \epsilon_t$$

Coefficients of variables (standard errors in parenthesis)

	Const.	T	E	CU	R <sup>2</sup>	SE	DW
All Sectors (1)	0.061 (0.002)	-0.002 (0.000)	-0.503 (0.066)	0.834 (0.052)	0.962	0.004	1.364
All Sectors (2)	0.065 (0.004)	-0.002 (0.000)	-0.770 (0.107)	0.897 (0.116)	0.873	0.007	1.090
Manufacturing (1)	0.073 (0.004)	-0.003 (0.000)	-0.652 (0.076)	0.733 (0.045)	0.951	0.007	1.228
Manufacturing (2)	0.077 (0.004)	-0.003 (0.000)	-0.594 (0.078)	0.622 (0.057)	0.929	0.006	1.347

Notes:

Q = Annual growth rate of physical labour productivity (in (1): per person employed, in (2): per hour of work); T = Time trend; E = Annual growth rate of labour input (in (1): employment; in (2): hours of work); CU = Annual percentage change of capacity utilization as proxy for state of the business cycle (based on calculations of the Institut für Weltwirtschaft, Kiel, for all sectors and the Deutsches Institut für Wirtschaftsforschung, Berlin, for manufacturing);  $\epsilon$  = Random error term;  $\beta_0, \beta_1, \beta_2, \beta_3$  = coefficients estimated by ordinary least squares; SE = Standard estimation error; DW = Durbin-Watson-Statistic.

of the decade. Not before the eighties did the tide turn in manufacturing as well.

The genesis of the wage revolution in the early seventies has an economic and a sociological dimension.<sup>7)</sup> As to the economics, the quick and sharp recovery which set in after the 1967 recession led right into a profit explosion; thus, in 1969, all prior collective contracts looked desperately obsolete so that a shop floor uprising in the form of wildcat strikes forced the union leadership into aggressive wage demands at the bargaining table. With the boom in their back, employers were ready to give way to these demands, be it in the shape of wage increases, a hefty reduction in working hours without pay losses and a whole battery of fringe benefit extensions, leading to a record increase of nominal wages by more than 20 % in 1969/70. By 1971/72, consumer price inflation had gained momentum and kept up wage demands despite a moderate cooling down of the business cycle. With inflation still running at above 5 % p.a., another boom set in, leading to another surge of wage demands in 1973. On top of this came the oil price shock in the fall of 1973, another tough bargaining session in 1974 with wage increases far surpassing 10 % despite the apparent worsening of the terms-of-trade and, eventually, a shift to a non-accommodating monetary policy to cut down inflation which had reached a politically intolerable peak level of about 7 % in 1974. By this determinate monetary action, firms and unions were apparently taken by surprise so that a severe macroeconomic contraction was unavoidable; this led to a moderation of wage demands and to a deceleration of, but far from a definite victory over price inflation. At least, the wage revolution had come to an end.

Despite this obvious macroeconomic logic of the events, there remains a good deal of sociological mystery behind the story: why did the unions suddenly switch over to a much more intransigent

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7) For a concise description of the events, see Flanagan et. al. (1983), pp. 241 ff.

stance than in the quiet fifties and sixties? Why did parallel strike action and unprecedented wage demands appear all over Europe at about the same time? Why were they accompanied by an upswing of student protest, a renaissance of ideological dogmatism and a new fashion for collectivist dreaming? Clearly, a sociologist would have to view the wage revolution as just one part of a more fundamental regime shift which covered wide ranges of society and which defies the more humble analytical tools of an economist. In the following we therefore take the wage revolution as a fact not to be further explained, but to be analysed in its consequences.

Did this upward shift of the wage level have long-term consequences for the labour market which are still relevant for today's unemployment? Or, to put it bluntly, are wages still too high today to achieve full employment? To tackle this question we must first define what precisely is meant by too high a wage level. Two meanings which are often confused in the literature have to be clearly distinguished. Firstly, whenever an economy is in a state of normal utilization of its capital stock, i.e., whenever there is no slump of aggregate demand rationing supply, there must also be a level and structure of wages compatible with full employment (assuming at least some substitutability of labour and capital). This is the simple consequence of the marginal productivity theory of wages in a Walrasian general equilibrium system. Hence, in years of normal or above normal utilization of the capital stock (e.g., 1979, 1980, 1986 and 1988) wages must be the culprit since a change of the wage level and/or structure can always compensate for a change in marginal value productivity at full employment. Following this logic, the wage level is wrong whenever the labour market signals a disequilibrium, i.e., - grossly speaking - the wage level is too high when there is a labour surplus and too low when there is a vacancy surplus; similarly, the wage structure is distorted whenever there are labour and vacancy surpluses in different labour market segments. This is the position of many neoclassical economists in actual policy debate, and whatever the outcome of any empirical exercise (except the most sensational finding of a long-run elasticity of



substitution between capital and labour of zero or very close to zero) it is a perfectly legitimate one. Of course, there are different ways of returning to full employment in a Walrasian general equilibrium system once unit labour costs have moved out of line: either wages are cut or marginal productivity is increased through capital deepening or a deliberate overheating of the economy to realise cyclical productivity gains (Okun's law); and there may be much scope for quarreling about which of these ways is least costly in social terms. In any case, however, the fundamental fact remains that the strategic variable is unit labour cost, and all economic policy efforts must be aimed at manipulating this variable. In this general sense, the wage or better: the labour cost explanation of unemployment is impeccable simply because it follows straight from the logic of general equilibrium theorising.

The second meaning of too high a wage level stems from an attempt to give the first meaning an empirical content which is independent of observed unemployment itself. The central question is: by how much has real unit labour cost grown since some acceptable base year in the past when full employment prevailed at a normal utilization of the capital stock? Thereby, real unit labour cost is ideally defined as the nominal wage deflated by the marginal value productivity of labour at full employment, or - what amounts to the same - the real wage deflated by the marginal physical productivity of labour, again at full employment. The rate of change of real unit labour cost thus defined is called a 'wage gap'.

To estimate a wage gap, two major conceptual problems have to be overcome: firstly, the marginal productivity of labour is not observable; the official statistics contain data on average productivity only. There are two ways out of this problem: either all parameters characterising the economy's production technology and its progress over time are estimated econometrically so that marginal productivity can be predicted *ex post* on the basis of these parameters, or some convenient production technology which allows some unambiguous inferences to be drawn from average to

marginal productivity, is imposed on the data. The first approach was chosen by Artus (1984) in a pioneering study on wage gaps in the manufacturing sectors of six industrialized countries. Unfortunately, it involves a whole bunch of severe econometric problems which make even Artus' careful and inventive methodology look quite shaky (and, accordingly, his results fairly dubious).<sup>8)</sup> The second approach was chosen by Bruno, Sachs (1985), Bruno (1986) and Burda, Sachs (1987): imposing a Cobb-Douglas technology, average and marginal labour productivity can be taken to change at the same rate so that, for the purpose of intertemporal comparisons, estimates of marginal productivity can be dispensed with. In principle, this approach may also be used within the less restrictive framework of a CES or even a Translog production function, with average and marginal productivities being linked through a set of parametric restrictions; however, to identify these restrictions, some important parameters of the technology would have to be estimated in the first place so that one is practically back to the ambitious task which this approach

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8) In the case of his estimates for Germany, the most serious problem is the following: with data for 1961-69, Artus estimates a share equation (as a substitute for a labour demand function). Unfortunately, most of this sample period was, in Germany, a time of overemployment, not full employment, so that it cannot be assumed (as is done by Artus) that firms were on their labour demand schedule, with marginal productivity of labour equalling the real wage; in addition, the sample period is extremely short (just eight years!). As all his major wage gap calculations are based on the elasticity of substitution as identified by his estimates of the share equation, with the simultaneously estimated production function being virtually irrelevant (Artus, p. 273), these shortcomings raise serious doubts about his results, at least for Germany.

was supposed to avoid.<sup>9)</sup> This is why, for the purpose of estimating wage gaps, we shall stick to the Cobb-Douglas assumption.<sup>10)</sup>

A second conceptual problem remains: average labour productivity is observable at the actual employment level, but not at full employment. As any neoclassical production function (including Cobb-Douglas) assumes marginal and thus also average productivity to decline with employment, one should expect actually observed productivity growth to be biased upwards as a proxy for full employment productivity growth whenever the labour force grows at a faster rate (or shrinks at a slower rate) than employment. By shedding the least productive workers who are in the labour force or not employing those who newly enter the labour force, visible productivity growth is boosted above its full employment trend growth.

Again, two imperfect ways have been tried out of this dilemma: one way is to approximate trend productivity by simply taking the average productivity growth between peak years of the business cycles (say, 1973, 1979, 1988) as has been done by Bruno, Sachs (1985, Ch. 9), Bruno (1986) and Gordon (1988). To us, this procedure looks wholly unsatisfactory since the cyclical peaks occurred on top of vastly different underlying unemployment levels, and the very logic of a neoclassical production function points to an increase of average productivity induced by shedding (or not

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9) See Bruno, Sachs (1985), p. 183. For the case of a CES production function, they show that the divergence of average and marginal productivity depends on the type of technical progress prevailing. Without an explicit estimation of this technical progress component on productivity growth, only very crude ad hoc inferences can be drawn (see Burda, Sachs, p. 294, footnote 4).

10) A recent estimate by Burda, Sachs (1987, Appendix I) seems to give empirical support to the Cobb-Douglas restriction of a unitary elasticity of substitution between capital and labour. However, the validity of their results crucially depends on whether their autoregressive estimation technique is acceptable or not. With standard econometric techniques excluding autoregressive elements, the elasticity of substitution usually turns out to be considerably lower than 1.

employing) the least productive part of the labour force; to simply eliminate the narrowly cyclical component of this process by taking peak-to-peak productivity growth as the trend is, at best, stopping half-way since it is precisely the non-cyclical component which can be expected to drive a long-term wedge between observed and full employment average productivity growth.<sup>11)</sup>

Alternatively, one may try to estimate a labour productivity equation which specifies a trend, a cyclical and an employment-induced component. Bruno, Sachs (1985, Ch. 9) did just this as an alternative to their own peak-to-peak methodology (which they admit to being extremely crude), but for various reasons their productivity equation looks rather ad hoc and the results fairly unreliable.<sup>12)</sup> In principle, we follow the same approach, but with quite a different productivity equation (see Table 6): in our model, the annual growth rate of the physical labour productivity is a function of a time variable  $T$ , the rate of change of labour input ( $E$ ), and the rate of change of utilization of the capital stock ( $CU$ ) as a proxy for the cyclical component. The four parameters to be estimated have distinct economic meaning: the constant term catches trend growth of labour productivity due to technical progress and/or increases of the capital stock, the time coefficient any secular slowdown of this trend growth, the labour input coefficient the productivity slowdown induced by secular employment increases (in the following called the "neo-classical selection effect") and the capital utilization

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11) See Bruno, Sachs (1985), Chapter 9; Klodt (1985); Burda, Sachs (1987), p. 25 f.

12) See Bruno, Sachs (1985), p. 181. As a proxy for the business cycle component, they use the absolute change of unemployment. As not only the level, but also the change of unemployment has become quite independent of the state of the business cycle in Germany in recent years (due to the high labour force growth and maybe hysteresis effects), this procedure is unsatisfactory. Burda, Sachs (1987) use their estimates of a capital share equation based on an error-correction model. Again, the validity of their results depends on whether one is ready to accept the heavily autoregressive estimation technique connected with this model.

coefficient the procyclical movements of productivity due to labour hoarding in recessions and de-hoarding in recovery periods, a kind of Okun's Law effect. Two different versions of the equation in Table 6 were estimated by ordinary least squares for both all sectors and manufacturing, with version (1) using the number of employees and version (2) the number of hours worked as a proxy for labour input.<sup>13)</sup>

Our estimation results for the sample period 1964-1986<sup>14)</sup> are summarized in Table 6. All coefficients have the expected sign and are well identified, with high levels of significance. Trend productivity growth is estimated to be between 6 and 8 % in the early years, followed by an average annual decrease of 0.2-0.3 %, with manufacturing starting at a higher rate, but also facing a somewhat steeper slowdown. Okun's Law is qualitatively confirmed, with a 1 % increase in capacity utilization leading to a 0.8-0.9 % increase of productivity in the economy as a whole, and a 0.6-0.75 % increase in manufacturing. Note that this does not imply that labour hoarding plays a less prominent role in manufacturing than in the rest of the economy since cyclical fluctuations of capacity utilization are themselves much more pronounced in manufacturing than in other sectors. The neoclassical selection effect is estimated as a 1 % increase of employment leading to about a 0.50 -0.65 % decline of average productivity in the economy as a whole (Version I) and in manufacturing. When measuring labour input in hours instead of persons, the coefficient of E turns out much higher and the statistical properties of the estimate much worse for all sectors, but not for manufacturing. Apparently it is somewhat easier to identify the parameters of a productivity equation in the case of manufacturing than of the

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13) Analogously, version (1) uses as endogenous variable average productivity per employee, version (2) average productivity per hour worked.

14) The sample was chosen so as to correspond to the samples used later in this paper for the estimation of labour demand functions and wage equations. Including the years 1960-63 does not change the results significantly.

economy as a whole since the underlying "technical" concept of a production function may be a more adequate stylized picture of a world of physical output than of invisible services which are included in the estimates for all sectors.

Given the estimates of Table 6, we are able to calculate a measure of average labour productivity at full employment for all sectors together and for manufacturing, both excluding and including cyclical effects. Given these measures, an index of real unit labour cost can be defined as the labour share that would prevail at the full employment average productivity of labour and the actual wage level. To account for the secular decline of self-employment in favour of dependent status employment we do not use the labour share proper, but the labour income share which assigns to each self-employed a hypothetical wage equal to the average wage of all actual employees. Thus, we arrive at three measures of real unit labour cost: (i) the actual labour income share (LIS) which, as a measure of real unit labour cost, is biased downwards in times of unemployment due to the neoclassical selection effect; (ii) a full employment labour share ( $LIS^F$ ) purged of the neoclassical selection effect, but still reflecting cyclical productivity variations; (iii) an adjusted full employment labour share ( $LIS^{A,F}$ ) purged of both the neoclassical selection effect and cyclical productivity variations. Full employment is thereby defined as a state in which labour surplus (unemployment minus vacancies) was zero which implies a warranted relative change of employment at any point in time of actual labour surplus divided by actual employment. This relative change was also imputed for manufacturing so that the share of manufacturing in total employment is assumed to be the same in the actual state and the hypothetical full employment state. The cyclical adjustment of productivity was accomplished by holding capacity utilization at the peak 1969 level all over the sample period and correcting the actual productivity levels accordingly. Note that, given the underlying Cobb-Douglas technology,  $LIS^F$  and  $LIS^{A,F}$  are not feasible options as actual labour income shares since, with marginal productivity equalling the real wage, any labour productivity decrease induced by higher employment levels reduces the

wage by the same rate so that the actual labour income share remains constant all throughout. Instead,  $LIS^F$  and  $LIS^{A,F}$  simply measure the "true" real unit labour cost at an exogenously given wage rate, not any actually possible distribution of value added between labour and the other factors of production, with an appropriately endogenized wage rate.

Figure 1 presents the time paths of the three labour income shares for the economy as a whole and for manufacturing.<sup>15)</sup> As the base year we chose 1968, since it marks the watershed between the sharp recession in 1967 and the output, price and wage boom beginning in 1969; in no other year of the sample period did the labour surplus come closer to zero in absolute terms.

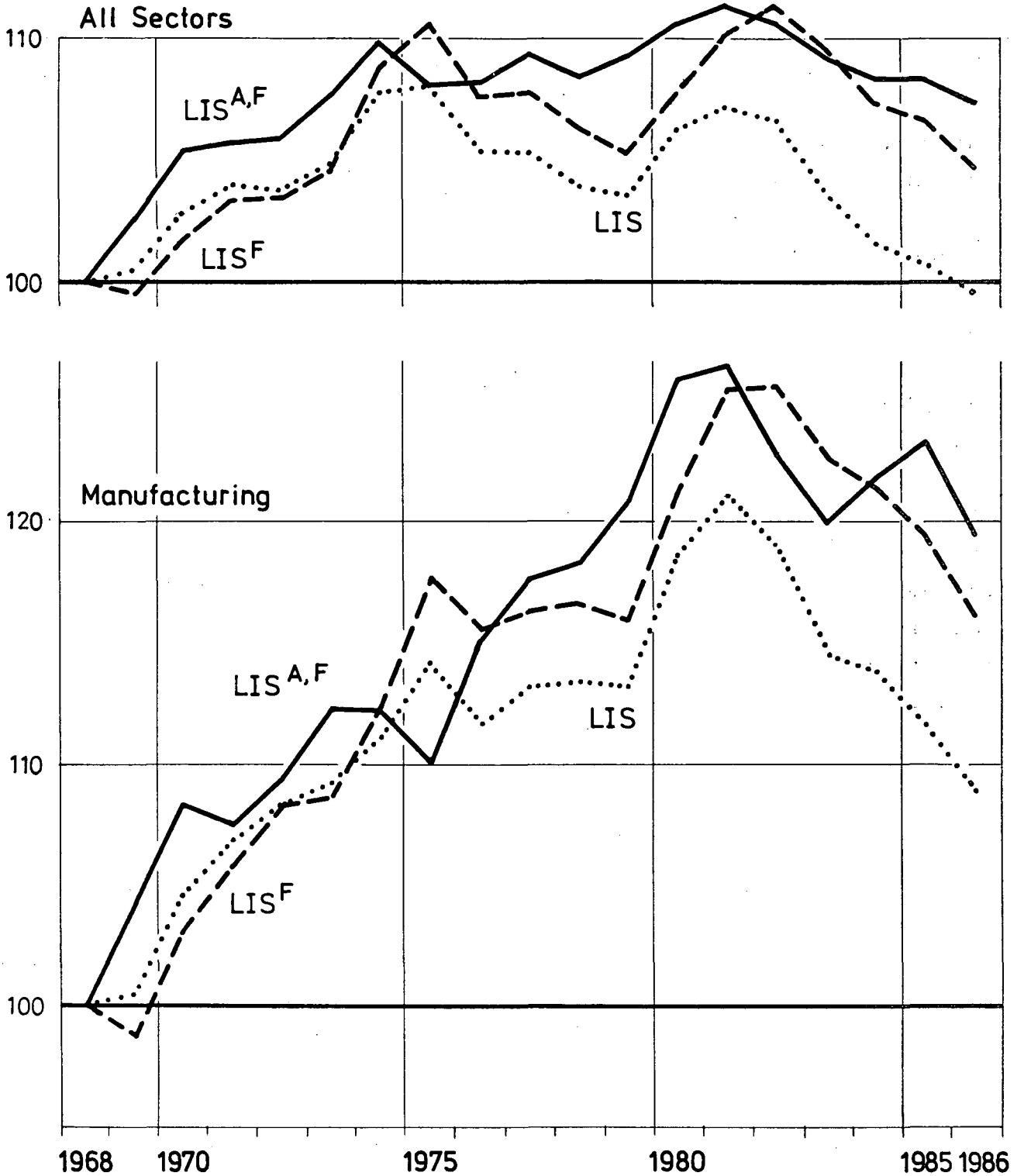
The time path of LIS for all sectors together has the shape of an inverted W: after a sustained increase by about 8 % from 1968 to 1975, LIS slightly falls during the cyclical recovery of the seventies, but rises again during recession time in 1981/82; with the cyclical recovery finally gaining momentum in the eighties, LIS drops back to levels which prevailed in the late sixties. Apart from the first wage push in the period 1969-74, the picture is dominated by cyclical forces as wages lag behind profits in the course of the cycle.  $LIS^F$  describes a similar inverted W path, but with a somewhat steeper rise in the first half of the seventies ending in an 11 % wage gap by 1975, and with a two-step upward shift overlapping the cyclical movement as unemployment surpasses one million in 1975 and two million in 1983. Note that - all over the first half of the eighties -  $LIS^F$  still points to a substantial wage gap of 6-11 %. The cyclically adjusted measure  $LIS^{A,F}$  follows a less volatile path, with the rise of the wage gap more evenly distributed over the seventies. Accordingly, the first (and the last) peak is reached as late as 1980, with a wage gap of almost 12 %; since then, the situation has visibly improved, but the extent of the improvement is less pronounced than in

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15) The data underlying Figure 1 are reprinted in Table 1\* of the Appendix.

Figure 1

The Time Paths of Alternative Wage Gap Measures

1968 = 100





the case of LIS and LIS<sup>F</sup> as the recent productivity gains are in part merely cyclical. In 1986, a moderate wage gap of around 7 % remains.

The picture for manufacturing is much more dramatic: all three measures move up sharply in the first half of the seventies leading to a vast wage gap of 10-18 % by 1975. In the second half of the seventies, LIS and LIS<sup>F</sup> stabilize on their high level, but rise again in 1980-82, while LIS<sup>A,F</sup> goes up quite continuously to reach a peak of around 23 % in 1981. From about this time on, a gradual reduction sets in which is steeper for LIS and LIS<sup>F</sup> than for LIS<sup>A,F</sup>; however, as late as 1986, both LIS<sup>F</sup> and LIS<sup>A,F</sup> still indicate substantial wage gaps between 15 and 20 %.

To summarize: Figure 1 clearly shows that the wage increases in the early seventies led the German economy and particularly its manufacturing sector right into a wage gap which survived the recovery period of the late seventies to figure as an inherited and even cyclically reinforced burden in the early 1980s, with manufacturing bearing the main share of this burden.<sup>16)</sup>

The markedly different development in manufacturing and the economy as a whole with its high and growing share of modern service sector employment deserves some more careful consideration. Unfortunately, estimating wage gaps for the service sector alone is a most unsatisfactory exercise since, in a world of physically undefined output, the notion of a production function becomes very fuzzy.<sup>17)</sup> Nevertheless, some descriptive statistics give an indicative impression of wage pressure in this sector compared to

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16) Note that, despite substantial methodological differences, our results come very close to those of Burda, Sachs (1987), Table 8. However, they do not stress the important point that the wage gap they calculate is only relevant for just one-third of all employment. Clearly, this must be kept in mind when interpreting their and our results.

17) This is the reason why aggregate wage gap estimates for the service sector alone are very hard to make.

manufacturing (Table 7): all over the seventies, the value added price index grew much faster in services than in manufacturing; given the increase of nominal unit labour costs shown in the table, it becomes obvious that, all throughout, manufacturing was hit much harder than services. Note that it is the second half of the seventies when the intersectoral difference of the development of real unit labour costs is most pronounced; characteristically, this is also the period when the cyclically adjusted full employment wage gap in manufacturing still grows while the respective gap in the economy as a whole stagnates or even shrinks. Only in the 1980s, after a second drastic downward adjustment of employment in manufacturing do the rates of change of real unit labour cost converge in both sectors. Apparently, import competition from newly industrialized countries finally did the job of boiling the manufacturing sector down to a competitive size with a better product mix to halt a further deterioration of its terms-of-trade relative to the service sector. All this points to the preliminary conclusion that the wage gap as it persisted from the mid-seventies until today is to a large extent a structural phenomenon, not an aggregate one. As such, we shall return to it in Section V of this paper.

Of course, the wage gap approach has severe theoretical shortcomings. Firstly, it relies on the very restrictive technological assumptions of a Cobb-Douglas world. Secondly, it does not capture any actually measured effect of a change of the real wage level on employment; instead, it takes the wage level as it is and simply juxtaposes it with a hypothetical marginal productivity which is derived from exclusively technological considerations without any economic optimization on the part of the labour demanding firms. Thirdly, there must always be some time in the past as a reference standard for the judgement about today's labour costs; however, a labour income share which guaranteed full employment twenty years ago may today imply an entirely different thing because, for example, a changed macroeconomic environment

Table 7: Average Annual Growth Rate of Value Added Deflator,  
Nominal and Real Unit Labour Cost (in p.c.)

	1969-74	79-80	80-87
a) Value Added Deflator			
- all sectors	+7.2	+4.2	+3.0
- manufacturing	+6.0	+3.3	+3.6
- services	+8.9	+4.9	+3.5
b) Nominal Unit Labour Cost*			
- all sectors	+8.7	+4.0	+2.0
- manufacturing	+8.1	+4.6	+2.5
- services	+9.3	+3.9	+2.5
c) Real Unit Labour Cost*			
- all sectors	+1.5	-0.2	-1.0
- manufacturing	+2.1	+1.3	-1.1
- services	+0.4	-1.0	-1.0

\* at current employment

Source: Own calculations from National Accounts Statistics.

calls for higher profit margins<sup>18)</sup> or the productivity gap between the intra-marginal and the marginal labour force has widened.<sup>19)</sup> At least the first two of these shortcomings can be cured by a direct econometric estimate of labour demand as a function of the real wage, and a partial simulation of by how much labour demand would have increased if some other more moderate path of real wage growth had been pursued.

Given a standard CES production technology, a log-linear labour demand function can be obtained by assuming cost minimization with mark-up pricing with the mark-up being proportional to average cost.<sup>20)</sup> Thus, labour demand depends on the level of real output and the level of the real producer wage. A labour demand function of this standard type has been estimated in the first difference form as it is presented in Table B. Thereby, employment (E) is measured as the number of (dependent) employees, output (X) as value added at constant prices, and the real producer wage (WE/P) as the nominal wage deflated by the value added price index.<sup>21)</sup> As there is much reason to assume that short-run rigidities prevent an instantaneous adjustment of employment to its optimal level after real wage, but also after output changes, some a priori decision on an appropriate lag-structure had to be made. After some experimentation, we chose a quadratic polynomial lag with end point constraint and a lag length of four years (including the current year), thus allowing for a fairly slow adjustment.<sup>22)</sup> For the recession years 1967 and 1968, a level dum-

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18) See Fitoussi, Phelps (1988).

19) See Blanchard, Summers (1986a), Paqué (1989a).

20) See Hansen (1978).

21) For details, see notes in the table.

22) On a priori grounds it is reasonable to allow for a slow adjustment since labour protection laws and other institutional rigidities should be expected to restrict firms' "short-run potential for changing labour input". In our view, most other studies are much too restrictive in this crucial respect.

Table 8: Labour Demand Equations, 1964-86

$$E = \alpha + \sum \beta_i X_{t-i} + \sum \gamma_i (WE/P)_{t-i} + \delta D_t + \epsilon_t$$

<u>Variables</u>	<u>All sectors</u>	<u>Manufacturing</u>
Const.	-0.013 (0.004)	-0.013 (0.009)
X	0.455 (0.128)	0.390 (0.096)
X <sub>-1</sub>	0.312 (0.089)	0.291 (0.058)
X <sub>-2</sub>	0.188 (0.087)	0.193 (0.080)
X <sub>-3</sub>	0.084 (0.064)	0.096 (0.065)
WE/P	0.018 (0.190)	-0.006 (0.144)
(WE/P) <sub>-1</sub>	-0.138 (0.072)	-0.219 (0.082)
(WE/P) <sub>-2</sub>	-0.193 (0.088)	-0.289 (0.129)
(WE/P) <sub>-3</sub>	-0.147 (0.080)	-0.216 (0.108)
D	-0.018 (0.005)	-0.026 (0.009)
R <sup>2</sup>	0.886	0.872
SE	0.006	0.011
DW	1.817	1.521
$\sum X_{t-i}$	1.039 (0.296)	0.970 (0.195)
$\sum (WE/P)_{t-i}$	-0.460 (0.240)	-0.731 (0.272)

Notes:

E = Annual growth rate of employment (excl. self-employed); X = Annual growth rate of value added at constant prices; (WE/P) = Annual growth rate of real producer wage (defined as annual compensation per employee divided by value added deflator); D = Dummy variable for the years 1967 and 1968;  $\epsilon$  = Random error term;  $\alpha, \beta_i, \gamma_i, \delta$  = coefficients estimated by instrumental variable technique, with a trend variable, the annual rate of change of the capital stock and of capacity utilisation (see notes to CU in Table 6) as instruments for X and second-degree polynomial lag with endpoint-constraint for the two lagged variables; SE = Standard estimation error; DW = Durbin-Watson-Statistic.

Data Source: National Accounts Statistics.

my variable was introduced to pick up the exceptionally strong employment effect which could not be fully explained in any of our specifications.<sup>23)</sup> To account for simultaneity of output and employment growth, an instrumental variable estimation technique was used, with a trend variable and the rate of change of the capital stock and capacity utilization as instruments for output.

Some important results of our estimates for the whole economy and for manufacturing alone are given in Table 8.<sup>24)</sup> In both cases, the long-run output elasticity of employment turns out to be very close to 1, thus, technically speaking, implying constant returns to scale of the underlying production function. Note, however, that the adjustment takes some time, with one-quarter of the total effect occurring not before two years after the output change. The long-run wage elasticity is smaller than 1 in absolute terms, about -0.5 for all sectors together and -0.75 for manufacturing. In both cases, the employment adjustment is very slow, with virtually no impact effect in the year of the exogenous shock, and the peak of the effect being reached two years after the shock took place. Given the heavily regulated institutional framework of the German labour market, it is not surprising to find such long lags in the realization of a firm's optimal employment plans. Using quarterly data, most other studies find lags of about 4-8 quarters, with the bulk of the effect falling into the first year.<sup>25)</sup> On an annual basis, this would

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23) The exceptional character of the 1967 recession which involved a very sharp cut of unemployment and the heavy use of guest workers as a labour market buffer stock has not been appropriately taken account of in many multi-country studies of labour demand (e.g., Symons, Layard, 1984; Gordon, 1988). Estimates without a dummy variable for this peculiar period may well lead to a substantial left-out variable bias, at least in the case of Germany.

24) Table 2\* of the Appendix gives the results of our estimates with working hours as endogenous and the hourly wage as exogenous variables. As it turns out, the pattern of coefficients is very similar in Tables 8 and 2\*.

25) E.g., Symons, Layard (1984), Gordon (1988).

come down to a virtually instantaneous adjustment of firms which is wholly implausible in the face of the constraints placed by law and collective bargaining agreements on firms' short-run flexibility. The long-run real wage effect in our estimates can be theoretically interpreted, in absolute terms, as the elasticity of substitution between capital and labour. With values of 0.46 and 0.73, it falls into the range of prior estimates with standard econometric methodology, but somewhat below the estimates of autoregressive models.<sup>26)</sup> Broadly speaking, then, our estimates are fairly conservative; if anything, they underestimate the real wage effect on employment.

To give a quantitative demonstration of the employment effect of the wage policy in the seventies and eighties, we have used our estimates for a very simple partial simulation: given output growth as it actually was, how much could employment have been increased by the substitution effect if some particular pattern of real wage moderation had prevailed over the sample period? Clearly, this is a purely hypothetical thought experiment since a different wage regime would naturally have had secondary effects on other variables of the economic system and on output itself which our partial simulation does not catch. However, as there are good theoretical reasons to assume that these effects would have magnified the employment effect at least in the long run,<sup>27)</sup> our simulation may give a quantitative picture of something like a lower bound for employment growth.

Two simple scenarios were chosen: scenario I assumes real wage growth to be one percentage point less than it actually was in

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26) I.a. Hansen (1978), Gordon (1988), both with standard econometric methodology, and Symons, Layard (1984) with autoregressive techniques.

27) On the supply side, a real wage cut is unambiguously favourable for employment growth. On the demand side, the wage cut may lead to a temporary decrease of the velocity of money; however, this short-run contractionary effect may be counteracted by an appropriate monetary policy.

each year starting from 1970 up to the present, thus implying about a 15 % downward adjustment of the wage level by 1986. Scenario II assumes real wage growth to be three percentage points less than it actually was all over the period 1970-74, i.e., broadly speaking the time of the wage revolution, thus leading to a cumulative wage cut of about 14 % by 1974. As it will turn out in Section IV of this paper, this annual 3 % wage moderation is about the size of the wage push which remains unexplained by ordinary economic variables in our wage equation so that, in a crude way, we are modelling a world without the wage revolution.

The employment paths of our simulations are graphically summarized in Figure 2. Scenario I indicates a continuously improved employment performance for the economy as a whole, with the simulated total employment level ( $E_I^T$ ) ending up about 7 % higher than it actually is today ( $E^T$ ). As to manufacturing, the absolute shrinkage of the sector is considerably slowed down, with a net loss of employment over 16 years being in the range of 10 %, not the actual 20 % of its prior level. By 1986, scenario II would have led to about the same net results as scenario I but, not surprisingly, with a different time profile: the relative employment gains would have been concentrated between 1973 and 1977, i.e., the time when the wage moderations of 1970-74 are predicted to exert their strongest impact.

When mechanically subtracting the employment gain in these scenarios from the actual labour surplus (LS) one obtains two hypothetical labour surpluses ( $LS_I$ ,  $LS_{II}$ ) which give a clue to the state of the labour market with these kinds of wage moderation. As Figure 3 shows, the wage policy of scenario I would have been sufficient to preserve a state of virtually full employment all over the seventies and to strongly dampen the recession-induced increase of unemployment in the early eighties, ending up with a labour surplus of about half-a-million today. The "no-wage revolution" scenario II is even more striking: it almost wipes out the effect of the business cycle trough in 1975 and conserves a state of overemployment until the early eighties when the economy is finally hit by the 1981-82 recession, again ending with a



Figure 2

### The Time Paths of Actual and Simulated Employment E

1970 = 100

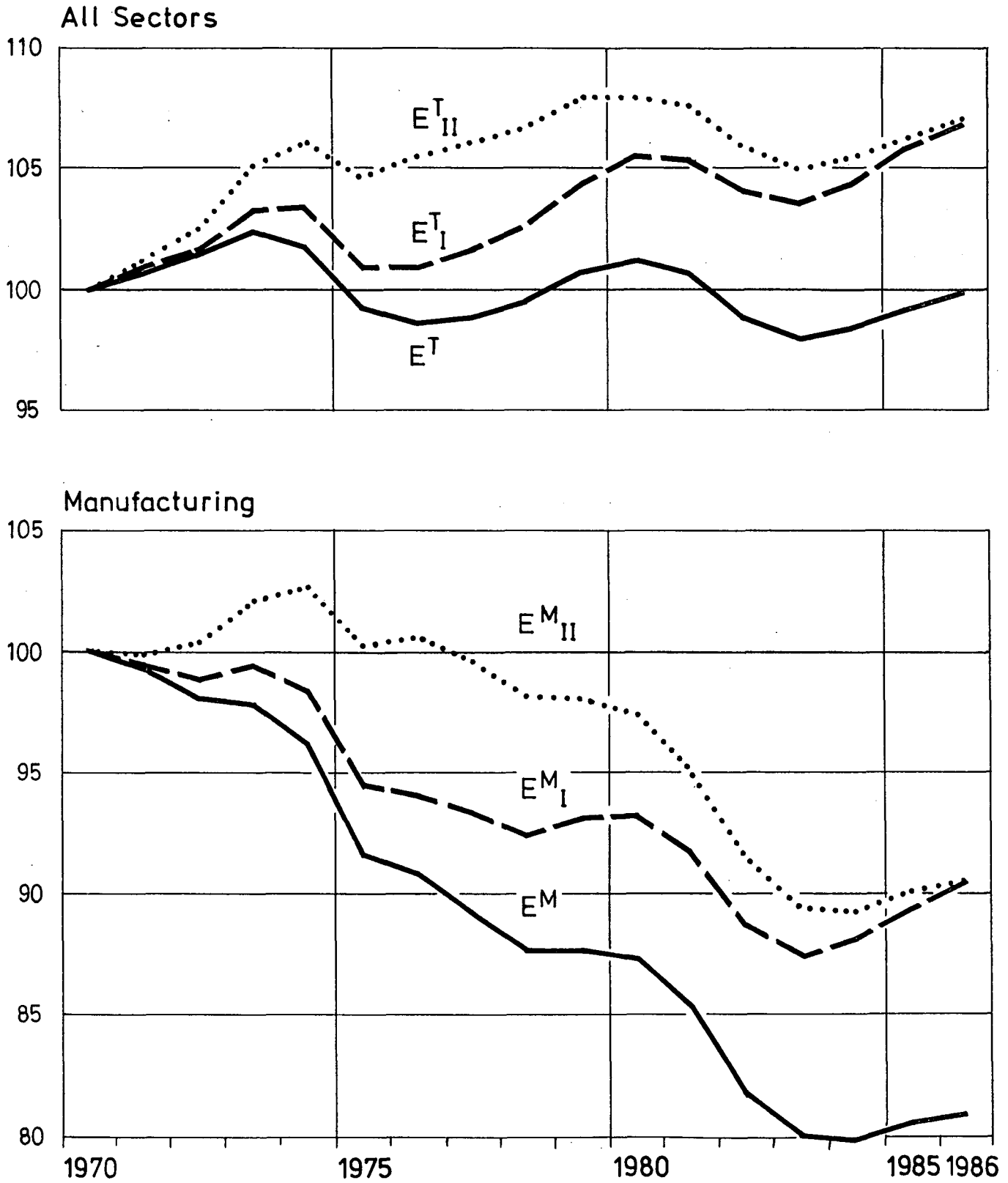
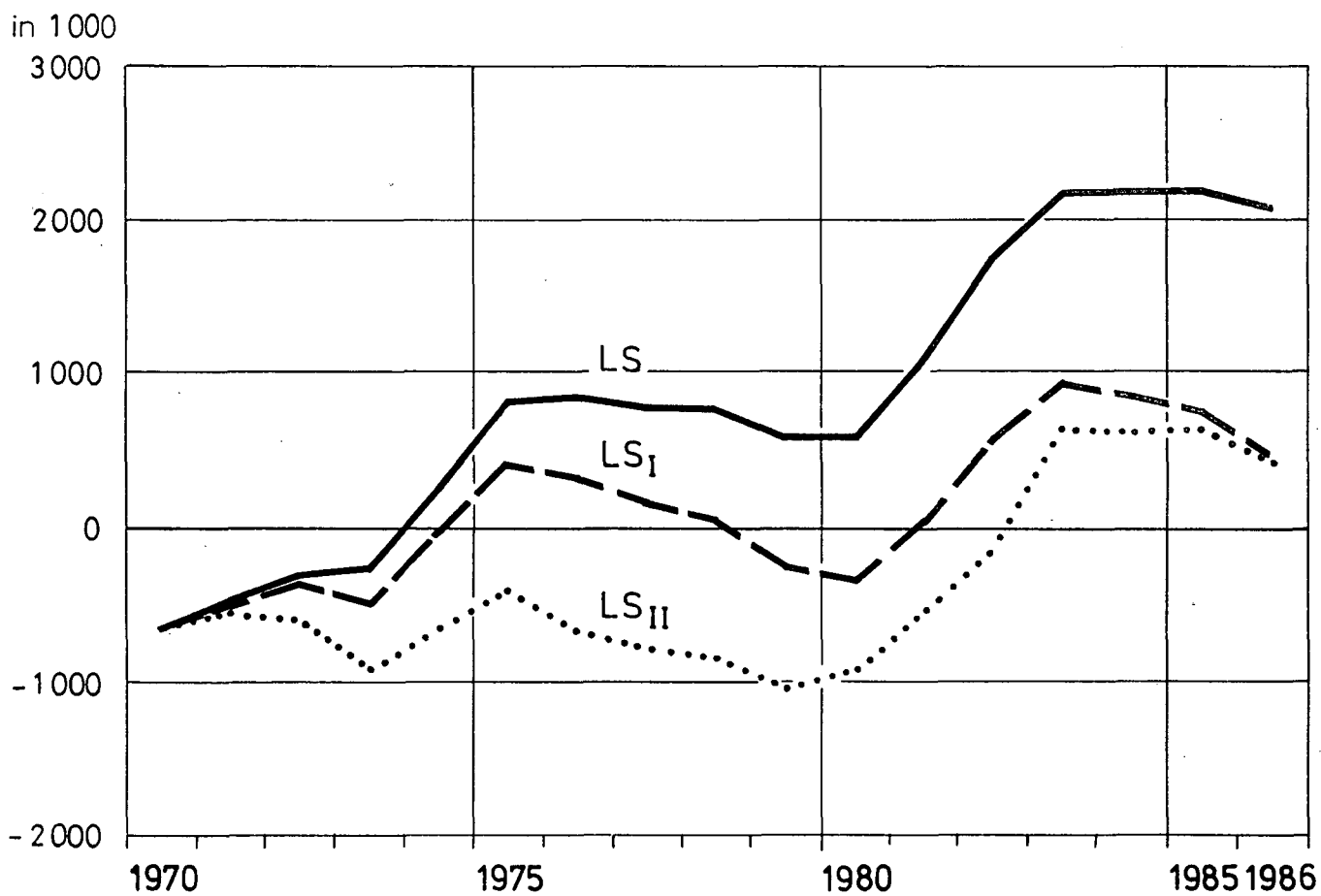


Figure 3

The Time Paths of Actual and Simulated Labour Surplus LS  
(Unemployed minus Vacancies)



labour surplus of about half-a-million people. Remembering that these are conservative estimates of the employment effect of wage moderation, there can be no doubt that the wage increases as they occurred in the seventies had a profound and long-lasting macro-economic impact on the state of the labour market. Bluntly speaking, it looks as if the economy had been set on a new track, with a particularly powerful impact on manufacturing which was bound to shrink forever as soon as the economy was hit by some severe cyclical downturn.

#### **IV. Hysteresis - A Feature of Corporatism**

In recent years, a new Keynesian interpretation of the European unemployment record in the 1980s has emerged, the so-called "theory of hysteresis".<sup>28)</sup> Briefly summarized, it states that, after the long and severe recession of 1981-82, a dual labour market has gradually developed with two kinds of workers: those who remained employed or became re-employed after some brief spell of unemployment, and those who became long-term unemployed. For the latter group, the chances for re-employment have worsened rapidly for essentially two reasons, namely (i) an effective devaluation of their human capital due to the lack of job practice, demotivation and demoralization, and the potential employers' inclination to take the length of an unemployment spell as a negative indicator for the expected productivity of a job applicant; and (ii) the wage setting process where the interests of (employed) insiders are much better represented than the interests of (unemployed) outsiders who usually have a lower than average productivity anyway. Note that Keynesians see the detrimental impact of the wage-setting process not or at least not primarily to stem from the corporatist structure of the labour market; they see it

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28) See Blanchard, Summers (1986a, b, c); Paqué (1989a).

rather as a general characteristic of labour markets in any capitalist economy.<sup>29)</sup>

Does this theory stand up to the facts in the case of Germany? A first straight empirical implication is a rise of the share of long-term in total unemployment, e.g. the share of those unemployed who have been out of work for more than one year (Figure 4).<sup>30)</sup> A cyclical peak-to-peak comparison reveals that from 1979 to 1986/87 this share rose from about 16 to 32 %, with a short intermediate drop in 1980/81 due to the onsetting recession which by September 1980 had already left its traces in the statistics. This clearly supports the hysteresis hypothesis. However, a most interesting feature is that an equally dramatic upward shift of this share took place in the second half of the seventies, with a peak-to-peak increase from 8.7 % in 1973 to 17.5 % in 1979. This points to the same process of hysteretic dualization going on since mass unemployment emerged on the scene in the mid-seventies. Taking three-year moving averages of the share, this picture is confirmed: except for a slight flattening out in 1979/80 and again towards the end of the sample period, the share of long-term unemployment increased gradually and persistently. Hence, both recovery periods 1976-80 and 1983-87 which, in many other respects, look similar anyway, reveal about the same pattern of hysteretic filtering of the pool of unemploy-

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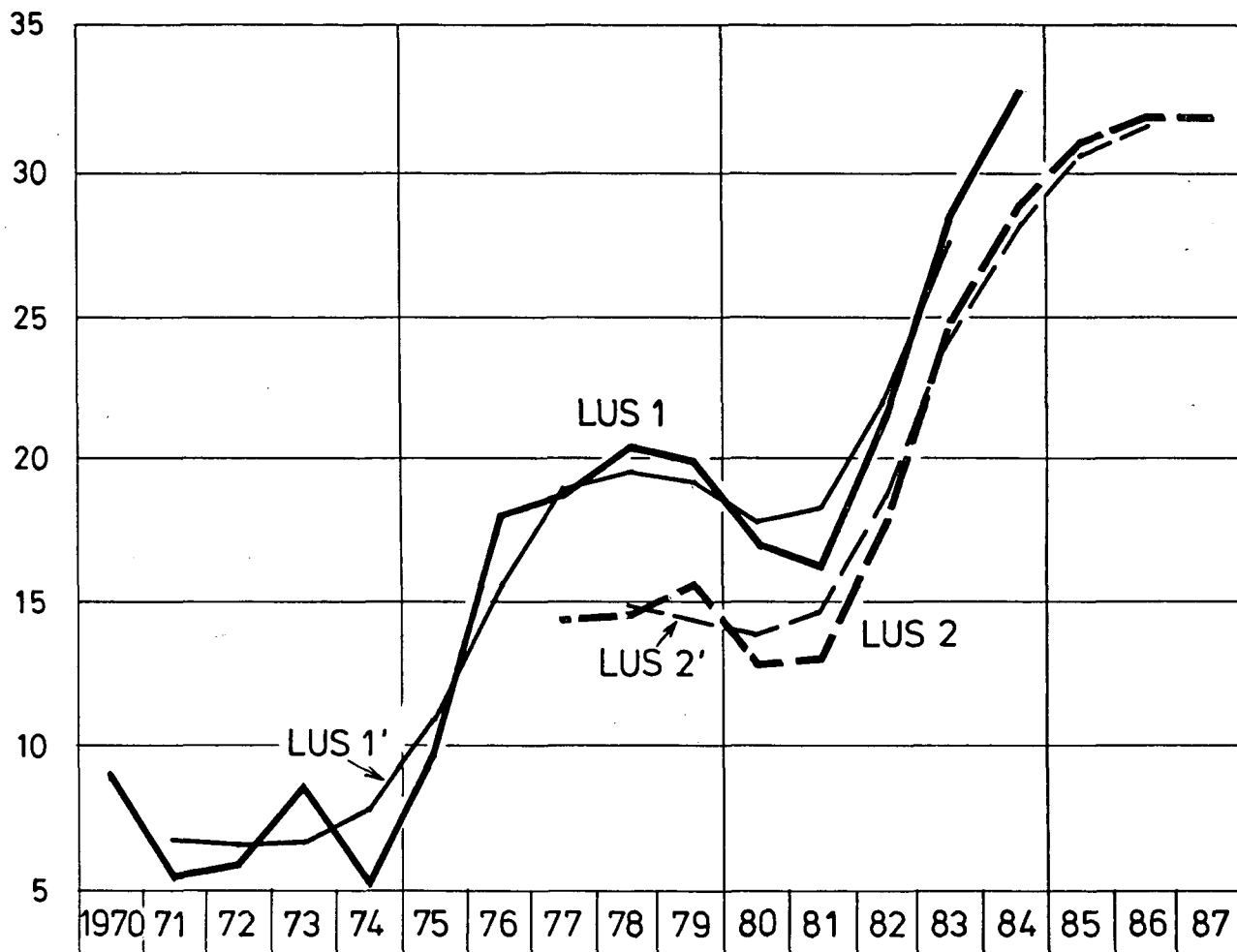
29) See Blanchard, Summers (1986a), p. 51.

30) In 1986, the method of calculating the duration of unemployment was changed in Germany. Since 1986, duration is defined as the time spent between the day of last registration at the labour office and the day of statistical counting. Before 1986, duration was defined as the time spent between the first registration after a single spell of non-unemployment of at least 13 weeks; hence, brief spells of employment were not considered as finishing the state of unemployment (although they were not counted as actual times of unemployment either). Naturally, the old method indicates a higher share of long-term unemployment of any length than the new one, so that for the years where LUS 1 (defined the old way) and LUS 2 (defined the new way) are both available, LUS 1 is consistently higher than LUS 2 (see Figure 4). For conceptual details of calculating the duration of unemployment in Germany, see Werner (1987), pp. 41 f.

Figure 4

Share of Long-term Unemployment in Total Unemployment\*  
(September value of respective year)

per cent



\* LUS 1 and LUS 2 are based on different definitions of long-term unemployment (see note in the text). - LUS 1' and LUS 2' are three-year moving averages of LUS 1 and LUS 2 respectively.

ed by chosy firms. Again, there is no point in drawing an artificial line between the experiences of the two decades.

There is a more far-reaching test of the hysteresis theory in terms of its implications for the intertemporal pattern of wage changes: if unemployment becomes hysteretic, one should expect wage moderation in the course of a recession to fade away soon after the recovery sets in so that those unemployed with a comparatively low productivity are subsequently prevented or at least severely hindered from finding a job. With an appropriate insider/outsider structure as it is provided by the collective bargaining type of labour relations in Germany, with the unions representing predominantly the interests of their (employed) members, this kind of wage pattern reflects a strong element of group rationality: as long as unemployment grows, wage moderation is in the interest of employed insiders since they recognize their own jobs to be threatened by a wave of lay-offs. As soon as unemployment has stabilized at whatever level, this threat disappears, and with those previously laid off having lost their voice and market clout, the remaining insiders favour wage increases.<sup>31)</sup> This kind of story has straightforward implications for econometric modelling: in standard wage equations, the growth of the wage level depends on the current unemployment rate which implies that persistently high unemployment in fact leads to permanent wage moderation. If the hysteresis theory is correct, the standard wage equation is misspecified and should be replaced by a hysteretic wage equation which includes some measure of the short-term deviation of the unemployment rate from its long-term level, with this level gradually adjusting to changes of the current rate. In the following, we develop a model along these lines and present econometric estimates of it.<sup>32)</sup>

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31) See Paqué (1989a).

32) The basic structure of our model is similar to some models used by Coe (1985, 1988).

The wage equations actually estimated are presented in Table 9. Equations (1) to (3) specify the growth rate of the hourly wage as a function of the rate of change of the consumer price index and labour productivity, two unemployment and two dummy variables. Both price inflation and productivity growth were entered as current and lagged values to account for the fact that not actual, but expected price and productivity changes are likely to influence wage bargaining. As some experimentation with free and different restricted lags showed, a simple linear lag with end-point constraint was sufficient to adequately capture the delayed adjustment. Other more sophisticated techniques of modelling expectations did not substantially change or improve the results.<sup>33)</sup> The unemployment rate entered with its current observation ( $U$ ) and with a lagged four-period moving average as a proxy for a long-term rate ( $\bar{U}$ ), both as natural logarithms.<sup>34)</sup> The rationale of this specification is straightforward: if there is no hysteresis, only  $U$  should have a dampening impact on wage growth, i.e., in Table 9  $\alpha_1 > 0$  and  $\alpha_2 = 0$ ; if there is "perfect" hysteresis, only  $U/\bar{U}$  has a negative effect on wage growth, with  $\alpha_1 = -\alpha_2$ , so that, as soon as  $\bar{U}$  approaches  $U$  a few years after a recession-induced increase of  $U$ , the dampening effect of unemployment on wage growth fades away. Of course, intermediate cases with partial hysteresis can be imagined so that a free estimation of both  $\alpha_1$  and  $\alpha_2$  makes sense as well. To check whether the early seventies were a time of an economically unexplained wage push and the early eighties with their apparent "Lohnpause" ("wage break") a time of genuine moderation, we introduced dummy variables for the period 1970-74 and 1982-85. To account for the simultaneity of wage and price determination, all equations were estimated by two-stage least squares, with a price equation as

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33) For example, ARIMA processes of different orders were used to model price expectations, but the major pattern of the results remained virtually unchanged.

34) Other restrictions on the parameter of  $U$  and  $\bar{U}$  were tried. In general, they did not lead to results much different from the ones presented in the text.

Table 9: Wage Equations 1964 - 1987

$$WH_t = \alpha_0 + \sum \beta_i CP_{t-i} + \sum \gamma_i Q_{t-i} + \alpha_1 \ln U_t + \alpha_2 \ln \bar{U}_t + \alpha_3 D(70-74)_t + \alpha_4 D(82-85)_t \quad (\text{equations 1,2,3})^*$$

$$WH_t = \alpha'_0 + \sum \beta'_i CP_{t-i} + \sum \gamma'_i Q_{t-i} + \alpha'_1 \ln US_t + \alpha'_2 \ln UL_t + \alpha'_3 D(70-74)_t + \alpha'_4 D(82-85)_t \quad (\text{equations 4,5,6})^{**}$$

Coefficients of variables	Equations					
	(1)	(2)	(3)	(4)	(5)	(6)
Const.	0.040 (0.025)	0.052 (0.024)	0.013 (0.014)	0.043 (0.029)	0.006 (0.048)	0.028 (0.015)
CP	0.206 (0.158)	0.496 (0.166)	0.476 (0.154)	0.200 (0.146)	0.469 (0.254)	0.547 (0.188)
CP <sub>-1</sub>	0.103 (0.079)	0.248 (0.083)	0.238 (0.077)	0.100 (0.073)	0.235 (0.127)	0.274 (0.094)
Q	0.417 (0.297)	0.689 (0.266)	0.609 (0.177)	0.475 (0.294)	0.648 (0.318)	0.732 (0.256)
Q <sub>-1</sub>	0.208 (0.148)	0.345 (0.133)	0.305 (0.088)	0.237 (0.147)	0.324 (0.159)	0.366 (0.128)
lnU	-0.006 (0.007)	-0.037 (0.012)	-	-	-	-
ln $\bar{U}$	-	0.040 (0.013)	-	-	-	-
ln(U/ $\bar{U}$ )	-	-	-0.037 (0.012)	-	-	-
lnUS	-	-	-	-0.024 (0.009)	-	-
lnUL	-	-	-	-	-0.021 (0.009)	-
ln(US/UL)	-	-	-	-	0.013 (0.010)	-0.017 (0.006)
D(70-74)	0.048 (0.012)	0.041 (0.010)	0.041 (0.010)	0.013 (0.018)	0.030 (0.022)	0.039 (0.012)
D(82-85)	-0.014 (0.011)	-0.015 (0.010)	-0.014 (0.009)	-0.009 (0.010)	-0.022 (0.014)	-0.027 (0.009)
$\sum CP_{t-i}$	0.309 (0.238)	0.744 (0.248)	0.714 (0.232)	0.300 (0.219)	0.704 (0.381)	0.821 (0.283)
$\sum Q_{t-i}$	0.625 (0.445)	1.034 (0.398)	0.914 (0.265)	0.712 (0.442)	0.971 (0.476)	1.097 (0.383)
R <sup>2</sup>	0.830	0.887	0.886	0.907	0.919	0.918
SE	0.018	0.015	0.014	0.015	0.015	0.015
DW	2.179	2.328	2.411	1.870	2.346	2.500

Notes:

\* with  $\alpha_2 = 0$  in equation (1) and  $\alpha_1 = \alpha_2$  in equation (3)

\*\* with  $\alpha'_2 = 0$  in equation (4) and  $\alpha'_1 = \alpha'_2$  in equation (6)

WH = Annual growth rate of nominal wage (defined as annual compensation per working hour of employee);

CP = Annual growth rate of consumer price index;

Q = Annual growth rate of physical labour productivity per working hour;

U = Unemployment rate;

$\bar{U}$  = Average unemployment rate of the current and the last three years:  $\bar{U}_t = 1/4 (U_t + U_{t-1} + U_{t-2} + U_{t-3})$ ;

US = Ratio short-term unemployment to employment;

UL = Ratio long-term unemployment to employment;

D(70-74) = Dummy variable for 1970-74;

D(82-85) = Dummy variable for 1982-85;

SE = Standard estimation error;

DW = Durbin-Watson-Statistic;

$\alpha_i, \beta_i, \gamma_i, \alpha'_i, \beta'_i, \gamma'_i$  = Coefficients estimated by two-stage least-squares (price equation of the form

$CP = F(M, M_{-1}, ToT, WH, CP_{-1})$  with M being the annual growth rate of the money supply and ToT the annual rate of change of the terms-of-trade; a first-degree polynomial lag with endpoint-constraint was used for the two lagged variables (CP and Q); n = Number of observations for equations (1)-(3): 24 (1964-1987); for equations (4)-(6): 21 (1967-1987).

Data Source: National Accounts Statistics.



specified in the table, using annual data for the whole German economy from 1964 to 1987.

The results of equations (1) to (3) are striking. Equation (1) is a standard wage equation, with  $\alpha_2 = 0$ . All coefficients have the expected sign, but most of them are not different from zero at the usual significance levels. An exception is the dummy coefficient for 1970-74 which indicates a hefty wage push of about 5 % p.a. in this period. In equation (2), long-term unemployment is added to the list of exogenous variables, and this markedly improves the quality of the estimate. Both the long-run price and productivity coefficients now come close to 1. Most importantly,  $\alpha_1$  and  $\alpha_2$  have the expected opposite signs and are about equal in absolute terms, both with a high level of significance.<sup>35)</sup>

This picture is confirmed when imposing the restriction  $\alpha_1 = -\alpha_2$  as is done in equation (3), the genuine hysteresis specification. Hardly any coefficient changes relative to equation (2), but, due to the fact that perfect hysteresis is entered as an additional restriction, the efficiency of the estimate improves. Note that the coefficient of the 1970-74 dummy variable still indicates a substantial wage push, while the dummy coefficient for 1982-85 points to a slight, but noticeable, wage moderation at that time. When comparing the three equations, one can hardly avoid the conclusion that the hysteresis specification performs best in explaining the pattern of wage growth. This result turns out to be quite robust with respect to changes of the sample period.<sup>36)</sup>

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35) Note that  $l_{nU}$  and  $l_{n\bar{U}}$  are highly correlated, but that multi-collinearity by itself is no argument against including both in the equation if there is only a sound theoretical case for doing so (see Rao, Le Roy Miller 1971, p. 48).

36) A shortening of the sample period either in the early years (the sixties) or in the late years (the eighties) did not substantially alter the results.

Equations (4) to (6) are specified just like equations (1) to (3), with one exception: instead of  $U$  and  $\bar{U}$ , a short-term ( $U_S$ ) and a long-term ( $U_L$ ) unemployment rate were used, defined respectively as the ratio of short-/long-term unemployment and the level of employment. The dividing line between short- and long-term unemployment was set at a spell of one year. As, in the course of a business cycle, many previously short-term unemployed grow into long-term unemployment, one should expect the pattern of equations (1) to (3) to show up again in equations (4) to (6). As it turns out, this is in fact the case although the evidence for hysteresis is somewhat less conclusive than before. Interestingly enough, equation (4) indicates that the short-term rate has more explanatory power than the overall rate in equation (1). When adding the long-term rate (equation (5)) the counter-balancing effects of short- and long-term rates reemerge as in equation (2), but the standard errors are higher all throughout. With hysteresis parametrically imposed (equation (6)), the coefficients look quite similar to those of equation (3), but - again - they are less well identified.<sup>37)</sup>

To summarize, the estimates give remarkably strong support for the hysteresis hypothesis. In addition, they point to a wage push in the early seventies of at least around 3 % p.a., which is the number we imputed into our simple simulation in Section III. In turn, there is some evidence for wage moderation in the early eighties following the recession 1981-82, although the extent of this moderation seems to be a far cry from the wage push in the early seventies.

If the hysteresis theory is basically correct, it has dramatic macroeconomic consequences. In its purist form, it implies that there is no stable Phillips-type trade-off between price

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37) In general, our estimates give a stronger support to the hysteresis hypothesis than the estimates by Coe (1985, 1988) and other studies (e.g., Gordon, 1988). Why this is so, deserves some more thorough analysis which goes beyond this paper. It will be part of a forthcoming paper of the author.

inflation and employment, but a stable "hysteretic" trade-off between price inflation and some measure of the divergence between the current and the long-term unemployment rate, in our model proxied by  $U$  and  $\bar{U}$ . Hence, in the short run, movements along a traditional Phillips curve are possible, thus, for example, describing the stabilization crisis at the beginning of the eighties. In the medium and long run, however, the curve shifts to the right as  $\bar{U}$  approaches  $U$  and the economy moves along the stable hysteretic curve. Whatever the slope of the Phillips curve happens to be, any short-run effect on unemployment is cemented as soon as the temporary divergence of  $U$  and  $\bar{U}$  melts away. Thus, the NAIRU is dragged along the actual unemployment rate.

Some authors have argued that this simply shows the obsolescence of the idea of a NAIRU since this concept seems to be of no use when it has no long-run fixed point. We think this interpretation misses the point: the NAIRU is a genuine macroeconomic concept couched in terms of wage and price equations which describe the cyclical behaviour of an economy. If this cyclical behaviour turns out to be stable in  $U/\bar{U}$ , not in  $U$  itself, the NAIRU fluctuates, but it does so in a nicely predictable and theoretically plausible way. The NAIRU does not lose its rationale since it still signals the short-run limit of inflating the economy to reduce unemployment. The macroeconomic equilibrium may be fragile, but still it is meaningful and relevant.<sup>38)</sup>

Note that, in the case of Germany, hysteresis is not an ad hoc explanation for some new phenomenon of the eighties, but a rather general characteristic of the macroeconomic performance since the mid-sixties. If we take the German economy as a prototype of a corporatist system which, until recently, was thought of in the literature as a particularly successful example of smooth and peaceful labour relations,<sup>39)</sup> the hysteretic feature of this per-

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38) See Blanchard, Summers (1988) and Solow (1986).

39) See Flanagan (1983), pp. 208 ff.

formance may require a re-evaluation of the merits of corporatism since the system is apparently unable to cope with long-run disequilibria. Figure 5 graphically illustrates this point by juxtaposing the unemployment rate and the annual growth rate of the nominal wage as far as it is exclusively due to the (hysteretic) effect of both  $U$  and  $\bar{U}$ . WH1 describes the path of nominal wage growth without, WH2 its path with the exogenous shifts in the early seventies and eighties. The picture shows that all three recessions 1967, 1975 and 1982 led to some wage moderation in the range of -2 % p.a., but that, in all three cases, the effect faded away rather quickly, with the unemployment rate only once returning to its prior level, namely in the aftermath of the 1967 recession which then led right into the wage revolution setting in two years later.

It is noteworthy that, in the periods of gradual recovery 1976-80 and 1983-87, wage moderation did not only fade away in actual wage bargaining, but also in the mainstream of the policy debate. In this respect, the annual reports of the influential Council of Economic Experts (Sachverständigenrat) are most revealing: while, in 1973 and more forcefully in 1974, the Council expressed disapproval of the wage push enforced by the unions against a rather permissive stance of the employers' associations, it recognized a climatic change in 1975 and then praised wage policy as very moderate. This tune was basically repeated in the reports of the following years up to the recession 1982 when the focus temporarily shifted back to the level of wages and fringe benefits. In the eighties, however, no urgent call for wage cuts was issued anymore since, apparently, the Council regarded the willingness of the unions to make sacrifices as exhausted anyway.

On a more speculative note, these considerations invite formulating a rudimentary theory of the performance of German corporatism with respect to cyclical fluctuations and long-term trends. Apparently, the comparative strength of the system lies in its short-run flexibility to limit the damaging effects of the cyclical slow-down and speed up the recovery through short-term wage

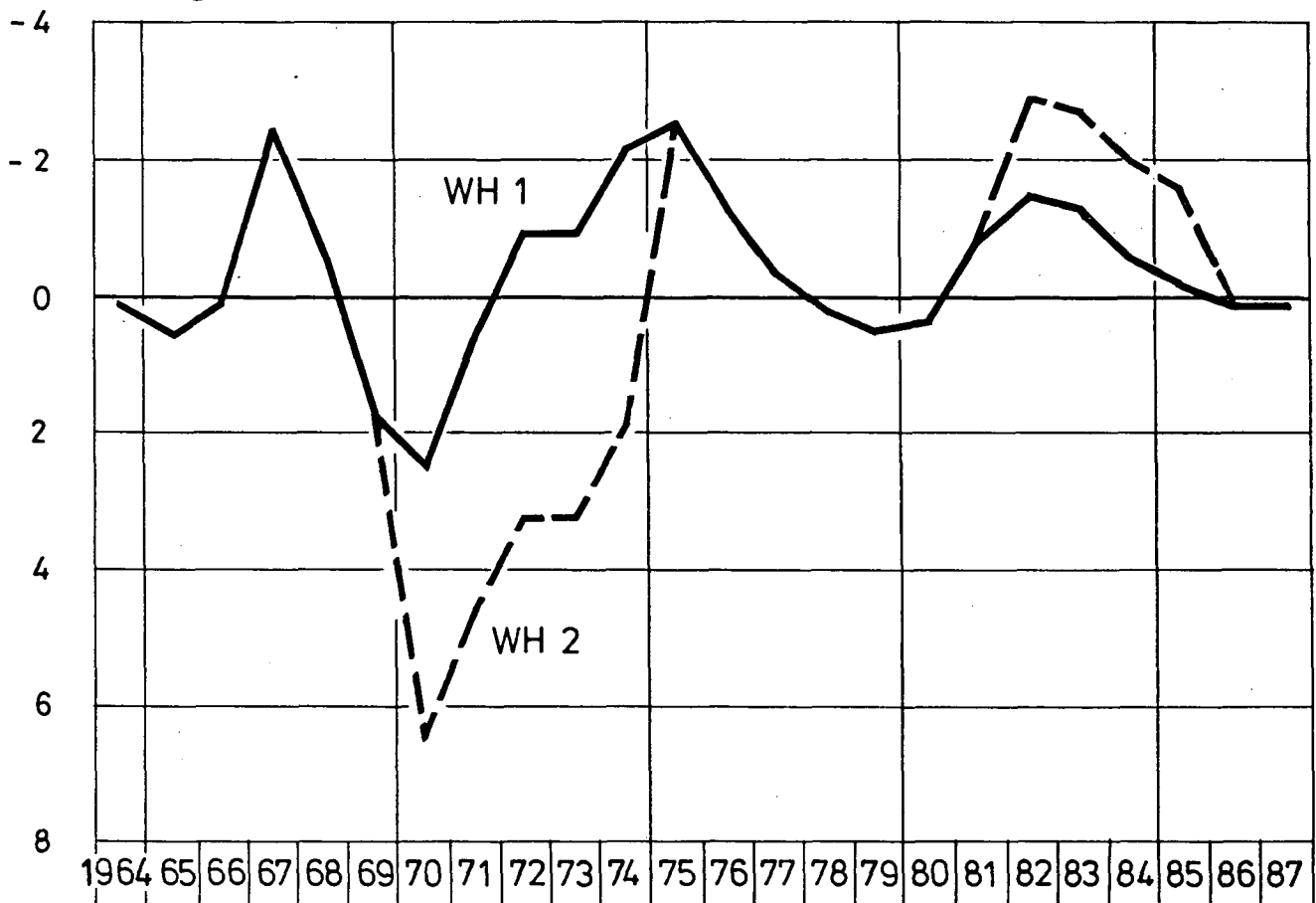
Figure 5

# Unemployment Rate and Hysteretic Wage Adjustment

per cent



per cent change



U = Unemployment rate

WH 1 =  $-0.037 \ln (U / \bar{U})$

WH 2 =  $-0.037 \ln (U / \bar{U}) + 0.041 D (70-74) - 0.014 D (82-85)$

moderation once the downturn is in full swing. However, the system is unable to prevent the downturn in the first place, and it is equally unable to prevent a dualisation of the labour market with employed insiders and long-term unemployed outsiders to emerge once the recovery is underway.

It is important to realize that the long-term failure of German corporatism to reach and return to a state of full employment cannot only be inferred from the dismal labour market record of the seventies and eighties, but - conversely - from the tremendously successful record of the sixties. As soon as the ten million refugees and expellees had finally been integrated into the German post-war economy by about 1959,<sup>40)</sup> the economy briefly passed through a state which was generally thought to be close to full employment, with the number of vacancies about equalling unemployment and not yet any substantial influx of guest workers. This state rapidly gave way to the secular overemployment of the sixties, with the number of vacancies by far surpassing unemployment and with the dramatically increasing number of guest workers supplementing the domestic labour force. Remarkably enough - and quite consistent with the hysteresis hypothesis - it took more than ten years of extreme labour shortage - briefly interrupted only by the sharp 1967 recession - to achieve a substantial upward correction of the wage level which then turned out to be excessive in view of the general macroeconomic distress of the 1970s. Apparently, once low productivity workers were employed and thus became part of the insiders' establishment, a built-in bias towards keeping down unit labour costs made itself felt until, in the recovery from the 1967 recession, a profit boom set in which was exceptional even by the standards of the sixties and which, together with the mysterious sociology of the time, led right into the wage revolution. Hence, secular overemployment in the sixties did not matter more for wage policy than secular unemployment in the seventies and eighties as long as it remained

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40) See Paqué (1987).

comparatively stable as it manifestly did in the period 1959-66.<sup>41)</sup> Note that, in this respect, Germany has a record similar to a few other quite corporatist European economies (although the labour shortage was still more extreme than elsewhere), but a totally different record from the non-corporatist United States, where the average unemployment rate in the sixties was lower, but not dramatically lower than in the seventies and eighties. This supports the conjecture that hysteresis is a much more pronounced phenomenon in economies with strong corporatist elements in wage bargaining than in economies with a more individualized labour market.<sup>42)</sup>

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41) See Paqué (1988a).

42) Keynesian advocates of the hysteresis theory like to emphasize that it is the similarity between the United States' experience after the Great Depression and the European experience in the eighties which points to a lack of demand rather than supply-side factors and union resistance as the determinants of the hysteretic unemployment malaise (see Blanchard, Summers, 1986a, pp. 52 ff.). A thorough evaluation of this claim goes beyond the scope of this paper. However, the obvious differences in the genesis of unemployment and recovery between these two historical episodes cast serious doubt on the Keynesian view: in the United States of the twenties and thirties, the unemployment rate rose within four years from a full or overemployment level of 3.2 % (1929) to 24.9 % (1933) which is a much more dramatic change than even both shifts around 1974/75 and 1981/82 in Germany taken together. From the trough in 1933 to the first post-depression cyclical peak in 1937, about 7 million jobs were recreated, i.e., employment grew at an average annual rate of about 4.5 % so that, in terms of employment, the level of 1929 was almost reestablished in 1937. Then came a second cyclical downturn in 1938 with a loss of 2 million jobs until the war economy boom set in about 1939. This pattern contrasts sharply with the German experience of the seventies and eighties, with two recessions (which were moderate by the standards of the 1920s and '30s!) pushing up the unemployment rate and the recovery periods leading to no more than a 1 % p.a. growth of employment. To account for the United States' experience, it may be sufficient to postulate some asymmetry between the way into and out of a serious recession: what was lost in four dramatic years could not be recouped at the same speed, but only in a few more years with the process then naturally exhibiting some features of hysteresis. This process was simply interrupted by the 1938/39 recession and, after that, heavily supported by the wartime boom. After all, it looks like a simple business cycle phenomenon with the business cycle having gigantic dimensions, both in the length of the downswing (4 years) and the length of the recovery period

## V. Structural Unemployment

In the modern macroeconomic literature, a new consensus has emerged that structural forces - properly operationalized - are not responsible for the European unemployment malaise.<sup>43)</sup> This view rests on two basic assertions: (i) the gradual structural change which has taken place in the seventies and eighties cannot possibly explain the drastic contemporaneous upward shift of the unemployment level in many countries of the industrialized world, including Europe; and (ii) measures of structural imbalance show that, after all, there has been no substantial increase in the observed mismatch between sectors, occupations and above all regions in any of these countries.

The first of these two arguments is correct as far as it goes; namely in focusing on the sudden emergence of unemployment. In the case of Germany, the historical experience in this century shows that unemployment never appears gradually, but only in discrete level shifts in the course of a recession. However, this says nothing significant about the nature of the malaise as soon

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(say, about a decade). This interpretation is compatible with the fact that the U.S. economy did not run at full utilization of its capital stock in the post-depression era until the early forties. Obviously, the picture for Germany (and also for other European countries) is very different, with the recessions 1974/75 and 1981/82 being much shorter, the recovery being much less dynamic, and the economy reaching a normal or even a full capacity utilization as early as 4 years after the cyclical trough. In short: there must be an important secular or structural element in the German experience which goes far beyond the working of cyclical forces. - Note that the U.S. experience of the twenties and thirties also differs markedly from the experience of Germany in the Weimar Republic when the depression increase of unemployment after 1929 happened on top of a secular unemployment level inherited from the past; after 1923, the unemployment rate in Germany did not fall substantially below 7 % any more.

43) See, e.g., Burda, Sachs (1987), Franz (1987c), Franz, König (1986), Jackman et. al. (1984), Jackman, Roper (1987), Layard et. al. (1985).



as unemployment becomes permanent despite a recovery setting in. Then, obviously, a once aggregate phenomenon may become a structural one. Hysteresis itself is at base a structural explanation since it describes the gradual emergence of a productivity wedge between those employed and those unemployed. In addition, hysteresis has in fact an objective structural dimension which can be read off the statistics. As Table 10 shows for the cyclical peak year 1979 and for 1987, those groups of unemployed persons who typically have a lower than average productivity due to some objective characteristic like age, a physical handicap or a lack of professional education or training are also those who most likely remain unemployed in the long run. The same is true of persons who live in backward or declining regions.

The second and more important argument is based on the so-called indices of mismatch between unemployment and vacancies. Structural balance is assumed to prevail whenever it is impossible to increase the rate of job hirings and thus to reduce unemployment through intersectoral movements of the unemployed. The rationale behind this definition has some intuitive appeal: only to the extent that the particular (mal-)distribution of unemployed and vacancies contributes to overall employment, does it make sense to speak of unemployment caused by an existing structural imbalance. Two major measures of mismatch are commonly used:  $M1 = 1/2 \sum |U_i/U - V_i/V|$  and  $M2 = 1 - \sum (U_i/U)^{1/2} (V_i/V)^{1/2}$  where  $U_i$  ( $V_i$ ) denotes the number of unemployed (vacancies) in sector  $i$  and  $U$  ( $V$ ) the number of unemployed (vacancies) in the economy as a whole. Economically,  $M1$  can be interpreted as the share of the total number of unemployed who would have to move across sectors to achieve structural balance, and  $M2$  as the potential employment gain which could be achieved if structural balance was established through this intersectoral movement.<sup>44)</sup> These measures have

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44) For details, see Jackman, Roper (1987), pp. 11 ff. For a methodological critique of the measures, see Paqué (1989b), pp. 6 ff.

Table 10: Share of Long-term Unemployment in Different Samples of Unemployed Persons (in p.c. of Total Unemployment)

	1979*	1987
Unemployed persons		
a) with completed professional education/training	13.2	27.5
without completed professional education/training	17.6	36.0
b) not physically handicapped	10.3	28.5
physically handicapped	25.6	45.1
c) age below 50	16.1	25.6
age equal or above 50	28.5	52.9
d) in state with lowest share (1)	11.4	23.4
in state with highest share (2)	18.0	36.9
e) in labour district with lowest share (3)	5.9	13.8
in labour district with highest share (4)	25.2	44.2

\* To correct for changes of the method of calculating long-term unemployment in 1985, the numbers for 1979 were adjusted to the downward shift of the overall level. The actual shares can be obtained by multiplying the numbers in the table by 1.279.

(1) Hesse and Baden-Württemberg respectively

(2) Northrhine-Westfalia

(3) Marburg and Schwäbisch Hall respectively

(4) Saarbrücken and Dortmund respectively

Source: Own calculations from National Labour Statistics: a) - c) September 1979 and 1987; d) - e) September 1979 and 1986.

served as the framework for the claim that structural unemployment has not substantially increased in Germany in recent years.

As to regional unemployment - by far the most important issue in the policy debate about structural imbalances - the argument is usually based on a cross-section of the 142 German labour districts: as can be seen in Table 11 (1), both M1 and M2 have gradually increased since the mid-70s, with M1 moving from 20.6 % (1973-77) up to 24.6 % (1983-87) and M2 from 3.5 % (1973-77) to 4.5 % (1983-87). This is not a negligible increase, but it is a far cry from delivering a major explanation of the growth and persistence of total unemployment. However, there is an important qualitative issue hidden behind these numbers. If one explicitly distinguishes two types of regional balance, namely the balance between selected large units of the whole (e.g., states) and the balance within these units, a much more differentiated picture emerges (Table 11 (2), (3)): between the states, there has been a substantial increase of regional imbalance in the period, with M1 rising from 11.7 % to 22.1 % and M2 from 1.1 % to 3.0 %; in contrast, just the reverse holds within states with all intra-state measures M1 and M2 markedly declining in the period in question. Consequently, the share of inter-state in total mismatch unemployment rose quite dramatically from 56.1 % to 89.8 % in terms of M1 and from 30.5 % to 66.6 % in terms of M2. Hence, there has been a significant qualitative shift of regional unemployment from a "spot issue" to a "cluster issue": in the early seventies, structural imbalance was a problem of many small backward areas more or less evenly scattered all over the country while, by the mid-80s, it has become a problem of many backward areas clustered in those regions where the declining industries like coalmining, steel and shipbuilding tend to be concentrated. Naturally, the same measured "absolute amount" of overall mismatch constitutes a much more severe obstacle to any macroeconomic fight against unemployment when it is regionally clustered since spill-over effects of regional growth centers cannot be relied upon to accelerate economic development in backward areas. In fact, the main structural issue which has gradually moved into the foreground of

Table 11: Mismatch-Unemployment as a Share of Total Unemployment (in p.c.)

	Index M1			Index M2		
	73-77	78-82	83-87	73-77	78-82	83-87
(1) Total	20.6	23.4	24.6	3.5	4.2	4.5
(2) Inter-State	11.7	17.6	22.1	1.1	2.0	3.0
(3) Intra-State						
- SLH/HH	19.0	16.7	12.0	2.3	1.8	1.2
- NS/BM	16.4	13.8	9.7	2.2	1.5	0.7
- NRW	15.5	15.0	13.5	1.8	1.8	1.4
- HS	20.5	20.6	18.3	3.0	3.2	2.5
- RP/SA	23.0	21.6	14.0	3.8	3.0	1.5
- BW	19.1	19.1	17.5	2.6	2.7	2.2
- NBY	22.8	21.0	18.0	3.6	2.7	2.1
- SBY	19.1	21.5	14.9	2.6	3.1	1.6
Share of Inter-State in Total (in p.c.)	56.1	75.1	89.8	-	-	-
	-	-	-	30.5	48.2	66.6

Notes:

$$M1 = 1/2 \sum |U_i/U - V_i/V| ; \quad M2 = 1 - \sum (U_i/U)^{1/2} (V_i/V)^{1/2}$$

Abbreviated names of state and state labour offices: SLH/HH = Schleswig-Holstein/Hamburg; NS/BM = Lower Saxony/Bremen; NRW = Northrhine-Westfalia; HS = Hesse; RP/SA = Rhineland-Palatine/Saar; BW = Baden-Württemberg; NBY = Northern Bavaria; SBY = Southern Bavaria.

Table 12: Estimates of Beveridge-Curves

$$\ln UR_t = \beta_0 + \beta_1 \ln VR_t + \beta_2 T_t + \epsilon_t$$

1960-1973

1974-1986

	Coefficient of		R <sup>2</sup>	Coefficient of		R <sup>2</sup>
	lnVR	T		lnVR	T	
F.R.G.	-1.13	2.79	0.63	-0.68	3.29	0.92
BL	-1.38	-4.88	0.84	-0.68	8.62	0.94
SLH/HH	-1.44	3.11	0.75	-0.73	2.18*	0.92
NS/BM	-1.27	4.95	0.71	-0.67	5.23	0.92
NRW	-1.62	8.86	0.80	-0.57	3.87	0.94
RP/SA	-1.39	5.54	0.73	-0.59	3.03	0.92
HS	-1.64	5.43	0.85	-0.96	-1.50*	0.84
BW	-1.08	6.28	0.41	-0.84	2.13*	0.82
NBY	-1.17	1.22*	0.83	-0.75	1.46*	0.89
SBY	-1.08	-1.76*	0.67	-0.69	1.63*	0.92

Notes:

UR = unemployment rate; VR = vacancy rate; T = time trend;  $\epsilon$  = random error term. Abbreviated names of states and state labour offices: see Table 9.  $\beta_0, \beta_1, \beta_2$  = coefficients estimated by instrumental variables technique, with  $\ln VR_{-1}$ ,  $\ln CU$  (log of capacity utilisation in manufacturing) and  $\ln CU_{-1}$  as instruments.

\* coefficient not significantly different from zero (5 % - significance level);

the policy debate during the seventies and eighties in Germany, is not regional imbalance itself, but rather the broad north/south divide which has completely pushed aside the questions of how to support small backward areas (above all the "Zonenrandgebiete") which was still prominent two decades ago at the heyday of global planning for regional equalisation of economic conditions.

Another tentative piece of empirical evidence for the causal link between the rise and persistence of unemployment and the increase of regional imbalances can be gained from separate estimates of Beveridge-curves for the German states. Underlying the Beveridge-curve is the idea that, over the business cycle, there is a stable negative relation between the number of unemployed and the number of vacancies which can be approximated by some simple functional form.<sup>45)</sup> As both unemployment and vacancy levels are simultaneously determined, this relation can only be estimated by appropriate instrumental variable techniques. Shifts of the Beveridge-curve themselves which may be accounted for by a time trend must be interpreted as reflecting the net effect of non-business cycle forces such as, e.g., a reduced search intensity of the unemployed, greater choosiness of firms in filling vacancies or simply a declining inclination to notify vacancies at all. If these forces have no strong regional element, one should expect all state Beveridge-curves to shift at about the same pace, i.e., with the same coefficient of the trend variable; if not, some explanation in terms of regional imbalance must be looked for.

Table 12 presents the equation of the basic Beveridge-curve we estimated for the Federal Republic of Germany as a whole and for nine German state labour districts which - with minor exceptions - come down to the German states. Note that the coefficient of

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45) On the Beveridge curve, see Jackman, Roper (1987), pp. 25 ff.

the time trend is expected to identify changes of the unemployment rate at a given vacancy rate which may be due to nationwide or specifically regional factors. As appropriate tests for parameter stability showed, the sample period 1960-86 had to be divided into two sub-periods, with the dividing line again being unambiguously located at the regime shift from over- to unemployment around 1973. The results are remarkable: in both sub-periods, the coefficients of the vacancy rate all have the expected negative sign, while most trend coefficients are positive, but differ widely between states. For the sixties, these interstate differences do not reveal a clearcut pattern so that - given the relatively poor statistical quality of the estimates for this period - no strong conclusions can be drawn.<sup>46)</sup> For the time after 1973, things look different: a clearcut north/south divide emerges, with the southern states having an insignificant trend shift in four out of five cases, with the one exception being the state labour district which includes the Saar, a region which suffers from the same industrial decline as the Ruhr in North Rhine-Westfalia. On average, the trend coefficient is much higher in the northern states. This nicely reflects the relative performance in terms of employment growth: a rank correlation between employment growth rates in the period 1973-86 and the estimated trend coefficients of the equations turns out negative and highly significant (around -0.9 including and -0.75 excluding Berlin). Given the fairly good statistical quality of the estimates for the period 1973-86, all this points to a marked regional component explaining the differential shifts of the Beveridge-curves.<sup>47)</sup> Of course, there is an underlying trend in the

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46) All standard statistical criteria indicated that the Beveridge-curve was much better identified for the period after than before 1973/74. This was so for all major specifications used.

47) This result differs sharply from the results of Jackman and Roper for Britain (p. 31). As there are substantial differences in the specification of the relevant equations - e.g., Jackman and Roper allow for an autoregressive component - it is unclear whether this really reflects genuine differences in development

aggregate estimate for Germany as well; apparently global forces overlapped the structural ones. Still then, the interstate variation around this aggregate shift looks quite substantial. Hence, the great emphasis which some studies have put on these global factors - above all, a not further explained decline of search intensity<sup>48)</sup> - looks somewhat misplaced, at least in the case of Germany. Instead, interregional differences of the employment performance may explain a good part of the curves' shifts.

There is a more fundamental sense in which current unemployment in Germany may be called structural. It goes back to the empirical finding of Section III that, since the mid-70s, the wage gap has predominantly been a structural problem, with manufacturing - and not the modern service sector - bearing the main share of the burden. The question then arises: can a "structural" wage gap lead to aggregate unemployment? A tentative answer lies in a comparison of the German case with a country which experienced a rapid structural change between sectors without any period of secular unemployment, the United States. Between 1970 and 1986, American manufacturing employment stagnated, but private service sector employment grew at an annual rate of 3.4 % which amounts to a net gain of 17.5 million service sector jobs, with the growth proceeding at a fairly constant rate all throughout cyclical booms and recessions. This employment success story had its counterpart in terms of a marked increase of intersectoral wage dispersion between manufacturing and services which also finds no parallel in Germany where the dispersion remained roughly constant. As a consequence, labour productivity growth slowed down much more dramatically in the American than in the German service sector.<sup>49)</sup> Apparently, intersectoral wage flexibility allowed a

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between Germany and Britain or simply methodological peculiarities. In general, the regional component of unemployment in Britain looks much less dramatic in recent years than in Germany (Paqué, 1989b, p. 9, Table 2).

48) See, e.g., Jackman et. al. (1984), pp. 26 f.

49) Burda, Sachs (1987), p. 31, Table 13.

rapid expansion of employment in the United States while intersectoral rigidity did not in Germany.

With the German manufacturing sector bound to shrink due to a rising wage gap, some other sector is due to take over the labour load. Thereby, without removing the structural wage gap in manufacturing itself, the adjustment can only happen in two different ways: either the wage level in the service sector is reduced relative to manufacturing so that low productivity laid-off workers find a service job, or the wage level is reduced altogether so that - at a given relative wage distortion between manufacturing and services - both sectors can expand. Thus, in the seventies and eighties Germany had and still has two alternatives: either it imitates the United States by allowing some intersectoral flexibility to give service sector employment an additional push above its trend growth, or it imitates its own past in the sixties when the relatively low wage level allowed structural change to proceed in a state of overemployment.<sup>50)</sup> Both ways are probably not feasible as corporatist resistance to them is too strong. Note that both ways amount to a reduction of labour costs at least somewhere in the economy to compensate for the employment effect of the wage gap in manufacturing. Hence, if we are ready to assign explanatory power to the difference of the experiences of the two countries in question - and it would be hard not to do so - then a structural wage gap combined with a rigid wage structure between sectors is sufficient to explain at least part of the persistent unemployment in Germany.<sup>51)</sup>

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50) See Paqué (1988a).

51) In essence, we share this conclusion with Burda, Sachs (1987); however, they fail to stress the fact that the wage gap appears to be structural, not global.



## VI. Summary: Corporatist Inertia and Macroeconomic Performance

We have shown that, at least for the case of Germany, there is no point in drawing a line between the labour market performance of the seventies after 1973 and the eighties. Five reasons for this conclusion have been elaborated:

- (i) The employment growth records of both periods look very much alike, but quite different from the record of the sixties up to 1973.
- (ii) From 1969-74, a wage gap evolved and then persisted with fluctuations up to the present. Since the mid-seventies at the latest, this gap has a pronounced structural component, with manufacturing being under much greater pressure than the service sector.
- (iii) Given a structural wage gap, only a rapid compensating expansion of the service sector could have re-opened the door to full employment. To accelerate this structural change to the warranted speed, a more pronounced intersectoral wage differentiation as it prevails e.g. in the United States was called for. Rigid corporatist wage setting prevented this from happening.
- (iv) Hand in hand with the shrinkage of manufacturing went a qualitative shift of regional imbalance from being a (minor) policy problem of many small backward regions scattered all over the country to being a (major) policy problem of regional clusters of unemployment.
- (v) In both recovery periods after the recessions 1974/75 and 1981/82, the labour market has become increasingly dualised, with a rising share of long-term unemployed being prevented from finding jobs by the gradual devaluation of their human capital and by the inelasticity of the wage level with respect to long-term unemployment, again a consequence of corporatist wage setting. As the empirical evidence suggests, only short-term cyclical variations of unemployment exert any influence on wage growth in Germany.

The prominent role we have assigned to corporatist inertia in cementing unemployment invites formulating the provocative theory

that German-style corporatism is never able to overcome any long-term macroeconomic disequilibrium in the labour market through collective action at the bargaining table. There are basically four periods which could serve as a testing ground for this strong claim: the time of the Weimar Republic from 1923-33, the period of the so-called economic miracle 1948-60, the sixties up to 1973 and the time thereafter. In two of these periods, namely 1923-33 and 1974 until today, chronic unemployment was the rule even in boom times, with the major difference being only that the overlapping business cycle was much more violent in the twenties and thirties than in the last two decades. As mentioned in Section IV, the sixties were a time of chronic overemployment, again no macroeconomic equilibrium. But how about the fifties, with their spectacular employment growth which led to an easy integration of ten million refugees in just one decade? Upon closer inspection,<sup>52)</sup> this German miracle can hardly be booked to the credit of collective bargaining. The reasons are simple: although German unions and employers' associations had much more organisational clout than is sometimes assumed by Anglo-American economists writing on the subject,<sup>53)</sup> they were completely overrun by the developments outside their own realm, namely the (re-)emergence of Germany's economy as a vigorous export machine on the world markets and the enormous - and persistently underestimated - productivity gains therefrom. With virtually everybody expecting growth to proceed at a lower pace than actually happened, all collective bargaining strategies - however aggressive they were meant to be in the first place - turned out extremely moderate in retrospect. Insider interests still played their prominent part, but - given the fortitious circumstances - they ended irrelevant anyway. Hence, hysteretic inertia was not really ineffective, but simply overlapped by the much more powerful force of export-led productivity growth.

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52) See Paqué (1987).

53) Above all, Olson (1982).

This crude historical assessment gives a clue as to where the chances for moving back to a state of labour market equilibrium (or again, overemployment?) may lie: in an external productivity shock which everybody underestimates. The completion of the European Common Market by 1992 may be such a shock and the starting point for a new virtuous circle. If not, we will have to wait for full employment until massive demographic changes finally lead to a contraction of the labour force, not to an expansion of employment.

Appendix:

Table 1\*: Wage Gaps for 1968-86 (1968 = 100)

	<u>All Sectors</u>			<u>Manufacturing</u>		
	LIS	LIS <sup>F</sup>	LIS <sup>A,F</sup>	LIS	LIS <sup>F</sup>	LIS <sup>A,F</sup>
1968	100	100	100	100	100	100
69	100.4	99.5	102.7	100.3	98.9	104.1
70	102.8	101,6	105,5	104.7	103.3	108.2
71	104.0	103.4	105,8	106.8	105.8	107.6
72	103.9	103.7	106,0	108.6	108.3	109.2
73	104.9	104.7	107,8	109.1	108.7	112.3
74	107.8	108.9	109,9	111.2	112.6	112.3
75	108.1	110.6	108,1	114.3	117.8	110.2
76	105.3	107.7	108,2	111.9	115.4	115.3
77	105.4	107.8	109,3	113.1	116.4	117.9
78	104.0	106,2	108,4	113.5	116.6	118.3
79	103.7	105,4	109,2	113.2	115.8	120.9
80	106.1	107.8	110,7	118.8	121.3	125.9
81	107.2	110,1	111,4	121.1	125.4	126.5
82	106.6	111,3	110,7	119.1	125.7	122.9
83	103.7	109,5	109,2	114.5	122.6	120.0
84	101.6	107,3	108,2	113.8	121.7	122.0
85	100.9	106,6	108,2	111.8	119.6	123.3
86	99.6	104,8	107,3	108.9	116.0	119.6

Table 2\*: Labour Demand Equations, 1964-86

$$LH_t = \alpha + \sum \beta_i X_{t-i} + \sum \gamma_i (WH/P)_{t-i} + \delta D_t + \epsilon_t$$

<u>Variables</u>	<u>All sectors</u>	<u>Manufacturing</u>
Const.	-0.020 (0.006)	-0.013 (0.009)
X	0.804 (0.104)	0.626 (0.074)
X <sub>-1</sub>	0.380 (0.121)	0.266 (0.060)
X <sub>-2</sub>	0.105 (0.137)	0.042 (0.071)
X <sub>-3</sub>	-0.022 (0.100)	-0.047 (0.054)
WH/P	-0.626 (0.153)	-0.160 (0.156)
(WH/P) <sub>-1</sub>	0.185 (0.084)	-0.151 (0.069)
(WH/P) <sub>-2</sub>	-0.066 (0.074)	-0.121 (0.095)
(WH/P) <sub>-3</sub>	-0.128 (0.057)	-0.071 (0.082)
D	-0.017 (0.008)	-0.028 (0.010)
R <sup>2</sup>	0.858	0.893
SE	0.009	0.012
DW	2.530	2.201
$\sum X_{t-i}$	1.267 (0.403)	0.886 (0.201)
$\sum (WH/P)_{t-i}$	-0.618 (0.279)	-0.503 (0.231)

Notes:

LH = Annual growth rate of hours worked (excl. self-employed);  
 X = Annual growth rate of value added at constant prices; (WH/P)  
 = Annual growth rate of real producer wage (defined as annual  
 compensation per working hour divided by value added deflator);  
 D = Dummy variable for the years 1967 and 1968;  $\epsilon$  = Random error  
 term;  $\alpha$ ,  $\beta_i$ ,  $\gamma_i$ ,  $\delta$  = coefficients estimated by instrumental  
 variable technique, with a trend variable, the annual rate of  
 change of the capital stock and of capacity utilisation (see  
 notes to CU in Table 6) as instruments for X); SE = Standard  
 estimation error; DW = Durbin-Watson-Statistic.

Data Source: National Accounts Statistics.

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