

Paqué, Karl-Heinz

**Working Paper — Digitized Version**

## Micro-macro links in West Germany's unemployment

Kiel Working Paper, No. 378

**Provided in Cooperation with:**

Kiel Institute for the World Economy – Leibniz Center for Research on Global Economic Challenges

*Suggested Citation:* Paqué, Karl-Heinz (1989) : Micro-macro links in West Germany's unemployment, Kiel Working Paper, No. 378, Kiel Institute of World Economics (IfW), Kiel

This Version is available at:

<https://hdl.handle.net/10419/47185>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Kieler Arbeitspapiere Kiel Working Papers

Working Paper No. 378

Micro-Macro Links  
in West Germany's Unemployment

by

Karl-Heinz Paqué\*

Institut für Weltwirtschaft an der Universität Kiel

The Kiel Institute of World Economics

ISSN 0342 - 0787

Kiel Institute of World Economics  
Düsternbrooker Weg 120, D - 2300 Kiel

Working Paper No. 378

Micro-Macro Links  
in West Germany's Unemployment

by

Karl-Heinz Paqué\*

August 1989

Ag 2782/89  
Weltwirtschaft  
Kiel  
ka

\*This paper was presented at the conference on "Macroeconomic Aspects of Unemployment" at Hebrew University, Jerusalem, May 4-5, 1989. Thanks are due to the participants of this seminar, above all Olivier Blanchard, Michael Burda, Jean-Paul Fitoussi and Patrick Minford, for valuable comments.

The author himself, not the Kiel Institute for World Economics, is solely responsible for the contents and distribution of each Kiel Working Paper.

Since the series involves manuscripts in a preliminary form, interested readers are requested to direct criticisms and suggestions directly to the author and to clear any quotations with him.

Contents	Page
I. Introduction	1
II. Terminology	2
III. Macro Theories of German Unemployment	2
1. Keynesian Demand Gap	2
2. Neoclassical Wage Gap	6
3. Transatlantic Crowding-out	9
4. Hysteresis	11
IV. Micro Forces behind Macro Hysteresis	24
1. Human Capital Devaluation	24
2. Interregional Imbalances	32
3. Structural Change between Sectors	38
V. Summary of Diagnosis and Policy Conclusions	40
References	46

## I. Introduction

The main point of this paper will be that West German unemployment in the late 1980's has a curious double character: while its genesis is largely determined by the macroeconomic events of the last two decades - two stabilization crises and one wage revolution -, its current state reveals strongly microeconomic features which call for micro rather than macro policy measures.

To make our case, we proceed as follows. In section II of the paper, we clear up our use of the terms 'macro' and 'micro' which may diverge somewhat from the normal textbook wording. In section III, we evaluate four major macro-paradigms of unemployment in West Germany: the traditional Keynesian demand-gap and the neoclassical wage-gap approach, the transatlantic crowding-out theory as recently advanced by Fitoussi, Phelps (1988), and, at some length, the hysteresis-theory as pioneered by Blanchard, Summers (1986a, b, c; 1988). We shall argue that none of these paradigms provides a sufficient explanation of the current persistence of unemployment in Germany, but that some of them - notably the wage-gap and the hysteresis-theory - contain most valuable elements; what they all lack is a due account of the structural and institutional (i.e. the 'micro') elements which are likely to cement an economy's macro inclination towards hysteresis. In section IV, we try to fill this gap by post-delivering a summary of these elements, with a focus on the structure of long-term unemployment, regional disparities and structural change between sectors of economic activity. In the final section V, we briefly evaluate different employment policy options and, from our own standpoint, make a policy choice.

This is an empirically oriented paper. As the questions we deal with are very diverse in nature and spirit, we do not make an attempt to provide a unifying formal framework; rather, we shall present a mixture of casual empiricism and econometrics aimed at filling some apparent gaps in the literature. Our case will be confined to (West)

Germany, but similar arguments may apply - with proper qualifications - to some other large E. E. C. -countries.

## II. Terminology

In this paper, we call something 'macro' if it concerns primarily the economy as a whole, with no particular pattern (or 'structure') being of any significance. As a complement, 'micro' simply means non-macro. Note that the borderline between macro and micro is thus related to, but not identical with the distinction between the demand and the supply side. A Keynesian lack of aggregate demand is usually a macro phenomenon. However, supply side deficiencies may belong to either category: too high a level of unit labour costs is macro in our sense while institutional rigidities and regulations are micro if they mostly affect some subset of the economy. Hence, our distinction is a matter of empirical judgement, not of precise theoretical classification.

## III. Macro Theories of German Unemployment

### 1. Keynesian Demand Gap

When evaluating the (traditional) Keynesian view that a lack of aggregate demand is the main explanation of German unemployment of the 1980's, one has to distinguish between two alternative meanings of the term 'explanation'.

If explanation means a historical account of the emergence of unemployment, then the Keynesian view has some appeal. Clearly, a new dimension of unemployment was reached in the early eighties in the course of a demand contraction which was the immediate result of deliberate policy shifts of the German Bundesbank towards stabilizing the price level and of the government towards consolidating public finances, both political backlashes after the prior 'locomotive ex-

periment' of concerted demand expansion in the late seventies. The relevant macro statistics are broadly consistent with this view, econometric evidence supports it.<sup>1</sup> After all, this is not surprising: the historical record shows that drastic upward shifts of the unemployment rate usually occur via a stabilization crisis; in Germany, this was so in 1923-24 and 1948-50 after currency reforms, but also in 1974-75 and again in 1981-83. Apparently, the intertemporal covariance of sharp demand contractions and equally sharp increases of unemployment is the statistically dominant force so that any econometric attempt at assigning employment to 'causes' tends to support a demand side hypothesis more than any supply side competitor. Note, in this respect, that the most widely quoted econometric accounting study (Bruno 1986) assigns at no time from 1974 to 1982 less than one half of German unemployment to aggregate demand causes, despite the pronounced and by now generally recognized wage pressure and the accompanying marked increase of unit labour costs from 1969 to early 1975, and despite the locomotive experiment of the late seventies which pushed the capacity utilization of the capital stock to a peak not reached since 1973 and not reached again until 1988.<sup>2</sup>

If 'explanation' means a genuine diagnosis of unemployment as it is today, the traditional Keynesian view is not compatible with the facts since the relevant economic indicators show that the German economy does not suffer from a general demand slump which involves underemployment of both capital and labour. By 1988/89, capacity utilization in industry - however measured - has probably just surpassed the prior peak levels of 1979 and 1973, after six years of steady - albeit moderate - real GDP-growth averaging about

---

<sup>1</sup> See, e.g., Bruno (1986) who assigns 2/3 of German unemployment of 1982 to aggregate demand (i.a. monetary and fiscal policy variables) and only the rest to a wage gap measure.

<sup>2</sup> Similar results for Germany have been obtained with different econometric techniques i.a. by Layard, Nickell (1985); Layard, Nickell, Jackman (1985); Franz, König (1986), and Gordon (1988).

2.5 % p.a. which lately accelerated to about 3.5 % (1988).<sup>3</sup> Whatever slack of demand may have been present at the beginning of the long upswing around 1982/83 or in the temporary slowdown of growth around 1984/85, it has definitely disappeared since then. Note that those econometric studies still pointing to an output gap in recent years (notably Coen, Hickman, 1988; Gordon, 1988) use data up to 1984 only, a time when the cyclical indicators in Germany revealed a slightly below average, not an extraordinarily high utilization of the capital stock; by now, their diagnostic messages have simply become obsolete.

In discarding a traditional Keynesian diagnosis, two caveats must be kept in mind. First, by definition, the capital stock today is the outcome of prior investments, and when the pace of capital accumulation slows down due to a demand induced recession as it did in 1981/82, the capital stock in later times will be lower and thus more easily fully utilized than in the absence of the recession. This means that, historically, Keynesian causes may have non-Keynesian consequences; however, as the capital stock inherited from the past is today a binding supply side constraint, this does not save the Keynesian diagnosis from being wrong. It merely introduces an element of path dependency which, of course, speaks for avoiding recessions in the first place. Second, the comparatively low rates of price and wage inflation in present-day Germany may provoke a

---

<sup>3</sup> According to the quarterly industry poll of the Ifo-Institute, Munich, which is usually regarded as the most reliable source for this kind of data, capacity utilization in manufacturing reached 88.7 % in the fourth quarter of 1988, higher than the prior peak levels of 1979 IV (85.5 %) and 1973 II (87.4 %) and only below the 'historical' high of 1970 I (92 %). On a yearly basis, capacity utilization in 1988 (86.7 %) has been higher than in 1979 (84.7 %) and about as high as in 1973 (87.1 %), but again below 1970 (91.0 %). On basis of (less reliable) capital stock figures and extrapolations of capital productivity, the Kiel Institute of World Economics and some other institutions calculate economy-wide annual capacity utilization indices. Defining the long-term high of 1970 as 100, the Kiel Institute Index reached 98.4 in 1988, slightly below the level of 1979 (99.1) and 1973 (99.2). All forecasters agree that, in the remaining three quarters of 1989, capacity utilization is likely to be kept at least at the present level without any expansionary policy measures.



traditional Keynesian to argue that - given some wage and price stickiness in the short run - there remains enough scope for exploiting a Phillips-curve trade-off between unemployment and demand induced price inflation; hence German unemployment would still be Keynesian in this sense.<sup>4</sup> This argument mistakes the absolute level of price and wage inflation as a better indicator for the state of the business cycle than some measure of capacity utilization and output growth. However, as the German (and other countries') historical experience shows, business cycle peaks have at different times been accompanied by vastly different levels of price inflation, depending on the prior record of price (in-)stability which forms the basis for economic agents' expectations. If anything, the acceleration of price inflation may give a clue as to the state of the business cycle, and this indicator does in fact signal some worsening of the price climate, with virtual consumer price stability in 1986 being followed by inflation rates of 0.5 % in 1987, 1.3 % in 1988 and, as most forecasters predict, somewhere around 2.5-3 % in the current year.<sup>5</sup> Hence, despite its low level by international standards, German inflation cannot be taken as evidence that the economy is still operating far below its capacity limits, with additional labour being employable at more or less constant marginal cost at a given capital stock. Yet, with a fully utilized capital stock, price increases can only serve as (non-anticipated) shocks to reduce the level of real wages so that, at

---

<sup>4</sup> Usually, Keynesian calls for expansionary macro policies in Germany are couched in terms of international coordination, with a view to the notorious German trade and current account surplus (see, e.g., lately *The Economist* of Feb., 4, 1989, p. 65 "Still waiting for the locomotive"). As far as these calls are simply meant as a case for international charity in the sense that Germany should pull other countries out of a slump (which, incidentally, is not visible), they have nothing to do with unemployment in Germany and thus go beyond the scope of this paper. As far as they are meant to make a case for unemployment reduction in Germany itself, their validity crucially depends on the elasticity of aggregate supply which is dealt with in the text.

<sup>5</sup> See, e.g., Commission of the European Community, *European Economy* (November 1988), p. 161, with a forecast of 2.5 % and Fels, Flemig, Langfeldt, Trapp (1988), p. 40, with a forecast of 3 % consumer price inflation for 1989 in Germany.

its lower than average marginal product, additional labour will be hired. Then, of course, the Phillips-curve strategy boils down to a Keynesian cure for a neoclassical malady, namely a level of real wages not compatible with full employment.

## 2. Neoclassical Wage Gap

In its macro form, the neoclassical diagnosis of German unemployment states that the level of unit labour costs is too high for full employment to be achieved. The only straight way to test this hypothesis comes down to comparing the current level of real unit labour costs at a hypothetical state of full employment with a base level at some time in the past when full employment of labour and capital actually prevailed. The difference between these two levels - expressed as a share of the base level - is then called a wage gap. Many serious technical difficulties are involved when calculating a wage gap. In particular, some crucial parameters of the economy's production technology must be estimated or imposed beforehand, and the 'neoclassical' inverse variation of employment and labour productivity has to be econometrically separated from the 'Keynesian' procyclical movements of productivity due to labour hoarding in recessions and dishoarding in booms. As these technical details have no bearing on our main argument, they do not need concern us here.<sup>6</sup>

Table 1 presents those two recent wage gap estimates for Germany which come closest to supporting the macro version of the neoclassical diagnosis.<sup>7</sup> For the manufacturing sector, both Burda, Sachs (1987)

---

<sup>6</sup> See Artus (1984), pp. 256 ff., Bruno, Sachs (1985), pp. 179 ff. and Paqué (1989b), pp. 13 ff. for the relevant details.

<sup>7</sup> Bruno (1986) obtains somewhat smaller wage gaps, Gordon (1988) no positive wage gaps at all; however, Gordon's methodology has serious shortcomings - above all the simple extrapolation of trend productivity growth from the seventies into the eighties - which make his estimates look quite suspect. For a critique of Gordon (1988) see Vaubel (1987).

Table 1 - Wage Gap Estimates for Germany (in %)

	1970-74	1975-79	1980-84	1985	1986	1987	1988
manufacturing:							
Burda, Sachs (1987)	6.0	18.5	25.0	24.9	.	.	.
Paqué (1989)	9.9	16.5	23.5	23.3	19.6	.	.
total economy:							
Paqué (1989)	7.0	8.6	10.0	8.2	7.3	7.0*	6.0*

\* own estimate after completion of the study.

and Paqué (1989b) obtain substantial wage gaps around 20 % in the 1980's, with only a very recent trend downwards. Note, however, that nowadays manufacturing has a share of no more than 35 % of total employment in Germany. An estimate for the economy as a whole by Paqué (1989b) indicates much lower gaps since the mid-seventies peaking at around 10 % in the early eighties and then falling to levels around 6-7 %. Also, intertemporal patterns are remarkable: while the wage gap in manufacturing grew into a new dimension in the second half of the seventies, it leveled off in the economy as a whole, with only a modest increase of three percentage points from 1970-74 to 1980-84. Table 2 gives a clue to the structural forces behind this picture: in the early seventies, both manufacturing and services were hit by a hefty rise of nominal labour costs which was mainly due to an increase of the wage level. Yet, all over the seventies, the service sector could significantly improve its terms of trade relative to manufacturing, so that, by the middle of the decade, real unit labour costs in services began to decline again while employment continued to grow. Not so in manufacturing, where it took two recessions with a net loss of almost two million jobs to achieve the required cost adjustment by the mid' 1980's. Apparently, import competition from newly industrialized countries finally squeezed 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.

Table 2 - Average Annual Growth Rate of Value Added Deflator, Nominal and Real Unit Labour Cost in Germany (in %)

	1969-74	1974-80	1980-87
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 Costs*			
- 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.

Given this distinct pattern of structural change between two major sectors of the German economy, it would be misleading to infer from a large manufacturing wage gap that the level of unit labour costs is on average 'too high' in the economy as a whole.<sup>8</sup> As the relatively small wage gap for the total economy indicates, a good part of the manufacturing wage gap is likely to be due to intersectoral terms-of-trade effects. By themselves, these effects raise an important issue of intersectoral wage rigidity to which we turn in section IV of this paper. Nevertheless, they speak against the simple neoclassical wage level diagnosis.

To save the macro-version of the neoclassical approach from obsolescence, some non-Keynesian macro reason must be found why about the same level of average unit labour cost means lower employment in the eighties than in the wage gap reference period,

<sup>8</sup> This inference pervades much of the argument by Burda, Sachs (1987)

usually the late sixties. Just this is the core of the transatlantic crowding-out hypothesis.

### 3. Transatlantic Crowding-out

Fitoussi, Phelps (1988) have advanced the theory that it was the peculiar policy mix of the early Reaganomics which caused the European - and thus also the German - unemployment malaise in the eighties, despite the downward correction of real unit labour costs. Briefly summarized, their argument runs as follows: after the tax reform act of 1981, the sharp rise of the U.S.-budget deficit led to an increase of real interest rates, a high current account deficit and - temporarily - to a drastic appreciation of the U.S.-dollar. As U.S.-firms were heavily favoured by the newly implemented tax cuts and investment subsidies, they did not face a rise in capital costs despite the increase of real interest rates. In Europe, however, high real interest rates did raise capital costs while the appreciation of the US-dollar reduced the pressure of competition; both effects pushed firms into increasing their mark-up over unit labour cost. Hence, despite the actual fall of real unit labour cost, employment contracted or at least stagnated.

Whatever the merits of this reasoning as a theoretical account of some macroeconomic disequilibria, it has fairly low diagnostic power for present-day unemployment in Germany. This is so for three reasons. Firstly, as an account of the sharp rise of unemployment in 1981-83, the theory is a failure due to wrong timing: the U.S.-budget deficit began its spectacular rise in 1982, a year when the business cycle trough had already been reached in Germany. Also, real interest rates - however measured - had made a great upward leap before, from around 3 % in 1978-79 to about 4 1/2-6 % in 1982, depending on which deflator is used and to what extent the movements of price inflation are smoothed by intertemporal averaging (see Table 3). It is very likely that, in these recession years, contractionary monetary and fiscal policies in Germany and most other countries (including

Table 3 - Alternative Measures of Real Interest Rate in Germany  
(in %)<sup>1</sup>

	a) 'current rate':		b) 'smoothed rate':	
	$(r-\hat{p}_c)$	$(r-\hat{p}_v)$	$(r-\hat{p}_c^*)$	$(r-\hat{p}_v^*)$
1978	2.9	1.4	.	.
1979	3.4	3.4	3.2	3.0
1980	2.7	3.7	3.2	4.2
1981	4.4	6.4	4.9	6.0
1982	4.3	4.6	4.4	5.1
1983	4.7	4.6	4.5	4.7
1984	5.4	5.8	5.2	5.3
1985	4.8	4.7	5.5	4.5
1986	6.1	2.8	5.1	3.5
1987	5.3	3.8	5.3	3.5
1988	4.8	4.3	.	.

- <sup>1</sup> r = average yield to maturity of public authorities bonds with terms of 3 years or more  
 $\hat{p}_c$  = annual increase of the private consumption deflator  
 $\hat{p}_v$  = annual increase of the value added deflator  
 $\hat{p}^*$  = centred moving (geometric) average of the rate of inflation over three years

since 1979 the U.S.) played by far the major part in the story.<sup>9</sup> Secondly, as to the persistence of unemployment in the recovery period, only the early years 1983-85 show the relevant configuration of macro variables (high US-budget and current account deficits, high real interest rates and an 'overvalued' dollar). However, with the exception of a brief dip of the business cycle in late 1984 and early 1985, these were not depression years in Germany: on average, real GDP grew at slightly above 2 % p.a., industrial production at 3 % p.a., gross fixed capital formation at 1.4 % p.a, with a notable difference in growth rates between investment in durable equipment (4.8 % p.a.) and investment in buildings (-0.8 % p.a.). Of course, this is no spectacular growth and - by placing a capital cost burden on Europe - the American policy mix may well have contributed to the

<sup>9</sup> See also Jackman (1988), p. 1248.

slowness of the recovery at that time. Insofar, the theory makes a valid point. Even then, however, the very different investment balances of European countries - note the investment boom in Denmark, the UK and Sweden - suggest that home made policy may still have played a major role. Thirdly, in the period after the dollar's fall and the gradual decline of real interest rates (see again Table 3)<sup>10</sup>, the growth of investment, output and employment accelerated markedly (especially in 1988), but unemployment remained stubbornly high, with a still growing share of long-term unemployed and no prospect of substantial improvement in the near future, even if the boom will continue at its present pace. Just these last years' positive business cycle experience which Fitoussi, Phelps (1988) take as indirect empirical support for their theory<sup>11</sup>, casts serious doubt on whether the transatlantic crowding-out hypothesis is really targeted at explaining the core of the European malaise, namely high unemployment even at the peak of a boom. It may be a valid supply side theory of the European business cycles in the 1980's, but it is not a genuine theory of unemployment persistence.

#### 4. Hysteresis

The failure of the (traditional) Keynesian paradigm to explain the European unemployment record in the 1980's has led Blanchard, Summers (1986a) to formulate a theory of hysteresis which takes explicit account of the asymmetry of this record. Briefly summarized,

---

<sup>10</sup> Note that this period should be dated from mid-1985 until 1988, despite the fact that the real interest rate, if measured by subtracting consumer price inflation from the nominal interest rate, did not come down until 1987. The sudden drop of consumer price inflation below zero in 1986 was certainly regarded by economic agents as a transitory phenomenon since it was all too obvious that the dramatic oil price decline would not continue at the pace it did at that time. Hence, for this late period, using the value added deflator instead of an index of consumer prices may be more appropriate for computing the real interest rate.

<sup>11</sup> Fitoussi, Phelps (1988), Preface, p. VII f.

the theory states that, after the long and severe recession of 1981-83, a dual labour market has gradually developed with two kinds of workers: those who remained employed all throughout or became re-employed after some brief jobless spell, and those who - for whatever reason - remained unemployed. For the latter group, the chances for re-employment have subsequently worsened for essentially two reasons: (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. Thereby, the detrimental impact of the wage-setting process is not or at least not primarily ascribed to centralized wage bargaining between unions and employers' associations in corporatist economies; it is rather booked on the account of employers' rational inclination to pay efficiency wage premia which lead to a wage level incompatible with full employment.<sup>12</sup>

Does this theory stand up to the facts in the case of Germany? Two straight empirical consequences of a process of hysteresis are that, in the course of cyclical recovery, (i) the share of long-term in total unemployment rises and (ii) the average duration of a completed relative to an uncompleted spell of unemployment declines (due to the adverse-selection effect of the 'good ones' leaving and the 'bad ones' remaining in the pool of the unemployed). In fact, this is broadly what happened in Germany: the share in total unemployment of those who have been out of work for more than one (two) year(s) rose from 13.0 (3.9) % in 1981 over 24.9 (7.2) % in 1983 up to 31.9 (16.1) % in 1987 (end of september respectively); in addition, the average duration of a completed spell of unemployment relative to an uncompleted one declined sharply, from 70 % in 1982 and still 68 % in 1984 down to

---

<sup>12</sup> See i. a. Summers (1988).



52 % in 1987.<sup>12a</sup> A similar process of hysteretic devaluation seems to have taken place in the recovery years of the second half of the seventies, with the share of long-term unemployment (uncompleted spell over one year) increasing from low levels of about 5 % in 1971-73 up to 14.5 % in 1979.<sup>13</sup> Hence hysteresis seems to be not a new phenomenon, but a general characteristic of extended recovery periods.

As is well-known, the hysteresis theory has far-reaching macro-economic implications for the intertemporal pattern of wage inflation: whenever unemployment becomes hysteretic, recession-induced wage moderation fades away because laid-off workers lose their market clout as they grow into long-term unemployment. This has straightforward consequences for econometric modelling: in traditional wage equations, the growth of the wage level depends i.a. on the current unemployment rate as a proxy for the extent of disequilibrium (i.e. excess supply) in the labour market. Implicit in this specification is the assumption that the non-accelerating inflation rate of unemployment (NAIRU) remains constant all throughout. The standard specification 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

---

<sup>12a</sup> Own calculations based on data of the German Bundesanstalt für Arbeit. Note that the expected duration of an uncompleted spell is higher than the time of unemployment passed at the time of inquiry. In a stationary state, with entries into and exits out of unemployment being equal, this expected duration should be about double the duration of the uncompleted spell. As, by 1987, the labour market came close to a stationary state in this sense, the average duration of a completed spell was about 26 % of the average expected spell duration for a person who was unemployed at the end of september 1987.

<sup>13</sup> As the method of computing long-term unemployment has been slightly changed in 1983 (for details, see Paqué 1989b, p. 32, footnote 30 and Werner 1987, pp. 41 f.), the share given for 1971-73 is a (quite reliable) estimate of the author; the share for 1979 is an ex-post recomputation by the German Bundesanstalt für Arbeit.

level gradually adjusting to changes of the current rate. In the following, we specify a simple model along these lines for the German economy. As we focus on hysteresis effects, we shall be very brief on other aspects of specification and estimation.<sup>14</sup>

Basically, our wage equation reads as follows:

$$(1) \quad w_t = \beta_0 + \beta_1 p_t^c + \beta_2 (p_t^v - p_t^c) + \beta_3 q_t + \beta_4 \ln U_t + \beta_5 \ln U_t^* + \epsilon_t,$$

with lower case letters denoting rates of change and upper case letters levels of the respective variables. Equation (1) specifies the rate of change of nominal wages in period  $t$  as a function of

- the rate of consumer price inflation ( $p_t^c$ ),
- the rate of change of the terms-of-trade, defined as the difference between the rate of producer price ('value added') and consumer price inflation ( $p_t^v - p_t^c$ ),
- the growth rate of labour productivity ( $q_t$ ),
- the natural log of the current unemployment rate ( $\ln U_t$ ), and
- the natural log of some longer-term unemployment rate obtained as a lagged moving average of  $U_t$  over a number of periods.

$\beta_0, \beta_1, \dots, \beta_5$  denote the coefficients to be estimated;  $\epsilon$  is a random error term with the usual properties; the subscript  $t$  marks the respective period  $t$ .

Equation (1) differs from traditional wage equations in two respects. Firstly, it explicitly includes two 'bargaining variables', namely the change of the terms-of-trade and labour productivity growth. This seems justified for institutional reasons: While German wage bargaining is organized on a regional branch level, it is de-facto synchronized since some sectors (above all metal manufacturing) serve as leaders in the wage setting process. Due to the extraordinary role played by a whole battery of public agencies and economic research

---

<sup>14</sup> A detailed account of the relevant specification issues is provided by Coe (1985, 1988). In some respects, our model follows the path traced out by Coe's empirical work.

institutions who regularly publish evaluations and forecasts of the business cycle and also of medium-term growth prospects, all major figures on macroeconomic developments are well-known and carefully observed by any negotiating party at the quasi-centralized bargaining table. Hence, with due account to the comparatively short contract duration (mostly one year) which has prevailed until recently<sup>15</sup>, they can be assumed to enter the strategic wage-setting game without much delay. If the labour share in value added is taken as a distributional target variable of the unions, one should expect that, apart from consumer price inflation, both terms-of-trade gains and labour productivity increases push up nominal wage demands since they are constituent elements of the producers' profits. After all, there is a long-standing controversy among German economists (including employers' and unions' representatives) about the so-called cost-neutral wage policy which centres mainly around price inflation, terms-of-trade gains (or losses) and labour productivity growth.<sup>16</sup> Secondly, we include a hysteresis-variable ( $\ln U^*$ ) which allows wage moderation to gradually fade away after an increase of the unemployment rate, even if this increase is not reversed in the course of the cyclical recovery. The rationale behind this specification is straightforward: if there is no hysteresis, only  $U$  has an effect - a dampening one - on wage inflation, i.e.  $\beta_4 < 0$  and  $\beta_5 = 0$ ; if there is 'perfect' hysteresis, only  $U/U^*$  affects wage growth, with  $\beta_4 = -\beta_5 < 0$  so that, as soon as  $U^*$  approaches  $U$  a few periods after a recession-induced upward shift of  $U$ , the dampening effect of unemployment on wage inflation dissolves. Intermediate cases with partial hysteresis can be imagined so that an unconstrained estimation of both  $\beta_4$  and  $\beta_5$  makes sense as well.

Equation (1) was estimated with both annual and semi-annual data from national accounts statistics, with the wage defined as total

---

<sup>15</sup> With the sharp decline of price inflation in Germany, longer-term contracts have reemerged in collective bargaining since the mid-eighties.

<sup>16</sup> See the seminal paper by Giersch (1967) who introduced the relevant ideas.

compensation per dependent employee,<sup>16a</sup> the consumer price as the deflator of private consumption, the producer price as the deflator of value added, and labour productivity as value added at constant prices per employee.<sup>17</sup> To account for a possibly lagged adjustment of nominal wages to price inflation, terms-of-trade and productivity changes, various different lag-structures were imposed in a number of specification searches. As to consumer prices and the terms-of-trade, the lags turned out to be very short, so that, with annual data, an unlagged response of wages and, with semi-annual data, a lagged response spread over just two periods by a moving-average turned out to be appropriate.<sup>18</sup> As to productivity growth, the lags appeared to be somewhat longer: with annual data, a two-period moving average, and, with semi-annual data, a second-degree polynomial distributed lag over four periods performed best in portraying the adjustment process<sup>19</sup>. As both consumer and producer price inflation cannot be taken to be independent of contemporaneous nominal wage changes, equation (1) was estimated by instrumental

---

<sup>16a</sup> Note that the wage thus defined includes social security contributions of employees and employers. Using more narrow concepts of the wage excluding these contributions did not substantially alter the results.

<sup>17</sup> Ideally, both the wage and the productivity variable should be measured per hour worked. However, as the statistics on hours worked are unreliable and sometimes hard to interpret for semi-annual data, we prefer using the definition in the text. All estimates were also carried out with per-hour wage and productivity variables; the results came very close to the ones presented in the text.

<sup>18</sup> Ordinary least squares estimates of equation (1) with price expectations explicitly modelled as ARIMA processes of different orders produced slightly lower inflation coefficients than the ones presented in the text, with the estimated equations in general having a somewhat poorer fit; however, none of the major empirical conclusions of this paper was affected by this change of specification.

<sup>19</sup> Note that - as supplementary estimates showed - nothing of significance changes if some other lag structure with about the same lag length is imposed.

variable techniques, with lagged values of  $p^C$  and  $(p^V - p^C)$  as well as all other exogenous variables in the equation as instruments.<sup>20</sup>

Table 4 and Table 5 present a selection of estimates of equation (1) with different parametric restrictions and for different sample periods. Note that, in all equations, a dummy variable (DY) was added to the list of exogenous variables to account for the exceptional nominal wage growth which took place in the early seventies and which can hardly be explained by any of the other exogenous variables. With annual data, the dummy covers the years 1970-75, with semi-annual data the semesters 1969 II to 1975 I.

Table 4, equation (Ia) shows the basic estimate for the whole sample period with no terms-of-trade and no hysteresis effects on wage inflation allowed ( $\beta_2 = 0$ ;  $\beta_5 = 0$ ). The coefficients of the productivity and the unemployment variable have the expected sign and magnitude as they can be found in other studies.<sup>21</sup> However, the consumer inflation term turns out to be mostly insignificant and quite low, implying a very modest degree of price indexation of nominal wages; in turn, the dummy coefficient is highly significant thus indicating a hefty wage push in the early seventies which remains unexplained by the other included variables.<sup>22</sup> Allowing for terms-of-trade effects

---

<sup>20</sup> Theoretically, both the unemployment rate and productivity growth are also endogenous to wage growth. However, many empirical studies have shown (see e.g. Paqué 1989b; Symons, Layard 1984) that the main part of the employment response to real wage shocks takes more time than just a year or even half a year to realize so that endogeneity should not be a serious problem; presumably, the same holds for the much disputed real wage induced productivity growth. Estimates with either or both of these variables instrumented by their own lagged values showed the results to be very similar to the ones in the text.

<sup>21</sup> See, e.g., Coe (1985, 1988).

<sup>22</sup> Leaving out the dummy variable leads to a significant upward shift of the inflation (and also the productivity) coefficient, but also to very high autocorrelation of the residuals and a comparatively poor fit. Other studies of traditional wage equations and Phillips-curves for Germany apparently avoid the unpleasant choice between an implausibly low inflation coefficient and a poor

Table 4 - Estimated Coefficients of Traditional Wage Equations for Germany, Selected Periods

	const.	$p^C$	$p^V-p^C$	q	lnU	DY	$\bar{R}^2$	DW	SEE	MDV	n
I. a) 1953-87, A	4.45 (1.43)	0.18* (0.22)	-	0.67 (0.20)	-1.11 (0.29)	3.54 (0.77)	0.82	1.78	1.17	6.95	35
b) 1953-87, A	2.41 (1.35)	0.53 (0.22)	0.59 (0.23)	0.80 (0.16)	-0.73 (0.27)	2.30 (0.76)	0.89	1.97	0.88	6.95	35
II. a) 1953-80, A	4.03* (2.98)	0.19* (0.46)	-	0.75 (0.41)	-1.07 (0.35)	3.64 (1.17)	0.72	1.78	1.13	7.76	28
b) 1953-80, A	2.79* (2.19)	0.47* (0.34)	0.68 (0.28)	0.73 (0.30)	-0.59 (0.32)	2.37 (0.97)	0.84	2.18	0.96	7.76	28
III. a) 1967-87, A	5.49 (2.20)	0.12* (0.25)	-	0.51* (0.37)	-1.40 (0.65)	3.44 (1.12)	0.82	1.55	1.41	6.72	21
b) 1967-87, A	2.46* (2.08)	0.71 (0.33)	0.77 (0.36)	0.69 (0.26)	-0.94 (0.49)	1.50* (1.20)	0.92	2.09	0.93	6.72	21
IV. a) 1967-87, SA	3.02 (1.48)	0.34 (0.14)	-	0.78 (0.25)	-0.72* (0.49)	3.58 (0.82)	0.83	1.16	1.38	6.73	42
b) 1967-87, SA	2.35 (1.39)	0.62 (0.16)	0.53 (0.20)	0.94 (0.24)	-1.02 (0.46)	1.59* (1.02)	0.86	1.33	1.27	6.73	42

Notes: Estimated equation:  $w_t = \beta_0 + \beta_1 p_t^C + \beta_2 (p_t^V - p_t^C) + \beta_3 q_t + \beta_4 \ln U_t + \beta_5 \ln U_t^* + \beta_6 DY + \epsilon_t$ , with  $\beta_2 = \beta_5 = 0$  in equation a),  $\beta_5 = 0$  in equation b).  $w_t$  = growth rate of nominal wage (defined as total compensation per dependent employee) in period t.  $p_t^C$  = growth rate of deflator of private consumption expenditure in period t; for semi-annual data lagged moving average over two periods.  $p_t^V$  = growth rate of deflator of value added in period t; for semi-annual data lagged moving average over two periods.  $q_t$  = growth rate of labour productivity (defined as value added at constant prices per employee) in period t; for (i) annual data: lagged moving average over two periods; (ii) semi-annual data: second-order polynomial distributed lag with endpoint-constraint over four periods (coefficient  $\beta_3$  in the table shows sum of lag coefficients).  $U_t$  = average unemployment rate in period t; for semi-annual data seasonally adjusted.  $U_t^*$  = average unemployment rate (i) for annual data: of the current and the last three years; (ii) for semi-annual data: for the current and the last six semester(s) (seasonally adjusted). DY = dummy variable (i) with annual data: for the years 1970-75; (ii) with semi-annual data: for the semesters 1969II-1975I.  $\epsilon_t$  = random error term.  $\bar{R}^2$  = adjusted R<sup>2</sup>; DW = Durbin-Watson-Statistic; SEE = standard error of the estimate; MDV = mean of dependent variable; n = number of observations; A = annual; SA = semi-annual;  $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_6$  = coefficients estimated by instrumental-variables-technique with (i) for annual data:  $p_{t-1}^C, p_{t-2}^C, (p_{t-1}^V - p_{t-1}^C), (p_{t-2}^V - p_{t-2}^C), q_t, \ln U_t$  and DY as instruments; (ii) for semi-annual data:  $p_{t-1}^C, p_{t-2}^C, p_{t-3}^C, (p_{t-1}^V - p_{t-1}^C), (p_{t-2}^V - p_{t-2}^C), (p_{t-3}^V - p_{t-3}^C), q_t, \ln U_t$  and DY as instruments. \* = coefficient not significantly different from zero at the 5 %-level. For semi-annual data, growth rates of respective variables are two-semester differences of natural logs. Data source: German National Accounts Statistics and Data of the Bundesanstalt für Arbeit.

Table 5 - Estimated Coefficients of Hysteresis Wage Equations for Germany, Selected Periods

		const.	$p^C$	$p^V - p^C$	$q$	$\ln U$	$\ln U^*$	$\ln(U/U^*)$	$\ln US$	$\ln UL$	DY	$\bar{R}^2$	DW	SEE	MDV	n
I.	a) 1953-87, A	1.15* (1.01)	0.73 (0.16)	0.47 (0.21)	0.79 (0.13)	-2.17 (0.60)	1.76 (0.60)	-	-	-	2.47 (0.60)	0.93	2.43	0.72	6.95	35
	b) 1953-87, A	0.43* (0.74)	0.83 (0.15)	0.38* (0.24)	0.89 (0.12)	-	-	-2.34 (0.68)	-	-	2.73 (0.73)	0.93	2.10	0.79	6.95	35
II.	a) 1953-80, A	0.85* (1.62)	0.82 (0.25)	0.44* (0.28)	0.89 (0.23)	-2.04 (0.73)	1.71 (0.69)	-	-	-	2.32 (0.77)	0.90	2.60	0.77	7.76	28
	b) 1953-80, A	-0.00* (1.54)	0.91 (0.24)	0.37* (0.31)	0.96 (0.24)	-	-	-2.13 (0.77)	-	-	2.45 (0.83)	0.89	2.28	0.81	7.76	28
III.	a) 1967-87, A	0.89* (1.41)	0.94 (0.21)	0.70 (0.34)	0.83 (0.21)	-2.21 (0.97)	1.75 (1.01)	-	-	-	1.52* (1.03)	0.94	2.68	0.78	6.72	21
	b) 1967-87, A	-0.00* (0.98)	0.91 (0.22)	0.63 (0.35)	0.98 (0.15)	-	-	-2.16 (0.99)	-	-	2.17 (1.03)	0.94	2.49	0.80	6.72	21
	c) 1967-87, A	2.71* (1.88)	0.96 (0.24)	0.83 (0.29)	0.71 (0.22)	-	-	-	-1.93 (0.90)	0.60* (0.46)	1.31* (1.00)	0.94	2.56	0.81	6.72	21
IV.	a) 1967-87, SA	2.45 (1.19)	0.68 (0.14)	0.27* (0.18)	0.79 (0.21)	-2.98 (0.77)	2.22 (0.75)	-	-	-	2.25 (0.88)	0.90	1.54	1.09	6.73	42
	b) 1967-87, SA	0.78* (0.83)	0.69 (0.14)	0.19* (0.18)	0.97 (0.19)	-	-	-2.59 (0.78)	-	-	3.17 (0.76)	0.89	1.49	1.14	6.73	42
	c) 1967-87, SA	0.56 (0.13)	0.98 (0.15)	0.56 (0.16)	0.76 (0.20)	-	-	-	-4.10 (0.81)	1.47 (0.39)	0.91* (0.85)	0.90	1.56	1.04	6.73	42

Notes: Estimated equation: for a) and b):  $w_t = \beta_0 + \beta_1 p_t^C + \beta_2 (p_t^V - p_t^C) + \beta_3 q_t + \beta_4 \ln U_t + \beta_5 \ln U_t^* + \beta_6 DY + \varepsilon_t$ , with  $\beta_4 = -\beta_5$  in equations b), for c):  $w_t = \beta_0 + \beta_1 p_t^C + \beta_2 (p_t^V - p_t^C) + \beta_3 q_t + \beta_4 \ln US + \beta_5 \ln UL + \beta_6 DY + \varepsilon_t$ .  $w_t$  = growth rate of nominal wage (defined as total compensation per dependent employee) in period t.  $p_t^C$  = growth rate of deflator of private consumption expenditure in period t; for semi-annual data lagged moving average over two periods.  $p_t^V$  = growth rate of deflator of value added in period t; for semi-annual data lagged moving average over two periods.  $q_t$  = growth rate of labour productivity (defined as value added at constant prices per employee) in period t; for (i) annual data: lagged moving average over two periods; (ii) semi-annual data: second-order polynomial distributed lag with endpoint-constraint over four periods; coefficient  $\beta_3$  in the table shows sum of lag coefficients.  $U_t$  = average unemployment rate in period t; for semi-annual data seasonally adjusted.  $U_t^*$  = average unemployment rate (i) for annual data: of the current and the last three years; (ii) for semi-annual data: for the current and the last six semester(s) (seasonally adjusted). DY = dummy variable (i) with annual data: for the years 1970-75; (ii) with semi-annual data: for the semesters 1969II-1975I.  $\varepsilon_t$  = random error term.  $\bar{R}^2$  = adjusted R<sup>2</sup>; DW = Durbin-Watson-Statistic; SEE = Standard error of the estimate; MDV = mean of dependent variable; n = number of observations; A = annual; SA = semi-annual;  $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$  = coefficients estimated by instrumental-variables-technique with (i) for annual data:  $p_{t-1}^C, p_{t-2}^C, (p_{t-1}^V - p_{t-1}^C), (p_{t-2}^V - p_{t-2}^C), q_t, \ln U_t, \ln U_t^*$  and DY as instruments; (ii) for semi-annual data:  $p_{t-1}^C, p_{t-2}^C, p_{t-3}^C, (p_{t-1}^V - p_{t-1}^C), (p_{t-2}^V - p_{t-2}^C), (p_{t-3}^V - p_{t-3}^C), q_t, \ln U_t, \ln U_t^*$  and DY as instruments; \* = coefficient not significantly different from zero at the 5 %-level. For semi-annual data, growth rates of respective variables are two-semester differences of natural logs. Data source: German National Accounts Statistics and Data of the Bundesanstalt für Arbeit.

changes the picture considerably (equation Ib): the statistical quality of the estimate is improved, and both the consumer price and the terms-of-trade coefficients are now above 0.5. Note that, in both of these traditional wage equations, the dampening effect of a labour market disequilibrium on wage growth is estimated to be fairly low, at least at relatively high unemployment: e.g., an increase of the unemployment rate from 4 to 8 % as it happened in Germany from 1980 to 1982/83 reduces wage inflation by just 1.11 % and 0.73 % p.a. respectively. By and large, these results are confirmed by the estimates for different samples as they are presented in the table, namely excluding the 1980's (equations II), and including just the last three major business cycles (equations III, IV with annual and semi-annual data).

Table 5, equations (I) are two hysteretic modifications of the wage equation (Ib) of Table 4. In equation (Ia), the coefficients of  $\ln U$  and  $\ln U^*$  - with  $U^*$  being a lagged moving average of  $U$  over four periods - have been estimated freely. As it turns out, both are highly significant and similar in magnitude, but opposite in sign thus pointing to some severe hysteretic inertia in wage adjustment. Im-

---

Footnote 22 continued

fit plus autocorrelation by introducing lagged endogenous variables and/or by using standard procedures of autocorrelation correction. To us, this looks much more ad hoc than allowing for a general unexplained wage push in the early seventies which also conforms to the widespread perception among economists that union behaviour in Europe was exceptional at that time (see Bruno, Sachs, 1985, Chpt. 11; Paqué, 1989b). Coe (1985) includes a dummy variable just for the two semesters 1969II and 1970I, Coe (1988) an additional seasonal (!) dummy for 1971-1974; both procedures also look quite arbitrary since they cut very brief periods out of half a decade with an exceptional social climate, with the dramatic events of the wildcat strikes in late 1969 and the famous aggressive bargaining round of 1974 being just two episodes of a more general phenomenon. - Note that it is very hard to test econometrically whether the wage push of the early seventies was an exogenous event or whether it should be attributed to an increased inflationary sensitivity: replacing the level dummy by a slope dummy for the inflation coefficient yields almost the same fit, with the wage push then fully accounted for by a temporary upward shift of the inflation coefficient.



posing the restriction  $\beta_4 = -\beta_5$  (equation Ib) supports this conclusion since the 'perfect' hysteresis specification performs much better on statistical grounds than the corresponding 'traditional' wage equation in Table 4. Note that the absolute magnitude of the short-term sensitivity of wage inflation with respect to changes in unemployment is considerably higher than in Table 4, with a doubling of the unemployment rate from 4 to 8 % now leading to a (temporary) wage moderation of more than 2 % p.a. which gradually declines over time and vanishes after four years. Also, the coefficients of both the inflation and terms-of-trade variables are now much better identified than before, with the inflation coefficient being above 0.7, thus indicating a fair amount of price indexation of nominal wages. Leaving the 1980's out of the sample (equations II) fully confirms this pattern, with all coefficients preserving their prior magnitude. Hence, again, the evidence points to hysteresis as a general phenomenon of the German post-war-record, not as a peculiarity of the 1980's. The results for the more recent period 1967-87 support our conclusions on hysteresis all throughout, be it for annual (equation IIIa,b) or semi-annual data (equation IVa,b).<sup>23</sup>

From 1967 up to the present, grouped data on the duration of uncompleted unemployment spells is available for Germany so that an additional test of hysteresis can be carried out: if wage behaviour is hysteretic, one would expect that short-term, but not long-term unemployment has a significant negative effect on wage inflation. By

---

<sup>23</sup> In general, the coefficients presented in Table 5 turned out to be quite robust with respect to other changes in the sample period as appropriate F-tests showed. Using other proxy variables for a labour market disequilibrium (e.g. the vacancy rate, the level of employment) or imposing a linear instead of a log-linear dependence of wage inflation on the unemployment rate (i.e. substituting  $\ln U$  by  $U$  and  $\ln U^*$  by  $U^*$ ) lead to qualitatively similar results, though in general at a worse statistical quality of the estimates. The same holds for different lag lengths of the moving average  $U^*$ : both shortening and lengthening the lag preserves the hysteretic overall picture - at least within the bounds from two to six years (i.e. four to twelve semesters) -, but the specifications with a lag length of about three to four years perform best on statistical grounds.

replacing our current and lagged unemployment variables by separate rates for short- and long-term unemployment (called US, UL respectively), the hysteresis test picture can thus be rounded off. The borderline between short- and long-term unemployment was set at an uncompleted spell of one year. Equations (IIIc) and (IVc) show the results of the estimates with separate unemployment rates: as expected, the short-term rate has a markedly negative, while the long-term rate has - if at all - a moderate positive effect on wage inflation, an outcome which is again broadly in line with the hysteresis hypothesis.<sup>24</sup>

To summarize, our macroeconometric estimates are compatible with the hysteresis-view of German unemployment since all major indicators point to an increasingly dualized German labour market in the 1980's. However, the question remains which economic forces are responsible for the hysteretic macro picture.

No doubt, the most celebrated candidate in the literature has become wage-setting in an insider-/outsider framework.<sup>25</sup> Attractive as this candidate certainly is in view of the prominent role of collective bargaining in Germany, it faces one major difficulty: by itself, i.e. without any recourse to some kind of outsiders' human capital devaluation, it can hardly be made compatible with the observation of a declining wage gap. If, e.g., a major demand contraction as in 1981-82 eventually pushed about 3-4 % of the labour force into unemploy-

---

<sup>24</sup> Drawing the borderline between short- and long-term unemployment at uncompleted spells of three months, six months and two years respectively did not reproduce the hysteretic picture to the same extent as in the table. This indicates that a spell of one year may be a reasonably good approximation for the qualitative shift from active to passive labour market participation. This conjecture is compatible with unemployment exit probabilities estimated by Budd, Levine, Smith (1988) for the UK; as they show, the exit probability falls off sharply at a spell of just about one year.

<sup>25</sup> See Blanchard, Summers (1986a), with strong reliance on the ideas of Lindbeck, Snower (1986), and the contributions in Cross (1988) which mostly focus on wage-setting.

ment, and if - as actually happened in the 1980's - wage policy had hysteretic features, but nevertheless allowed profit margins to recover so that any sensible macro wage gap measure indicates about a return to pre-recession levels of real unit labour cost, then it is difficult to understand economically, why the outsiders' unchanged human capital stock will not be gradually reemployed. Clearly, the failure of the macro-version of the neoclassical labour cost theory equally applies to a 'macro-version' of the insider-outsider theory.

Simply adding some efficiency wage considerations does not make the case more convincing as a little thought experiment may indicate: if, in the course of a recession, one of two workers with identical human capital is laid off while the other one remains employed so that, subsequently, the only difference between them consists in the very fact of insider- versus outsider-status, then it overstretches economic imagination to assume that, after cyclical recovery and the melting away of any prior wage gap, a profit-maximizing firm employing the insider would not recognize the outsider to match the insider in terms of (potential) productivity and thus not profitably reemploy him. Even more importantly, an efficiency-wage based insider-/outsider-theory fails to contribute to the explanation of the most obvious and striking international fact of labour markets in the 1980's, the difference in performance between the United States and most EEC-countries, not the least Germany: while the United States managed to cut down its unemployment rate from almost 10 % in 1982 to just about 5 % most recently, Germany achieved only a very modest reduction from 9.3 % in 1983 to slightly above 8 % in 1988; likewise, the US-employment growth rate in the recovery period surpassed 2.5 % p.a., the German one was less than 1 % p.a. As there is no argument why efficiency wage premia should suddenly play a much more prominent role in Germany than in the United States - if anything, the high mobility of the American work force coupled with a more dynamic cyclical upswing west of the Atlantic speaks for the reverse to hold -, efficiency wage

models should not serve as major ingredients of an explanation of the current German malaise.<sup>26</sup>

Hence, by negative selection, one is left with some not yet specified non-macro reason as the key to the hysteretic German unemployment record.

#### IV. Micro Forces behind Macro Hysteresis

In the following, we evaluate three major micro candidates which may be responsible for the hysteretic macro appearance of unemployment in Germany, namely human capital devaluation, regional imbalances and - more generally - intersectoral structural change. Note that all three are closely intertwined so that separating them is merely a matter of expository convenience.

##### 1. Human Capital Devaluation

Conceptually, two types of human capital devaluation may be distinguished: (i) an 'external' devaluation due to a decline of demand for certain kinds of labour (including crude physical force) which is the indirect result of structural change in the markets for goods and services; and (ii) an 'internal' devaluation due to the lack of job practice, demotivation and demoralization in the course of an unemployment spell, in principle independent of structural change. The theoretical contributions on hysteresis have so far mostly focused on the second type; it has the unfortunate property of being empirically very fuzzy since subjective categories like morals, motivation or the 'rusting' of skills are hardly quantifiable. The first type is somewhat easier to grasp: If aggregate statistics reveal that long-term unem-

---

<sup>26</sup> This does not mean that efficiency wage models are not an important theoretical contribution to labour economics with a very broad range of applicability (see Katz, 1986). It rather means that, for the particular question at hand, their explanatory power is very limited.

ployment is concentrated among those unemployed with negative structural characteristics like, e.g., lack of qualification, bad health, old age or location in declining regions, then a good case can be made for external devaluation dominating the picture. If, e.g., the share of long-term in total unemployment is *ceteris paribus* much higher in, say, the declining coal mining area C than in the fast growing modern service region S, then it would be awkward to ascribe this fact not to the difference of local economic conditions, but to the endogenous deterioration of human capital in C compared to S due to some local differential in skill rusting, morals or motivation. Bluntly speaking, the former coal miner in C does not remain long-term unemployed because he has recently become a bad coal miner, but because (i) he is a coal miner at all or (ii) no jobs in other sectors are on offer in region C. In case (i), his specific skill is not demanded anymore; in case (ii), he finds no vacancy to match. In either case, his human capital is devalued right from the start of his unemployment spell, be it through skill rigidity or regional immobility. Of course, this structural discrepancy will not be immediately recognized as such by the collective bargaining parties in the labour market so that, at first, wage moderation will prevail after a recession. However, with cyclical recovery gaining ground, the structural core of the labour market disequilibrium will become visible to unions and employers' associations so that a hysteretic macro pattern of wage inflation will emerge.

A casual glance over some aggregate statistics shows that structural factors like age, qualification and health play an important part for long-term unemployment in Germany: in September 1987, 74.1 % of all long-term unemployed (with an uncompleted spell over one year) were either aged above 55 and/or had an impaired health and/or no vocational qualification; the corresponding share of short-term unemployment of this group was 57.7 %. If the large group of unemployed without vocational qualification is excluded - it alone comprises about 50 % of all unemployed -, these shares drop to 42.2 % and 21.6 % respectively, i.e. more than 40 % of all long-term unemployed are either quite old for a successful job search or in a relevant sense 'disabled'.

German statistics allow a somewhat more complete empirical evaluation of the importance of structural factors for long-term unemployment. From the mid-1970's until today, an annual investigation at the end of september breaks down the share of long-term in total unemployment by different characteristics, namely by

- state labour offices (9 units),
- vocational qualification (2 units: qualified/unqualified),
- health standard (2 units: with/without impaired health or a physical handicap),
- age (2 units: below/above 55 years), and
- sex (male/female).

With all cross classifications, this yields a yearly cross section of 144 observations. This grouped data set was used to estimate a logit-model of the form

$$(2) \ln [p_i / (1-p_i)] = \beta_0 + \beta_1 Q_i + \beta_2 H_i + \beta_3 A_i + \dots \\ \dots + \beta_4 Q_i H_i + \beta_5 Q_i A_i + \beta_6 H_i A_i + \sum \gamma_j D_{ji} + \epsilon_i,$$

with  $p_i$  being defined as the share of long-term unemployed (uncompleted spell over one year) in total unemployment in the respective group  $i$ ,  $Q_i$ ,  $H_i$  and  $A_i$  denoting dummy variables for unemployed with no vocational qualification ( $Q_i$ ), with impaired health or a physical handicap ( $H_i$ ) and with age above 55 years ( $A_i$ ) in group  $i$ ;  $D_{ji}$  ( $j = 1, 2, \dots, 7$ ) denote dummy variables for the seven German state labour offices Schleswig-Holstein/Hamburg (SL/H), Lower Saxony/Bremen (LS/B), Northrhine-Westfalia (NW), Hesse (HS), Rhineland-Palatine/Saar (RP/S), Northern Bavaria (NB), and Berlin (BL), with the remaining two offices Baden-Württemberg (BW) and Southern Bavaria (SB) serving as the lower benchmark since they are the two regions with the persistently smallest share of long-term unemployed;  $\epsilon_i$  denotes a random error term.  $\beta_0, \beta_1, \dots, \beta_6$  and  $\gamma_j$  ( $j = 1, 2, \dots, 7$ ) are the coefficients to the estimated; thereby  $\beta_4, \beta_5, \beta_6$  are slope dummy coefficients for  $\beta_1, \beta_2, \beta_3$ . Appropriate tests with additional slope dummies (e.g. for different state labour offices) showed that relieving further restrictions was not required on statistical grounds.

Economically, equation (2) states that, for an unemployed person at the end of september in year  $t$ , the natural log of the odds of being long-term unemployed depends on his particular set of structural characteristics; thereby, with grouped data, the odds are approximated by the actual ratio of long- and short-term unemployment in group  $i$ , and the structural characteristics are represented by corresponding dummy realizations for the group as a whole.<sup>27</sup>

Table 6 presents ordinary least squares estimates of equation (2) for the four years 1975, 1979, 1983 and 1987, for male and female unemployed respectively. As the adjusted  $R^2$  indicate, the structural characteristics do quite well explain the cross-section variation of the endogenous variable, especially for the latest year 1987. As to the relative importance of the lack of vocational qualification (Q), an impaired health (H) and age above 55 years (A), the message is fairly unambiguous: all throughout H and A have a higher explanatory power than Q; however, since 1983, the gap has somewhat narrowed, with a lack of qualification now playing a more prominent role than in the 1970's for both sexes. As to health and age, the latter outperforms the former for women; the reverse holds for men up to 1983, but not anymore in 1987. For both sexes, age gains quite dramatically in importance in the course of the cyclical upswings from 1975 to 1979 and from 1983 to 1987. The signs of the slope dummy coefficients reasonably complement the picture: they are negative for BA and HA, because age and to some extent also bad health have by themselves such a prominent influence on the probability of long-term unemployment that, when applying together or with other characteristics, any additional handicap has a much smaller marginal effect than if it applies alone. This is not the case when H and Q apply together since an unimpaired health is likely to be an asset for

---

<sup>27</sup> As the endogenous variable in the equation is a proxy of the true variable, the error term  $\epsilon$  also reflects the approximation error; as this error declines with the number of units in group  $i$ , some heteroskedasticity of  $\epsilon$  could be expected (see Pindyck, Rubinfeld, 1981, pp. 290 ff.). However, as appropriate estimates showed, the efficiency gain of using weighted instead of ordinary least squares turned out to be negligible.

Table 6 - Estimated Coefficients of Logit-Model (equation 2)

	1975		1979		1983		1987	
	male	female	male	female	male	female	male	female
Const.	-2.92 (0.08)	-2.94 (0.07)	-2.66 (0.08)	-2.24 (0.05)	-1.95 (0.06)	-1.82 (0.04)	-1.87 (0.05)	-1.58 (0.04)
Q	0.14 (0.08)	0.19 (0.08)	0.09* (0.09)	0.11 (0.05)	0.31 (0.07)	0.32 (0.05)	0.26 (0.06)	0.36 (0.04)
H	1.39 (0.08)	0.87 (0.08)	1.46 (0.09)	0.71 (0.05)	0.89 (0.07)	0.62 (0.05)	0.79 (0.06)	0.51 (0.04)
A	0.92 (0.08)	1.05 (0.08)	1.42 (0.09)	1.49 (0.05)	0.63 (0.07)	1.17 (0.05)	1.38 (0.06)	1.56 (0.04)
QH	0.23 (0.10)	0.19 (0.09)	0.24 (0.10)	0.29 (0.06)	0.11* (0.08)	0.15 (0.06)	0.13 (0.06)	0.11 (0.05)
QA	-0.12* (0.10)	-0.28 (0.09)	-0.02* (0.10)	-0.10 (0.06)	-0.12* (0.08)	-0.30 (0.06)	-0.14 (0.06)	-0.29 (0.05)
HA	-0.75 (0.10)	-0.35 (0.09)	-1.09 (0.10)	-0.68 (0.06)	-0.48 (0.08)	-0.32 (0.06)	-0.70 (0.06)	-0.49 (0.05)
State (1st)	0.23 (0.09)	0.12* (0.08)	0.72 (0.10)	0.30 (0.06)	0.63 (0.07)	0.51 (0.05)	0.70 (0.06)	0.57 (0.05)
State (2nd)	0.23 (0.09)	0.10* (0.08)	0.45 (0.10)	0.22 (0.06)	0.49 (0.07)	0.44 (0.05)	0.67 (0.06)	0.46 (0.05)
State (3rd)	0.18 (0.09)	0.06* (0.08)	0.25 (0.10)	0.22 (0.06)	0.44 (0.07)	0.27 (0.05)	0.63 (0.06)	0.45 (0.05)
$\bar{R}^2$	0.91	0.90	0.92	0.96	0.90	0.96	0.96	0.98
SEE	0.21	0.19	0.22	0.13	0.16	0.12	0.14	0.10
n	72	72	72	72	72	72	72	72
Name of 1st state	RP/S	NW	RP/S	NW	NW	NW	NW	NW
Name of 2nd state	NW	LS/B	NW	LS/B	SH/H	LS/B	SH/H	LS/B
Name of 3rd state	LS/B	HS	SH/H	RP/S	LS/B	RP/S	LS/B	SH/H

Notes: Estimated equation  $\ln[p_i/(1-p_i)] = \beta_0 + \beta_1 Q_i + \beta_2 H_i + \beta_3 A_i + \beta_4 Q_i H_i + \beta_5 Q_i A_i + \beta_6 H_i A_i + \sum_j \gamma_j D_{ji} + \varepsilon_i$ , with subscript i denoting group i, p defined as the share of long-term unemployed (uncompleted spell over 1 year) in total unemployment of the respective group, Q as a dummy variable for unemployed with no vocational qualification, H as a dummy variable for unemployed with impaired health or a physical handicap, A as a dummy variable for unemployed with age above 55 years, QH as a dummy variable for those unemployed with both characteristics Q and H, QA for those with both Q and A and HA for those with both H and A;  $D_j$  are dummy variables for the German state labour offices Schleswig-Holstein/Hamburg ( $D_1$ ; SL/H), Lower Saxony/Bremen ( $D_2$ ; LS/B), Northrhine-Westfalia ( $D_3$ ; NW), Hesse ( $D_4$ ; HS), Rhineland-Palatine/Saar ( $D_5$ ; RP/S), Northern Bavaria ( $D_6$ ) and Berlin ( $D_7$ ); in the table, only coefficients and names of the three state labour offices with the highest dummy coefficients are presented;  $\varepsilon$  denotes a random error term.  $\beta_0, \beta_1, \dots, \beta_6$  and  $\gamma_j$  ( $j = 1, 2, \dots, 7$ ) were estimated by ordinary least squares.  $\bar{R}^2$  = adjusted  $R^2$ ; SEE = standard error of estimation; n = number of observations; standard estimation error of coefficients are given in brackets. \* = coefficient not significantly different from zero at the 5 %-level.



compensating a lack of qualification. For both sexes, the development of the three state dummy coefficients indicates an increasing importance of regional factors in the recovery periods 1975-79 and 1983-87, at least relative to Q and H. Note that, in general, regional factors which are closely linked to the geographical incidence of structural change, play a more important role for men than for women; this is not surprising, since men are likely to have their human capital more specifically tied to some sectoral activity. Note also that the names of the 'top states' indicate the regional factor to have become more geographically concentrated: up to 1983, the southern labour office Rhineland-Palatine/Saar was still among the leaders in long-term unemployment due to the declining coal mining and steel industry in the Saar Valley; since then, the states of the northern plains are left alone at the top.<sup>28</sup>

To broadly summarize, Table 6 points - comparatively speaking - to

- a modest, but somewhat increasing importance of qualification,
- a marked, but decreasing importance of health,
- an overwhelming and still increasing importance of age, and
- a marked and increasing importance of regional factors

as determinants of long-term unemployment.

Table 7 supplements this picture by presenting the fitted probabilities (based on the estimates in table 6) of long-term unemployment for an

---

<sup>28</sup> The same model was estimated for the remaining years 1976-78, 1980-82 and 1984-86. In general, these additional estimates supported all conclusions about intertemporal changes which are drawn in the text on basis of the estimates in four-year-intervalls. - Note that the method of computing long-term unemployment has been slightly changed in 1983. Before that time, very short periods of employment (up to 13 weeks) were not counted as terminating a spell of unemployment; from 1983 onwards, they are counted as such (for details, see Paqué 1989b, p. 32, footnote 30 and Werner 1987, pp. 41 f.). Hence, for the years 1975 and 1979, the overall level of p is biased upwards. As a parallel estimate for 1983 with p measured in the old and the new way showed, the relative magnitude of the coefficients is virtually the same for both methods of computing p; thus none of our major conclusions should be much affected.

Table 7 - Probability (in %) for an unemployed man to be long-term unemployed (based on estimates of Table 6)

	1975	1979	1983	1987
in BW, SB:				
Q = H = A = 0	5.1	6.6	12.5	13.4
Q = 1, H = A = 0	5.8	7.1	16.2	16.7
H = 1, Q = A = 0	17.7	23.3	25.8	25.3
A = 1, Q = H = 0	11.9	22.5	21.2	38.1
Q = H = 1, A = 0	23.8	29.6	34.6	33.5
Q = A = 1, H = 0	12.1	23.6	24.5	41.0
H = A = 1, Q = 0	20.4	29.6	28.8	40.1
Q = H = A = 1	24.9	36.3	35.4	46.5
Q = H = A = 0:				
- in 1st state	6.3	12.6	21.0	23.8
- in 2nd state	6.3	9.9	18.9	23.2
- in 3rd state	6.0	8.3	18.0	22.4
Share of long-term in total unemployment (men)	11.0	22.3	25.4	31.8

unemployed man at different configurations of his structural characteristics.<sup>29</sup> As to the cyclical pattern of long-term unemployment, the table reveals some striking features:

- (i) The 'base probability' - i.e. the probability of being long-term unemployed despite the best possible structural characteristics - made a jump from the cyclical peak of 1979 to the unemployment trough of 1983, but hardly increased in the two recovery periods 1975-79 and 1983-87. Hence the rise of the share of long-term in total unemployment from 11 % in 1975 to 22.3 % in 1979 and from 25.4 % in 1983 to 31.8 % in 1987 should be largely due to structural factors.
- (ii) In the recovery period 1975-79, all structural characteristics except qualification markedly increased their importance, with 'age' and 'region' having the lead. In the downswing 1979-83, 'qualification' and 'region' strongly gained ground while the

<sup>29</sup> To keep the table lucid, only the case of male unemployed is considered. However, the following conclusions by and large apply to the case of female unemployed as well.

power of 'health' and 'age' stagnated. In the recovery period 1983-87, 'age' has become by far the most important determinant of long-term unemployment growth, followed by 'region'; in turn, 'qualification' and 'health' have lost clout.

On the whole, our results support the view that external rather than internal forces are mostly responsible for human capital devaluation and thus for labour market dualization in Germany. To explain why age, bad health and lack of qualification have reduced the long-term chances for reemployment, one does not need any recourse to a powerful process of dequalification and demotivation during a jobless spell. Rather, it is sufficient to assume that, given the high level of dismissal protection German labour law and collective bargaining agreements grant to any worker under normal business cycle conditions<sup>30</sup>, the cyclical downturns of 1974-75 and 1981-82 were taken by firms as a chance to cut down their labour costs by laying off the least productive workers. Right from the start as job seekers, those laid-off workers with some 'structural handicap' (lack of qualification, impaired health and, above all, age) were at a disadvantage since - given the quite rigid structure of collective bargaining wages - there is no chance for them to offer a compensatory wage cut for their particular handicap. Hence, in the course of economic recovery, they were left untouched as a sediment of long-term unemployment. Note that, in this light, the human capital devaluation usually precedes the state of unemployment; it is only temporarily concealed by favourite cyclical conditions and the constraints imposed by the labour law which prevents a continuous equilibrium type adjustment of the wage and/or employment structure to the forces of structural change.<sup>31</sup>

---

<sup>30</sup> For a complete summary of dismissal protection in Germany, see Soltwedel (1980), pp. 185 ff. In general, German labour law requires that any dismissal must be 'socially justified', with by far the most important case of justification being urgent business requirements. Of course, this condition is most likely to be met in times of recession.

<sup>31</sup> On this matter, see Soltwedel (1988), pp. 190 ff.

The changing relative importance of the three structural handicaps lack of qualification, impaired health and age as determinants of long-term unemployment fits nicely into the general pattern of structural change of the German economy from a smokestack industrial to a modern industrial and service economy. Apparently, age and lack of qualification increase their importance since modern industrial and service sectors require on average more sophisticated skills which cannot be expected from the unqualified labour force, and a high degree of flexibility which cannot be expected from older people. Conversely, an impaired health loses some of its prior importance which it had at the heyday of industrial society since, comparatively speaking, the market value of crude physical force has declined.

The increasing importance of regional factors for the explanation of long-term unemployment appears to be a direct reflection of the regional incidence of economy-wide structural change: laid-off workers in declining regions remain long-term unemployed either because their skills are too specifically linked to the declining sectors or because not enough job alternatives in other sectors are available in the region. At least in the latter case, our evidence somewhat contradicts the received wisdom in the modern macroeconomic literature that regional imbalances are no important elements of the unemployment malaise in Germany (and Europe in general).<sup>32</sup> In the following, we shall critically evaluate this view.

## 2. Interregional Imbalances

The received wisdom is mainly based on the so-called indices of mismatch between unemployment and vacancies. Regional balance is assumed to prevail whenever it is impossible to increase the rate of job hirings and thus to reduce unemployment through interregional movements of the unemployed. The rationale behind this definition has

---

<sup>32</sup> See, e.g., Burda, Sachs (1987), Franz (1987c), Franz, König (1986), Jackman et al. (1984), Jackman, Roper (1987), Layard et al. (1985).

some intuitive appeal: only to the extent that the particular (mal-)distribution of unemployed and vacancies contributes to overall employment, may it make sense to speak of unemployment caused by an existing regional imbalance. Two major measures of mismatch are 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 region  $i$  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 between regions to achieve regional balance, and  $M2$  as the potential employment gain which could be achieved if regional balance was established through this interregional movement.<sup>33</sup> These measures have served as the framework for the claim that regional unemployment has not substantially increased in Germany in recent years.

The argument is usually based on cross-section data of the 142 German local labour offices: as can be seen in Table 8 (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 persistence of 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., state labour offices) and the balance within these units (between local labour offices), a much more differentiated picture emerges (Table 8 (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 ratio of inter-state to total mismatch unemployment rose quite dramatically from 56.1 % to 89.8 % in terms of  $M1$  and

---

<sup>33</sup> For details, see Jackman, Roper (1987), pp. 11 ff. For a methodological critique of the measures, see Paqué (1989b), pp. 6 ff.

Table 8 - Regional Mismatch Indices for Germany

	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						
- SH/H	19.0	16.7	12.0	2.3	1.8	1.2
- LS/B	16.4	13.8	9.7	2.2	1.5	0.7
- NW	15.5	15.0	13.5	1.8	1.8	1.4
- HS	20.5	20.6	18.3	3.0	3.2	1.5
- RP/S	23.0	21.6	14.0	3.8	3.0	2.5
- BW	19.1	19.1	17.5	2.6	2.7	2.2
- NB	22.8	21.0	18.0	3.6	2.7	2.1
- SB	19.1	21.5	14.9	2.6	3.1	1.6
Ratio of Inter-State (1) to Total (2), in %	56.1	75.1	89.8	30.5	48.2	66.6

Notes:

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

Abbreviated names of state and state labour offices: SH/H = Schleswig-Holstein/Hamburg; S/B = Lower Saxony/Bremen; NW = Northrhine-Westfalia; HS = Hesse; RP/S = Rhineland-Palatine/Saar; BW = Baden-Württemberg; NB = Northern Bavaria; SB = Southern Bavaria.

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, regional 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 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').

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- or U/V-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>34</sup> 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.<sup>34a</sup> 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 9 presents the estimates of a Beveridge-curve of the form

$$(3) \ln U_t = \beta_0 + \beta_1 \ln V_t + \beta_2 T_t + \epsilon_t,$$

---

<sup>34</sup> On the Beveridge curve, see Jackman, Roper (1987), pp. 25 ff.

<sup>34a</sup> Note that the last alternative is likely to be particularly relevant in Germany since most labour market observers agree that the notorious inefficiency of German labour offices makes firms refrain from notification. Right now, the number of vacancies is estimated to be around 600000 whereas less than 200000 are officially registered. If the inclination of firms to notify vacancies is negatively correlated with the regional unemployment rate due to the comparatively poor quality of the unemployed in boom regions, the mismatch measures will be biased downwards.

Table 9 - Estimates of Beyeridge-Curves for German State Labour Offices 1960-87<sup>1,2</sup>

	const.	lnV	T	$\rho$	$\bar{R}^2$	SEE	T(74-87)
BL	2.11 (0.68)	-1.24 (0.37)	3.5 (2.0)	0.88 (0.09)	0.71	0.14	7.6 (2.0)
SH/H	2.36 (0.26)	-1.50 (0.17)	2.5 (0.8)	0.57 (0.17)	0.93	0.10	3.0* (1.9)
LS/B	2.26 (0.26)	-1.41 (0.17)	3.0 (0.8)	0.56 (0.17)	0.93	0.10	4.5 (1.2)
NW	2.24 (0.31)	-1.46 (0.19)	2.7 (1.0)	0.60 (0.15)	0.93	0.10	3.1 (1.4)
HS	2.41 (0.27)	-1.45 (0.16)	1.0* (0.8)	0.45 (0.17)	0.95	0.10	-0.6* (1.7)
RP/S	2.12 (0.23)	-1.51 (0.17)	2.8 (0.7)	0.54 (0.17)	0.93	0.09	3.0 (0.9)
BW	1.85 (0.40)	-1.21 (0.22)	2.2 (1.1)	0.23* (0.19)	0.90	0.18	2.2* (1.5)
NB	2.60 (0.17)	-1.38 (0.11)	0.6* (0.5)	0.29* (0.19)	0.96	0.09	1.2* (0.7)
SB	2.54 (0.25)	-1.29 (0.16)	0.3* (0.7)	0.52 (0.17)	0.90	0.09	1.7 (0.6)

<sup>1</sup> Estimated Equation:  $\ln U_t = \beta_0 + \beta_1 \ln V_t + \beta_2 T_t + \epsilon_t$ , with U being the average unemployment rate (in % plus 1), V being the average vacancy rate (in % plus 1) in year t and T being a trend variable (trend coefficient in the table equals estimated coefficient times 100); all equations were estimated by instrumental variable technique with correction for first-order autocorrelation of residuals and  $\rho$  being the estimated autocorrelation coefficient (instruments:  $\ln V_{-1}$ ,  $\ln C$ ,  $\ln C_{-1}$ , T,  $T_{-1}$ ,  $\ln U_{-1}$ , with C defined as economy-wide degree of capacity utilization, computed by the Institute of World Economics, Kiel),  $\bar{R}^2$  = adjusted  $R^2$ ; SEE = standard estimation error; T(74-87) = trend coefficient of separate estimate for period 1974-87; standard estimation errors of coefficients in parenthesis; (\*) = coefficient not significantly different from zero at the 5 %-level.

<sup>2</sup> Abbreviations:

BL = Berlin; SH/H = Schleswig-Holstein/Hamburg; LS/B = Lower Saxony/Bremen; NW = Northrhine-Westfalia; HS = Hesse; RP/S = Rhineland-Palatine/Saar; BW = Baden-Württemberg; NB = Northern Bavaria; SB = Southern Bavaria.



with U being the average unemployment rate (in % plus 1), V being the average vacancy rate (in % plus 1) in year t and T being a trend variable;<sup>35</sup> equation (3) was estimated with instrumental variable techniques<sup>35a</sup> for nine German state labour offices which - with minor exceptions - come down to the German states. The results are remarkable: the coefficients of the vacancy rate all have the expected negative sign and fall into a fairly narrow range between -1.2 and -1.5; in contrast most trend coefficients are positive and differ widely between states. Thereby, 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 Northrhine-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 and the estimated trend coefficients of the equations turns out negative and highly significant (around -0.8). The same holds for a separate estimate of these curves for the period 1974-87 of which only the trend coefficients are reprinted in the table. All this points to a marked regional component explaining the differential shifts of the Beveridge curves.<sup>36</sup> Hence the great emphasis which some studies

---

<sup>35</sup> Some specification search showed that a log-linear Beveridge-curve performed best on statistical grounds for all state labour offices; however, our main conclusions about the trend shifts turned out to be very robust with respect to specification changes. - As the vacancy and the unemployment rates are extremely low for some states in some years of the sample period (i.e. below 0.5 %), we added 1 all throughout so that changes in the lowest range do not receive too much weight in the log-linear specification. - To account for intertemporal shifts of the curve, a simple linear trend was sufficient; quadratic and cubic trend terms in appropriate specifications turned out mostly insignificant.

<sup>35a</sup> For technical details, see notes to Table 9.

<sup>36</sup> This result deviates sharply from the results of Jackman, Roper (1987) for Britain (p. 31). As there are some differences in the specification of the relevant equations, it is unclear whether this really reflects genuine differences in development between Germany and Britain or simply methodological peculiarities. In

have put on global factors - above all, a not further explained decline of search intensity<sup>37</sup> - looks somewhat misplaced, at least for the case of Germany. Instead, interregional differences of the employment performance may explain a good part of the curves' shifts.

To summarize, our results point to an increase of regional disparities of unemployment during the last two decades in Germany. Of course, this increase has been too creeping to account for sudden upward shifts of unemployment. However, it may well help to explain a significant part of unemployment persistence.

### 3. Structural Change between Sectors

There is a more fundamental sense in which current unemployment in Germany may be called structural or 'micro'. It goes back to the empirical argument in Section III that, since the mid-70s, the growth of the wage gap has predominantly been a structural phenomenon, with manufacturing - and not the modern service sector - bearing the main share of the burden. The question then arises: can a 'structural' wage gap explain aggregate unemployment? After all, the net loss of about two million jobs in the recessions 1974-75 and 1981-83 was almost exclusively due to the shrinkage of industrial employment while the moderate employment gains in the recovery periods 1975-80 and 1983-88 were mostly - though not exclusively - made in service sector employment.<sup>37a</sup> A tentative answer to this question lies in a comparison of the German case with a country which experienced a rapid structural change between sectors without

---

Footnote 36 continued

general, the regional component of unemployment in Britain looks much less dramatic in recent years than in Germany (Paqué, 1989b, p. 9, Table 2), where unemployment rates in 1987 covered a range from 5.1 % in Baden-Württemberg to 11.8 % in Lower Saxony/Bremen.

<sup>37</sup> See, e.g., Jackman et al. (1984), pp. 26 f.

<sup>37a</sup> See Glyn, Rowthorn (1988), pp. 146 and Paqué (1989b), pp. 4 ff.

persistent 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>38</sup> Apparently, intersectoral wage flexibility allowed a 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 high wage gap and, on top of it, two sharp recessions, another sector was due to take over the labour load. It did to some extent, with an employment growth rate of about 2.3 % p.a. in 1976-80 and 2.8 % p.a. in 1983-87. Clearly, this was not sufficient to cut back unemployment as labour force growth speeded up due to a rising participation ratio. Hence, without removing the structural wage gap in manufacturing itself, a return to full employment could only happen in two different ways: either the wage level in the service sector was reduced relative to manufacturing so that low productivity laid-off workers could find a service job, or the wage level was reduced altogether so that - at a given relative wage distortion between manufacturing and services - both sectors could expand. Thus, in the seventies and eighties Germany had and still has two alternatives: either it imitates the United States by allowing some more intersectoral wage flexibility to give service sector employment an additional boost above its trend

---

<sup>38</sup> Burda, Sachs (1987), p. 31, Table 13. Also, a good part of the exceptionally bad overall productivity growth of the US-economy and the disproportionately large increase of low-wage employment may be explained by this rapid structural change. See Bluestone, Harrison (1988), Freeman (1988), and The Economist of Nov. 12, 1988, p. 86 f. "America's Shrinking Middle".

growth, or it imitates its own past in the early sixties when the relatively low wage level allowed structural change to proceed in a state of overemployment.<sup>39</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 vast 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 may well explain at least part of the persistent unemployment in Germany.<sup>40</sup>

#### V. Summary of Diagnosis and Policy Conclusions

Our main diagnostic points from the preceding two sections may be summarized as follows:

1. The bulk of German unemployment arose in the course of the two severe macroeconomic stabilization crises 1974-75 and 1981-83. At its new dimension, the labour market disequilibrium subsequently took on hysteretic macro features, i.e.
  - nominal wage inflation resumed its normal path despite a persistently high unemployment rate, and
  - a dual labour market developed, with a growing share of long-term unemployed.
2. The main reasons for the hysteretic macro picture lie in a combination of microeconomic or structural factors:
  - (i) In the German economy with its extensive dismissal protection for labour in normal times, there is likely to be a strong

---

<sup>39</sup> See Paqué (1988).

<sup>40</sup> 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 aggregate.

asymmetry between lay-offs and reemployment: Firms use sharp cyclical downturns to purge their labour stock of the least productive workers, but do not reemploy them as soon as a 'fresh' (and prospectively more productive) labour becomes available in the market as in fact happens when the labour force grows. Hence a recession uncovers a human capital devaluation which has already taken place on the job due to e.g. age, impaired health or, to a lower extent, lack of qualification, but which has to be tolerated by firms under normal cyclical conditions because dismissal protection impedes a more continuous adjustment and regeneration of employment.

- (ii) Measured properly, regional disparities in Germany have grown since the mid-seventies so that, to an increasing extent, long-term unemployment is not only the outcome of a genuine devaluation of human capital, but also of a lack of labour demand in regions with a particularly bad structural mix of economic activity.
- (iii) As the net loss of about two million jobs in the recessions 1974-75 and 1981-83 occurred in manufacturing where the pressure of labour costs was particularly pronounced due above all to unfavourable terms-of-trade effects, more jobs were to be created in the service sector to prevent laid-off industrial workers from growing into long-term unemployment. This happened, but - compared to the US-economy - to a very modest degree mainly because intersectoral wage rigidity did not allow low wage service sector employment to grow as it did in the United States.

3. For diagnostic purposes, the standard explanation of hysteresis - too high a wage level in an insider-outsider framework and human capital devaluation in the course of an unemployment spell - are only of secondary importance since
- estimates of aggregate, not of manufacturing wage gaps do not support the view that the current wage level is much too high, and

- the incidence of long-term unemployment is so strongly related to identifiable structural characteristics that it would be far-fetched to place much explanatory weight on processes of endogenous dequalification or demotivation.

Given this diagnosis, what can economic policy contribute to reducing unemployment in Germany? As to microeconomic or structural policy, there are at least three interesting policy options.

1. The apparently large differences in human capital values between labour of different age groups, health status and qualification as well as the pronounced regional component of unemployment call for more wage differentiation. In the extreme, anybody with a structural handicap should be allowed to offer his labour at a wage which is below, may be substantially below the standard wage as fixed in collective bargaining agreements. Thus long-term unemployed could compensate their inherent structural disadvantage by individually offering favourable terms of trade to firms; declining regions could attract capital by cutting labour costs and thus compensating for other unfavourable local conditions.

Of course, there are counterarguments against this kind of policy: (i) One may argue that efficiency wage considerations would prevent firms from taking advantage of their potential for (downward) wage differentiation. Prima facie, the experience of the United States speaks against this argument. In any case, the only way of testing its validity is by allowing all kinds of differentiation in collective bargaining, and then see whether they have a chance for survival in the labour market. (ii) One may argue that the wages of many now long-term unemployed would fall below the level of long-term unemployment aid which is paid indefinitely as a fixed percentage (at least 56 % of the last net income in employment) so that a classical poverty gap would emerge. Again, this may be true, but it could only be tested in a market unconstrained by collective bargaining standards. At any rate, it would clarify the

costs in terms of 'voluntary unemployment' of a social system which is anchored in past human capital valuation. In addition, some minor reforms of the unemployment aid system such as the introduction of a gradual phasing out of unemployment aid at certain income threshold levels could help to alleviate the problem. (iii) One may argue that introducing wage differentials which go substantially above the traditionally accepted extent<sup>41</sup> will simply not be acceptable to unions since this would come down to a virtual dismantling of corporatist wage setting. This is no doubt true since some sort of collective social peace guaranteed by corporatist institutions enjoys high esteem in the German public. Hence, while wage differentiation appears to be the most obvious and effective instrument at hand, it may not be usable in the corporatist environment of Germany.

2. Theoretically, a labour market programme aimed at raising the productivity of long-term unemployed may do the same job as a wage cut for this group. As to unqualified labour, this may in fact be so in practice although the casual evidence on qualification initiatives is far from unambiguous. As to those unemployed of advanced age or bad health (who alone make up about 40 % of all long-term unemployed), the situation is more gloomy since their structural handicap cannot be removed by more vocational training. As to the regional factor, temporary programmes to support employment growth in depressed regions by, e.g., subsidizing capital formation, make economic sense; however, experience shows that these programmes have a tendency to degenerate into a channel for permanent subsidization of senile industries without any significant structural improvements. On the whole, targeted supply side programmes of this kind cannot serve as more than supplementary tools, not as core elements of a successful fight against unemployment.

---

<sup>41</sup> There is disagreement about whether industrial wage differentiation has increased, decreased or remained constant in recent years in Germany (see Bell, Freeman 1985; Gundlach 1986; Soltwedel 1988). In any case, the increase of differentiation - if it happened at all - was very modest relative to the extent of structural imbalances.

3. A third policy option would be a thorough deregulation of some markets for goods and services to initiate a wave of productivity gains. Favourite candidates could be some modern service sectors such as communications, transport and insurance where expansion in Germany lagged well behind other industrialized countries, above all the United States. If such a productivity push is not anticipated by collective bargaining, there may be a chance for a reduction of unit labour costs in these sectors and a corresponding surge of service employment. At its (admittedly utopian) best, this kind of development - initiated by the completion of the European Common Market in 1992 - could parallel the miraculous German growth of the 1950's when the fast integration of world markets for industrial products allowed German manufacturing to expand rapidly and thus to absorb the labour surplus due to the inflow of refugees after World War II.<sup>42</sup>

As to macro policy, one must make a clear distinction between supply and demand side measures. Policies aimed at increasing the elasticity of aggregate supply will help to alleviate the unemployment problem to the extent that, through substitution effects, any increase of labour demand for some parts of the labour force eventually triggers down to the structurally disadvantaged groups. Clearly, this must be welcome. The same holds for a general wage moderation and thus a general cut in labour costs, if - again - the excess demand for labour in some parts of the economy can be channelled through relative wage effects (wage drift) into the disadvantaged parts. Whether this happens does, of course, depend on the willingness of the unions to accept a new surge of wage drift for some time, without a rapid adjustment of the standard wage. The German experience of the early seventies when excessive wage drift in 1968/69 contributed to the subsequent wage revolution, makes one somewhat sceptical about this prospect.

As to monetary demand policy, it is hard to see what it should do in the present boom period other than passively complementing any

---

<sup>42</sup> See Paqué (1987).



prospective expansion of aggregate supply. Clearly, with high capacity utilization as it prevails, any deliberate monetary expansion to increase employment would lead right into inflationary bottlenecks, just as it did in the cyclical overheating at the end of the seventies when the German economy took over the role of an international demand locomotive. At that time, the unemployment rate could be cut down by just one percentage point in a two-year expansion which pushed up the inflation rate from 2.8 % in 1978 to almost 6 % in 1980, thus providing the rationale for the then following sharp contractionary monetary measures with all their far-reaching long-term consequences.

As to fiscal demand policy, things look hardly different. Whatever the long-term merits of income tax cuts may be as a supply side measure, they are hardly needed to support an ongoing boom; if they had an expansionary effect, it is now likely to foster price inflation, not real income and employment growth. The same holds a fortiori for an increase in public spending, even if it is on infrastructure investment. There may be arguments for this kind of public investment to remove bottlenecks on the supply side, although even these arguments are weak for a country like Germany with its very good infrastructure; however, it looks misplaced and ill-timed as a deliberate expansionary demand policy.

To summarize, only micro policies can now help to alleviate the German unemployment problem which, in the current macroeconomic climate, has become a kind of singular monument of past macroeconomic failures. To be sure, nothing spectacular should be expected from any move towards more structural differentiation and flexibility as it has been advocated here. Such a move will only help to speed up the reintegration of those parts of the unemployed who still have at least some realistic chance of finding a job. Otherwise, we may have to wait until the gigantic demographic shifts at the end of this century finally 'solve' the problem by drastically cutting labour supply, not by increasing labour demand.

## References

- ARTUS, Jacques R. (1984), "The Disequilibrium Real Wage Rate Hypothesis. An Empirical Evaluation". IMF Staff Papers Vol. 31 (1984), pp. 249-302.
- BELL, Linda A. (1985), Richard B. Freeman, Does a Flexible Industry Wage Structure Increase Employment?: The U.S. Experience. National Bureau of Economic Research. Working Paper No. 1604.
- BLANCHARD, Olivier, Lawrence H. SUMMERS (1986a), Hysteresis and the European Unemployment Problem. NBER Macroeconomic Annual 1986. Cambridge, Mass. 1986.
- , -- (1986b), Hysteresis in Unemployment. NBER Working Paper No. 2035. Cambridge, Mass. 1986.
- , -- (1986c), Fiscal Increasing Returns, Hysteresis, Real Wages and Unemployment. Harvard Institute of Economic Research. Discussion Paper No. 1266. Cambridge, Mass. 1986.
- , -- (1988), "Beyond the Natural Rate Hypothesis". American Economic Review, Papers and Proceedings Vol. 78 (1988), pp. 182-187.
- BLUESTONE, Barry, Bennett HARRISON (1988), "The Growth of Low-Wage Employment: 1963-86". American Economic Review, Papers and Proceedings, Vol. 78 (1988), pp. 124-128.
- BRUNO, Michael (1986), "Aggregate Supply and Demand Factors in OECD Unemployment: An Update". *Economica*, Vol. 53 (1986), No. 210, pp. S35-S52.
- , Jeffrey D. SACHS (1985), *Economics of Worldwide Stagflation*. Cambridge, Mass. 1985.
- BUDD, Alan, Paul LEVINE, Peter SMITH (1988), "Unemployment, Vacancies and the Long-Term Unemployed". *Economic Journal*, Vol. 98 (1988), pp. 1071-1091.
- BURDA, Michael C., Jeffrey D. SACHS (1987), Institutional Aspects of High Unemployment in the Federal Republic of Germany. NBER Working Paper 2241. Cambridge, Mass. 1987.
- COE, David T. (1985), "Nominal Wages, the NAIRU and Wage Flexibility". OECD Economic Studies No. 5 (1985), pp. 85-126.
- (1988), "Hysteresis Effects in Aggregate Wage Equations". In: CROSS, Rod (Ed.), *Unemployment, Hysteresis and the Natural Rate Hypothesis*. Oxford 1988, pp. 284-305.

COEN, Robert M., Bert G. HICKMAN (1988), "Is European Unemployment Classical or Keynesian?" *American Economic Review, Papers and Proceedings*, Vol. 78 (1988), pp. 188-193.

CROSS, Rod (1988) (Ed.), *Unemployment, Hysteresis and the Natural Rate Hypothesis*. Oxford 1988.

THE ECONOMIST of Nov. 12, 1988, pp. 86 f. "America's Shrinking Middle".

-- of Feb. 4, 1989, p. 65 "Still Waiting for the Locomotive".

FELS, Joachim, Günter FLEMIG, Enno LANGFELDT, Peter TRAPP (1988), "Bundesrepublik Deutschland: Zunehmende Angebotsengpässe". *Die Weltwirtschaft*, 1988, Heft 2, pp. 26-45.

FITOUSSI, Jean P., Edmund S. PHELPS (1988), *The Slump in Europe - Reconstructing Open Economy Theory*. Oxford 1988.

FRANZ, Wolfgang (1987c), *Strukturelle und friktionelle Arbeitslosigkeit in der Bundesrepublik Deutschland: Eine theoretische und empirische Analyse der Beveridge-Kurve*. In: BOMBACH et al. (Eds.), *Zur Theorie und Politik der internationalen Wirtschaftsbeziehungen*. Tübingen 1987.

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

FREEMAN, Richard B., "Evaluating the European View that the United States Has No Unemployment Problem". *American Economic Review, Papers and Proceedings*, Vol. 78 (1988), pp. 294-299.

GIERSCH, Herbert (1967), "Probleme stabilitätskonformer Lohnpolitik". *Kyklos*, Vol. 20 (1967), pp. 147-165.

GLYN, Andrew, Bob ROWTHORN (1988), "West European Unemployment: Corporatism and Structural Change". *American Economic Review, Papers and Proceedings*, Vol. 78 (1988), pp. 194-199.

GORDON, Robert J. (1988), "Wage Gaps versus Output Gaps: Is There a Common Story for All of Europe?". In: GIERSCH, Herbert (Ed.), *Macro and Micro Policies for More Growth and Employment*. Symposium Kiel 1987. Tübingen 1988.

GUNDLACH, Erich (1986), "Gibt es genügend Lohndifferenzierung in der Bundesrepublik Deutschland?" *Die Weltwirtschaft*, Heft 2, pp. 74-88.

JACKMAN, Robert (1988), Review of "The Slump in Europe: Reconstructing Open Theory" by Fitoussi, Jean-Paul, Edmund S. Phelps. *Economic Journal*, Vol. 98 (1988), pp. 1248-49.

--, Steven ROPER (1987), "Structural Unemployment". *Oxford Bulletin of Economics and Statistics*, Vol. 49 (1987), pp. 9-36.

- JACKMAN, Robert, Richard LAYARD, Christopher PISSARIDES (1984), On Vacancies. Discussion Paper 165 (revised). London School of Economics, Centre for Labour Economics, London 1984.
- KATZ, Lawrence, Efficiency Wage Theories: A Partial Evaluation. NBER Working Paper 1906. Cambridge, Mass. 1986.
- LAYARD, Richard, Steven NICKELL (1985), "Unemployment, Real Wages and Aggregate Demand in Europe, Japan and the United States". Carnegie-Rochester Conference Series on Public Policy. Vol. 23 (1985), pp. 143-202.
- , --, Robert JACKMAN (1985), European Unemployment Is Keynesian And Classical, But Not Structural. Center of European Policy Studies, Working Documents 13. Brussels 1985.
- LINDBECK, Assar, Dennis SNOWER (1986), "Wage Setting, Unemployment and Insider-Outsider Relations". American Economic Review, Vol. 76 (1986), pp. 235-239.
- PAQUE, Karl-Heinz (1987), Labour Surplus and Capital Shortage - German Unemployment in the First Decade after the Currency Reform, Kiel Working Papers, 290. Institut für Weltwirtschaft. Kiel 1987.
- (1988), The Mixed Blessing of Labour Shortage. German Overemployment in the Sixties. Kiel Working Papers 332. Institut für Weltwirtschaft. Kiel 1988.
- (1989a), Is Structural Unemployment a Negligible Problem? A Critical Note on the Use of Mismatch Indices. Kiel Working Papers 357. Institut für Weltwirtschaft. Kiel 1989.
- (1989b), Wage Gaps, Hysteresis and Structural Unemployment. The West German Labour Market in the Seventies and Eighties. Kiel Working Papers, 332, Institut für Weltwirtschaft. Kiel 1988.
- PINDYCK, Robert, Daniel RUBINFELD (1981), Econometric Models & Economic Forecasts. New York 1981.
- SOLTWEDEL, Rüdiger (1980), Rückwirkungen sozialpolitischer Maßnahmen der Tarifpartner und des Staates zugunsten bestimmter Erwerbstätigen Gruppen auf dem Arbeitsmarkt - Identifikation und Vorschläge. Kiel 1980.
- (1988), "Employment Problems in West Germany - The Role of Institutions, Labour Law and Government Intervention". Carnegie-Rochester Conference Series on Public Policy. Vol. 28 (1988), pp. 153-220.
- SUMMERS, Lawrence (1988), "Relative Wages, Efficiency Wages, and Keynesian Unemployment". American Economic Review, Papers and Proceedings, Vol. 78 (1988), pp. 383-388.

SYMONS, James, Richard LAYARD (1984), "Neoclassical Demand for Labour Functions for Six Major Economies". *Economic Journal*, Vol. 94 (1984), pp. 788-799.

VAUBEL, Roland (1987), Möglichkeiten für eine erfolgreiche Beschäftigungspolitik. Paper presented at the Annual Meeting of the Verein für Socialpolitik in Berlin, 1987.

WERNER, Heinz (1987), Ermittlung der Arbeitslosigkeit und Leistungsbezug in der EG. Beiträge zur Arbeitsmarkt- und Berufsforschung 108. Nürnberg 1987.