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## Price and quantity adjustments in the Austrian labour market

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**Institut für Höhere Studien (IHS), Wien  
Institute for Advanced Studies, Vienna**

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**Helmut Hofer, Karl Pichelmann and Andreas-Ulrich Schuh**



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## **Abstract**

Austria is among the very few countries in the European Union which have managed to maintain comparatively low unemployment rates and high employment rates. In international comparison Austrian unemployment is very stable over the business cycle. This is mainly due to the high sensitivity of the labour force on cyclical conditions and, partly, also on the relatively weak responsiveness of employment to cyclical fluctuations in output, the latter being possibly attributable to the high degree of real wage flexibility in Austria. However, we also found evidence for outsider effects in the Austrian wage setting process stemming from the increased share of long term unemployed, which plausibly reflect human capital effects on reemployment possibilities for persons being unemployed for extended periods of time. Relative wage structures, on the other hand, appear to be rather rigid.

## **Zusammenfassung**

Österreich zählt zu den wenigen Ländern in der Europäischen Union, die es geschafft haben, ein hohes Beschäftigungsniveau bei vergleichsweise niedriger Arbeitslosigkeit aufrecht zu erhalten. Im internationalen Vergleich betrachtet, zeigt sich, daß die österreichische Arbeitslosenquote über den Konjunkturzyklus hinweg sehr stabil ist. Dies läßt sich hauptsächlich auf die hohe Sensitivität des Arbeitskräfteangebots in Hinblick auf die konjunkturelle Lage und teilweise auch auf die nur schwache Beschäftigungsresponse auf Produktionsschwankungen zurückführen. Letzteres dürfte durch die hohe aggregierte Reallohnflexibilität in Österreich erklärbar sein. Es finden sich aber auch empirische Hinweise auf Outsider-Phänomene im österreichischen Lohnbildungsprozeß, die vom steigenden Anteil der Langzeitarbeitslosen ausgehen. Höchstwahrscheinlich reflektieren diese Humankapitalverluste, welche die Wiederbeschäftigungschancen von Personen mit längerer Arbeitslosigkeitsdauer reduzieren. Im Gegensatz zur hohen makroökonomischen Reallohnflexibilität sind die relativen Lohnstrukturen in Österreich eher starr.

### **Keywords**

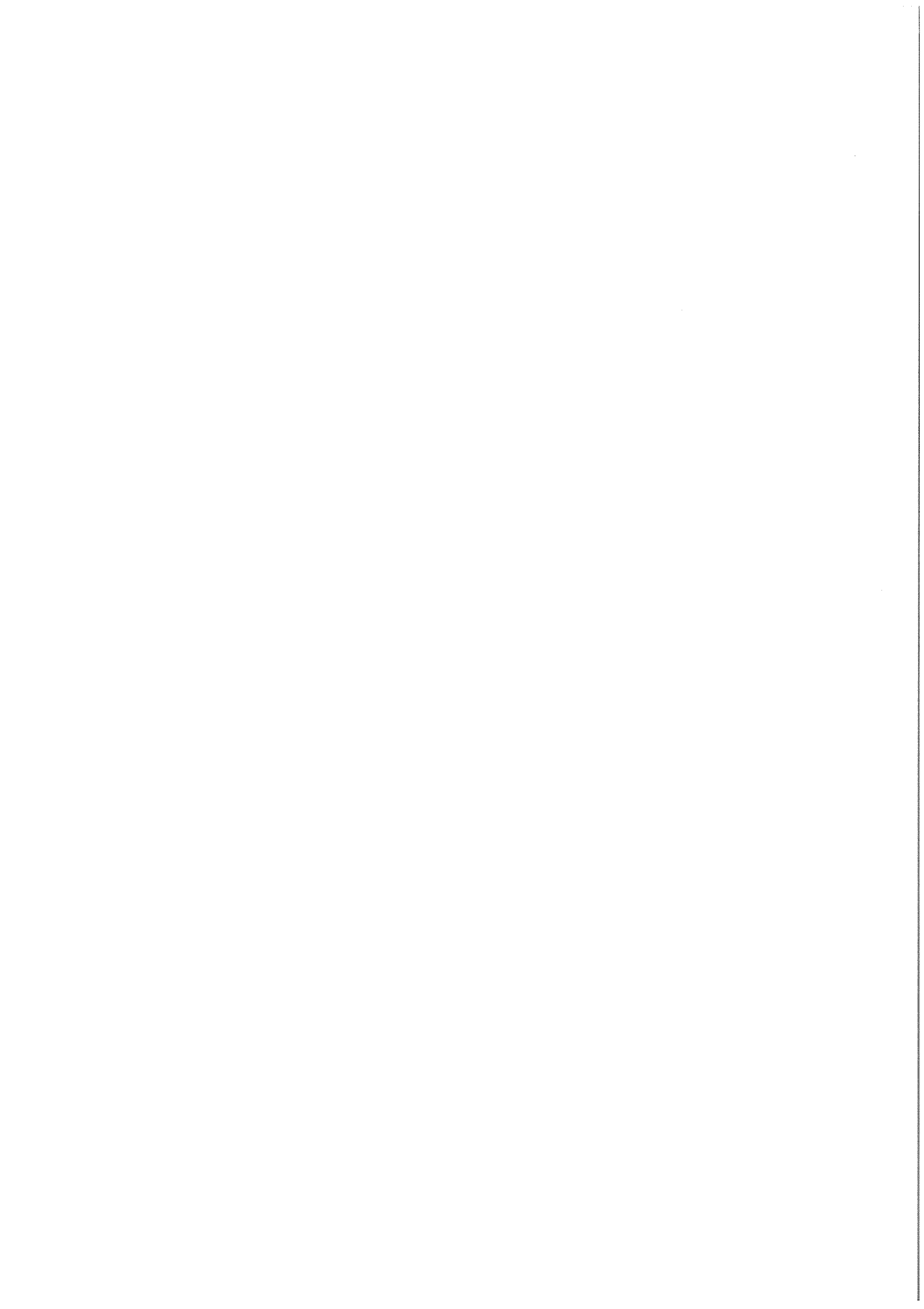
The Austrian labour market, real wage flexibility in Austria, labour market dynamics, relative wage structures

### **Schlagworte**

Der österreichische Arbeitsmarkt, Reallohnflexibilität in Österreich, die Dynamik des Arbeitsmarktes, relative Lohnstrukturen

### **JEL-Classifications**

J3, J4, J6



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## I. Introduction

Poor labour market performance has been a growing source of concern for OECD countries in the past three decades. In Europe, in particular, unemployment has risen sharply and in 1996 the average unemployment rate of the European Union as a whole increased to about 11%. However, the labour market situation differs significantly between Member States. Unemployment rates are in the range between 3% and 22%, employment rates vary between 50% and 75%. Despite some deterioration in recent years, Austria is among the very few countries in the European Union which have managed to maintain comparatively low unemployment rates and relatively high employment rates. In this paper we take a brief look at price and quantity adjustment mechanisms in the Austrian labour market which may have contributed to this favourable outcome.

After reviewing briefly the basic theoretical reasoning we start with an empirical investigation into the gross flow dynamics in the labour market and the cyclical volatility of employment and unemployment in Austria. We then proceed to take another look at the process of aggregate wage formation in Austria and show that the wage setting process is indeed conducive to its favourable labour market performance. However, we also find some evidence for outsider effects in the sense that the increased share of long-term unemployed has reduced the dampening effect of unemployment on wages. In the last section of the paper we take up the question of relative wage flexibility by analysing industry wage differentials and the evolution of the returns to education and experience in Austria. Broadly speaking, our empirical findings suggest that quantity adjustments and aggregate real wage flexibility are very pronounced features of the Austrian labour market; relative wage structures, on the other hand, appear to be rather rigid which may have had some repercussions on the amount of job turnover and the gross flows between employment, unemployment and being out of the labour force.

## II. Some Theoretical Considerations

In recent studies the conventional framework for thinking about unemployment in an imperfectly competitive world pictures the labour market equilibrium in terms of the intersection between a downward-sloping aggregate labour demand curve and an upward-sloping wage setting curve in real wage-employment space (c.f. Bean, 1994). The wage-setting curve represents the real wage that emerges, at any given level of employment, from wage bargaining or the operation of efficiency wage mechanisms. The labour demand schedule (or more accurately, the price-employment schedule) depicts firms' optimal price

and employment decisions, given the nominal wage they face and their existing stock of capital. In the long run, when capital can be adjusted, and with constant returns to scale, the price mark-up will not depend upon the activity level in the labour market.

The above framework has also been phrased in terms of a "Battle of the Mark-Ups", reflecting the general idea that in the short run it is inflation (or a current account deficit), but in the long run it is (equilibrium) unemployment which reconciles competing claims on overall output. Thus, movements in unemployment can be caused by shifts in aggregate demand giving rise to cyclical unemployment, and by shifts in the price or wage-setting schedules which change equilibrium unemployment.

The textbook story claims that negative (positive) demand disturbances may temporarily push actual unemployment above (below) its equilibrium level, but over the medium term the ensuing process of dis-inflation (inflation) will inevitably drive unemployment back to equilibrium. The conventional story then continues to argue that the degree of nominal inertia is simply not high enough to explain the sustained increase in unemployment in Europe. Thus, the story concludes, there must have been unfavourable shifts in the fundamental supply-side determinants of the NAIRU. The policy implication then, of course, is to press for supply-side reforms.

However, despite considerable efforts, it has been hard to identify changes in the basic determinants of equilibrium unemployment large enough to account for the observed trend increase in actual unemployment. Consequently, the alternative hypothesis has been put forward that unemployment may be strongly dependent on its own history ("hysteresis"). According to this view, current equilibrium unemployment is not independent of past actual unemployment, because of endogenous mechanisms that tend to translate movements in actual unemployment into changes of equilibrium unemployment. Obviously, the presence of such mechanisms blurs the simple-minded distinction between demand and supply factors because demand shocks end up having longer-term supply consequences (Pichelmann and Schuh 1997).

Turning now to the question of the adjustment paths towards equilibrium, it is important to note that even in a standard (log)-linear NAIRU model the dynamic response to shocks may be much more complex as the conventional theory asserts. This can be shown, for example, by combining an accelerationist Phillips-Curve (giving rise to a vertical aggregate-supply-

schedule in inflation/unemployment space) with an aggregate demand-schedule incorporating quantity theory and Okun's law. Under fairly standard assumptions, the steady-state solution for the system has inflation equal to nominal money growth and actual unemployment equal to equilibrium unemployment. However, it should also be noted that the two schedules may lead to a system of Volterra-Lotka type equations, in which the Eigenvalues of the characteristic equation are complex numbers; thus, any disturbance to the steady state results in perpetual cycles in the inflation-unemployment space (van der Ploeg 1993).

Another interesting implication arises when the impact of unemployment on (log) wages is assumed to be non-linear. Recall in that respect that the relevant relationship is known as the Phillips curve rather than the Phillips line. Suppose, for example, that the inflation rate is driven by the divergence between the logarithm of unemployment and the logarithm of the natural rate. Then, even if the log of unemployment is on average equal to the log of the natural rate, the average level of unemployment will be larger the greater the variance of unemployment. This result thus produces the intuitively appealing result that countries which conduct stabilisation policy better will have a lower average unemployment rate (Fischer, 1994).

Taking into account the existence of lagged adjustment processes in the labour market changes fundamentally the properties of equilibrium unemployment. Whereas the natural rate theory postulates that there exists a long run equilibrium which is determined by a number of exogenous variables, the lagged adjustment hypothesis implies that the equilibrium unemployment rate should be regarded as a continuously moving target which is determined by the movements of exogenous variables which are amplified by the interactions of the effects of lagged endogenous variables (Karanassou and Snower 1997). As the exogenous variables generally move substantially over time, lagged adjustment processes imply that predicted unemployment rates may differ substantially from their long run stationary state values. Consequently, the long run equilibrium unemployment rate is no longer the adequate reference point for economic policies. Economic policies which aim at the reduction of unemployment should therefore not only focus on measures which reduce the long-run unemployment rate but should concentrate also on factors that influence the speed of labour market adjustment processes.

However, in order to obtain a better understanding of price and quantity adjustments in the labour market, it is indispensable to keep the magnitude of the gross flows associated with net

changes in employment and unemployment in mind. Rates of job creation and job destruction, worker mobility and the turnover in the unemployment pool interact in a complex way with wage-setting and other institutional features of the labour market. For example, Bertola and Rogerson (1997) have argued that relative wage compression may be conducive to higher job turnover, thereby linking micro wage rigidities to a higher degree of quantity adjustments and vice versa. For this reason we start out in the empirical section of the paper with a look at gross flow dynamics and the cyclical volatility of employment and unemployment in Austria.

### III. Quantity Adjustments

#### Job Turnover and Labour Mobility in Austria

On an international level, the analysis of gross flows in the labour market that looks at both workers and jobs is gaining significance.<sup>1</sup> What is remarkable is that the gross flows observed are much higher than would have been expected from looking at changes in net employment. On an enterprise level, the job turnover rate is quite high within and between the individual branches of industry.

The rate of job reallocation that occurs between enterprises in Austria is high. For example, at the beginning of the 1990s, roughly 5% of jobs disappeared, but this loss was more than made up for by jobs created in other enterprises. While in the period from 1991 through 1992 employment gains were achieved, the job destruction rate accelerated during the 1992-93 slump by approximately 1.5 percentage points and gross job losses were around 7% of existing jobs. In the course of the economic recovery in 1992-94 the job creation rate rose again to 6%, while the job destruction rate remained at its high level and even rose slightly.

The rate of job reallocation in Austria corresponds roughly to the rates in comparable European countries (see Table 1). The present data somewhat underestimates the job turnover rate, because newly founded enterprises or closures have not been taken into account. This explains the surprisingly low rate for the US, as the dynamics of start-ups play a much greater role in the United States than in Europe.

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<sup>1</sup> A recent overview is available in the fifth chapter of the OECD Employment Outlook (1996).

**Table 1: Job turnover in continuing firms (in % of total employment)**

	Job Creation	Job Destruction	Job Turnover	Net Job Change
	Austria*			
1989/90	7,6%	5,1%	12,7%	2,4%
1990/91	6,3%	6,1%	12,4%	0,3%
1991/92	6,2%	5,6%	11,8%	0,6%
1992/93	5,0%	6,9%	11,9%	-1,9%
1993/94	6,0%	7,4%	13,4%	-1,4%

\* Periods between 1989-91 and 1991-94 are comparable only up to a limited degree due to the use of different samples

#### International comparison (annual averages)

Austria 1989-1994	6,2%	6,2%	12,4%	0,0%
USA 1984-1991	4,6%	3,1%	7,7%	1,5%
France 1984-1991	6,6%	6,3%	12,9%	0,3%
Germany 1983-1990	6,5%	5,6%	12,1%	0,9%
Finland 1986-1991	6,5%	8,7%	15,2%	-2,2%
Sweden 1985-1992	8,0%	9,6%	17,6%	-1,6%
Italy 1987-1992	7,3%	6,2%	13,5%	1,1%
Denmark 1983-1989	9,9%	8,8%	18,7%	1,1%

Source: OECD Employment Outlook 1996, for Austria IHS

According to the above data, job turnover has a high degree of significance in relation to the changes in net employment. At a constant overall level of employment, an estimated 100,000 jobs are lost in Austria every year in enterprises that reduce in size or close down. The reallocation of jobs has concentrated on movements within the individual industries, while sectoral shifts in employment patterns only account for roughly one third of the annual job turnover rate. An important issue is the persistence of job creation and job destruction. According to our sample, roughly 80 percent of new jobs remained after one year and 65 percent after two years. Job destruction seems to be somewhat more persistent. For enterprises with net employment decreases, roughly 85 percent of the jobs lost had still to be recovered after one year and 77 percent after two years.

**Table 2: Job turnover by industry and enterprise size in 1990-91**

	Job Creation	Job Destruction	Job Turnover	Net Job Change
<b>Industries</b>				
Primary sector	1,7%	2,4%	4,2%	-0,7%
Manufacturing	5,0%	4,6%	9,6%	0,5%
Construction	8,2%	7,2%	15,4%	1,0%
Wholesale and retail trade	8,0%	8,3%	8,5%	-0,3%
Tourism	11,6%	9,3%	20,9%	2,4%
Public administration	3,3%	1,4%	4,7%	1,9%
Other services	8,1%	9,6%	17,7%	-1,5%
<b>Size of enterprise</b>				
1 - 5 employees	14,3%	12,2%	26,5%	2,1%
6 - 20 employees	8,0%	8,0%	16,0%	0,0%
20 - 50 employees	5,8%	8,0%	13,8%	-2,2%
50 - 100 employees	4,9%	5,9%	10,8%	-0,9%
over 100 employees	3,7%	2,3%	6,0%	1,4%

Source: IHS

Table 2 shows that considerable shifts between shrinking and expanding businesses are also taking place within the individual industries. Tourism has the highest turnover rate: the job turnover rate is 20 percent per year. In addition, the construction industry and the wholesale and retail sector have high turnover rates; the same applies to the remaining service industries with the exception of local public bodies. Manufacturing shows a job creation rate well below average, which also pushes down the job turnover rate.

There is also a clear link between the size of an enterprise and the job turnover rate. The larger the enterprise, the lower the job turnover rate in percentage of persons employed. However, the conclusion cannot be drawn that primarily smaller enterprises are responsible for the largest net job gains, because not only the job creation rates but also the job destruction rates are far above average in this case. In addition, roughly 15% of jobs created occurred in the group of enterprises with more than 100 employees in spite of the low job creation rate of 3 to 4 percent. However, during the recession of 1992-93 almost one fifth of jobs in these enterprises disappeared.

An interesting empirical aspect is the fact that the creation of new jobs and the elimination of existing jobs tend to be concentrated on a few enterprises. Roughly half of the new jobs are created in 10% of the expanding enterprises, while only 10% of shrinking enterprises are the cause for more than 50% of jobs destroyed. It should also be noted that these statistics do not take account of start-ups or closures.

Much higher than the job turnover rate is, of course, the rate of turnover in employment as persons change between existing jobs. Taking account of reported hiring and firing on short notice, seasonal fluctuations, summer jobs, etc., the number of employment contracts commenced or terminated per year in Austria is around 1 million. A recent study based on administrative data demonstrates the high flexibility of the Austrian employment system (see Synthesis 1997). Every third employment contract is a new one established in the course of a year. Within the past 20 years, over 6 million persons were employed at least once, of which only 38% held jobs for at least 10 years. On average, every employed person has held 3.3 jobs lasting on average roughly 2.5 years. Rising dynamics has been observed over the past years in this context. While the average number of newly commenced employment contracts was roughly 830,000 between 1976 and 1990, the number climbed to one million in the following years.

The considerable turnover in the Austrian labour market is also reflected in the dynamics of the movement in and out of unemployment. In 1996, an annual average of 656,753 inflows and 706,449 outflows were recorded for unemployment (approx. 20% of the dependently employed labour force). Remarkable is the parallel development of inflows and outflows over the business cycles. While counter-cyclical movements of inflows into unemployment correspond to a priori expectations, it may seem a bit surprising that the outflow rate also rises in business cycle downturns. This means that higher unemployment in periods of slumps goes hand-in-hand with a higher rate of replacements within the system of employment. This mechanism thus intensifies the trend toward a pattern in total unemployment, in which the share of persons with relatively low re-employment probabilities is on the rise.

What is remarkable is that almost half of the employees surveyed had had more than one employer within the past five years and more than half of the employees had experienced two or more different job episodes. According to this indicator, the stability of the employment status tends to rise with age, but, for example, even among the 40 to 55-year-olds only 57% had held only one job within the past five years.



**Table 3: Stability of employment status in the period 1989-94 (Sum of lines = 100)**

Job episodes	1	2	3	4	5 and >	Total
Number employers						
1	82.4%	7.1%	4.0%	2.5%	4.0%	54.2%
2		71.6%	11.4%	6.2%	10.8%	19.6%
3			65.9%	12.8%	21.3%	10.6%
4				60.4%	39.6%	6.3%
5 and over					100.0%	9.3%
Total	44.7%	17.9%	11.4%	7.7%	18.3%	100.0%

Source: IHS

Obviously, when interpreting the stability of employment seasonal fluctuations have to be taken into account. Austria is a country with one of the highest rates of seasonal unemployment in Europe. In a rough estimate, about one-third of all unemployment spells per year and almost one-fourth of total unemployment is due to seasonal fluctuations in employment. Closely connected and in part identical with seasonal unemployment is the problem of temporary layoffs; temporary lay-off unemployment seems to have increased in recent years with more industries developing seasonal structures in order to avoid idle capacities.

### **The Cyclical Volatility of Growth and Employment and the Flexibility of Real Wages**

Table 4 reveals that unemployment rate fluctuations over the business cycle differ significantly across European OECD countries. Taking the standard deviation of the first differences of the unemployment rate as a proxy for the variability of the unemployment rate, it appears that the fluctuations of unemployment are quite low in Austria, Switzerland and France, whereas they are comparatively high in Finland, Ireland and the United Kingdom.

The magnitude of unemployment variability over the business cycle is affected by a number of different factors. In this context it may be interesting to note that the volatility of output in Austria is not significantly lower than in other European countries. In fact, according to the above measure, some countries like France, the Netherlands or Sweden have experienced less cyclical fluctuations in output than has Austria.

**Table 4: The cyclicality of employment and unemployment**

	Variability of Output(1)	Employment responsiveness(2)	Responsiveness of labour force to employment(3)	Variability of unemployment rate(1)
	1970-96	1970-96	1970-96	1970-96
Austria	1,79	0,47	0,83	0,35
Denmark	1,92	0,62	0,26	1,10
Finland	3,24	0,64	0,19	1,78
France	1,59	0,45	0,13	0,57
Ireland	2,49	0,55	0,21	1,41
Netherlands	1,55	0,52	0,12	1,02
Sweden	1,73	0,77	0,51	0,84
Switzerland	2,57	0,67	0,85	0,47
United Kingdom	2,32	0,65	0,29	1,23

(1) Standard deviation of first difference (in log and multiplied by 100, for output)

(2) The estimated coefficient b in the regression <employment deviation from trend> = a + b\*<output deviation from trend>, where the trends have been established using the Hodrick-Prescott filter, imposing identical smoothing factors for employment and output in each country.

(3) The estimated coefficient b in the regression <labour force deviation from trend> = a + b\*<employment deviation from trend>, where the trends have been established using the Hodrick-Prescott filter, imposing identical smoothing factors for labour force and employment in each country.

In a mechanical sense, cyclical fluctuations in output may lead to variations in employment which, in turn, may trigger different responses of the labour force and, ultimately, unemployment (Elmeskov and Pichelmann 1994).

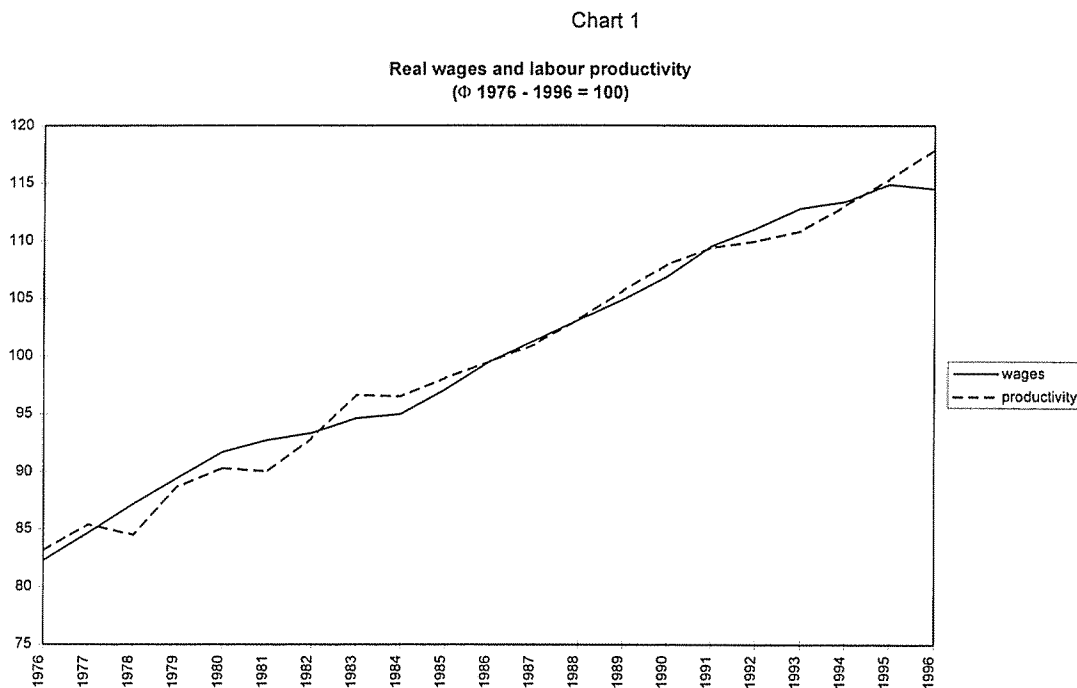
The estimates presented in Table 4 indicate that the responsiveness of employment to cyclical fluctuations in output has been relatively weak in Austria, i. e. there are large offsetting procyclical movements in productivity per person. The traditional explanation for this is labour hoarding due to employment adjustment costs, but as we argue later real wage flexibility may be important as well. It should be noted, however, that in recent years the employment responsiveness to cyclical fluctuations in output has increased in all the countries surveyed above; this holds true for Austria as well.

The second important element behind the low variability of Austrian unemployment is clearly the very high sensitivity of the labour force to cyclical conditions. According to the measure presented in Table 4, Austrian labour force movements cushion almost completely the effects of cyclical employment fluctuations. The high degree of responsiveness of the labour force to deviations of employment from trends in Austria can be attributed, on the one hand, to cyclical migration flows of foreign labour and, on the other hand, to a relatively high elasticity of participation rates of women and younger and older workers with respect to labour market conditions.

In this context, a strong reliance upon early retirement has often been mentioned as one of the reasons for low unemployment in Austria. Indeed, if the reduction in the labour force due to early retirement were mechanically translated on a one-to-one basis into an increase in unemployment, then unemployment would have been almost 50% higher than it actually was in 1996. This mechanist calculation should be viewed with great caution, however, because it does not take into consideration labour market adjustment processes (e. g. direct effects on wages and wage patterns, or indirect effects such as increases in social security contributions etc.), thus strongly overestimating the ameliorating effect of early retirement in the medium and long term (Pichelmann et al. 1996).

## IV. Price Adjustments

The following graph illustrates the trend in real wages per active employee<sup>2</sup> (at producer prices) and labour productivity for Austria. It clearly shows that wage policy tends to take its lead in the medium term from price and productivity trends. Over the business cycle, wages and productivity do repeatedly, but only briefly, diverge from one another, but in the medium term the real wage gaps that occurred were always closed again. In interpreting this data, however, one should naturally bear in mind that both labour productivity and real wages are endogenous variables in the economy and are mutually dependent on one another.



Source: IHS, \* real wages per active employee and GDP per active employee

Many observers, for example the OECD, have pointed to the high aggregate real wage flexibility in Austria as a major reason for her favourable labour market performance. This feature of wage formation is also borne out by the QUEST-model of the European Commission featuring for Austria the highest impact of unemployment on wages and a remarkably high long run real wage elasticity as well (see Table 5).

<sup>2</sup> Persons in dependent employment excluding those on either maternity or military service leave

**Table 5: The influence of unemployment on wage formation**

	<i>immediate effect</i>	<i>long run real wage elasticity</i>
Austria	-1,60	2,53
Belgium	-0,90	1,18
Denmark	-0,90	1,11
Finland	-0,75	1,28
France	-0,90	1,27
Germany	-0,65	0,89
Greece	-0,55	1,24
Ireland	-0,48	0,71
Italy	-0,95	1,44
Netherlands	-0,95	1,42
Portugal	-0,64	1,45
Spain	-0,88	1,86
Sweden	-1,10	1,83
United Kingdom	-0,50	0,74
USA	-0,50	0,55
Japan	-2,50	3,47

Source: Roeger W., in't Veld J. (1997)

Based on their estimation of a fully formulated price and wage system for Austria, Hofer and Pichelmann (1996) summarise the empirical findings on the characteristics of the wage determination process for the overall economy as follows:

- The development of producer wages essentially follows an error correction model, whereby the share of national income claimed by wages serves as the error correction term; this implies that the labour share remains constant in long-term equilibrium. In terms of dynamics, this corresponds to the well-known relationship of real wage growth (based on producer prices) being equal to the increase in productivity.
- Inflation shocks triggered by real import price increases or indirect tax increases were fully absorbed in the process of setting wages to the extent that such price shocks apparently did not exert any significant influence on real producer wages.
- However, the increase in the direct tax burden on labour over the past few years (primarily in the form of higher social security contributions) seems to have exerted significant pressure on real product wages at least in the short to medium term. Empirical analysis shows that these forward shifting processes for taxes, imposed on the employer, are more

heavily accentuated than those imposed on the employee. This difference is, however, not statistically significant.

- Although unemployment does clearly dampen wage increases, the effect is not linear, which means that there was also a relation between higher unemployment and the growing number of unemployed with less labour market effectiveness (expressed, for instance, in the increasing percentage of long-term unemployed). Therefore, all other factors equal, the wage-curbing effect of unemployment declined.

According to these estimates, the structural component in unemployment has risen significantly in Austria, as well as in other EU countries, over the past two decades; in 1996 the difference between actual unemployment (as defined by the OECD) and its structural component amounted to only about one percentage point. As an alternative measure of the extent of cyclical unemployment in Austria, an estimate of the Okun relation has been used. The Okun relation describes the relation between the cyclical component of unemployment and the output gap. For given values of actual unemployment and the output gap (estimated from a Hodrick-Prescott filtering procedure), the structural component of unemployment has been estimated as a time-varying constant. The results more or less confirm that only about one fifth of current unemployment can be attributed to short-term cyclical factors; the estimation results further suggest that with a coefficient of  $-0.15$  any positive or negative output gap translates only very weakly into deviations of actual unemployment from its structural component.

In this paper we take another look on Austrian wage formation from a somewhat different angle, namely by applying a Johansen cointegration test in order to identify the long run properties of the Austrian wage setting process. We then proceed by looking at some short run dynamics of Austrian wages and unemployment.

In order to analyse wage setting behaviour in the Austrian labour market we conducted cointegration tests for wages from a Johansen VAR. The data set contained data for the period 1964-95 for five variables, namely gross product wages per worker, product prices, labour productivity, the unemployment rate and the share of long term unemployment. We used product prices in order to account for effects from the external side of the economy. The share of long term unemployed was intended to capture persistence effects arising from human capital depreciation during extended unemployment spells. We allowed for three lags.

From the Johansen VAR we found clear evidence for at least one cointegrating vector, and very possibly three (see Table 6).

**Table 6: I(1) Analysis**

List of Variables:

W	Gross Product Wages per Hour
P	Product Prices (GDP Deflator)
PR	Productivity per man hour
UR	Unemployment Rate
SLU	Share of Long Term Unemployed

Effective Sample:	1967-1995
Lags in VAR model:	3
No. of observations:	29
Obs.-no. of variables:	13

Eigenvalue	L-max	Trace	H0	p-r	L-max90	Trace90
0.9307	77.42	155.79	r=0	5	20.90	64.74
0.7487	40.05	78.37	r=1	4	17.14	43.84
0.5418	22.63	38.32	r=2	3	13.39	26.70
0.4120	15.40	15.69	r=3	2	10.60	13.31
0.0099	0.29	0.29	r=4	1	2.71	2.71

Table 7 reports the cointegrating vector for wages which has the theoretically appealing property that labour productivity enters the wage cost equation with unitary long run elasticity. The cointegrating vector points to a rather high long run elasticity of wages with respect to unemployment. The positive impact of the share of long term unemployed on wage costs indicates that persistence effects seem to be at work in the Austrian Labour market which diminish the downward pressure from unemployment on wages.

**Table 7: A cointegrating vector for wages (Johansen VAR)**

Dependent variable: LogW

<i>Variable</i>	<i>Coefficient</i>
log P	1.036
log PR	0.976
log UR	-0.154
SLU	0.003

Estimates of a dynamic wage equation give some insights into the short-run dynamics of Austrian Wage formation. Table 8 reports the dynamic regression for wages on the basis of the cointegrating vector. The long-run parameters underline the clear relationship between wages, prices and productivity with unit coefficients. Table 8 reveals that changes in product

prices have a clear impact on wage setting in the short run, whereas changes in unemployment and productivity seem to feed through into wages only over the medium to long run.

**Table 8: Dynamic wage equation**

OLS, Time Range 1966-95

Dependent Variable:  $\log W - \log W(1)$

Variables	Coefficient	St. Dev.
$\log(P/P(1))$	0.34451	0.12643
$\log(P(1)/P(2))$	0.29062	0.12789
Error Correction Term	-0.22279	0.02359
UR-UR(1)	-0.00416	0.00386
CONSTANT	-1.29455	0.13795

SE:0.00698      MAPE: 7.82      DW:1.849      RHO(1):0.06

From the long run analysis we found evidence for persistence effects stemming from the share of long term unemployment which plausibly may reflect human capital effects on reemployment possibilities for persons being unemployed for extended time periods. The share of long-term unemployment in total unemployment is, however, closely related to the level of the unemployment rate itself. Table 9 reports the results from a simple regression for the share of long-term unemployed.

**Table 9: Long-term unemployment**

OLS, Time Range 1966-95

Dependent Variable: SLU

Variables	Coefficient	St. Dev.
SLU(1)	0.74233	0.12191
UR	-1.47066	0.59532
UR(1)	4.48908	1.01636
UR(2)	-2.11209	0.85925

SE:1.19409      MAPE:7.51      DW:2.110      RHO(1):-0.10

Table 9 reveals that any increase in unemployment tends to reduce the share of long term unemployment in the short run as the composition of unemployment with respect to duration is driven by the increase of the inflow into unemployment. After some time, however, sorting and selection mechanisms in the labour market lead to a long-run increase in the share of long-term unemployment induced by an initial rise in total unemployment. Finally, note that



the results from Table 9 imply a long-run relationship between the level of the unemployment rate and the share of long-term unemployment.

### The Structure of Wages in Austria

The inter-industry wage dispersion in Austria is high by international standards. However, this is mainly due to human capital differentials and gender specific effects (see e. g. Zweimüller and Barth 1994). The standard method to control for such individual characteristics is to estimate industry wage premia via an Mincer-type earning function. This exercise shows that the size of inter-industry wage dispersion in Austria is relatively similar to other West-European countries, like, e. g., Germany or Norway.

Table 10 shows the development of the Austrian inter-industry wage dispersion over time. As can be seen from the lower panel of Table 10 inter-industry wage differentials persist and the industry structure is relatively unchanged. The degree of the inter-industry wage dispersion remains quite similar over time. There is only a very small increase in the dispersion since 1983. This evidence seems to indicate that the wage structure is rather stable in Austria, at least with respect to industry wage differentials.

**Table 10: Inter-industry wage dispersion in Austria**

	1983	1985	1991	1993
SD1 ( $\beta$ )	8.49%	7.02%	9.09%	9.51%
SD2 ( $\beta$ )	6.22%	5.56%	6.45%	6.87%
SD3 ( $\beta$ )	5.97%	5.32%	6.02%	6.62%
Correlation of the wage structure				
1983	1.00	0.80	0.85	0.77
1987		1.00	0.90	0.89
1991			1.00	0.91
1993				1.00

Source: Hofer, H. (1996)

Notes: Each estimate is from a cross-sectional wage regression for male employees in the private sector of the Austrian economy.  $\beta$  are 21 industry effects derived from regressions of log wages on schooling, a quadratic polynomial in experience, working time, status and 6 regional dummies. SD1 ( $\beta$ ) is the standard deviation of the differentials; SD2 ( $\beta$ ) employment weighted differentials; SD3 ( $\beta$ ) weighted and adjusted differentials, calculated according to De New-Haisken and Schmidt (1997).

This section presents evidence on the development of returns to skill and experience for male employees in the private sector. We compare the education-specific yields and the experience/earning profiles for the period from 1981 to 1993. We specified the following earning function:

$$y_{it} = \alpha_1 \text{'SKILL}_{it} + \beta_{1t} \text{'EXP}_{it} + \beta_{2t} \text{'EXP}^2 + \beta_{3t} \text{'EXP} \text{'DWC} + \beta_{4t} \text{'EXP}^2 \text{'DWC} + \beta_{5t} \text{'DWC} \\ + \chi_{\tau} \text{'Z}_{it} + u_{it} = B_t \text{'X}_{it} + u_{it},$$

where  $y$  = log of net monthly earnings, SKILL = vector of educational dummies, EXP = potential labour market experience, its square is  $\text{EXP}^2$ , DWC = a dummy for white collar worker, Z = a vector of 8 industry dummies, a foreigner dummy and a constant, B = corresponding vector of parameters and  $u$  = error term. As usual, we assume  $u$  as normally distributed with zero mean and fix variance. The first index refers to individual  $i$  ( $i=1,2,..n$ ) and the second to year  $t$  ( $t=1981, 1983, 1985, 1987, 1989, 1991$  and  $1993$ ). With respect to skills we differentiated between 6 educational categories. These categories are derived from the highest educational/vocational degree. Our base category is the Compulsory School without any higher education or vocational degree. The second group contains persons with an apprenticeship degree (APPR). Furthermore, we differentiate between workers with secondary technical and vocational school degree (3 year courses) (BMS), secondary technical and vocational college degree (5 year courses) (BHS), secondary academic school (upper level) (AHS) and workers with an university degree (UNI). Potential labour market experience is calculated as age - schooling - 6.

The estimates of the returns to schooling confirm the expected results on average. The higher the level of education, the higher the income. Over time, however, the returns to schooling seem to have declined. If one compares the return by type of school education (compulsory school was standardised to 100), it turns out that secondary school education has lost relative to compulsory school education. The high returns for an university degrees have also fallen. In contrast to the evidence gathered in the United States, there is no relative deterioration in the income situation of less skilled workers. This trend is compatible with the increased supply of more highly qualified labour (see Table 12).

**Table 11: Income index by level of education completed**

	1981	1983	1985	1987	1989	1991	1993
Compulsory school	100	100	100	100	100	100	100
Apprenticeship	110	109	111	111	111	112	111
BMS <sup>1</sup>	121	117	120	121	124	119	122
AHS <sup>2</sup>	139	134	136	138	139	134	130
HAK <sup>3</sup>	154	144	148	145	148	148	141
University	196	189	183	184	184	182	184

	1981	1983	1985	1987	1989	1991	1993
Rate of return	8,69	7,87	7,63	7,44	7,60	7,37	7,22

Source: own calculations based on microcensus data. The table shows the difference in net monthly income with respect to education for male employees in the private sector; the estimation controls for work experience, labour force status and industry affiliation. The rate of return shows the percentage yield of an additional year of schooling.

1 Secondary technical and vocational schools (3-years course) 2 Secondary general education school (5-years course) 3 Secondary commercial school (5-years course)

Concurrent with international data, estimates for stylised experience-earnings profiles result in the expected concave shape. The following illustration shows the experience-earnings profile for the years between 1981 and 1993 with income at the start of working career set to 100. Experience-earning profiles differ markedly between wage earners and salaried employees. The latter attain much more pronounced considerable wage increases in the course of their careers. Over time, a trend toward flatter wage profiles is discernible, but not very strong.

**Table 12: Relative supply of the labour force by education**

	Labour Supply Total		mainly private sector	
	1981	1991	1981	1991
Compulsory school	40,6%	29,4%	43,3%	32,2%
Apprenticeship	35,5%	40,5%	38,8%	44,9%
BMS <sup>1</sup>	11,8%	13,0%	10,3%	11,3%
AHS <sup>2</sup>	3,4%	4,3%	2,7%	3,3%
HAK <sup>3</sup>	4,0%	5,6%	3,1 %	5,4%
University	4,7%	7,2%	1,9 %	2,9%
Total (in million persons)	3,411	3,684	2,804	2,895

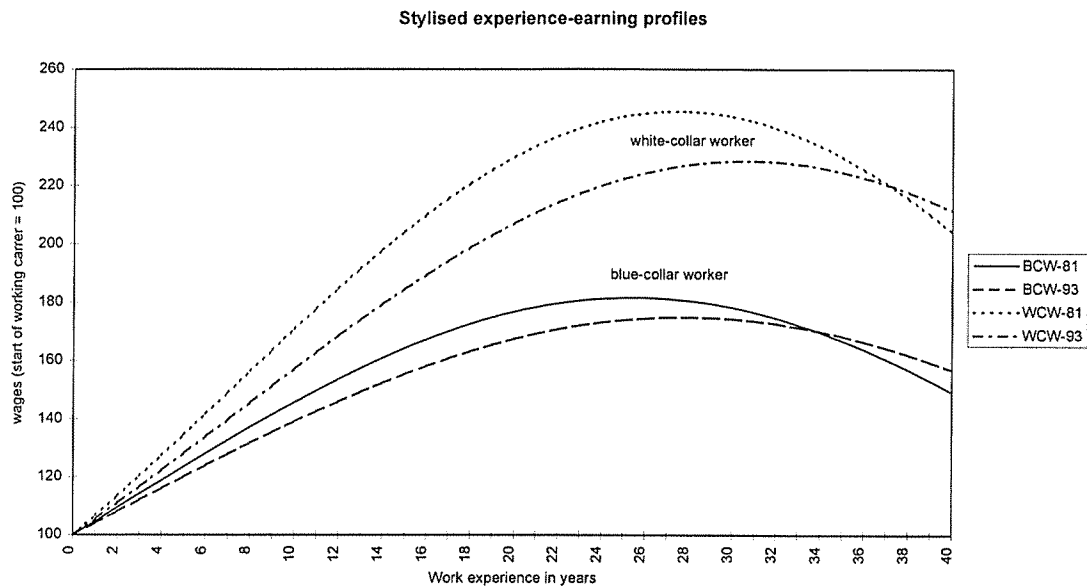
Source: ÖSTAT, based on population census

1 Secondary technical and vocational schools (3-years course) 2 Secondary general education school (5-years course) 3 Secondary commercial school (5-years course)

In comparison to Germany (see e. g. Bellmann and Möller 1995, Steiner and Wagner 1998), wage profiles seem to be much steeper in Austria. One possible explanation for this is that Austrian employees accumulate more occupation-specific human capital. But this seems to apply only to a small group of employees. What carries a lot of weight in Austria is the

seniority component in earnings. This implies that an employee endowed with human capital specific to that enterprise is initially paid below his or her marginal product, and later on, above it. This type of wage system may be beneficial for employers as well, but may cause problems when human capital is devalued due to technological progress.

Chart 2



The problems of older workers on the labour market are aggravated by the steep income profiles. Although the probability of being dismissed is below average in the case of older jobholders, once a job is lost the chances of finding a new one are relatively scant. Flatter age-earnings profiles could contribute to ameliorating the situation of older workers.

Summarising the evidence on the development of the wage structure in Austria, we found only very minor changes with respect to the degree of inter-industry wage dispersion, returns to schooling and experience. In spite of considerable changes in the Austrian economy, the wage structure seems to be rather stable in the eighties and early nineties.

## V. Conclusions

Despite some deterioration in the past fifteen years, the Austrian labour market performance has been outstanding in international comparison. The only other EU country with such low unemployment is Luxembourg, Austria enjoys the lowest youth unemployment rate and the share of long-term unemployed is only half as high as the EU average. Contrary to widely held beliefs, this favourable outcome is not primarily due to systematic reductions in labour supply as Austria is also a top performer in terms of the overall employment rate; however, the employment rate of older workers is significantly below the EU average.

In this paper we have taken a brief look at the price and quantity adjustment mechanisms in the Austrian labour market which may have contributed to this favourable outcome. Broadly speaking, our empirical findings suggest that quantity adjustments and aggregate real wage flexibility are very pronounced features of the Austrian labour market. In view of the high turnover on the labour market, the employment protection regulation appear to be flexible enough in most areas of private sector economic activity so as to avoid burdening the required reallocation processes with prohibitively high costs. Important quantity adjustment mechanisms are also apparent in the form of a very high responsiveness of labour supply to cyclical employment fluctuations, a factor that smoothes unemployment over the business cycle. The single most important characteristic of the Austrian labour market, however, is in our view the high degree of aggregate real wage flexibility in Austria. Nevertheless, we have also found evidence for outsider effects in the Austrian wage setting process stemming from the increased share of long-term unemployment. Relative wages also appear to be rather rigid, which may have had some repercussions on the amount of job turnover and the gross flows between employment, unemployment and out of the labour force.

Our analysis indicates that economic policy will have to deal with the unemployment problem in Austria mainly by attacking structural rigidities in labour and product markets. The prospect that the problem will solve itself without policy intervention is very improbable, because according to our estimates roughly four-fifth of current unemployment is due to non-cyclical factors. Stronger growth by itself will not suffice to master the problems on the labour market.

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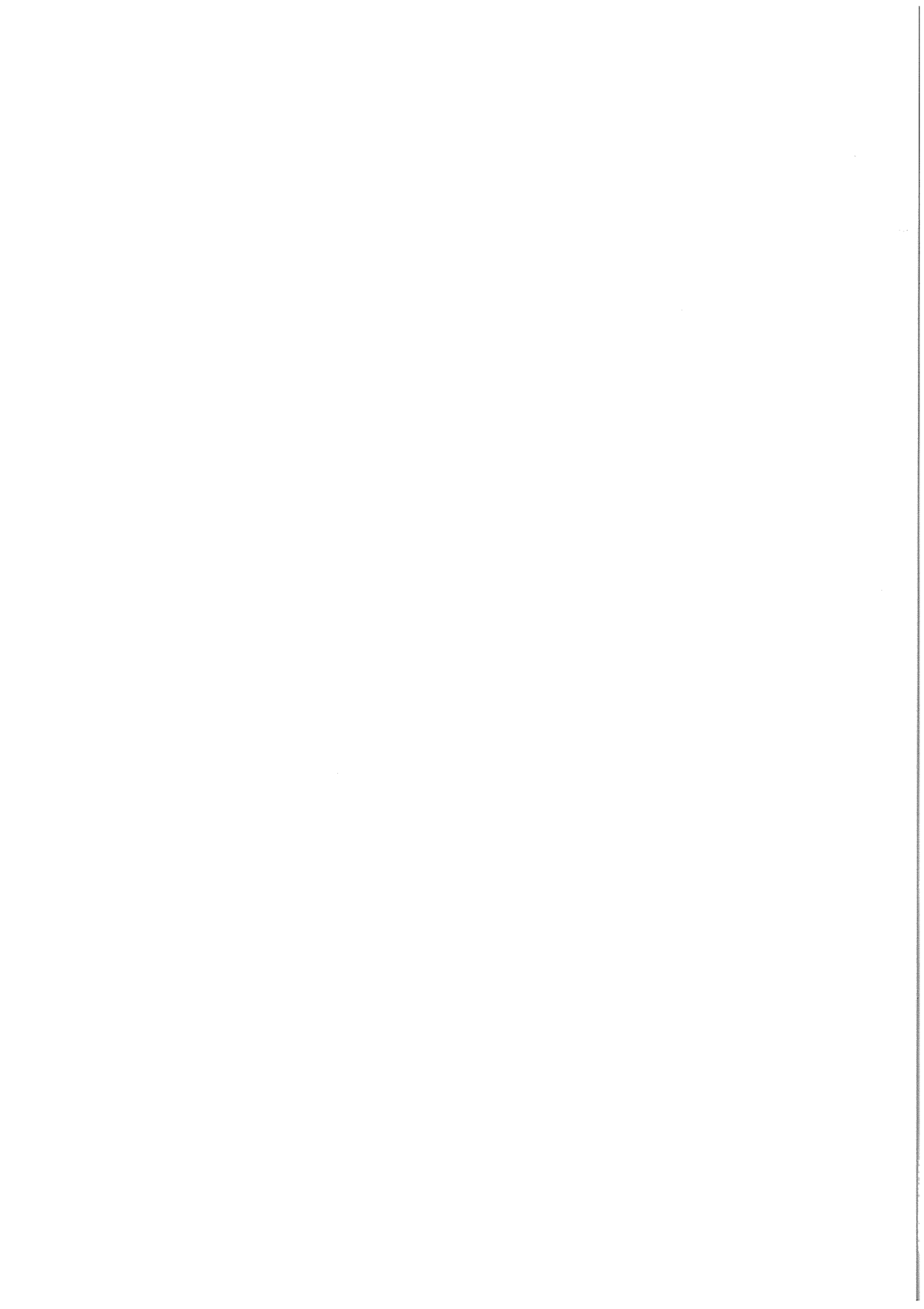
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