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I. Introduction

Incomes policy has been a recurrent feature of economic policy in many Western economies. In some countries incomes policy has taken the form of wage stops or guidelines imposed by the government. In Austria by contrast, incomes policy has always relied on the self-restraint of the labor unions within the framework of the institutions of the social partnership.1) The present paper begins with a brief account of the changing objectives of trade union wage policy. The second part analyzes the movement of negotiated wage rates in the manufacturing sector, as the most tangible expression of actual union wage policy with regard to productivity growth, inflation, and unemployment. The regression analysis also investigates two aspects of incomes policies that most clearly set Austrian inflation and employment policies apart from those of other countries: the impact of economic forecasts and of the developments in the external sector on wage settlements. The paper ends with a summary.

II. Trade union wage policy2)

Labor productivity is a very important element of any incomes policy for it determines the room for non-inflationary wage increases. At times when attention is directed at preventing an acceleration in inflation, the wage rule is changed to allow wages to increase at the rate of productivity increases plus the rate of growth of consumer prices. In Austria, according to union statements3) the unions have always followed

a wage policy oriented toward the long-run productivity growth. The long-term aspect of this policy was stressed in the fifties and sixties by the pursuit of a countercyclical wage policy ("active wage policy"). By pressing for higher wage increases in a recession, the purchasing power of the consumers - and thus aggregated demand - was to be strengthened.4) During an expansionary phase, on the other hand, unions would exercise restraint in their wage claims, so as to enable entrepreneurs to make profits sufficient for the rapid accumulation of capital.5) Even though the idea of a countercyclical wage policy still surfaced occasionally in trade union discussion, the end of the sixties saw a basic change in the thinking of the trade unions.6) Two main factors bringing about this change were the deterioration of the balance of payments situation and the experience of the recession of 1967. Initially the promotion of economic growth, and then later the maintenance of full employment, was given higher priority than before. At the beginning of the seventies a new wage policy in the form of a general guideline was formulated: with an economic growth rate of 5% thought feasible, union wage settlements were intented to achieve an average growth rate of real wages of 3% in the long run. This is known as the "Benya formula".

The original arguments for a countercyclical wage policy were gradually abandoned since they collided with the goal of external stability. It became increasingly clear that a stimulation of the economy without considering the development of exports and imports is just not possible, and short-term considerations as well as economic forecasts began to play a very important role in formulating wage demands. This applies in particular to the period since 1977 when the huge trade deficit forced the unions to ask for very small wage increases. The aim was twofold: to weaken

domestic demand and imports, and also to improve the international competitive situation.

This orientation of union wage policy toward the external sector is part and parcel of what came to be known as the "hard currency option". The hard currency option involved tying the Austrian schilling to the German mark, and with some room for variance seemed to imply that wage movements in Austria should generally follow those in Germany in order to prevent pressures on exchange rates as a result of differential growth of labor costs in the two countries.7)

III. The regression equations

1. Wages and productivity in Austria

In Austria, as in many other countries, growth of labor productivity decelerated over the period 1960 to 1985. While productivity growth was close to 6% in the period 1960 to 1973, it was less than 3% in the period 1973 to 1985. Labor productivity is defined here as output per employee hour, to take account of the reduction in standard working time in 1970, 1972 and 1975. The labor productivity measure refers to the whole economy even though the wage concepts used in this analysis refer only to the manufacturing sector: the growth of wages in all sectors of the economy was to be geared to productivity increases in the overall economy.8) See Table A for long-term trends in productivity, prices, and wages.

Table A

Productivity, Price and Wage Developments,
Austria 1960-85

Average Annual Rates of Change

	1960-73	1973-85	1960-85
Output Per Man Hour	5,6	2,7	4,2
Consumer Prices	4,2	5,7	4,9
Negotiated Wage Rates	8,3	8,2	8,2

2. Definition of variables

We first explore the question how wages have followed productivity and prices increases, in particular the slowdown in productivity growth in the period 1973 to 1985, by regression analysis.

In one formulation, wage increases are related to lagged annual changes of hourly productivity and of consumer prices. In another, the productivity variable is a three-year moving average of hourly labor productivity. This is likely to correspond better to the Benya formula which is a long-term concept.

The basic regression equation takes the following form:

$$W = a0 + a1PY + a2P + a3NWT$$

W is the annual rate of change of contractual hourly wages of blue-collar workers in the manufacturing sector (1960 to 1966 contractual wages of blue collar workers in the manufacturing sector according to the Netto-Tariflohnindex of the Austrian Institute of Economic Research; 1966 to 1984 according to the Tariflohnindex of the Central Statistical Office).

P is the rate of change of consumer prices.

PY is the rate of change of hourly labor productivity defined as

PY = GDP/(N*H), where

GDP = real gross domestic product

N = total employment (dependent and independent employment)

H = hours worked per employed;

Source for hours worked: 1969-1985 hours worked in the economy according to the Mikrozensus, before 1969 extrapolated according to the number of hours worked in the manufacturing sector.

The variable normal working time is the annual rate of change in normal working hours. This variable allows for the effects of the decrease in working hours that took effect in 1970, 1972 and 1975. In these years, the reduction in normal working hours translates into an increase of the growth rate of contractual wage rates by the same percentage.

The coefficient a3 indicates the degree to which the reduction in working hours is taken into account in the wage negotiations. A coefficient between -1 and zero indicates that the reduction in working hours had the effect of lowering wage increases.

The coefficients a1 and a2 describe the sensitivity of wage changes to changes in labor productivity and prices.

3. The sample period and the "wage explosion" of the year 1975

The regressions were run over the period 1960 to 1985 and over the period 1964-1985 to make the results comparable to those from regressions including forecast variables and from earnings regressions. However, in some of the regressions presented the year 1975 was omitted from the sample. This year is characterized by the coincidence of two or three main influences. First, the weekly working time was reduced from 42 hours per week to 40 hours. This is a a reduction of 5 percent (resulting in an increase in the growth rate of wages by 5,7 percentage points). Second, the wage round of the fall of 1974 which set the wage increases for the year 1975 was carried out under expectations of high GNP growth, low unemployment, and a rather high inflation rate. Actually, GNP growth was about 5 percentage points below the forecast, unemployment was higher, and the inflation rate turned out to be somewhat lower. The rate of inflation in the previous year 1974, however, was exceptionally high. It is rather difficult to separate the effect of the reduction in working hours from the other effects, such as the effect of the lagged inflation rate and of the unemployment rate on wage increases because several special factors were operating simultaneously in this one year. The lagged inflation rate, for example, may capture some of the influence that should properly be attributed to the wrong forecast of economic activity for the year 1975 or to the reduction in working hours. With a value of 19,8 percent, the wage increase in 1975 is 11 percentage points above the average value for the period 1960-1985 and thus assumes a very large weight in determining the value of the coefficients. Thus, in order to avoid these estimation problems, the year 1975 was omitted from the sample period in some of the regressions.

4. Results of the simple regression equations

The results of this analysis are reported in Table B. When he lagged annual productivity change is taken to represent the productivity rule, the coefficient is around 0,65, much below the value of one, which one would expect if the productivity guidelines were followed strictly. But this may be an unfair representation of the productivity guidelines. Although not always explicit, the productivity factor should be a trend productivity growth concept rather than annual rates of growth of labor productivity. When the productivity factor is represented by the average of three years (t, t-1, t-2), the coefficient rises to a value between 0,8 and 1,0.

A subdivision of the whole period into a period extending from 1960 to 1973 and a second period extending from 1973 to 1985 reveals substantial differences in the productivity coefficients of the two subperiods.9) In the first period the lagged annual productivity increase yields a substantially better fit than the three-year productivity trend factor; the reverse is true for the second period. In the first period the coefficient of the productivity trend (three-year average) is around one, but markedly higher in the second period (Table B, equ.10).10)

The other variable explicitly considered in this analysis is the rate of price increase. The coefficient of this variable is around one or slightly below, regardless of the subperiod considered. There are only slight differences in the goodness of fit (but larger ones with regard to the Durbin-Watson statistics) between equations with the concurrent and lagged inflation rate. For sample periods including the year 1975, the lagged inflation rate does better; the reverse is true for sample periods excluding the year 1975.

Table B

Wage Inflation Equations, Selected Sample Periods a)

Equation and sample period	Independent variable: Constant	Normal working time	Inflation concurrent	Inflation lagged	Productivity lagged	Productivity 3-year average	Summary statistic: R2	Durbin-Watson	SE
1. 1960-1985	0,12	-1,19		0,96	0,66		0,819	1,7	1,48
	(0,1)	(-5,9)		(6,0)	(4,3)				
2. 1960-1985	-1,05	-1,02		1,02		0,88	0,812	1,8	1,50
	(-0,7)	(-4,8)		(6,0)		(4,2)			
3. 1960-1985 b)	0,73	-0,78		0,81	0,68		0,693	1,4	1,34
	(0,6)	(-3,1)		(5,2)	(4,9)				
4. 1960-1985 b)	-0,83	-0,44		0,86		1,00	0,739	1,3	1,23
	(-0,7)	(-1,8)		(5,8)		(5,6)			
5. 1960-1985 b)	1,82	-0,56	0,76		0,48		0,706	2,0	1,33
	(1,9)	(-2,3)	(5,2)		(3,7)				
6. 1960-1985 b)	0,06	-0,25	0,85			0,81	0,786	2,0	1,12
	(0,1)	(-1,1)	(6,8)			(5,3)			
7. 1970-1973	0,51	-0,54	0,77		0,72		0,844	1,9	0,95
	(0,4)	(-2,9)	(4,2)		(3,1)				
8. 1960-1973	-1,65	-0,21	0,88			1,07	0,774	2,1	1,14
	(-0,5)	(-0,8)	(4,1)			(1,9)			
9. 1973-1985	-0,12	-1,50		1,06	0,46		0,900	1,4	1,55
	(-0,1)	(-4,4)		(3,6)	(1,9)				
10. 1973-1985	-0,92	-1,69		0,68		1,44	0,950	1,4	1,09
	(-0,7)	(-6,7)		(2,8)		(4,0)			

a) The dependent variable is the annual rate of growth of negotiated wage rates. Normal working time is in annual rates of change. The numbers below the coefficients are t-statistics

b) Excluding the year 1975

When the year 1975 is excluded from the sample period the coefficients of the variable normal working time are less than 1 in absolute value; this seems to indicate that the cost-raising legislated decrease in weekly working time was partly offset by lower wage increases. The opposite conclusions is reached when the year 1975 is included in the sample period. The strong effects of the inclusion of this one year on the parameter estimates can also be gleaned from the other coefficients: the estimates of the inflation coefficients are raised, those of the productivity coefficients lowered. Equation 4 in Table B, the equation with the three-year moving productivity term with the year 1975 excluded from the sample period, seems best to represent the productivity-cum-inflation guideline. In this configuration, both the coefficient of productivity and of inflation are close to unity for the period considered, but, as can be seen from Table A, the growth of wages is about one percentage point per year below the growth of labor productivity plus the growth of prices. There seems to be room for the effects of cyclical variables in the equation.

The preceeding analysis is only preliminary, of course, for it abstracts from the effect of labor market tightness on the wage setting process. In the following section we investigate the cyclical variability of wage increases.

5. The cyclical variability of wage increases

The essence of the countercyclical wage policy is that during a recession unions attempt to obtain larger wage increases than would be expected from the operation of the labor market, and during periods of strong demand unions negotiate smaller

increases than might be justified by market conditions.11) Empirically, this implies that the relationship between the rate of change of money wages and the rate of unemployment (or some alternative index of labor market pressure) will be weaker under this wage policy than in the absence of the policy. Unfortunately, the nature of the relationship in the absence of the wage policy is not really known, so that the data can only be used to determine the extent to which negotiated wages are sensitive to unemployment. The more important a countercyclical objective in wage negotiations, the less sensitive money wage changes will be to variations in employment.

These observations can also be applied, though to a lesser degree, to the boom period at the beginning of the seventies when the Benya formula was in effect: wages were to advance at a rate of 3 percent plus the rate of inflation with no allowance for changes in the labor market.

To represent the labor market situation the unemployment rate is now introduced into the wage equation in its inverse form.12) During the whole period 1960-1985 the unemployment is significantly related to negotiated wage changes, a finding that is inconsistent with a successful countercyclical wage policy (see Table C, equations 1-3). 13) For the sample period including the year 1975, the specification with the lagged unemployment yields a slightly better fit; for the period excluding the year 1975, the concurrent unemployment rate does better. When the sample is broken into two periods, no significant differences in the value of the unemployment coefficient appear.14) If anything, the results would suggest that the relationship between wage changes and unemployment is looser in the later period than in the

Table C

Wage Inflation Equations, Including Unemployment, Selected Sample Periods a)

Equation and sample period	Independent variable: Constant	Normal working time	Lagged inflation	Unemployment	Lagged unemployment	Productivity: lagged	Productivity: 3-year average	Summary statistic: R2	Durbin-Watson	SE
1. 1960-1985	-0,64	-0,95	0,72		3,41		0,55	0,844	1,8	1,40
	(-0,5)	(-4,8)	(3,4)		(2,1)		(2,2)			
2. 1960-1985 b)	-0,18	-0,36	0,61	3,77			0,51	0,822	1,4	1,04
	(-0,2)	(-1,7)	(4,1)	(3,0)			(2,3)			
3. 1960-1985 b)	-0,46	-0,40	0,60		3,13		0,69	0,798	1,4	1,11
	(-0,5)	(-1,8)	(3,4)		(2,4)		(3,4)			
4. 1960-1973	-0,16	0,44	0,11	5,53		0,53		0,880	1,3	0,88
	(-0,1)	(-2,1)	(0,4)	(2,5)		(2,0)				
5. 1960-1973	-0,89	-0,18	-0,04	7,17			0,56	0,843	1,7	1,01
	(-0,29)	(-0,8)	(-0,1)	(3,1)			(1,0)			
6. 1973-1985	-0,78	-1,49	1,00	6,03			-0,51	0,976	1,3	0,79
	(-0,85)	(-7,7)	(4,9)	(3,0)			(-0,7)			
7. 1973-1985	-0,88	-1,55	0,90	4,68				0,975	1,4	0,77
	(-1,0)	(-9,1)	(6,0)	(6,4)						

a) Variables are the same as in Table B. The unemployment measure is the inverse of the unemployment rate as described in the text

b) Excluding the year 1975

early period. This does not seem to accord well with the stated objective of a countercyclical wage policy.

The introduction of the unemployment rate into the wage equations has a severe impact on the other coefficients. For the period 1960-1985 the coefficient of the inflation rate drops by about 0,3 percentage points when the year 1975 is included, but does not change much when the year 1975 is excluded. The influence of price increases appears to be negligible in the first period. The low value of the inflation coefficient may be the result of the government's attempt in the sixties to raise the prices of goods and services that are subject to price control in an anticyclical fashion, i.e., to hold prices of these goods and services down at times of a general price increase and vice versa.15) The estimated coefficient of the inflation rate is much higher in the later period beginning in 1973 and lies around 1. Thus, prices became a proportionately more important influence on negotiated wages as the variance in prices increased.

A second general finding of the second stage of the regression analysis is that negotiated wage changes are not strongly related to changes in labor productivity, once the unemployment rate is introduced into the wage equation. If the productivity variable is a 3-year average, the coefficient lies between 0,5 and 0,7 for the whole period (Table C, equation 1 to 3). While the estimated effect of the productivity variables (whether a lagged productivity growth rate or a trend variable) holds up in the first period, the productivity coefficient becomes very small, even negative in the second period (Table C, equ.6). Thus, it seems that the slowdown of wage increases in the second period can be explained solely by the rise in the unemployment

rate (equ.7, Table C), while for the whole period cyclical productivity movements are an important determinant of wage developments. There are two reasons for this result. First, breaking up the whole period at the point of the productivity slowdown removes much of the variability in the productivity trend, a point already made. Second, while productivity growth and unemployment were only loosely related in the first period, the development of unemployment almost parallels that of productivity in the second. The correlation coefficient between the 3-year productivity trend and the inverse of the unemployment rate rises from 0,45 in the first period to 0,91 in the second period (excluding the year 1975). Thus, the unemployment rate may capture some of the effects that are due to the productivity variable.

6. Lagged or contemporaneous exogenous variables?

The union bargaining model that underlies the analysis of increases in negotiated wages would seem to suggest that the determinants of wage settlements are lagged variables, such as the unemployment rate, the inflation rate and a productivity trend, as unions react with a certain recognition lag to the development in these variables.

Wage equations were estimated with both the lagged and the contemporaneous unemployment rate; except for the wage equations covering the whole period (including the year 1975), the unlagged version produced better results than the version with lagged unemployment. Use of both contemporenous and lagged unemployment did little to improve the goodness of fit. For the productivity variable too, the

regressions yield better results when the moving average of productivity includes the productivity increase in the current year (compare equ.2 Table 6 with equ.1, Table D).

So far, the price term has been specified as the lagged inflation rate. Table D reports equations which include both the contemporaneous and lagged inflation rate as variables. The sum of the inflation coefficients is now 0,93 instead of 0,61 in the specification with the lagged inflation rate. The coefficient of the unemployment rate is considerably lower than in the specifications reported earlier. The results for the subperiods are also quite different from the earlier specifications. The difference in the specification is quite striking for the first period. The sum of the inflation coefficients is now 0,51 instead of around zero with the lagged inflation rate.

In conclusion, the regression results indicate that for all variables used, the contemporaneous as well as the lagged values affect the outcome of wage negotiations. This may have a simple explanation. Wage settlements are generally spread out through the year and wage bargaining that takes place in the middle or toward the end of the year will also take account of recent developments; this then will show up as a contemporaneous influence and the mean lag in the analysis of yearly data will be less than one year.

But there are also two other interpretations; one runs in terms of expectations, the other, applicable primarily to the inflation terms, attributes the contemporaneous influence to a simultaneous equation bias. These points will be taken up in turn.

Table D

Wage Inflation Equations, Including Unemployment, Selected Sample Periods a)

Equation and sample period	Independent variable: Constant	Normal working time	Inflation	Lagged inflation	Unemployment	Productivity lagged	Productivity 3-year average	Summary statistic: R2	Durbin-Watson	SE
1. 1960-1985 b)	0,71	-0,47		0,51	4,22		0,33c)	0,800	1,4	1,11
	(0,7)	(-2,1)		(3,6)	(3,1)		(1,6)			
2. 1960-1985 b)	-1,22	-0,30	0,47	0,46	1,33		0,80	0,876	1,6	0,89
	(-1,2)	(-1,7)	(2,9)	(3,4)	(1,0)		(3,7)			
3. 1960-1973	-0,22	0,49	0,33	0,18	3,02	0,62		0,900	1,4	0,87
	(-0,2)	(-2,3)	(1,1)	(0,6)	(1,0)	2,2				
4. 1973-1985	-1,34	-1,46	0,35	0,78	3,48			0,986	1,5	0,60
	(-1,9)	(-10,7)	(2,6)	(6,2)	(4,7)					
Instrumental variables for the contemporaneous inflation rate										
5. 1960-1985 b)	-0,71	-0,36	0,27	0,51	2,58		0,64	0,832	1,3	1,04
	(-0,6)	(-1,7)	(1,1)	(2,9)	(1,6)		(2,6)			
6. 1973-1985	-1,07	-1,47	0,17	0,91	5,04		-0,34	0,978	1,0	0,82
	(-1,0)	(-7,3)	(0,8)	(3,7)	(2,1)		(-0,5)			
7. 1973-1985	-1,18	-1,50	0,20	0,84	4,04			0,977	1,0	0,77
	(-1,3)	(-8,4)	(1,0)	(5,0)	(4,1)					

a) Variables are the same as in Tables B and C

b) Excluding the year 1975

c) The productivity variable is a two-year average (t-1, t-2) of productivity growth

7. Simultaneous equation bias

The use of the contemporaneous inflation rate in the wage equation raises the problem of simultaneous equation bias. To eliminate this possible source of bias an instrumental variable approach was used. For details see Appendix 1.

The new regressions yield slightly lower inflation coefficients but higher coefficients for the unemployment rate. The sum of the inflation coefficients decreases from 0,93 to 0,78 for the period 1960-1985 (excluding 1975), and from 1,13 to 1,04 for the period 1973-1985. See Table D, equations 5 and 7.

8. Wage policy and economic forecasts

The institutional arrangements suggest that economic forecasts have played a certain role in determining the wage claims put forward by the labor unions. To test this hypothesis a new set of regressions were run. The sample period starts now in 1964, the first year in which the social partners made economic forecasts. To facilitate a comparison between equations with and without forecast variables, the standard equations were reestimated for the sample period 1964-1985. The results are recorded in Table E. For the whole period, regressions involving the expectational variables for inflation, unemployment, and the growth rate of the economy (annual growth rate of gross domestic product) are somewhat inferior to the regression equations with the actual inflation rate, the lagged unemployment rate and the productivity trend, but once the unemployment forecast is replaced by the actual lagged unemployment rate, the expectational variables perform

Table E

Wage Inflation Equations including Forecast Variables, Selected Sample periods a)

Equation and sample period	Independent variables: Constant	Normal working time	Inflation c)	Lagged inflation	Lagged Unemployment	Productivity 3-year average	Forecast: Inflation	Forecast: Unemployment	Forecast: GDP	Summary statistics: R2	Durbin-Watson	SE
1. 1964-1985	-1,30	-0,91		0,79	4,48	0,43				0,904	1,9	1,19
	-1,1	-5,3		4,3	3,1	1,9						
2. 1964-1985	-1,44	-0,91	0,09	0,76	4,07	0,46				0,905	1,9	1,22
	-1,1	-5,2	0,3	3,6	2,0	1,8						
3. 1964-1985	-0,94	-0,86					0,86	3,32	0,69	0,851	1,8	1,48
	-0,7	-3,1					3,1	1,3	2,3			
4. 1964-1985	-0,67	-0,95		0,69	4,65				0,47	0,910	1,8	1,15
	-0,7	-5,7		4,7	3,6				2,2			
5. 1964-1985	-0,94	-0,90		0,55	4,22		0,24		0,53	0,913	1,6	1,16
	-0,9	-5,1		2,4	3,0		0,8		2,3			
6. 1964-1985 b)	-0,98	-0,41		0,66	3,68	0,66				0,889	1,4	0,89
	-1,1	-2,2		4,7	3,3	3,6						
7. 1964-1985 b)	-1,33	-0,38	0,22	0,58	2,61	0,75				0,896	1,3	0,90
	-1,3	-2,0	1,0	3,7	1,7	3,6						
8. 1964-1985 b)	0,03	-0,53		0,54	4,65d)		0,13		0,32	0,860	1,3	1,03
	0,0	-2,5		2,6	3,8		0,5		1,4			

a) Variables are the same as in Tables B and C

b) Excluding the year 1975

c) Instrumental variables estimate

d) Concurrent unemployment

even sligthly better. This is also true if the inflation forecast is dropped from the equation (equ.4, Table E). Estimates also given for the period 1964-1985, excluding the year 1975.

A subdivision of the sample period into two periods brings to light substantial differences: forecasts play no role at all in the first period. The reason may be that this was a relatively tranquil period and forecasts did not deviate much from the trend of economic variables, and unemployment and productivity changes dominated the wage development in the first period.16) The expectational variables, however, seem to have played an important role in the second period. The regression equations involving the forecast of inflation, unemployment, and economic growth do about as well as the regressions with the actual values of the variables. The most satisfactory equation, with a very high R2 and no indication of serial correlation (as in the equations with the actual values of the variables), is the one which includes the contemporaneous rate of unemployment together with the forecasts of inflation and economic growth (equ.5, Table F).

The coefficient of the inflation forecast, if alone in the equation or the sum of the coefficient of the inflation forecast and the coefficient of lagged inflation, is always above the value of 1. The coefficient of the inflation forecast may be biased upward, however, to the extent that current or anticipated wage behavior is an element in the price forecast; thus the size of the coefficient is suspect because of simultaneous equation bias, but no attempt has been made to eliminate this possible source of bias.

Table F

Wage Inflation Equations including Forecast Variables, Selected Sample Periods a)

Equation and sample period	Independent variables: Constant	Normal working time	Inflation c)	Lagged inflation	Unemployment	Productivity	Forecast: Inflation	Forecast: Unemployment	Forecast: GDP	Summary statistics: R2	Durbin-Watson	SE
1. 1964-1973	-0,56	-0,56		0,37	5,00 b)	0,56 d)				0,890	0,8	0,97
	-0,3	-2,6		0,9	1,7	1,8						
2. 1964-1973	1,99	-0,32		0,25	8,15		-0,30		-0,12	0,861	1,9	1,22
	0,9	-1,1		0,5	1,9		0,6		-0,2			
3. 1973-1985	-1,07	-1,47	0,17	0,91	5,05	-0,34 e)				0,978	1,0	0,82
	-1,47	-7,3	0,8	3,7	2,1	-0,5						
4. 1973-1985	-2,35	-0,96		1			1,28	2,26	0,48	0,969	2,8	0,90
	-2,0	-4,3					5,12	1,4	2,1			
5. 1973-1985	-2,00	-1,23		0,56	2,85		0,67		0,29	0,989	2,2	0,58
	-2,6	-7,6		3,4	3,2		2,8		1,7			

a) Variables are the same as in Tables B and C

b) Lagged unemployment

c) Instrumental variables estimate

d) Lagged productivity

e) 3-year average

Another notable difference to the standard equations concerns the performance of the GDP forecast. While the productivity trend does not appear to have a significant impact on wage movements, and is even wrongly signed in the second period, the GDP forecast appears to have had a significant impact on Austrian wage development in this period (compare, in particular, equation 3 and 5 in Table F).

The regression results presented so far, enable us to answer the question whether or not the extraordinary high wage increases in 1975, aside from the effect due to the decrease in the work week, are due to ebullient expectations with regard to the year 1975. A comparison of equation 1 and 5 in Table E indicates that inclusion of the GDP forecast generally improves the fit of the equation. But this result does not refer to the effect of the (inacurate) forecast in the year 1975 alone. Further evidence on the role of expectational variables in producing high wage settlements in 1975 is provided by the results contained in Table F. In equations 3,4 and 5 the normal working time variable in effect acts like a dummy variable for the year 1975.17) Substituting the GDP forecast for the productivity variable reduces the coefficient of the dummy variable from 1,47 in equation 3 to 0,96 in equation 4, and to 1,23 in equation 5. This means that a sizeable part of the high wage increases is explained by the expectational variables.18) To pursue this question further, the sample period was lengthened to include the years 1970-1972, years in which the normal working time was also shortened and in which economic forecasts presumably had already played a role in the wage determination process. A comparison of equation 1 with equation 7 and of equation 2 with equation 8 in Table G reveals that for the periode 1970-1985 the regression equation including the forecast of inflation and of GDP gives a better fit, a lower sum of the inflation coefficients

Table G

Wage Inflation Equations including Forecast Variables, Selected Sample Period a)

Equation and sample period	Independent variables: Constant	Normal working time	Inflation b)	Lagged inflation	Unemployment Conc.	Unemployment lagged	Productivity 3-year average	GDP	Forecast Inflation	Forecast GDP	Summary statistics: R^2	Durbin-Watson	SE
1. 1970-1985	-2,25	-0,96	0,19	0,85		3,66	0,43				0,929	2,2	1,28
	-1,5	-5,0	0,5	3,5		1,7	1,4						
2. 1970-1985	-2,45	-1,09	0,27	0,97	3,50		0,22				0,922	2,1	1,34
	-1,6	-5,1	0,7	3,7	1,3		0,4						
3. 1970-1985	-1,84	-1,03	0,09	0,84		5,11		0,19			0,922	2,2	1,34
	-1,2	-5,2	0,3	3,2		2,8		1,0					
4. 1970-1985	-1,87	-1,14	0,16	0,97	4,96			-0,7			0,921	2,0	1,35
	-1,2	-6,0	0,4	3,6	2,7			-0,3					
5. 1970-1985	-2,76	-0,94		0,56		4,59		0,28	0,60		0,934	2,2	1,23
	-1,8	-4,9		1,8		3,3		1,5	1,4				
6. 1970-1985	-2,68	-1,04		0,71	4,61			0,03	0,58		0,931	2,1	1,26
	-1,7	-5,4		2,2	3,1			0,1	1,3				
7. 1970-1985	-1,78	-0,91		0,50		4,10			0,47	0,44	0,934	1,9	1,24
	-1,4	-4,7		1,6		2,6			1,2	1,5			
8. 1970-1985	-2,61	-1,00		0,66	3,84				0,60	0,27	0,935	2,0	1,22
	-2,0	-5,2		2,1	2,6				1,5	0,8			

a) Variables are the same as in Tables B and C

b) Instrumental variables estimate

(even disregarding the possible upward bias in the coefficient of the inflation forecast), and a lower coefficient of the variable normal working time. All these differences indicate that omitting the expectational variables in the explanation of the wage increases in 1975 biases the coefficients of the other variables in the expected direction.19)

It is also of interest to compare the performance of equations containing the GDP and inflation forecasts with those containing the actual inflation variables and the concurrent growth rate of GDP: these equations are reported in Table G as equation 3-6. The coefficient of the growth rate of GDP is quite small, less than half of that of the GDP forecast (the sign of the coefficient changes when contemporaneous unemployment instead of lagged unemployment enters the equation). The goodness of fit is increased if the inflation forecast is substituted for the actual rates of inflation (instrument variable estimates for contemporaneous inflation) (Table G, equations 5-8).

Overall, the performance of the forecast variables is quite remarkable considering that the forecasts are from the fall (September) of the previous year and thus do not yet incorporate information on the most recent economic developments. The good results obtained with the expectational variables indicates that wage setting does not only react to past economic developments but explicitly takes account of the future course of the economy.

9. The external sector and wage settlements

As the Austrian economy opened up towards the world economy, the leadership of the Austrian labor unions became more and more concerned with maintaining the competitiveness of the Austrian economy vis-a-vis the main trading partners. The goal of keeping the current account in balance suggests another modification of the wage equation, the inclusion of a variable characterizing the external sector. When the deficit in the current account as a percentage of GDP is introduced into the wage equation the variable is significantly different from zero but competes with the productivity trend or the GDP forecast variable. To save on degrees of freedom, the inflation rate in some equations is a composite variable, with one third of the weight going to the inflation forecast and two thirds going to the lagged (actual) inflation rate. Preliminary experimentation with the time profile of the external-sector variable suggests a two-year average of the deficit lagged one and two years. (See Table #) If the sample period is restricted to the seventies, only the deficit lagged by one period enters the equation with a significant coefficient, implying a more immediate response to the development in the external balance (see Table I). These results suggest a strong link between the external sector and the wage determination process. The emergence of a trade imbalance tends to dampen wage growth. An increase in the deficit by one percentage point lowers the increase in negotiated wages by almost half a percentage point.

The high wage increases in the years 1974 to 1976 were a major cause of the huge deficits in the current account in the following years, resulting in production and employment losses. But not the whole burden of the adjustment process was carried

Table H

Wage Inflation Equations including the deficit in the current account,
Selected Sample Periods a)

Equation and sample period	Constant	Normal working time	Inflation b)	Unemployment lagged	Productivity 3-year average	GDP forecast	Deficit b)	Summary statistics R^2	Durbin-Watson	SE
1. 1964-1985	-1,97	-0,84	0,97	3,63	0,55			0,911	1,7	1,14
	-1,6	-5,0	4,6	2,4	2,3					
2. 1964-1985	-0,96	-0,90	0,80	4,18		0,53		0,913	1,6	1,23
	-0,1	-5,5	4,9	3,2		2,5				
3. 1964-1985	-0,61	0,82	0,82	5,44		0,29	0,68	0,946	2,1	0,92
	-0,7	-6,0	6,2	4,7		1,5	3,1			
4. 1964-1985 c)	-1,55	-0,35	0,81	2,97	0,76			0,900	1,2	0,85
	-1,6	-2,0	5,1	2,6	4,1					
5. 1964-1985 c)	-0,14	-0,63	0,61	4,52		0,48		0,847	1,5	1,05
	-0,1	-3,1	3,5	3,7		2,4				
6. 1964-1985 c)	-0,71	-0,35	0,76	4,56	0,48		0,61	0,954	2,2	0,59
	-1,0	-2,9	6,8	5,2	3,3		4,2			
7. 1964-1985 c)	0,37	-0,50	0,62	5,95		0,21	0,73	0,929	1,9	0,73
	0,5	-3,4	4,9	6,4		1,3	4,2			

a) Variables are the same as in Tables B and C

b) The inflation variable is a composite variable, with one third of the weigth going to the inflation forecast, two thirds to the lagged inflation rate.

c) Excluding the year 1975

d) The deficit variable ist the current account deficit as a percentage of GDP; average of values lagged by one and two years

Table I

Wage Inflation Equations including the deficit in the current account,
Selected Sample Periods a)

Equation and sample period	Constant	Normal working time	Inflation lagged	Unemployment lagged	Productivity 3-year average	Forecast Inflation	Forecast GDP	Deficit b)	Summary statistics R^2	Durbin-Watson	SE
1. 1973-1985	-1,16	-1,13	0,67	5,12		0,31		0,40	0,989	2,4	0,57
	-1,5	-7,8	4,2	6,6		1,2		3,0			
2. 1973-1985	-1,36	-1,26	0,59	3,93	0,48	0,31		0,38	0,993	3,1	0,49
	-2,0	-8,9	4,1	4,3	1,9	1,5		3,4			
3. 1973-1985	-1,48	-1,10	0,59	3,83		0,44	0,32	0,33	0,997	2,2	0,33
	-3,2	-13,1	6,3	6,8		3,0	3,9	4,1			
4. 1973-1985	-0,63	-1,34	1,02 c)	2,34			0,43	0,36	0,977	1,7	0,83
	-0,6	-7,6	4,2	1,6			2,1	1,9			
5. 1970-1985	-1,48	-0,87	0,69	6,26		0,25		0,49	0,942	2,4	1,16
	-1,3	-4,7	2,3	5,3		0,7		2,0			
6. 1970-1985	-2,73	-0,80	0,67	4,32	0,40	0,49		0,37	0,953	2,6	1,10
	-2,0	-4,4	2,3	2,4	1,4	1,2		1,4			
7. 1970-1985	-1,81	-0,85	0,65	5,04		0,35	0,33	0,42	0,950	2,3	1,14
	-1,6	-4,7	2,2	3,2		0,9	1,2	1,7			
8. 1970-1985	-1,48	-0,95	1,12 c)	3,03			0,44	0,39	0,919	2,4	1,37
	-1,1	-4,5	3,8	1,5			1,3	1,3			

a) Variables are the same as in Tables B and C

b) The deficit variable is the current account deficit as percentage of GDP, lagged by one year

c) The inflation variable is a composite variable, with third of the weight going to the inflation forecast, two thirds to the lagged inflation rate

by a rise in unemployment; the explicit concern for international competitiveness set in motion a process of wage moderation that tended to offset earlier excessive cost increases.

To test further for the influence of the external sector on wage developments, a terms-of-trade variable (defined as the growth rate in the deflator of total domestic demand minus the growth rate in the GDP deflator) lagged by one year was inserted into the wage equation instead of the deficit in the current account. But there is no evidence that wage changes adjust to changes in the terms of trade per se.

IV. Summary

In contract to other countries incomes policy in Austria has relied exclusively on the self-restraint of the trade unions. The objectives of trade union wage policy and their implementation play therefore an important role in Austrian employment and inflation policies. According to statements by union officials real wages were to grow at the pace set by productivity growth. Over the years, the productivity guideline gradually evolved from an orientation that moved towards long-term productivity growth to one that sought to taking into account short-term economic developments, including the performance of the external sector. An analysis of negotiated wage rates in the manufacturing sector over the period 1960 to 1985 shows in fact that the inflation rate and productivity growth are two important determinants of wage inflation. But there are also other factors at work. First, the size of wage settlements responds strongly to changes in the tightness of the

labor market, as represented by the unemployment rate. Second, expectations with regard to economic growth and inflation act as important determinants of wage increases. The good performance of the inflation and GDP forecast variables in the regression equations indicate that the parties to the wage negotiations explicity consider the economic expectations formed by the social partners when negotiating over wages, rather than simply adapting to past economic developments. In the seventies, the inflation term was about equally divided between past inflation and forward looking expectations. Thus, wage increases do not just reflect an ex-post adjustment to inflatin. This seems also to hold for GDP forecasts. The orientation towards expected economic variables may be an important contribution of the social partnership arrangements, since it allows a flexible adjustment to changes in real variables.20).

Third, the concern of the leadership of the Austrian trade unions with maintaining the competitiveness of the Austrian economy assigns a role to the external sector of the economy in determining wage increases. And indeed, the empirical results indicate that the emergence of a trade imbalance tends to moderate the increase in negotiated wage rates. This corrective mechanism, together with the orientation of the wage bargaining process towards expected economic variables, may constitute those aspects of the wage setting that are most specifically Austrian. Both alleviate the burden of adjustment that falls upon unemployment in a recessionary period, and may be a key factor in Austria's good employment and inflation record.

Appendix 1

Instrumental variables for the rate of inflation

In the years 1976, 1978, and 1984 the inflation rate in Austria was raised by increasing the value-added-tax. The effect of these tax increases is estimated at 0,75, 0,40 and 2,00 percentage points (see Walterskirchen, 1977, p.112; Walterskirchen, 1979, p.110; Pollan, 1980, Pollan, 1984). These tax-induced price increases were deducted from the inflation rates in the years mentioned. The adjusted inflation rate was then estimated by ordinary least squares. The instrumental variables were a three--year-moving average (t, t-1, t-2) of increases in compensation per employee in the whole economy, a three-year moving average of economy-wide productivity increases (t, t-1, t-2), the contemporaneous increase in import prices, the lagged increase in import prices, and a time trend times a weighted average of the contemporaneous and lagged increase in import prices to account for the rising importance of imports in the Austrian economy (the contemporaneous and lagged rate of increase in import prices were weighted together in the relation 2:1). The tax-induced price increases were then added back to the predicted values of the inflation rate. This variable was then used in the wage equations.

The instrumental variable approach was applied to two time periods. The predicted inflation rate for the sample period 1960-1985 was used for the wage equations involving the periods 1960-1985 and 1960-1973; the predicted inflation rate for the period 1964-1985 for all other samples periods.

Notes

1) For a description of these institutions see Flanagan et al. (1983).

2) See Pollan (1983) and Lang (1978).

3) See Kienzl (1967) and Kienzl (1973).

4) "Der Sinn einer antizyklischen Lohnpolitik liegt darin, daß durch die Steigerung der Masseneinkommen und die Steigerung der Konjunktur wenigstens auf dem Sektor der Konsumgüterindustrien eine Konjunkturstütze geschaffen wird, die einen kumulativen Wirtschaftsabschwung zumindest behindern kann." Österreichischer Gewerkschaftsbund (1963) p.I/55-56.

5) See the statement by a leading economist and trade union official: " ... die Lohnbewegungen sollten nicht ein solches Ausmaß annehmen, daß die Erzielung eines wachstumspolitisch erforderlichen Gewinnes unmöglich gemacht wurde. Hätte die Gewerkschaftsbewegung in der zweiten Republik, vor allem in Zeiten der Konjunktur, ihre volle Kraft eingesetzt, hätte sie unzweifelhaft das Lohnniveau stärker in die Höhe treiben können, als es tatsächlich geschehen ist, was aber nur ein vorübergehender Erfolg gewesen wäre, denn eine derartige Lohnpolitik hätte die Investitionstätigkeit untergraben und damit das zukünftige wirtschaftliche Wachstum einem kurzfristigen, vorübergehenden Erfolg geopfert." Kienzl (1973), p.228.

6) As early as 1962, a year of economic recession and of high inflationary pressures, the countercyclical wage policy conflicted with the goal of price stability and the trade unions agreed to a wage stop in exchange for a price freeze for the duration of seven months. (Raab-Olah-agreement).

7) This aspect is more closely analyzed in Pollan (1987).

8) See Kienzl (1973), p.227.

9) In the period 1960-1973 the variation in year-to-year changes in productivity is small relative to that found in the period 1973-1985. Taking a three-year average of year-to-year productivity changes might reduce the variation in the productivity variable too much in the first period, but seems to be warranted in the second period.

There is also another problem in estimating the effect of productivity changes in the wage equations in the two subperiods, problems that are even more virulent when the unemployment is also included as an explanatory variable: the slowdown in productivity occurred around 1974; thus, in each subperiod the productivity trend term varies very little and thus also stands for the constant term in the regression; the value of the constant term is reduced substantially by the substitution of the productivity trend term for the annual growth rate.

10) The sample period for the years 1973-1985 also includes the year 1975. But since one exogenous variable, i.e., the variable "normal working time" consists of only one observation in 1975 (with zeros in the other years), this variable acts like a dummy for the year 1975, so that the estimated coefficients are the same as those when the year 1975 is excluded from the sample period; only the summary statistics are altered.

11) According to Kienzl (1973, p.227) an anti-cyclical wage policy does not mean, however, that the unions attempt to achieve the same wage increases in boom and recession periods. Furthermore the exercise of wage restraint in boom periods has at times been made difficult by the existence of strong wage drift as firms competed for scarce labor (Kienzl, 1973, p.227).

12) The influx of foreign workers in the sixties and seventies into the economy reduced the seasonal component of unemployment in Austria. To adjust for this change, the figure for the unemployment rate excludes seasonal unemployment and thus makes the unemployment better comparable over time. For a more detailed justification of this procedure see Pollan (1980), p.706.

13) These findings of cyclical sensitivity of negotiated wages during this period are consistent with the findings of earlier studies. Cf. Breuss (1980) and Flanagan et.al. (1983).

14) The coefficient of the unemployment rate is, however, quite sensitive to the specification of the other variables, in particular of the inflation rate.

15) There is some indication that this policy was actually successfully carried out in the sixties. See Pollan (1978), pp.94-95.

16) The coefficients of the inflation and GDP forecasts even assume negative values.

17) See footnote 10.

18) Under the assumption that the increase in hourly wage rates is raised by the full amount of the reduction in the weekly working time in 1975 (i.e., by 5,7 percent), these estimates yield a special effect for 1975 of 2,736 (=(1,48-1.00)*5,7) for equation 3, but of only 1,311 (=(1,23-1,00)*5,7) for equation 5, which includes the GDP and inflation forecasts as explanatory variables, and of -0,228 (=(0,96-1,00)*5,7) for equation 4, which also includes the unemployment forecast.

19) See section III.3.

20) Studies of aggregated wage determination in other countries (Flanagan, et al. (1983); Coe (1985)) indicate that wage setting is most likely to reflect adaptive behavior to past price developments.

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