How to explain Wage Growth Slowdown in Austria?

A sectoral-panel analysis of collectively bargained minimum wages

Philipp Gerhartinger, Philipp Haunschmid and Dennis Tamesberger

JXU JOHANNES KEPLER UNIVERSITY LINZ

ICAE INSTITUTE FOR COMPREHENSIVE ANALYSIS OF THE ECONOMY

How to explain Wage Growth Slowdown in Austria?

A sectoral-panel analysis of collectively bargained minimum wages.

Philipp Gerhartinger, Philipp Haunschmid and Dennis Tamesberger[1]

Abstract:

This paper studies the relationship between union power, unemployment and wages. We find many theoretically well-established links suggesting that unemployment negatively affects bargaining power. As an empirical strategy we use Austrian data from 1966 until 2015 on the development of collectively bargained minimum wages. Such data directly reflects the result of a bargaining process between unions and employer organizations, and enables to show the link between bargaining power and unemployment. Moreover, it allows for further discussion on the potential influence of other macroeconomic and institutional variables, such as trade openness and union density.

Keywords:

WAGE GROWTH, MINIMUM WAGES, UNEMPLOYMENT, UNIONS, BARGAINING POWER

1. Introduction

Since the beginning of the financial and economic crisis we have observed a dramatic increase in unemployment and at the same time a significant slow-down in wage growth in most OECD- and European countries (OECD 2016). This development is in line with the wage-Philipps curve, which assumes that the bargaining power of workers depends on labour market conditions. When unemployment is high, it is easier for firms to replace employees and more difficult for employees to find a new job (Blanchard 2000: 112ff.). Such circumstances affect the distribution of bargaining power accordingly. A similar explanation is provided by Marx (1962: 661ff.) who pointed out that the size of the 'reserve army' is positively related to the bargaining power of capital in the wage-setting process. Moreover, Marx (1962: 665) as well as Kalecki (1943) attested unemployment to have a disciplining effect on workers. So there are at least two causal connections between unemployment and wages: an individual aspect and a collective power aspect. In this paper we focus on the later.

Much research has been done to explain the declining labour share on the basis of cross-country-analysis (EC, 2007; IMF, 2007; ILLS 2011; Kristal 2010; OECD, 2012 and 2015; Stockhammer 2009). The result is a very complex picture that explains changes in labour share by globalization, productivity, technological change, financial markets, unions and welfare institutions. Most of the time unemployment is not integrated as an explaining variable because of methodological problems.

A second relevant research approach does not focus on the labour share but on the individual real wages (Gregg 2014, Blanchflower/Oswald 1995), which means that this approach also captures individual power aspects in the bargaining process.

In Austria, little research has been done on the relationship between unemployment and wages, though some relevant work has been conducted with various approaches and relevant constraints (Knell/Stiglbauer 2012; Materbauer/Walterskirchen 2003; Pernicka/Traxler 2004; Onaran 2016). Marterbauer and Walterskirchen (2003) showed, on the basis of a time-series analysis, that macro-economic variables like unemployment, GDP-growth and productivity explain up to 80 percent of the development of labour share and unit labour costs in the time period 1970 to 2000. However, changes of institutions or of political frameworks were not considered in their work, thus Pernicka and Traxler (2004), who could not find any significant influence of trade unions in Austria, aimed to fill in these gaps. They explain the absence of a significant effect by too little variation in the union density rate over time. Knell and Stiglbauer (2012) followed a new approach and were able to show that wage setting in Austria is strongly influenced by reference norms for the time period 1980 to 2006. Thereby they did not focus on either the labour share or the individual development of wages, but on the development of minimum wages, which brings certain advantages. They neither

accounted for institutional aspects nor applied analysis to the post crisis period. Recently, Onaran (2016) provided empirical evidence on the basis of panel data in Austria for the period 1976 to 2005. Data revealed that imports and foreign direct investment have negative effects on wages without including unemployment. A long-term explanation (including the post crisis period) of wage-trends accounting for unemployment as well as economic and institutional aspects in Austria is still missing. The underexposure of Austria is surprising because in Austria the slow-down of wage growth was very strong between 1967 and 2015 despite well-developed corporatist industrial relations (Gerlich/ Grande/Müller 1988; Tálos 2008).

The current article aims to deepen knowledge about Austria concerning the influencing factors on wages by answering the following questions: How can the long-term trends in wages in Austria be explained? And what relationship exists between wage growth, unemployment and power?

In this article we add at least three different points to the current discussion on the slow-down of wage-growth. First, contrary to most cross-country studies, focus here is on the long-term trend of a single country. Second, we use a broad concept, which includes economic and institutional aspects, enabling a comprehensive explanation of wage developments. Third, and probably most important, instead of the labour share or the individual real wages, we use the "index of agreed minimum wages" (Tariflohnindex) in our empirical work. This provides a large number of disaggregated wage-setting units on a sectoral level. The major advantage of using this data is that it directly reflects the collectively bargained wages and therefore in a sense the union power relations. Contrariwise, the wage share or real wage developments are also influenced by structural changes (e.g. rising manager wages) or by changes of the composition of the labour force.[2] The fact that the data allows for focus only on the collective power aspect also enables cutting back on macroeconomic noise in the dependent variable and inserting of the unemployment rate as a regressor in the equation without running into methodical problems.

2. Theoretical perspectives

Unemployment and wages

In economic theory there is a consensus that wages are a result of bargaining processes that are dependent on labour market conditions. According to theory, wages depend on two power aspects.

---

[2] The composition effect means that average real wages change not only because of an increase or decrease of the wage of employees but also because of changes in the composition of the labour force. If low-paid employees are the first to lose their jobs in a recession, the average wage of the remaining employees will automatically increase and vice versa (ILO 2015).

First, it depends on the nature of the job, i.e. is it easy to replace an employee because he or she is doing mainly routine activities in comparison to a higher wage job that requires high skills, creativity and commitment. Second, a good labour market situation with a low unemployment rate makes it easy for employees to find a new job, and if they are unsatisfied with the current wage, job changes are more frequent. Therefore, a firm trying to keep employees will pay higher wages. Consequently, a low unemployment rate increases the individual and collective bargaining power of employees and leads to higher wages and vice versa. This negative relation between the unemployment rate and wages is also visible in the simple AS-AD-Model. In the AS-AD-model, wages depend on expected prices, the unemployment rate and a catchall variable, the later of which summarizes aspects like unemployment benefits or the form of collective bargaining (Blanchard 2000; Mankiw 2003). Besides the introductive macro-models, the relation between unemployment and bargaining power also has a central role in game theoretic models (see e.g. Rubinstein 1990) and job search models (see e.g. Pissarides 2000). Shapiro and Stiglitz (1984) carved out these relations between unemployment and the power distribution on the labour market more clearly. In a famous article, Shapiro and Stiglitz (1984) argue that unemployment works as a worker discipline device, and the costs of unemployment avoid shirking on the work place. The neoclassic theory raises questions of power concerning imperfect markets or concerning bargaining results between groups on the labour market. Nevertheless, they do not analyze power in a fundamental sense with its consequences on the whole social system (Rothschild 2002).

This gap is filled by the thoughts of Marx and Kalecki. For Marx it was obvious that during capitalistic development unemployment will occur. The reasons for this are the changing composition of capital because of technological reasons, the tendency of concentration and the centralization of the capital itself. Accordingly, the capital accumulation tends to overproduction, which goes hand in hand with a surplus-worker-population, namely the so-called "reserve army of labor". The unemployed or the "reserve army of labor" are not only an automatic result of capitalism; in Marx' view they are also a central lever of capital accumulation. High unemployment enables capitalists to press down wages, generate a higher surplus value from workers and have enough disposable workers if an extension of production requires it (Marx 1962: 658ff.). In a similar vein, Kalecki explains why in a capitalist system full employment is rather the exception than the norm. In his inspiring work "Political Aspects of Full Employment", Kalecki (1943) mentioned three arguments for the resistance of capitalists against full employment. First, they dislike government interference in the problem of employment as such; second, they dislike the direction of government spending; and, third, they dislike the social and political changes resulting from full employment. Especially the last point illustrates the consequences of unemployment or full employment on the distribution of power in society: "Indeed, under a regime of permanent full employment, the 'sack' would cease to play its role as a disciplinary

measure. The social position of the boss would be undermined, and the self-assurance and class-consciousness of the working class would grow. Strikes for wage increases and improvements in conditions of work would create political tension" (Kalecki 1943: 326).

If we compare the neoclassic with the Marx-Kaleckian view, we see a consensus that unemployment has a disciplinary function on the workers, and that higher unemployment rates decrease wages. But Marx and Kalecki go beyond this view by seeing unemployment as a fundamental and functional ingredient of a capitalist economy. This is contrary to neoclassical theory where it is assumed that the market economy tends to equilibrium with only a "natural rate" of unemployment at which inflation is constant (Stockhammer 2006). To formulate it more precisely: "(…) Marx and Kalecki also share a common conclusion with natural rate proponents, in that they would agree that positive unemployment rate are the outgrowth of class struggle over the distribution of income and political power. (…) To put it in nutshell, mass unemployment results in the Friedmanite/New Classical view when workers demand more than they deserve, while for Marx and Kalecki, capitalists use the weapon of unemployment to prevent workers from getting their just due" Pollin (1998: 5f.).

In bringing these theoretical aspects to our concrete research question, we have to consider that there is more than one causal relation between unemployment and the development of wages. This is in line with Blanchflower and Oswald (1995), who in their famous analysis refer to at least two different reasons for predicting that high unemployment will tend to lead to low pay. The Marxist theory of the reserve army predicting union bargaining power is only one. Another refers to the role of unemployment as a disciplinary force on a more individual level. When unemployment is low and employees therefore can assume that there are many other jobs open to them, firms might tend to pay more to ensure that individual workers exert enough effort at work.

In our work we only focus on union bargaining power. The individual aspects would not lead to an increase in minimum wage, but instead to an increase in optional excess payment over bargained minimum wage. It therefore has nothing to do with union bargaining power in minimum wages. In other words, it only results in effective real wages, but does not result in minimum wages. We need to bare this in mind, as this is another major difference of this study compared to other research which focuses on the labor share or individual real wages, where both the individual and the union aspects are accounted for.

Empirically, the OECD (2016) showed, on the basis of panel-data for OECD-countries, that the rise in unemployment has gone hand-in-hand with lowering wages since the beginning of the financial and economic crisis in 2008. In Austria, Materbauer and Walterskirchen (2003) were able to explain

changes in labour share and unit labour costs mainly by GDP-growth, productivity and unemployment.

Institutions, class power and wages

Although macroeconomic variables have a high explanatory power, which seems to be only part of the puzzle to explain wage growth slow-down. The New Keynesian approach focuses strongly on labour market institutions for explaining wages. Accordingly, wages not only reflect marginal productivity but also depend on the power of labour unions (Blanchard/Givazzi 2003). This focus is also shared in sociology and political science where wages are mainly explained by the quality of industrial relations and by (political) institutions that represent the interests of employees (Ebbinghaus/Visser 1999; Soskice 1990; Wallerstein 1999; Western/Healy 1999). The main idea is that workers and employers have conflicting interests concerning the development of wages. Workers want to expand their real wages and employers want to keep production costs low. Unions use their organizational strength and threat of strikes to bargain higher wages. We can therefore expect that strong unions lead to higher wages (Card 2001; Rubin 1986; Western/Healy 1999). To measure the power of workers, union density is commonly used as an indicator for a worker's capacity for collective action (Ebbinghaus/Visser 1999). Wage developments are therefore closely linked to social relations among classes. Sometimes also strike activities are taken into account (Kristal 2010; Wallace/Leicht/Raffalovich 1999), but strike activities do not make sense for Austria because Austria has traditionally low and constant strike activities.

Another aspect capable of hampering the bargaining power of unions is the international openness of economies. Even though international trade may foster wealth gains (Francois et al. 2013; Ossa 2014), it is also observable that international trade can increase profits relative to wages by increasing imports of cheap products from developing countries. By importing goods from developing countries, firms are reducing production costs and bringing workers from developed and less developed countries into direct (wage) competition (Kristal 2010). Consequently, the global competition between workers through international trade can lead to a race to the bottom concerning wages and labor standards (Kapeller/Schütz/Tamesberger 2016). Following this argumentation, Egger and Kreickemeier (2012) showed that trade liberalization increases global wage inequalities because wages only increase in the exporting countries and not in the importing countries. Onaran (2016) provides similar findings for Austria.

Against this backdrop, we formulate the following hypothesis to explain wage slowdown in Austria:

   H1: An increase of unemployment leads to lower wage growth (negative sign).

H2: Both reference values in the union bargaining process (inflation, productivity) are positively correlated (positive sign) with the minimum wage growth.

H3: Union density is positively correlated with wage growth (positive sign), which means that decreasing union density leads to lower wage growth.

H4: The Degree of trade openness is negatively associated with wage growth in Austria (negative sign).

3. Method and data issues

For the empirical part of this paper we use data on bargained wages. In Austria about 99 percent of all employees are covered by collectively bargained agreements (Pernicka/Traxler 2004). These ("Kollektivverträge" in German) cover agreements about wages, working time and many other employer-employee relations. The main players in this bargaining process are trade unions and employer organizations. There are seven separate trade union organizations and together they form the Austrian Trade Union Federation, though in the bargaining process the former have the biggest influence. The union of private sector employees is the largest trade union, and it bargains many different agreements, for example, agreements for white collar workers in trading companies in the health sector and banking. Altogether there are many hundreds of single agreements renegotiated almost every year. These negotiations take place over the whole year but the agreements for the metal sector usually mark the start of the 'bargaining season'. This season lasts until May when most of the agreements have been made (Knell/Stiglbauer 2012).

For the purpose of our empirical analysis we use yearly data from 1966 until 2015 on an aggregated level. We use an index of the collectively agreed minimum wage on a sectoral level differentiated by blue and white collar workers. This index is a weighted average of many single agreements, and by using this aggregation we end up with yearly observations for 15 sectors. As this data only reflects the development of minimum wages, we might end up with biased estimates if actual wages increase (or decrease) faster than minimum wages. On this issue Knell and Stiglbauer (2012) came to the conclusion that the increase in the effective wage is usually very similar to that of the minimum wage, and therefore this data can be used to describe the general development of all bargained wages. Later we will use w_{it} as the annual percentage increase in the minimum wage in sector i, for $i = 1, \ldots, 15$ and $t = 1966, \ldots, 2015$. This data is publicly accessible through Statistik Austria.

This is different to the data used in the literature in two ways. First we only measure the development of wages bargained by unions, as we are interested in a measure of union bargaining power, and second we use growth rates rather than log-differences. It is important to keep these

differences in mind when we compare our results to those in the literature. We also show the nominal increase in minimum wages, and therefore it is necessary to control for price changes. The inflation rate is included rather than the real wage growth, and we later discuss the results of this approach.

Unemployment u_t is the unemployment rate in year t taken from AMECO. The inflation rate i_t is also taken from AMECO. Productivity growth p_t is measured as GDP per hour worked and has been provided by WIFO. Union density ud_t is measured as the rate of union members to the total number of employed people and is taken from OECD and trade openness. to_t is measured as the rate of export and imports of goods to GDP and is also taken from AMECO. More detailed information about our data can be found in table 1.

Table 1: Variable Overview

Variable	Operationalisation	Source	Mean SD	Min Max
DEPENDENT VARIABLE (727 observations)				
Minimum Wage Growth	annual growth rate of minimum wages (Tariflohnindex), sectoral	STATISTIK Austria	.050 (.034)	.0002 .2040
INDEPENDENT MACRO VARIABLES (49-50 observations)				
Unemployment	annual unemployment rate (international definition), national	AMECO	3.48 (1.42)	1.10 5.70
Inflation	annual inflation rate, national	AMECO	.034 (.021)	.0050 .0952
Productivity	annual growth rate of GDP per hour worked, national	WIFO	.025 (.020	-.0143 .1019
Trade Openness	rate of export and imports of goods to GDP, national	AMECO	.735 (.174)	.458 1.050
INDEPENDENT INSTITUTIONAL VARIABLE (48 observations)				
Union Density	rate of union members to total number of employees	OECD	46.66 (11.70)	27.84 65.84

In constructing this panel set, we roughly followed Knell and Stiglbauer (2012) and included more variables, which are supposed to influence the bargaining power (see Theory). We assume that the macroeconomic situation of Austria as a whole is relevant for the wage negotiations rather than the specific situation within one sector.

Figure 1 shows the development of real wage growth measured as the average of the bargained minimum wages over all sectors. We show the real growth rate of minimum wages (in the empirical model we use it in nominal terms), as it is a more convenient graphical representation. At first glance

we see a slowdown of wage growth around 1976 and no clear pattern after that. We also see losses in real wages in some years including the aftermath of the current financial and economic crisis.

Figure 1: Average real growth of minimum wages in Austria 1967-2015.
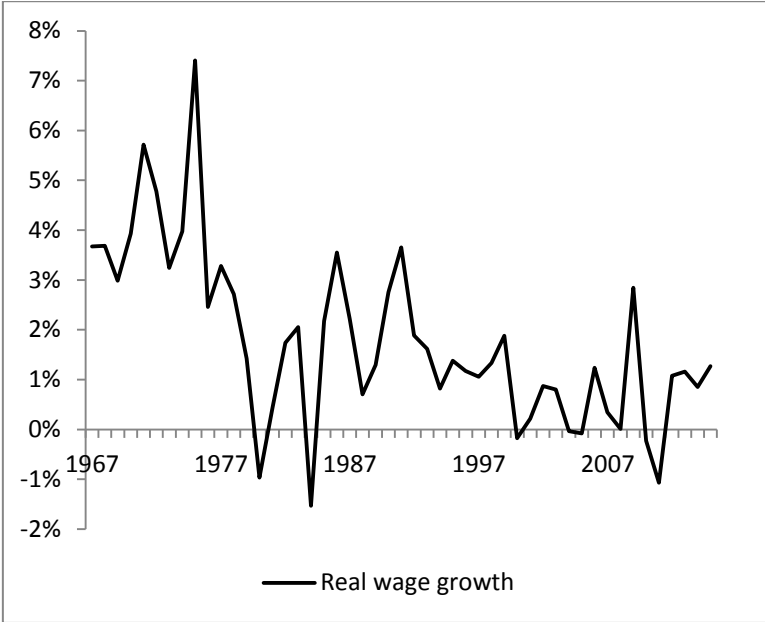
Figure 2 shows the development of the unemployment rate. Here we can identify an upward trend and strong movements around this trend. Especially after 1980 we see a fast increase in the unemployment rate.

Figure 2: Unemployment rate Austria 1966-2015.

We see a steady decline with little variation in union density in our data. In 1966 union density was at roughly 65 percent, and in 2013 it was down to around 28 percent. We discuss this fact but do not suspect the decline in union density to have a big influence on bargaining power, as there are other institutional settings in Austria.

Because Austria is a small and open economy, the trade openness index – which according to Wallerstein (1999) should be measured as the rate of imports and exports of goods to GDP – is high. We see a general rise in trade openness and, especially after Austria joined the European Union in 1995, we see an accelerated increase. As is typical of an open economy, we see that the variable for trade openness is very sensitive to changes in global demand and reacts strongly to global recessions.

Empirical Strategy

With these variables we construct a panel data set with $N = 15$ and $T = 49$. As we use growth rates in w_{it} we lose the first observations for 1966. Ultimately we want to identify the drivers of wage growth and especially try to estimate the impact of unemployment on wage growth. We assume the following relationship:

$$w = f(u, i, p, to, ud)$$

We estimate a model of the following form:

$$w_{it} = \beta_2 u_{t-1} + \beta_3 X_t + \alpha_i + \varepsilon_{it} \qquad (1)$$

were α_i are sector specific fixed effects and the vector X_t contains our set of control variables listed in table 1. We use the first lag of unemployment as an independent variable for several reasons. First, we have seen in first analysis that the first lag of the unemployment rate offers more explanatory power, and the unemployment rate at t becomes insignificant if we include both. Second, we follow Gregg et al. (2014) in assuming that using the lagged unemployment reduces potential endogeneity problems. This is a widely used approach in the literature, for example, in Marterbauer and Walterskirchen (2003).

As we cannot reject the presence of unit roots in our panel, we have to address this issue. A first difference estimator (FD) will be the baseline specification. After first differencing, the panel unit root tests reject the null hypothesis of unit roots, and therefore we avoid running into spurious regression problems by using a first difference estimator.

We also report the results of a fixed effects estimation and include different time variables to account for several trends in our variables. This is in line with the literature on this subject. Knell and Stiglbauer (2012) use decade dummies, and Gregg et al. (2014) report different specifications using a

linear trend and year dummies. In our results we report these different specifications and show that the results do not change much, and thus support our approach. These results are also in line with those of the first difference estimator, and we conclude that our results from the fixed effect specification are not spurious. Clustered standard errors are used to account for serial correlation and heteroscedasticity.

As additional robustness checks we estimated single time series for all sectors, a specification that included both a trend and year dummies, and a specification in log-differences of the levels for the whole panel. All checks confirm our results. An analysis of our residuals shows no signs of autocorrelation or heteroscedasticity.

4. **Results**

Determinants of Minimum Wage Growth

Table 2 shows that there is a strong negative relation between unemployment (in the previous year, *t-1*) and the collectively bargained minimum wage growth in Austria, referring to the period of 1967 to 2015. A rise in unemployment in period *t-1* results in a smaller growth in minimum wages in period *t*. The coefficients range between -.011 and -.002, depending on the model. All coefficients are significant at a 99 percent level. The fact that the unemployment-coefficient is relatively stable over the four models in the table (controlling for time trends in the data in various ways, see method) further proves that there is a robust relationship between the two variables. These results confirm our first hypothesis and are therefore in line with Marx' postulated effect of unemployment on the union bargaining power. Everything else held constant, higher unemployment results in less union power in the wage setting process.

Furthermore, there is a strong positive correlation between inflation and the minimum wage. The higher the inflation rate in a period, the higher the minimum wage growth in the same period. The coefficients range between .396 (in the first differences model) and .880. All coefficients are significant at a 99 percent level. The relatively small range within the coefficients indicates robust results and supports our second hypothesis. The inflation rate is the main reference value that is accounted for by unions in the bargaining process. A higher inflation rate, however, cannot be interpreted as a rise in union power in the wage setting process, as the inflation rate first determines the *real* minimum wage growth. The higher the inflation rate, the higher the wage agreement needs to be so as not to result in a loss of real wage for employees. That is why a control of inflation is essential and why a coefficient close to one (in the fixed effect level-level-model) makes sense: A one

percentage point increase in the inflation rate shall cause the nominal minimum wage growth rate to increase by about the same size. As the coefficients are slightly below one, everything else held constant, the real minimum wage would decrease over time. Especially for lower wage groups, this is in line with the Austrian wage data. The first tercil (for which the minimum wage is most important) was faced with a decrease in real wage, at least concerning the last decade.

In model (3) inflation is dropped from the regression analysis because of collinearity resulting from the inclusion of the year dummies. As discussed above (see method), the inclusion of year dummies is to been seen as the strongest control for possible time trends. The obstacle, however, is that the inclusion also results in a loss of variation, as only little variation is not due to developments in any of the periods. The same is true for the other two independent macro variables: productivity and trade openness.

The correlation between the growth rate of productivity and the minimum wage is positive as well. The higher the productivity growth in a period, the higher the minimum wage growth in the same period. Analog to the results of the inflation rate, this result is plausible, as the productivity growth is also used as a reference value in the bargaining process; further support that hypothesis 2 holds. The results, however, only give significant correlations in model (2), where the time trend is controlled for by the introduction of a linear trend (the weakest control). In all other models the variable either yields no significant results or is dropped from the equation because of collinearity. The inflation rate seems to be the more important reference value in the wage bargaining process.

Trade openness is negatively correlated with the minimum wage growth. The higher the trade openness, the lower the growth rate of minimum wage. The coefficients range between -.031 and -.077, all at a 99 percent level of significance. This is to be seen as support for hypothesis 4.

The union density, however, does yield instable and somehow implausible results in the various models. Models (1), (2) and (4) give a negative correlation between the union density and the minimum wage growth. Model (3), conversely, gives a positive relation between the two variables. Nonetheless, the coefficients are very small with most being highly significant. The underlying assumption in hypothesis 3 was that high union density results in more union power in the wage setting process and therefore in higher minimum wage growth.

The literature on this topic suggests that in Austria union density does (so far) not affect the wage level, as there is too little variation in the union density over time (Pernicka/Traxler 2004). Even though union density is falling, it is doing so on a stable path and accompanied by the fact that union power is highly institutionalized by the Trade Union Federation and by the Chamber of Labour (Talós 2008). Furthermore it might be the case that a fall in union density needs to reach a critical level

before it has a significant negative effect on the union power in the wage setting process. Another explanation lies in the possibility of reversed causality: adequate high minimum wage growth rates might cause employees to underrate their union membership. The better the performance, the less importance people attach to unions. This might especially be true in the Austrian case, where we have traditionally strong unions, very high coverage of collective bargain agreements and high union density.

Table 2: Determinants of Minimum Wage Growth in Austria

| VARIABLES | Dependent Variable: Minimum Wage Growth; 1967-2015 | | | |
	(1) First Differences	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects
Unemployment (t-1)	-0.0106***	-0.00734***	-0.00984***	-0.00236***
	(0.00117)	(0.000704)	(0.00109)	(0.000615)
Inflation	0.396***	0.848***	-	0.880***
	(0.0924)	(0.0515)		(0.0547)
Productivity	0.142	0.178***	-	0.0987
	(0.0894)	(0.0543)		(0.0616)
Trade Openness	-0.0708***	-0.0306***	-	-0.0771***
	(0.0232)	(0.00970)		(0.0149)
Union Density	-0.00262*	-0.00412***	0.000551***	-0.000797**
	(0.00131)	(0.000488)	(0.000128)	(0.000341)
Constant	-0.00120	6.820***	0.0577***	0.116***
	(0.000909)	(0.924)	(0.00540)	(0.0223)
Sector FE		YES	YES	YES
Linear Time Trend		YES	NO	NO
Year Dummies		NO	YES	NO
Decade Dummies		NO	NO	YES
Observations	684	699	699	699
R-squared	0.097	0.772	0.880	0.789
Number of ID		15	15	15

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Elasticities of the minimum wage growth determinants (log-log-model)

The coefficients in the above results (table 2) are difficult to interpret in terms of relations among regressors within a model. The log-log model in table 3 allows for relational interpretation. As a time trend control we have chosen the decade dummies in the log-log model. This seemed to be an adequate compromise in between using year dummies, where too many variables would have been dropped, and using the simple linear trend, which would have been the weakest control for a time

trend. We did not want to lose too many variables, because of the focus on the relational interpretation.

We see that the most important determinant of minimum wage growth in our model is Inflation, with a coefficient of .487. This is what was intuitively expected (see above for a discussion on why). Nearly as important is trade openness (-.458), which is also discussed as one of the major determinants in the literature. Union density is again difficult to interpret (see a more comprehensive discussion above), even though the coefficient in the log-log model is relatively large (-.323). The significance, however, is smaller compared to all other coefficients. The least relevant determinant of the minimum wage growth seems to be the productivity growth rate with a coefficient of .077 (also with weaker significance).

The unemployment rate has a coefficient of -.252 at a 99 percent significance level. A one percentage decrease in the unemployment rate therefore results in a .252 percentage increase in the growth rate of minimum wage; everything else held constant.

The elasticity coefficient of the unemployment is basically in line with the literature. A one percent increase in unemployment is supposed to result in a 0.1 percent decrease in real wage, and vice versa (Blanchflower/Oswald 1995). However, there are some major differences in the underlying models concerning the dependent variables. Blanchflower and Oswald (1995) use the real wage in their widely noticed comprehensive analysis, instead of a growth rate of wage. The fact that they are working with an inflation-adjusted dependent variable is not a big problem, as we are taking inflation into account via a control variable as well. The absolute number compared with a growth rate, however, does make a difference in the interpretation of the coefficients.

Referring to Blanchflower and Oswald (1995), in a situation where we have an unemployment rate of, say, 5 percent (which gives us about 500,000 unemployed individuals), an annual minimum wage growth of 3 percent, and a minimum wage of 1,500 €, a decrease of the unemployment rate by 10 percent causes the following reactions in the parameters: the unemployment rate shrinks to 4.5 percent giving us 450,000 unemployed individuals (a reduction of 50.000 unemployed) and the minimum wage would be 1,515 € (a rise of 15 €).

Referring to our results, the same decrease in the unemployment rate causes the minimum wage growth to rise to 3.075 percent, giving us a minimum wage of 1,546 € (a rise of 46 €). The absolute size of this increase, however, not only depends on the size of the assumed minimum wage, but also on the assumed minimum wage growth rate. In a situation where – everything else held equal – the minimum wage growth rate would equal one percent, the same manipulation of the equation would

give us an adopted minimum wage growth rate of 1.025 percent and a minimum wage of 1,515 €; this is an equal increase compared to the results of Blanchflower and Oswald (1995).

Table 3: Elasticities of determinants

	Dependent Variable: Log Minimum Wage Growth
VARIABLES	(1) Fixed Effects 1967-2015
Log Unemployment (t-1)	-0.252*** (0.0412)
Log Inflation	0.478*** (0.0277)
Log Productivity	0.0765** (0.0257)
Log Trade Openness	-0.458*** (0.128)
Log Union Density	-0.323** (0.115)
Constant	-0.123 (0.572)
Sector FE	YES
Linear Time Trend	NO
Year Dummies	NO
Decade Dummies	YES
Observations	670
Number of ID	15
R-squared	0.712

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Conclusion

In this paper we attempted to shed light on the development of wages in Austria. We contribute to the literature by focusing on the development of minimum wages, which themselves are the result of a complex bargaining process between unions and employer organizations. As real wages in Austria behave very similar to minimum wages, our results can be interpreted on a broader level. The aim of this paper was to show that the bargaining power of unions, measured by the outcome of these negotiations, namely minimum wages, depends on several macroeconomic variables.

The unemployment rate plays a crucial role in this setting. As we can empirically confirm this assumption, we are in line with both the theory and similar results in the literature. Austria is a special case in this regard, as the bargained wage agreements cover almost 99 percent of all employees. Despite the decline in union density over the years, the role of unions in the wage setting process is still crucial and highly institutionalized. Nevertheless, we find robust results that the unemployment rate has a negative influence on minimum wage growth, thus confirming our hypothesis. For the Austrian case it is very interesting that there is no difference between union and non-union members, as the result of the bargaining process is binding for all employees regardless of their union membership. Other results from the literature suggest that – at least on the basis of individual data for effective wages – the effect of unemployment on wages seems to be higher for non-union members (Blanchflower/Oswald 1995). This leads to the suggestion that the institutional wage setting process in Austria has stabilized wages and that a decline in the coverage of collective bargaining agreements would lead to a stronger reaction of wages to unemployment.

> *"My point nevertheless is that through changing power relationships at the workplace and the decision-making process through which investments decision get made, labor and the left can then also achieve a more egalitarian social structure of accumulation, one in which capitalists' power to brandish the weapon of unemployment is greatly circumscribed" (Pollin 1998, 11f.)*

We also find a negative effect of trade openness, which needs further research. There is an ongoing debate on the effects of free trade agreements and it would be an interesting approach to discuss the effects of trade on the bargaining power of unions.

6. References

Blanchard, O. (2000): Macroeconomics. Second Edition. New Jersey: Prentice Hall.

Blanchard, O./ Giavazzi, F. (2003): Macroeconomic Effects of Regulation and Deregulation in Goods and Labor Markets. Quarterly Journal of Economics, 118: 879–907.

Blanchflower, D. / Oswald, A. (1995): International Wage Curves. In: Freeman, R. / Katz L. (Eds.): Differences and Changes in Wage Structures. University of Chicago Press.

Card, D. (2001): The Effect of Unions on Wage Inequality in the U.S. Labor Market. Industrial and Labor Relations Review, 54 (2), 296-315.

Ebbinghaus, B./Visser, J. (1999): When Institutions Matter: Union Growth and Decline in Western Europe, 1950-1995. European Sociological Review, 15 (2), 135-158.

EC (European Commission) (2007): The labour income share in the European Union. Employment in Europe 2007 (Brussels, Directorate-General for Employment, Social Affairs and Equal Opportunities), 237–72.

Egger, H./ Kreickemeier, U. (2012). Fairness, trade, and inequality. Journal of International Economics, 86, 184-196.

Francois, J./ Manchin, M./ Norberg, H. Pynduk/ O./ Tomberger, P. (2013): Reducing Trans-Atlantic Barriers to Trade and Investment: An Economic Assessment. Final Project Report.

Gerlich, P. / Grande, E. / Müller, W. C. (1988): Corporatism in crisis: stability and change of social partnership in Austria. Political Studies, 36 (2), 209-223.

Gregg, P. / Machin, S. / Fernández-Salgado, M. (2014): Real wages and unemployment in the big squeeze. The Economic Journal 124 (May), 408-432.

IILS (2011): World of Work Report 2011. Making markets work for jobs. Geneva: ILO.

ILO (2015): Global Wage Report 2014/15. Wages and income inequality. Geneva: ILO.

IMF (2007): 'The Globalization of Labor', IMF World Economic Outlook, April, Chapter 5. 161-192.

Kalecki, M. (1943): Political aspects of full employment. *Political Quarterly*, 14 (4), 322-331.

Kappeller, J./Schütz, B./Tamesberger, D. (2016): From free to civilized trade: a European perspective. Review of Social Economy, 74(3), 320-328.

Knell, M. / Stiglbauer, A. (2012)**:** Reference Norms, Staggered Wages and Wage Leadership. Theoretical Implications and Empirical Evidence. International Economic Review, 53(2), 569–592.

Kristal, T. (2010): Good Times, Bad Times: Postwar Labor's Share of National Income in Capitalist Democracies. American Sociological Review, 75(5), 729–763.

Mankiw, N.G. (2003): Makroökonomik. 5. Auflage. Stuttgart: Schäffer-Poeschel.

Marterbauer M. / Walterskirchen E. (2003): Bestimmungsgründe der Lohnquote und der realen Lohnstückkosten. WIFO Monatsberichte 2/2003.

Marx, K. (1962) [1890]: Das Kapital Bd.1-3. In Marx Engels Werke (MEW 23-25) Dietz Verlag Berlin.

OECD (2016): OECD Employment Outlook 2016. Paris: OECD Publishing.

OECD (2015): The Labour Share in G 20 Economies. Report prepared für the G 20 Employment Working Group. Turkey, 26-27 February 2015.

OECD (2012): Labour Losing to Capital: What Explains the Declining Labour Share? OECD Employment Outlook, Chapter 3. 109-161.

Onaran, Ö. (2016): The Effects of Globalization on Employment, Wages and the Wage Share in Austria. Vienna: AK Wien.

Ossa, R. (2014): Trade Wars and Trade Talks with Data. American Economic Review, 104(12): 4104-4146.

Pernicka, S./Traxler, F. (2004): Die verteilungspolitischen Effekte von Arbeitsbeziehungen und Gewerkschaften : ein internationaler Vergleich. In: Pernicka, S./Traxler, F.: Ungleichheit und Umverteilung. Marburg : Metropolis-Verl..

Pissarides, C. (2000): Equilibrium Unemployment Theory. Cambridge: MIT Press.

Pollin, R. (1998): The "Reserve Army of Labor" and the "Natural Rate of Unemployment": Can Marx, Kalecki, Friedman and Wall Street All Be Wrong? *Review of Radical Political Economics*, 30 (3), 1-13.

Rothschild, K. W. (2002): The absence of power in contemporary economic theory. *The Journal of Socio-Economics,* 31, 433-442.

Rubin, B. A. (1986): Class Struggle American Style: Unions, Strikes and Wages. American Sociological Review, 51 (5), 618-633.

Rubinstein A./ Osborne, M. (1990): Bargaining and Markets, Academic Press, San Diego.

Shapiro, C./ Stiglitz. J. (1984): Equilibrium Unemployment as a Worker Discipline Device. *The American Economic Review*, 74 (3), 433-444.

Soskice, D. (1990): Wage determination: the changing role of institutions in advanced industrialized countries. Oxford Review of Economic Policy, 6 (4), 36-61.

Stockhammer, E. (2009): Determinants of functional income distribution in OECD countries. IMK Studies. Hans-Böckler-Stiftung.

Stockhammer, E. (2006): Is the NAIRU theory a Monetarist, New Keynesian, Post Keynesian or a Marxist theory. Department of Economics Working Paper Series, 96. Vienna: WU.

Tálos, E. (2008): Sozialpartnerschaft. Ein zentraler politischer Gestaltungsfaktor in der Zweiten Republik. Wien: Studien Verlag.

Wallace, M./Leicht, K.T./Raffalovich, L.E. (1999): Unions, Strikes and Labor'Share of Inocme. A Quarterly Analysis of the United States, 1949-1992. Social Science Research, 28, 265-288.

Wallerstein, M. (1999): Wage-Setting Institutions and Pay Inequality in Advanced Instustrial Societies. American Journal of Political Science, 43 (3), 649-680.

Western, B./Healy, K. (1999): Explaining the OECD Wage Slowdown: Recession or Labour Decline? European Sociological Review, 15 (3), 233-249.