

Wage Staggering and Wage Leadership in Austria – Review and Implications

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This study examines the importance of wage staggering and wage leadership in the Austrian system of collective bargaining. Collective wage agreements in Austria generally remain valid for one year and are staggered; the highest concentrations of new agreements can be found in the months of January, May and November each year. The relevant literature describes Austrian wage bargaining as a system of wage leadership, with the agreement reached by the metal workers, which usually goes into effect in early November of each year, setting a precedent for wage agreements reached by other sectors in the ensuing months. Through an analysis of detailed individual series from the Index of Agreed Minimum Wages, it is actually possible to provide empirical evidence for the existence of wage leadership. The results also show that the wage-leading metal sector is substantially more sensitive to macroeconomic forecasts than the other sectors are. This phenomenon and the rapid transmission to the sectors that follow are probably key reasons why empirical evidence of high real wage flexibility has been found in Austria.

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For a long time now, the institutional features of wage bargaining systems have been a topic of major interest in academic as well as policy-oriented macroeconomic research (e.g. in OECD publications). One particularly relevant question is whether wage bargaining is centralized and/or coordinated. Collective wage bargaining in Austria is often said to be a system of “wage leadership”: The first settlement to be reached at the start of the “autumn bargaining round” each year is for the metal sector, and the wage increases negotiated there are believed to provide a signal for the wage negotiations that follow.

Upon closer examination of the results of collective agreements, we can identify clear temporal staggering almost over the entire year, with certain months showing significant concentrations in the number of agreements entering into effect.

Providing empirical evidence of wage leadership is not an easy task. First, wage increases exhibit considerable variance, and other industries do not simply mirror the settlements reached in the metal sector. Second, simple correlations or regressions alone do not represent conclusive evidence either, as macroeconomic variables – such as sectoral wage increases – are highly correlated in any case. In light of these difficulties, Knell and Stiglbauer (2009) use various lines of argumentation and analytical steps in order to verify the existence and significance of wage leadership in Austria.

This study is structured as follows: In section 1, we provide a description of collective wage bargaining in Austria. In section 2, we proceed to a comprehensive discussion of how those negotiations are staggered over time. We then summarize the Austrian debate on the existence of wage leadership as well

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as the results of empirical studies carried out on this topic (section 3). The characteristics of Austria's wage-setting institutions in an international comparison are discussed in section 4, after which we draw economic policy conclusions in section 5.

1 Collective Bargaining in Austria

1.1 Who is involved?

In a typical year, some 400 collective wage agreements are signed in Austria (ÖGB, 2005). The negotiations are conducted by the unions on the employees' side (the Union of Salaried Private Sector Employees for white collar workers and the various sectoral unions for blue collar workers) and by the relevant trade associations belonging to the Austrian Federal Economic Chamber (WKÖ) on the employers' side. For public sector employees, the Union of Public Services negotiates on behalf of federal employees with the federal government, which is usually represented by a state secretary responsible for public service. The umbrella organizations (i.e. the WKÖ and especially the Austrian Trade Union Federation, ÖGB) do not play a (direct) role in those negotiations.

In formal terms, collective agreements are almost always concluded separately for blue and white collar workers.² However, wage negotiations for the two groups are frequently carried out in joint bargaining rounds. Moreover, for blue collar workers, the union mergers observed in recent years have brought about a slightly higher degree of uniformity in wage settlements. Another characteristic feature is the traditional distinction drawn between industry and trades of a given sector,

e.g. in the construction sector or the metal sector. There are in part substantial differences between the two groups in terms of their wage and salary levels as well as the agreed wage increases.

As a rule, collective wage agreements are valid throughout Austria. However, regional distinctions are made in some cases, especially in the food, beverages and tobacco sector or in the public sector (where separate negotiations are held for Vienna and the other federal provinces of Austria).

1.2 Collective Agreements Generally Signed for a One-Year Period

In order to characterize the Austrian system of collective bargaining in quantitative terms over a longer period of time, one would require detailed information on all of the settlements reached as well as the contract lengths. Collecting these data would involve an extremely high level of effort. For this reason, Knell and Stiglbauer (2009) chose a different approach: The authors use detailed series from Statistics Austria's Index of Agreed Minimum Wages (IAMW) for the base years 1986 and 1976 to derive 100 individual series which generally represent key collective wage agreements. Further information on these data can be found in the annex to this study.

Table 1 shows the distribution collective-agreement durations in weighted as well as unweighted form. Measured by their weight in the IAMW 1986, over 89% of collective agreements had a duration of exactly one year, and approximately 95% of agreements had a duration of between 11 and 13 months.³

² However, the pay scales in the metal sector have been harmonized for both types of workers.

³ In some cases, variations in contract duration are used as a means of reaching a compromise in collective wage settlements (e.g. by prolonging the validity of a settlement which the employers consider somewhat inflated).

Table 1

Distribution of Contract Durations of Collective Wage Agreements

Duration	1980 to 2006	
	Unweighted	Weighted (based on the IAMW 1986)
	%	
Up to 10 months	2.3	1.8
11 months	1.8	1.3
12 months	85.1	89.4
13 months	5.3	4.1
14 to 18 months	4.0	2.2
Over 18 months	1.5	1.2
Total	100.0	100.0

Source: Knell and Stiglbauer (2009).

1.3 Collectively Negotiated Wages: A Key Determinant of Growth in Actual Wages

At approximately 95%, the coverage of collective wage agreements is quite high in Austria (Bönisch, 2008). This means that collectively agreed minimum wages⁴ and periodic wage increases are binding for the vast majority of employees. Consequently, there can be little doubt as to the fundamental relevance of collective agreements to the general development of wages.

However, one might object that an analysis of collectively negotiated wages is not particularly relevant because many industries in Austria are known to pay higher wages and salaries than the collectively negotiated minimum wages.⁵ However, these “excess payments” relate to wage *levels*, whereas this study clearly focuses on wage

growth, and the agreed annual rates of increase in actual wages and salaries usually follow the pattern of negotiated minimum wages.

The parallel development of these two wage indicators is illustrated in chart 1, which compares the growth of collectively negotiated wages with that of compensation per employee (a measure of the development of actual labor costs from Austria’s national accounts). The chart shows that the two grow at similar rates. Wage drift (i.e. the difference in growth between actual and minimum wages) is generally slight and can be attributed primarily to business cycle developments. Since the mid-1990s, however, wage drift has generally been (slightly) negative, which is probably related to a reduction in the level of “excess payments” and to the increase in part-time employment.

⁴ Austrian law does not prescribe a general minimum wage. Still, the social partners have a general agreement on minimum wages (of currently EUR 1,000 per month on a gross basis) to be used in the individual settlements as well as regulatory minimum wages for a few professions.

⁵ Moreover, in many cases there are also “real wage” settlements in addition to the collective agreements on sector- and profession-specific minimum wages. However, no comprehensive data basis is available for such wage agreements, unlike for the negotiated minimum wage rate indices, which only capture minimum wages. As a result, this study does not go into further detail on this type of wage agreements. For an analysis of “excess payments” (wage cushion) in Portugal, see Cardoso and Portugal (2005).

Chart 1

Comparing Collectively Agreed Wages and Actual Compensation (1980 to 2006)

Source: Statistics Austria.

2 Wage Staggering

Wages do not change constantly; instead, they follow a clearly recognizable pattern over time: First, wage agreements typically remain in effect for a fixed period of time (mostly one year in Austria), and second, the wages in different industries change in different months of the year. Therefore, wage setting does not follow the simplest neoclassical model, which assumes full wage flexibility, nor does it fit in with the dominant assumption in the current macroeconomics literature, namely that of “Calvo contracts” in which wage changes are stochastic and the probability of a new settlement is constant over time. Instead, the Austrian system is remarkably consistent with the assumption of “staggered wages” as first introduced to macroeconomics by Taylor (1980) – primarily in order to show that monetary policy can have persistent real effects even under the assumption of rational expectations. It is striking how few empirical studies

have been conducted on the synchronization and staggering of wage settlements,⁶ especially in light of the extensive New Keynesian literature which builds on the assumption of rigid wage contracts.

Collective wage negotiations in Austria generally exhibit the following pattern over time: The “wage bargaining year” starts in November, when settlements in the metal sector and a handful of other industrial sectors go into effect; these settlements are followed by the wholesale and retail trade employees’ settlement and many others (most of which belong to the public sector) at the beginning of each year. The collective wage agreement for the banking sector is signed in February, followed by a number of other sectors in May (mainly the restaurant/catering and construction sectors). Almost no (quantitatively) significant collective agreements enter into effect in the summer and early fall. The next bargaining year begins with the

⁶ Exceptions include Taylor’s original work (1980) as well as the studies conducted by Olivei and Tenreyro (2007, 2008).

metal sector's wage settlement in November.

Table 2 shows the distribution of collective wage agreements over a typical year (2006). The wage bargaining year begins with the wage settlements that go into effect at the beginning of November. In particular, these include the settlements for blue and white collar workers in the metal sector as well

as additional agreements in the manufacturing sector. In November 2006, those agreements accounted for a total weight of nearly 14% of the IAMW 1986.

In December 2006, wages did not change in any important collective agreements. A majority of wage settlements (nearly 55% of the total weight in the IAMW 1986) go into effect in

Table 2

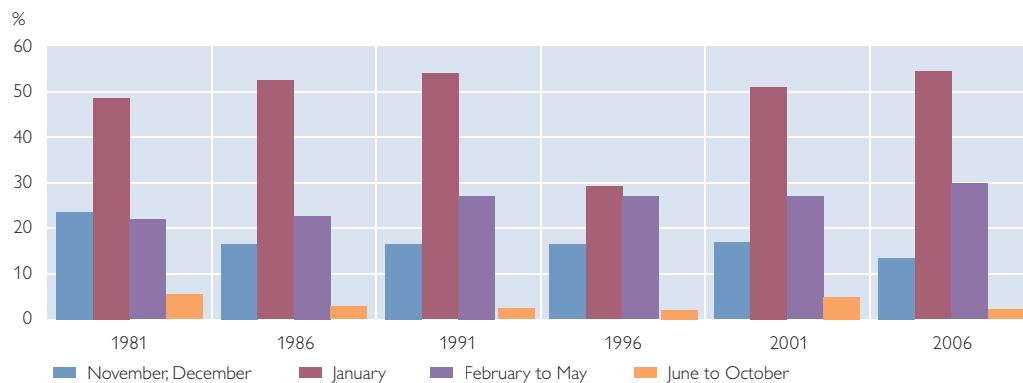
Temporal Distribution of Collective Wage Agreements in 2006

Sample series from the IAMW 1986 (in descending order by weight)

	Month of entry into effect	Number of series in month	Overall weight of these series %	Cumulative weight
Metal industry blue collar workers (BCWs) and white collar workers (WCWs), mining and iron production industry WCWs and BCWs, stone and ceramics industry WCWs	November	7	13.5	13.5
(none)	December	0	0.0	13.5
Wholesale and retail trade WCWs, WCWs in general trades, federal government employees, BCWs in metal trades, teachers employed by federal provinces, Austrian Federal Railway employees, provincial government employees, BCWs in wholesale and retail trade, Post and Telegraph Administration employees, teachers employed by federal government, Vienna government employees, police, employees of social insurance institutions, municipal employees (10,000 to 50,000 inhabitants), municipal employees (50,000 to 250,000 inhabitants), municipal employees (500 to 10,000 inhabitants), university-level faculty, BCWs in goods transport, teachers employed by the province of Vienna, Vienna public transport employees, Austrian Broadcasting Corporation (ORF) WCWs, employees of bus transport lines, armed forces personnel, forestry BCWs	January	39	54.5	68.0
Bank and private bank WCWs, savings bank WCWs, Raiffeisen-type credit cooperative WCWs, Volksbank credit cooperative WCWs	February	8	5.3	73.3
BCWs in agricultural estate operations, WCWs in agricultural cooperative warehouse associations	March	6	1.3	74.6
Insurance company WCWs, textile industry BCWs, WCWs in printing trades, freight transport WCWs, textile industry WCWs in Vorarlberg province, wood processing industry WCWs	April	13	5.2	79.8
BCWs in restaurant, catering, beverage serving and hospitality businesses, BCWs in construction trades, BCWs in supplementary construction trades, BCWs in wood processing trades, chemical industry BCWs, WCWs in construction trades, construction industry BCWs, wood processing industry BCWs, stone and ceramics industry BCWs, WCWs in restaurant, catering, beverage serving and hospitality businesses, construction industry WCWs, paper industry BCWs, sawmill industry BCWs	May	18	18.1	97.9
BCWs in glass industry	June	2	0.3	98.3
Butchers	July	5	1.1	99.3
(none)	August	0	0.0	99.3
(none)	September	0	0.0	99.3
Bakers	October	2	0.7	100.0

Source: Knell and Stiglbauer (2009).

Note: These series are based on 100 series from the IAMW 1986 with a total weight of 93%. Criteria for inclusion in the table: weight $\geq 0.25\%$; the series with the highest weight in each month is included in any case.

Temporal Distribution of Collective Wage Agreements in Austria (1981 to 2006)

Source: Knell and Stiglbauer (2009).

January each year: These settlements include wholesale and retail trade employees as well as numerous categories of public sector employees (table 2). Regarded over the course of the wage bargaining year (i.e. from November to October), therefore, the bulk (more than two-thirds) of wages and salaries of dependently employed persons in Austria have changed by January.

In the three months that follow, changes are observed in comparatively few industries, most notably credit institutions in February and insurance companies in April. After January, May is the next month in which a large number of new wage and salary settlements take effect (approximately 18% in terms of weight). In particular, collectively negotiated wages in the restaurant/catering and construction sectors usually change in this month, meaning that nearly all changes in collectively negotiated wages (approximately 98% of the overall index weight) occur within six months.

To what extent can this snapshot of the year 2006 be considered typical of a longer time period? Naturally, not every year is the same, but the basic pat-

tern is highly stable. The fact that the wage settlement in the metal sector has taken effect in November every year since 1981 is particularly relevant in this context.⁷ The ensuing sequence of staggered wage contracts has also remained relatively constant for many years.

Chart 2 provides support for these statements over the period from 1981 to 2006 (in five-year increments). The chart shows that the share of collective wage agreements taking effect in November and December has dropped slightly, while the share of agreements taking effect in January has increased somewhat, as has the share of agreements in the period from February to May. (The small share observed in January 1996 can be attributed to wage freezes in the public sector that year.)

On the basis of chart 2, it is tempting to draw the conclusion that the temporal pattern described here is just as old as the “social partnership” regime in Austria, but it only came into existence in the early 1980s. In fact, the data for the years prior to 1980 do reveal a different temporal sequence which not only diverges from that

⁷ In 1980, the new collective agreement for this sector entered into effect in October.

shown in table 2 and chart 2, but is also relatively unstable. Brandl and Traxler (2008) arrive at a similar conclusion. The transition to the sequence described here is closely related to the establishment of a system of wage leadership in Austria.

3 Wage Leadership

Not only does the Austrian system of collective wage bargaining follow a pattern of staggered wage contracts, it is also widely believed that the Austrian metal sector – which is generally the first to reach a settlement in the wage bargaining year – is the “wage leader” and thus has a decisive influence on the ensuing settlements. In this section, we first briefly describe the origins of this system, after which we proceed to discuss the empirical evidence for wage leadership in Austria.

3.1 Austrian Metal Sector Leading Wage Developments Since the Early 1980s

Since around 1980, the metal workers’ union⁸ has assumed the role of wage leader in Austria. This development marked a deliberate departure from the previous system of centrally coordinated collective wage bargaining (Traxler, 2005). This change is also closely linked to Austria’s transition to a hard currency policy (Nowotny, 2006).

The following statement by the metal workers’ union is emblematic of this new direction: “It is in the exposed sectors of the economy that wage policy has some leeway, and the results obtained there must be the guideline for wage policy in the sheltered sectors.

[...] In general, growth and inflation are regarded as the main determinants of wage policy. [...]” (Activity Report of the Austrian Trade Union Federation 1982, cited in Traxler, 2005).

Interestingly, the objective of redistributing wages among different companies (which was apparently considered desirable into the 1970s) is also rejected in this statement: “The possibility of redistribution lies almost exclusively within individual companies. [...] Redistribution among companies which are not connected is not only impossible, but also undesirable. [...] The extreme differences in companies’ earnings will necessarily bring about vast discrepancies in wages [...]” (ibid).

3.2 True Wage Leadership?

However, a mere declaration of intent such as the one cited above does not provide insight into the effective influence of the metal workers’ wage settlement on the ensuing agreements in other sectors. Empirical evidence is required, but for a long time it has not been possible to provide such evidence due to attendant difficulties, such as the compilation of a suitable data basis and the use of an adequate empirical estimation method. Moreover, it is also necessary to resolve a number of conceptual issues.

3.2.1 Wage Increases Vary Widely

One clear indication of wage leadership would be uniform wage increases in all industries. However, this is not the case. On the contrary, annual wage increases in Austria exhibit considerable variance.

⁸ Due to recent union mergers, the metal workers’ union has now become the union of metal, textile and food workers, GMTN. This union represents workers of enterprises classified in ÖNACE 2008 sections 24 to 33 in the metal sector. These include the manufacture of basic metals, fabricated metal products, machinery and equipment, computers and data processing devices as well as motor vehicles. The Union of Salaried Private Sector Employees handles wage negotiations for white collar workers in the metal sector, which are conducted jointly with the GMTN.

Chart 3 shows the annual wage increases in the metal sector compared to the median to the first and ninth decile of all settlements. In some years (e.g. 1989/90 and 1990/91), the difference between the first and last decile is larger than two percentage points.⁹ The growth rates of collectively negotiated wages in the metal sector are relatively high compared to those in other sectors, as they are nearly always above the ninth decile of all collective wage settlements.

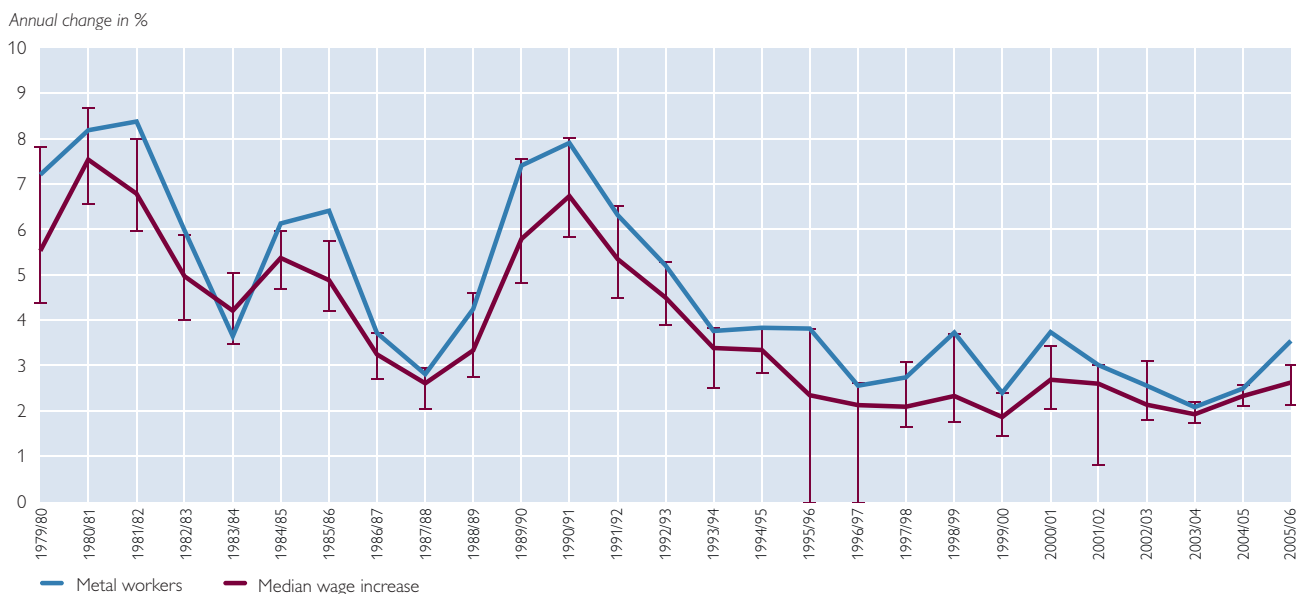
If wage leadership exists in Austria, then it does not bring about uniform wage increases. A look at the institutional circumstances also raises doubts as to the actual effectiveness of wage leadership: After all, collective wage agreements in Austria are concluded on a sectoral basis. While the WKÖ is al-

ways involved on the employers' side (with the exception of the public sector), the employees are represented by a larger number of individual unions. Other unions are not bound in any way by the wage settlement reached in the metal sector, and there is no formula according to which that settlement is to be taken into account in the ensuing negotiations. In addition, the union umbrella organization Austrian Trade Union Federation, ÖGB, has relatively little influence compared with the individual unions.

Several years ago, Pollan (2004) voiced serious doubts as to the existence of wage leadership in Austria and attempted to support those doubts empirically. Pollan's point of departure is the argument that wage leadership would have to bring about a harmoniza-

Chart 3

Annual Growth in Metal Workers' Wages Compared to Other Collective Wage Settlements



Source: Knell and Stiglbauer (2009).

Note: The vertical lines represent the first and the ninth decile of wage increases in all collective wage settlements.

⁹ The interdecile ranges in the years 1995/96 and 1996/97, which are also conspicuously large as the first decile lies at zero in each case, can be attributed to wage freezes in the public sector.

tion of wage levels in the individual industries.¹⁰ This equation of wage leadership with solidarity in wage policy is problematic in light of the quote from the metal workers' union above, which explicitly states that solidarity between industries is not (or no longer) desired.¹¹ Likewise, Pollan's attempt to refute the existence of wage leadership empirically is not convincing. He first points out that there are large differences in collectively negotiated hourly wages and monthly salaries, after which he uses industry-specific series from the IAMW in an attempt to demonstrate that wages and salaries have drifted apart over time. However, this cannot be accomplished using index series, as they do not contain information on the level of wages and salaries.

In response to Pollan's work, Traxler (2005) argued that the macroeconomic coordination of wage bargaining (e.g. by means of wage leadership) may have two objectives: (1) overall wage moderation or (2) the coordination of wage settlements for the sake of distribution policy goals. These two objectives cannot be reconciled according to Traxler, as wage leadership as pursued in the first objective supports the exposed (export-oriented) sector of an economy, by accounting for the development of unit labor costs compared to those in other countries, as well as serving the national-level objective of paying sufficient wages to deter workers from migrating to other sectors.¹² At that time,

Traxler was unable to present empirical evidence to this effect, but announced that such a study would be published later. This study (Brandl and Traxler, 2008) is discussed in the box entitled "Empirical Evidence of Wage Leadership."

3.2.2 Operationalizing the Concept of Wage Leadership

The discussion up to this point suggests that the wage agreements reached by the wage leader serve as a guideline for wage increases in other sectors, which could also be regarded as an upper limit.

Given the fact that wage increases are not uniform, however, we can assume that sectoral wages are not determined exclusively by the wage leader's settlement. Therefore, the wage leader can only have a *partial* impact on the ensuing collective wage agreements, which are also influenced by sector-specific circumstances and any changes in macroeconomic conditions. As a result, empirical studies on wage leadership rely on wage regressions for possible "following" sectors, with the wage increases of the potential wage leader (among other factors) serving as the explanatory variable (e.g. Smith, 1996, on the UK chemical industry as well as Lindquist and Vilhelmsson, 2006, on the public sector in Sweden).

However, it is important to bear in mind that even if the coefficient for the potential wage leader diverges from zero and is significantly positive, this

¹⁰ Pollan substantiates this claim with a statement by Heinz Kienzl, a former union official who later became Chief Executive Director of the Oesterreichische Nationalbank. Kienzl noted that the unions in Austria strive for solidarity in wage policy (Kienzl, 1973, cited in Pollan, 2004).

¹¹ A study based on social security data from the years 1972 to 1991 (Gusenleitner et al., 1998) comes to the conclusion that wage inequality in Austria (measured at the level of the individual employee) declined until 1977, then climbed steadily from that time onward. This conclusion is compatible with the view that solidarity in wage policy was originally pursued but later abandoned.

¹² A certain degree of solidarity – in the sense of cushioning sectoral wage differences – is said to be achieved due to the fact that the wage-leading metal sector bases its wage negotiations not on industry productivity, but on overall economic productivity (which tends to be lower); ÖGB, 2003.

alone does not constitute conclusive evidence of wage leadership. Due to the high correlation of sectoral wage settlements, such a result is probable for many different hypothetical wage leaders. Therefore, further empirical analyses are required. Lindquist and Vilhelmsson (2006), for instance, conduct Granger causality tests in order to determine whether the public sector in Sweden exhibits wage leadership characteristics. Smith (1996) tests the plausibility of wage leadership by running specification tests on various empirical models.

3.2.3 Wage Leadership in Austria is Empirically Verifiable

Knell and Stiglbauer (2009) extend Taylor's model of staggered wage contracts (Taylor, 1980) to include "reference norms" which account for the possibility that wages in other sectors can have a direct impact on wage formation. An estimation equation is derived from the Taylor model and imple-

mented empirically as a panel regression with variable coefficients. The empirical model comprises 100 individual time series from the IAMW spanning a period of 27 years (1980 to 2006).

Among the reference norms tested, the specification which defines the metal workers' wage settlement as a direct explanatory factor ("wage leadership norm") on sectoral collective wage settlements yields the most plausible overall results. In particular, the authors show that the wage-leading metal sector is substantially more sensitive to macroeconomic forecasts than the other sectors are. This finding is based on tests of parameter restrictions arising from the theoretical model and on specification tests such as those applied in Smith (1996), among other things. Additional details on the study are provided in the box "Empirical Evidence of Wage Leadership" below. This result can be regarded as convincing evidence that wage leadership exists in Austria.

Empirical Evidence of Wage Leadership

This box provides a detailed presentation of the method and main results of the study conducted by Knell and Stiglbauer (2009). In addition to individual time series from the IAMW (see annex), the authors use macroeconomic time series for expectations about inflation, unemployment and real economic growth (all of which are based on forecasts published by the Austrian Institute of Economic Research, WIFO).

Theoretical Model

The study's point of departure is the Taylor model, which enables an analysis of inflation persistence (and the persistence of other macroeconomic variables) caused by wage rigidity in a system of staggered wage negotiations with fixed contract durations (Taylor, 1980). The wages in other sectors influence wage formation in a given sector only to the extent that they impact expected inflation (and thus also real wage expectations).

However, surveys of executives, human resource managers and union representatives suggest that the wages in other sectors are often used directly as a benchmark ("reference norm") for wage settlements. Therefore, the Taylor model is extended in order to allow for the influence of such reference norms. Various types of reference norm are taken into consideration. One of the two most important norms is an "external reference norm" in which the average wage increase in all other sectors (since the last change in the given sector's wages) serves as a guideline. Here it is important to note that this assumption implies that all sectors

act in the same manner, with each sector using the average wage development for the rest of the economy as a point of reference for its own negotiations.

The second important reference norm is the “wage leadership norm,” which is by definition asymmetrical: The wage leader’s settlement serves as the point of reference for the “following” sectors, while the wage leader itself does not have a reference norm (and only considers the real economic outlook and inflation forecasts, as in the original Taylor model). The solution presented in the theoretical model shows that the value of the persistence parameter depends on the specification of the reference norm. In any case, this value is higher in the Taylor model extended to include reference norms than in the original model; however, this additional persistence turns out to be considerably lower in the case of wage leadership than in the case of an external reference norm. This is plausible because the wage-leading sector focuses far more heavily on the future and is not dependent on previous wage settlements. As a result, the collective wage bargaining system is far better able to effect macroeconomic changes (e.g. in response to a shock such as the current economic crisis).

Empirical Model and Econometric Estimates

In the next step, the theoretical model is used to derive an estimation equation in which wage changes in a sector mainly depend on

- a reference norm,
- expected inflation (using current WIFO forecasts for the ensuing year), and
- expected real economic development, measured in terms of real economic growth or the change in the overall unemployment rate (also using WIFO forecasts).

The theoretical model implies a parameter restriction which is important for assessing the validity of regression results: The sum of the coefficients of expected inflation and the reference norm should be equal to one.

In the panel regressions, the authors used a model with variable coefficients, as sectoral responses to the influencing factors mentioned above can be expected to vary in intensity if wage leadership exists.

Results

The regressions yielded plausible results. All three explanatory variables turned out to be key determinants of sectoral wage developments. The coefficient of the reference norms is on average roughly as high as that of expected inflation. Real economic development forecasts also affect wage settlements in the expected manner.

However, this simple comparison of individual regression results still does not indicate which of the various reference norms provides the most apt description of the wage-setting process in Austria. In order to answer this question, three additional steps were taken: (1) The authors performed various specification tests (J-tests, nested tests), and their results permitted the conclusion that the wage leadership norm is clearly preferable to the external reference norm. (2) Additional tests were performed on the parameter restriction, and their results also supported this conclusion, as did (3) an analysis of the temporal pattern of the estimated coefficients over the course of the wage bargaining year. On the basis of the evidence collected, this article concludes that wage leadership is indeed a characteristic of the Austrian wage bargaining system.

Another interesting point is the heterogeneity of the estimated coefficients. The first column in the table below shows the average values of the three main influencing factors across all sectors. One of the most striking results from the regressions with variable coefficients is the fact that the wage-leading sector (shown in the second column) is far more sensitive to expected macroeconomic developments. The coefficient for unemployment forecasts is nearly ten times as high as the average across all sectors (which exhibits only weak statistical significance). The coefficient for inflation forecasts is also substantially higher than the average. This suggests that the macroeconomic outlook hardly has a direct effect on wage settlements in

Estimated Coefficients in the Standard Specification

Explanatory variable	Average across all sectors	Results for the wage-leading metal sector
Reference norm (wage leadership norm)	0.579 (0.017)***	x x
Inflation (forecast)	0.454 (0.034)***	1.216 (0.094)***
Absolute change in unemployment rate (forecast)	-0.219 (0.100)**	-2.092 (0.331)***

Source: Knell and Stiglbauer (2009).

Note: Standard deviations in parentheses. *** and ** indicate significance at the 1% and 5% confidence level, respectively. The estimation equation includes a constant as well as period dummies.

the “following” sectors; instead, its impact is primarily indirect, through the settlement reached by the wage leader.

On Brandl and Traxler (2008)

Brandl and Traxler’s empirical study relies on detailed data regarding individual collective wage agreements and compares the period from 1969 to 1979 with the period from 1980 to 2004. Using simple linear regressions, the authors find evidence of wage leadership in the latter period, but not in the former; these findings are consistent with prevailing characterizations of the Austrian wage bargaining system and its development.

However, a number of objections to their empirical method can be raised: (1) The estimation equation was derived *ad hoc*, not from a theoretical model. (2) No forecast data are used. (3) The estimation equation includes two real economic indicators (economic growth and changes in unemployment). (4) The authors do not consider any alternative reference norms or possible asymmetries. In addition, as discussed above, merely finding a positively significant coefficient for a potential wage-leading sector does not constitute strong empirical evidence of wage leadership. According to our results, this would apply to most sectors.

4 Wage Setting: An International Perspective

4.1 Austrian Collective Wage Agreements Exhibit High Coverage and Short Durations by International Comparison

International publications regularly cite Austria as the country with the highest level of coverage when it comes to collective wage agreements, as the results of collective wage bargaining apply to nearly all Austrian employees (OECD, 2004, table 3.3; Du Caju et al., 2009, table 1).

Nevertheless, collective wage bargaining is also an important determinant of wage development in other countries: A firm survey conducted within the framework of the WDN

shows that workers’ wages change only relatively seldom and that new collective wage agreements are the main reason behind such changes (Druant et al., 2009). This applies even more to euro area countries, as collective wage bargaining is especially important in those countries compared to the other EU Member States.

The duration of approximately one year for collective wage agreements in Austria is rather short compared to those in the rest of Europe. In other countries (e.g. Belgium, Ireland, Spain and Sweden), contract durations of two to three years are common (Du Caju et al., 2008). This difference reduces the need for wage indexation in Austria. Together with the decentralized coor-

dination instrument of wage leadership, it also enables Austrian wage formation to adapt to economic circumstances comparatively quickly and real wages to be quite flexible (Arpaia and Pichelmann, 2007).

4.2 Wages in Other Countries also Adjusted Most Often in January

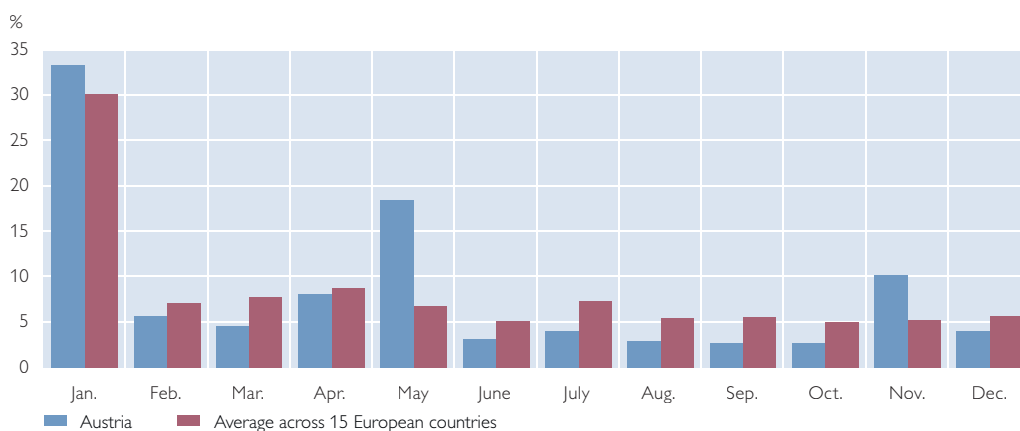
Research in macroeconomics and labor economics to date has not devoted sufficient attention to the fact that changes in collectively negotiated wages are not distributed evenly over the year, but occur more frequently in certain months. A recent WDN survey (Druant et al., 2009) shows that this pattern is not specific to Austria alone, but is actually a widespread phenomenon. Chart 4 shows the typical months in which wage changes go into effect in Austria compared with a European average based on 15 countries. In contrast to the sources used above, these data are not based on series from an official negotiated wage index, but on company surveys which exclude the public sector. This explains why only 33% of

Austrian companies participating in the survey indicated wage changes in January (compared to almost 55% in table 2). However, if we set that difference aside, the correlation between the two monthly distributions is still very high, with a highly significant Spearman's rank correlation coefficient of 0.9.

It turns out that at the European level, too, a large share (approximately 30%) of new wage settlements take effect in January, with especially high percentages (around 50%) reported in Spain, Portugal, the Netherlands and Hungary. The special importance of the months of May and, even more so, November is a unique characteristic of the Austrian system, however. Wage settlements in other countries are concentrated in July (Belgium, France), March (Portugal), April (Czech Republic, Ireland, Hungary) or August (Slovenia). It is conceivable, though, that a wage leadership system requires a longer time period without any significant new wage settlements (i.e. from May to November in Austria) in order for the leading sector to negotiate a new bench-

Chart 4

Comparison of Wage Adjustment Months in Austria and Europe



Source: WDN survey, Druant et al. (2009).

Note: The percentages reflect the share of companies surveyed which indicated that they typically adjust wages in the given month. Where companies indicated that wage adjustments do not follow a typical temporal pattern, their wage adjustment distributions over the year was assumed to be similar to those of the other companies. The average (not weighted by country size) is based on the following countries: Belgium, Czech Republic, Estonia, Spain, France, Greece, Hungary, Ireland, Italy, Lithuania, Netherlands, Austria, Poland, Portugal and Slovenia.

mark after the summer break without being encumbered by recent developments.

In any case, accounting for asymmetries in wage staggering appears to be advisable from an economic policy standpoint and from a modeling perspective, as we will discuss further in section 5.

4.3 Wage Leadership Often Serves as a Coordination Mechanism in Sectoral Wage Bargaining

For quite some time now, wage bargaining systems have been a focal point of interest in macroeconomic research, as many believe these systems to be a key determinant of a country's macroeconomic performance (especially with regard to the rates of unemployment and employment). Many economists take a critical view of market power on the workers' side,¹³ arguing that such power will lead to excessive wages and higher levels of unemployment compared to competitive markets. However, if we assume that market imperfections (such as information asymmetries, etc.) are widespread, then collective wage bargaining may even improve market results (Schettkat, 2003).

The Calmfors-Driffill hypothesis is very popular in this context (Calmfors and Driffill, 1988): It states that both decentralized and centralized collective wage negotiations lead to lower unemployment than wage bargaining at the sectoral level does. In centralized wage setting systems, the unions would be able to negotiate higher wages due to their market power. At the same time, however, the unions would consider

the potential negative macroeconomic consequences of their decisions (e.g. higher unemployment) from the outset and might sacrifice wage increases voluntarily as a result.

The Calmfors-Driffill hypothesis has been criticized for many different reasons. In the context of this article, the criticism voiced by Soskice (1990) is especially relevant: Soskice claims that the formal level at which negotiations take place is less relevant to the results of wage negotiations; instead, what is important here is whether wage bargaining is coordinated throughout the economy. According to Soskice, coordination can be achieved in many ways, be it through formally centralized wage bargaining, through decentralized coordination within umbrella associations on the employers' and the employees' side, or through wage leadership. For this reason, wage bargaining systems are now characterized on the basis of their formal level of centralization as well as the degree to which bargaining is coordinated.

In the OECD's current classification, Austria is considered to exhibit a medium level of centralization (scoring a 3 on a scale of 1 to 5) and a high level of coordination in wage bargaining (scoring a 4 on a scale of 1 to 5); OECD, 2004, table 3.5. According to that classification, the wage bargaining systems e.g. in Belgium, Finland, Germany, Ireland, Italy, Japan and the Netherlands also exhibit a high degree of coordination. Many of those countries rely on a system of wage leadership (Traxler, 2005; Du Caju et al., 2009), while others use a trilateral system of wage setting in which the re-

¹³ In contrast, hardly any attention has been paid to the employers' side. This can probably be explained by the fact that Anglo-Saxon countries – which dominate the economics literature – largely rely on decentralized wage setting, with wages negotiated either individually or by a labor union and the management of a company. From this perspective, researchers have devoted insufficient attention to the existence and significance of employer associations.

spective government is also involved. However, we are not aware of any empirical studies which attempt to provide detailed evidence for the significance of wage leadership in any of those countries.

5 Economic Policy Implications

In the New Keynesian literature, which has dominated macroeconomic research in recent decades (Woodford, 2003; Galí, 2008), contractually agreed prices and wages play a key role. In the simplest models developed in this school of thought, prices and wages are the only existing frictions and are thus also exclusively responsible for the real effects of demand shocks and monetary policy. However, the mechanisms and implications of those models depend heavily on the underlying assumptions made with regard to wage setting. It is therefore important to address the finer points associated with existing wage-setting systems more intensively and in greater detail than in the past.

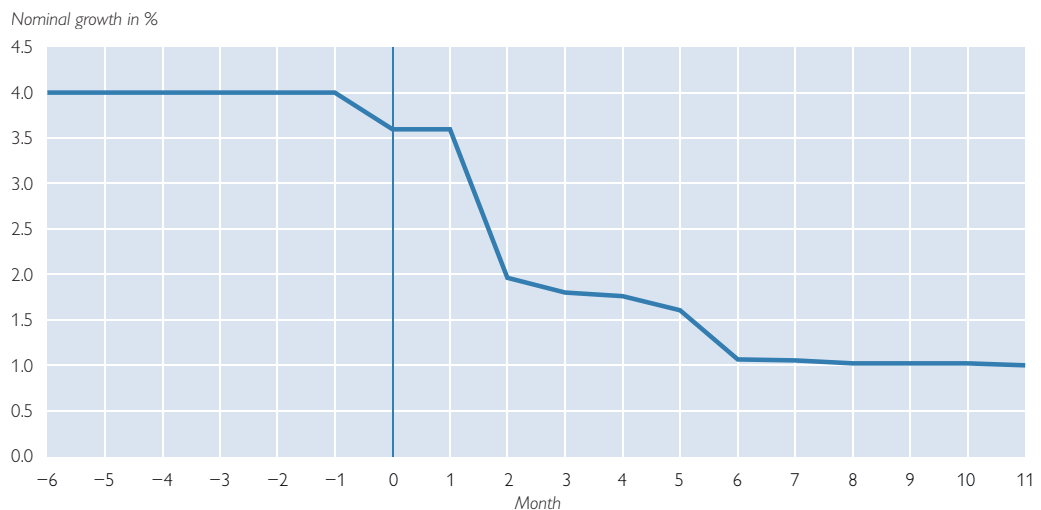
This importance is demonstrated e.g. in a study by Knell (2009), which shows that conclusions as to the degree of real wage flexibility are strongly influenced by assumptions about the institutional details of the wage-setting process. The classification of countries as flexible or rigid also depends on whether asymmetrical wage staggering, the use of indexed wage agreements and the importance of heterogeneous contract durations are taken into account.

In Knell and Stiglbauer (2009), this point is discussed in greater detail for the significant (yet often neglected) features of wage staggering and wage leadership. Here it becomes clear that a system involving staggered wage contracts with certain temporal concentrations (e.g. a system in which the majority of new wage settlements come about in

January) is capable of absorbing shocks more quickly than a system in which new wage settlements are distributed evenly over the course of the year. This is also intuitively plausible, as such a concentrated system produces only minor wage changes in the course of the year, but at the same time it allows better-adjusted and coordinated wage setting around the beginning of each year.

Similarly, it is also clear that a system characterized by wage leadership can accelerate necessary adjustment processes. This point is illustrated in chart 5, which shows the idealized reaction of general wage developments in Austria under the simplifying assumption that the wage leader's settlement is emulated completely. The reaction path is based on the temporal weights found in table 2. After relatively high nominal wage growth in periods -6 to -1 (4% in the chart; the actual figures are provided for illustrative purposes only), wage growth declines from period 0 onward, after the wage leader adjusts to changing macroeconomic conditions (e.g. a substantial increase in unemployment forecasts and/or lower inflation) with a wage increase of +1%. In line with the temporal pattern of wage staggering, the general development of wages is adjusted downward in the "following" sectors, with the largest change occurring in month 2 (January). After only six months, nearly the entire adjustment process is completed.

How long it takes for this adjustment mechanism to take effect depends on the time at which changes arise in the macroeconomic environment. For example, despite the massive deterioration in economic forecasts in late 2008 and early 2009, growth in the negotiated minimum wage rates in Austria barely changed until the fall of 2009 because most collective wage agreements had already been concluded.

Idealized Reactions of Wage Growth to a “Change of Course” by the Wage Leader

Source: Statistics Austria, OeNB.

Aside from its impact on the speed of response to macroeconomic shocks, the temporal structure of wage bargaining is also significant for monetary policy: Olivei and Tenreyro (2007) show for the U.S.A. that the macroeconomic effects of monetary policy shocks depend on the quarter in which they arise, a fact which they also attribute to an uneven concentration of wage changes over time. In a follow-up article (Olivei and Tenreyro, 2008), the authors broaden their analysis to include Germany, France, the United Kingdom and Japan, once again confirming their main findings.

The institutional details associated with wage-setting processes play a de-

cisive role in macroeconomic modeling, in adaptations to unforeseen developments and in monetary and fiscal policy design. Wage leadership is an essential element in this context, because it can be regarded as a decentralized mechanism of macroeconomic coordination.

Another interesting question which goes beyond the scope of our study would be whether or not cross-border wage leadership also exists and the degree to which it is useful. For example, some researchers maintain that the German metal sector plays a wage-leading role of sorts for Austria and the Netherlands.

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Annex: Notes on the Data Used

Disaggregated Raw Data from the Index of Agreed Minimum Wages

The data on negotiated minimum wages analyzed in Knell and Stiglbauer (2009) were taken from the IAMW (base year: 1986), a Laspeyres index of collectively negotiated minimum wages in Austria. This index was published by Statistics Austria on a monthly basis for the period from January 1986 to December 2006.¹⁴ Values for earlier years were obtained by chaining with series from the IAMW 1976 (up to December 1985).¹⁵ As mentioned above, wage leadership has only prevailed in Austria since the early 1980s; therefore, data on wage increases from the IAMW 1976 were only used from the year 1980 onward.

IAMW data have generally been analyzed only at the aggregate level in Austria. For this study, however, we rely on individual series as published monthly by Statistics Austria for the IAMW 1986. At the lowest level, these data comprise 125 monthly indices in four categories (blue collar workers, white collar workers, public transport employees and public sector employees). Most of these indices (98 out of 125) corresponded to exactly one collective wage agreement, while others represented multiple (i.e. up to ten)

agreements. These circumstances created problems in the interpretation of the index series and were in part responsible for the fact that not all of the series could be used for this empirical analysis.

In total, the 125 individual series represent 195 underlying collective wage agreements (Statistics Austria, 1988), which in turn represent all agreements of this kind.

Preparation of IAMW Series

The pattern observed in collective wage settlements in recent years suggests that collectively negotiated wages change approximately once per year in Austria. For each individual series, we checked whether the index value changed in a given year (and if it did, in which month). In some cases, we observed changes in more than one month within the same year, e.g. because an index series represented multiple collective wage settlements¹⁶ or for other reasons.¹⁷ Wherever possible, we determined which index change represented the most relevant change in such cases.

In most cases, we were able to do so, and thus we used 100 of the 125 index series for our empirical analyses of evidence for wage leadership. The resulting sample contains virtually all important collective wage agreements

¹⁴ A new indicator – the IAMW 2006 – has been developed for the period from 2006 onward.

¹⁵ The IAMW 1976 exhibits a very similar structure. For a more detailed explanation of how we constructed our data set, see Knell and Stiglbauer (2009), Annex C. For a detailed description of IAMW data, please refer to Statistics Austria (1978, 1988) and the abridged version in Statistics Austria's publication *Statistische Nachrichten* (6/1978 and 1/1988).

¹⁶ It is not only the number of collective agreements underlying an index series that matter, but also whether they are synchronous. For example, the “blue collar workers” (“white collar workers”) series in the food, beverages and tobacco industry represent ten (eight) different collective agreements which obviously have asynchronous contract durations. In contrast, the ten collective wage agreements underlying the “wholesale and retail trade workers” index series are perfectly synchronized.

¹⁷ Other reasons include IT problems related to the rounding of figures or problems caused by the changeover to the euro. Moreover, in addition to the “normal” collectively negotiated wage increases in the public sector, there were multiple cases of retroactive compensation for actual inflation during the term of an agreement (as last seen in the summer of 2003).

representing 93.3% of the total weight of the IAMW 1986.¹⁸

For each index series, we then compiled the following information: (1) the month in which the index changed in a given year, (2) the time period since the previous change, and (3) the rela-

tive growth in the index value between the month of the current change and that of the previous change. On that basis, we were able to derive the values for wage increases and the duration of collective wage agreements.

¹⁸ *The most important area we omitted was the food industry (two index series, one for blue and one for white collar workers), as there were too many index changes of approximately equal size over the course of the year. In addition, several series (especially those covering the employees of independent professionals such as attorneys, physicians, etc.) were not included in the sample because they were not represented in the IAMW 1976.*