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## The Emergence of Wage Coordination in the Central Western European Metal Sector and its Relationship to European Economic Policy

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# **The Emergence of Wage Coordination in the Central Western European Metal Sector and its Relationship to European Economic Policy**

## **Abstract**

In the European Monetary Union the transnational coordination of collective wage bargaining has acquired increased importance on the trade union agenda. The metal sector has been at the forefront of these developments. This paper addresses the issue of cross-border coordination of wage setting in the metal sector in the central western European region, that is, in Germany, the Netherlands and Belgium, where coordination practices have become firmly established in comparison to other sectors. When testing the interaction of wage developments in the metal sector of these three countries, relevant macro-economic (inflation and labour productivity) and sector-related variables (employment, export-dependence) are considered with reference to the wage policy guidelines of the European Commission and the European Metalworkers' Federation. Empirical evidence can be found for a wage coordination effect in the form of increasing compliance with the wage policy guidelines of the European Metalworkers' Federation. The evidence for compliance with the stability-oriented wage guideline of the European Commission is weaker.

Keywords: wage coordination, metal sector, EMU, European economic policy

JEL classification: J30, J51, E02, F55, L61

# **Grenzüberschreitende Lohnkoordination im Metallsektor des westlichen Mitteleuropas und ihre Bedeutung für die europäische Wirtschaftspolitik**

## **Zusammenfassung**

Seit Etablierung der Europäischen Währungsunion gewinnt die grenzüberschreitende Koordinierung von Lohnverhandlungen für die europäischen Gewerkschaften an Bedeutung. Insbesondere der Metallsektor nimmt dabei eine Vorreiterrolle ein. In diesem Beitrag werden die Effekte eines grenzüberschreitenden Koordinierungsnetzwerks im Metallsektor Deutschlands, der Niederlande und Belgiens untersucht. Bei den ökonometrischen Schätzungen werden makroökonomische und sektorspezifische Variablen verwendet und in Beziehung zur Lohnkoordinierungs-Leitlinie des Europäischen Metallgewerkschaftsbunds und der Europäischen Kommission gesetzt. Die empirischen Ergebnisse deuten auf einen Effekt des Lohnkoordinierungsnetzwerks hin, der im Einklang mit der Lohnkoordinierungs-Leitlinie des Metallgewerkschaftsbunds steht.

Schlagworte: Lohnkoordination, Metallsektor, EWU, europäische Wirtschaftspolitik

JEL-Klassifikation: J30, J51, E02, F55, L61

## Introduction

The Europeanisation of markets in general and, more specifically, European Monetary Union (EMU) as well as the eastern enlargement of the EU have given rise to a coordinated cross-border approach to collective bargaining policies by European trade unions since the 1990s (Sisson and Marginson 2002, Marginson and Traxler 2005). The European Metalworkers' Federation (EMF) has been at the forefront in adopting a 'European' approach to collective bargaining, laying down common rules and guidelines for wage bargaining for its member organisations in the early 1990s (Schulten 1998). This process is far from being uniform across the continent. Rather, it takes the form of 'transnational clusters of coordination' among metal sector unions from neighbouring countries (Glassner 2009). One of the most 'active' clusters of coordination is the bargaining coordination network of the central western European region, that is, Germany, the Netherlands and Belgium.

To date there has been no empirical evaluation of the effectiveness of this bargaining network. Thus, this paper aims at analysing the 'wage coordination effects' of this particular arrangement for the cross-border coordination of collective bargaining. Two theoretical approaches have guided the research design of our analysis. First, since the countries of the Eurozone have been deprived of the exchange rate instrument to adapt to asymmetric shocks, the burden of adjustment to disruptive economic developments within EMU has been shifted to wages. The theory of Optimum Currency Areas (OCA) can therefore be taken as an analytical tool to analyse the effects of wage policy coordination in the framework of European employment policy. However, the OCA framework is rather functionalist and does not say much about the actual interests of the union actors from different countries. Therefore we also investigate the motivation of wage bargainers in our country sample in a broader framework of neo-institutionalist sociological theory. In this regard, we shall give an overview of the institutional background of collective bargaining in the countries under investigation before analysing wage bargaining outcomes and their interactions with relevant bargaining criteria. The analysis is supplemented by structured interviews with wage bargaining experts from the metal sector in central western Europe. By considering the national institutional features of collective bargaining systems, and drawing on game theory and economic theory, we shall offer an explanation why trade unions might be interested in entering into a cross-border approach on wage policy coordination.

When it comes to assessing the de facto effectiveness of transnational collective bargaining coordination, taking central western Europe as a starting point seems sensible as it is in this region that the conditions for a cross-border approach to collective bargaining are most favourable. This is in large part due to the similarities between these countries – in particular, between Belgium and the Netherlands – with regard to their political and industrial relations systems, as well as culturally. Furthermore, the economies of these three countries – in particular, the metal sectors – are strongly integrated and inter-

dependent. The deep integration of the metal sectors in Belgium, the Netherlands and Germany dates back to the early stages of Europeanisation and is rooted in the European Coal and Steel Community and the successive European Economic Community.

When setting up the hypotheses for our empirical investigation, the achievement of sector-related wage policy goals included in two wage policy instruments are of prime relevance. First, the EMF's European Coordination Rule (EMF 1998) is of key interest in our analysis. Secondly, we shall investigate the emergence of a 'coordination effect' of a general macroeconomic coordination instrument, namely the goal of a stability-orientated wage policy as formulated in the 'Integrated guidelines for growth and jobs' (EC 2007). In its recommendations, which were adopted by the ECOFIN Council in 2008 (ECOFIN 2008), the European Commission underscores that wage increases should be in line with price stability and productivity growth in the medium term in order to ensure that wage developments contribute to macroeconomic growth and stability.

However, there is a crucial difference between the European wage policy goal and the sectoral wage policy goals with regard to the concept of price increases. Whereas the EMF refers to *actual inflation*, the European Commission's target focuses on *price stability* within the EU, and is thus at least indirectly based on the European Central Bank's benchmark for the annual average target inflation in the Eurozone. One of the crucial questions addressed in the analysis is the existence of a possible conflict between the two inflation goals, which may result in a misalignment of wage developments between EU countries and run counter to the stability goal formulated in the 'Integrated guidelines for growth and jobs'. Deviations from the European Commission's guideline can be downwards – that is, constitute a competitive wage policy – or, in the case of a wage policy that does not take competitiveness into account, may lead to 'excessive' wage growth. In relation to the wage policy goal set by the unions in the European metal sector, the question of whether there is a pattern-setting effect on the part of German wage agreements in relation to wage increases negotiated by bargaining units in the two smaller neighbouring countries is of central interest.

The paper is structured as follows. In section 1, the institutional settings of industrial relations, bargaining traditions and practices, as well as the most important developments in collective bargaining in Belgium, the Netherlands and Germany that are of relevance for wage policy coordination at the transnational level, will be summarised. Wage policy institutions and instruments that are of relevance for the European coordination of collective bargaining will be presented in section 2. In this respect, we introduce the European Coordination Rule adopted by the European Metalworkers' Federation (EMF) in section 2.1 for which we give an economic interpretation in section 2.2. The second instrument under investigation is the stability-orientated wage policy goal included in the 'Integrated guidelines for growth and jobs' which will be laid out in section 2.3. Section 3 presents the hypotheses that will be tested through multiple regression analysis, the model specifications and the empirical findings. Finally, conclusions are presented.



# 1 The institutional setting of wage bargaining in Belgium, the Netherlands and Germany: similarities and differences

Starting from the assumption that the transnational coordination of collective bargaining policies presupposes a certain degree of similarity between national systems of industrial relations (Marginson and Sisson 1996 and 2004; Dølvik 2002), the cross-border coordination of collective bargaining between Belgium, the Netherlands and Germany may not be an insurmountable goal as these countries share important features with regard to both the structures of their industrial relations systems and bargaining traditions and practices. First, in all three countries collective bargaining on *wages* takes place predominantly at the sectoral level (EC 2006). Second, in two of the three countries of the central western European region – that is, in Belgium and the Netherlands – the practice of extending collective agreements to other employers in the metal sector that are not affiliated to the signatory party to the agreement is widespread. Thus, collective bargaining coverage is comparably high in Belgium and the Netherlands where coverage rates range from around 90 to 100 per cent, with de facto full coverage of workers in the metal sector. In Germany collective bargaining coverage in the metal sector is lower due to the very limited practice of extending collective agreements (see Table 1).

Table 1:

Important features of the national system of industrial relations and of the metal sector in Belgium, the Netherlands and Germany

Variable	Belgium	Netherlands	Germany
Collective bargaining coverage (CBC) rate (in %) <sup>a</sup>	96	88	67
CBC in the metal sector	90-95	~100	~100
Union density (in %) in the metal sector	90-95	> 50	70 - > 80 (West) 60 (East)
Levels of CB <sup>b</sup> :			
National, inter-sectoral	***	*	*
Sectoral	** (wages: ***)	*** (wages : ***)	*** (wages: ***)
Company	*	*	*

<sup>a</sup> As a share of employees covered by any collective agreement in the total number of dependently employed persons, 2000–2001. – <sup>b</sup> \*\*\* = predominant, \*\* = important, \* = existing but not important.

Sources: Marginson and Traxler (2005); EC (2006); EC (2004); Beguin (2005); Traxler (2009); author's calculations.

Despite far-reaching similarities in industrial relations, collective bargaining and – in particular – wage setting in the three countries under consideration, they are characterised by some important particularities with regard to institutional structures and bargaining traditions (see, for example, Crouch 1993). In the following sections (1.1 to 1.3) the main characteristics of wage-setting institutions and the most important changes of collective bargaining systems since the early 1980s in Belgium, the Netherlands and Ger-

many are briefly described. In the subsequent section 1.4 we shall give an overview of wage developments in these countries.

## 1.1 Belgium

The system of wage formation in Belgium stands out in this respect. Wage increases in the private sector are coupled to price increases in a system of automatic indexation. The system of index-based wage setting has been subject to several reforms. In the metal sector, the most recent change occurred in 1996, when an annual index-based increase was introduced. Before this reform, automatic index-based increases of blue-collar workers' wages in the metal sector took place on a biannual basis or – in the 1970s and 1980s – even more often within one year. The annual indexation came into effect in 1997, with 1 July as reference date for the index-based increase of minimum wages in the metal sector, in accordance with the year-on-year increase of consumer prices (ABVV Metaal 2010).

The adoption of the law on the 'Promotion of Employment and the Preventive Safeguarding of Competitiveness' in 1996 that stipulates that the average wage increase in Belgium should not exceed wage increases in the country's most important trading partners (i.e. Germany, France and the Netherlands) marks a turning point in wage bargaining. In the same year, a freeze on private sector wages was imposed by the government as social partners failed to reach an inter-professional agreement. Since the adoption of the 'law on competitiveness' an *ex ante* wage norm proposed by the Central Economic Council, a joint, inter-professional advisory body,<sup>1</sup> has served as a guideline for collective bargaining actors at the peak level. Every two years, the so-called 'Group of Ten' negotiates the inter-professional agreement<sup>2</sup> that sets provisions for a wide range of other employment and social policy issues, as well as a common wage norm. Trade unions have accepted the law – and the introduction of a 'central wage standard' – with reservations. Unions have from the beginning considered the central wage norm as 'indicative' rather than as 'imperative' (ABVV Metaal 2010).

From 2000, the social partners regularly concluded two-year agreements at the inter-professional level, with the exception of 2005, when social partner negotiations failed (SPF 2010). The empirical evidence, in terms of unit labour cost growth, does though not indicate a trend towards wage restraint in Belgium (see Annex A1) since the introduction of the law on competitiveness. However, in the metal sector the 1990s represent

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<sup>1</sup> The Central Economic Council brings together representatives from private sector unions, employers (large-scale enterprises, small- and medium-sized businesses, the self-employed and agriculture) and academics co-opted by the member organisations to discuss economic issues and advise the government on economic policy-making.

<sup>2</sup> The agreement negotiated by the 'Group of Ten', made up of representatives of the three largest trade union confederations and four employers' associations (large companies, SMEs, the self-employed and agriculture), is considered to be a 'gentlemen's agreement' and is made legally binding through its adoption by the National Labour Council as an 'Interprofessional Agreement'.

a period of wage restraint in terms of collectively settled wages (see Figure 1, section 1.4).

## 1.2 Netherlands

In contrast to developments in Belgium, the state has continuously withdrawn from wage setting in the Netherlands. Whereas in the 1970s, state-imposed coordination in the form of wage freezes or the imposition of a general wage norm was quite frequent (Van Ruysseveldt and Visser 1996), the ‘Agreement of Wassenaar’ (1982) marked the end of state interference in wage formation. In line with a set of measures on labour market deregulation and the decentralisation of collective bargaining the central indexation system that automatically linked wage increases to inflation has been abolished. Although the Dutch government did not directly interfere in wage formation, the 1980s were characterised by a trend towards pronounced wage restraint. Thus, unit labour cost growth in the Netherlands lagged behind that in Germany and Belgium in the 1980s (see Annex A1). This was even truer for the export-dependent metal industry where collectively negotiated wage rates remained below those in the neighbouring countries Belgium and Germany during the 1980s (Figure 1, section 1.4). Wage restraint was the result of the trade unions’ defensive bargaining strategy, due to mounting unemployment. Union strength – in terms of union density – plummeted throughout the 1980s (Ebbinghaus and Visser 2000).

During the 1990s, wage bargaining coordination in the Netherlands was state-sponsored<sup>3</sup>, whereby the government’s influence on social partner negotiations was fairly indirect. For instance, in order to fight increasing unemployment in the early 1990s the government put pressure on the social partners to voluntarily accept wage freezes. In effect, the social partners agreed on a ‘zero-line’ for wage negotiations in the recession years 2002–2004 (Van het Kaar 2003; Houwing and Vandaele 2010).

The conclusion of the Wassenaar agreement marked the beginning of a general trend towards decentralisation that has gained further momentum in the early 1990s (Visser and Hemerijck 1997). Decentralisation and flexibilisation of wage setting and establishing working conditions has been supported by the government through the increased inclusion of opening clauses in sectoral agreements that could be further specified on the enterprise-level. In the metal sector, the company level is gaining in importance with regard to wage determination, although bargaining at company level is less important than in other sectors, such as chemicals.

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<sup>3</sup> ‘State-sponsored’ bargaining refers to a bargaining situation in which the state joins social partner negotiations. The degree of state-involvement may vary in terms of the degree of state power with regard to the implementation of the agreement (Traxler and Kittel 2000).

### 1.3 Germany

Industrial relations in Germany differ to a considerable degree from those in the Netherlands and in Belgium. The German type of corporatism is less based on tri- and bipartite labour market institutions. State involvement in collective bargaining is restricted by the autonomy of the social partners to negotiating collective agreements. However, the involvement of the social partners in public labour market policy-making is strong, and the social partners have to be formally consulted by the government on a wide range of social policy issues. Collective bargaining is less centralised than in Belgium and the Netherlands, however, with sectoral-level bargaining paramount. Nevertheless, collective bargaining is characterised by a high degree of coordination between sectors. In a form of ‘sequential’ wage bargaining, the metal sector takes the lead by setting rates for wage increases and other conditions that serve as a reference for bargainers in other sectors. This kind of rather decentralised bargaining coordination mechanism – referred to as pattern bargaining – emerged in the late 1970s (Traxler 2003). Pattern bargaining is a relatively decentralised mechanism of coordination that has proven to be effective in bringing into line pay increases across sectors within a country (for example, Traxler et al. 2001, 2008a). However, the wage coordination role of metal sector bargaining actors is rather informal and the wage rate set in the metal sector serves as a rather ‘implicit’ coordination criterion for bargaining units from other sectors rather than having an open ‘signalling function’ (Traxler et al. 2008a). The ‘implicit’ nature of the pattern setting bargaining unit and the latency of the process of inter-sectoral pattern bargaining is underscored by the fact that there are no formal rules or accords that specify a macroeconomic coordination goal to be pursued by the trade unions. In the metal industry, however, there is an established tradition that unions orientate themselves towards macroeconomic developments that go beyond a sector-specific focus.<sup>4</sup> Bargaining actors in the metal sector have acknowledged their ‘leading role’ in the negotiation process and the fact that agreements concluded by them are taken into consideration by bargaining agents of other sectors. However, union bargainers in the metal sector emphasise that bargaining units from other sectors orientate themselves towards outcomes in the metal sector on a purely voluntary basis. Thus, ‘pattern-taking’ is not taken for granted as a general practice (IG Metall 2010).

Despite the existence of an institutional setting of collective bargaining in Belgium and the Netherlands that may give rise to ‘competition-orientated’ bargaining by taking wage developments of large trading partners as a benchmark for domestic wage increases (see sections 1.1 and 1.2), empirical evidence of the development of collectively negotiated wages in the metal industry from 1980 onwards according to Figure 1 (sec-

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<sup>4</sup> A shift from a purely productivity-orientated wage policy towards a wage guideline that also includes price increases occurred in the mid-1960s as negotiations failed in the German metal sector (Meinhold 1969). The so-called ‘Meinhold Formula’ that promotes wage increases in line with real macroeconomic productivity growth and inflation has been acknowledged by the peak-level union DGB (German Trade Union Confederation), but has attained special importance as a wage guideline for the metal sector union IG Metall.

tion 1.4) does not clearly indicate a continued undercutting of German wage rates by Dutch or Belgian bargaining actors.

## **1.4 Development of collectively settled wages in the metal sector in Germany, Belgium and the Netherlands**

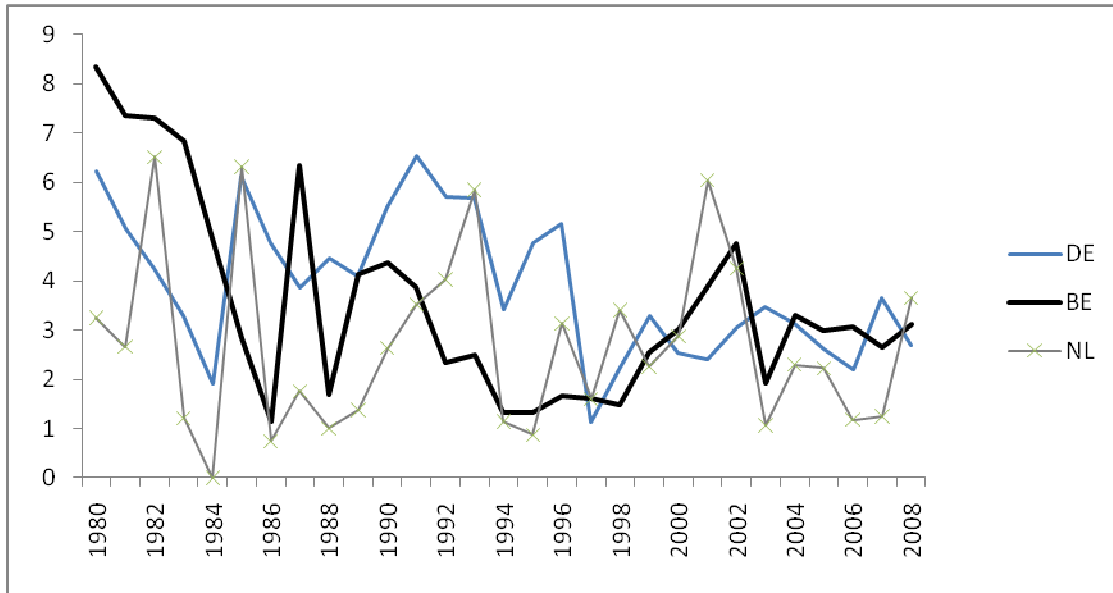
Figure 1 provides an overview of annual wage increases negotiated by the social partners in the metal sector in the three countries under consideration. Three general observations can be made with regard to the development of collectively settled wages. First, the beginning of the 1980s was characterised by lower wage increases in all three countries. Government and social partner responses to the economic downturn during this period resulted in the decentralisation of collective bargaining. In Belgium the steep decrease in wage growth seems to reflect the disinflation process that was promoted by government policies during this period. The ‘Agreement of Wassenaar’ (1982) marked a turning point in the field of wage policy in the Netherlands, with wages stagnating or growing only very moderately in the following years. In the mid-1980s working time has been reduced almost simultaneously in Belgium, the Netherlands and Germany.<sup>5</sup> Wage growth was comparably high in Germany up to 1991, and continued to remain at high or medium levels, with the exception of the period between 2000 and 2002. In the 1990s the process of wage moderation was particularly pronounced in Belgium. This may reflect pressures on wages resulting from the implementation of the law on competitiveness in 1996 (see section 2).

The development of annual change rates of collectively settled wages in the metal sector in the three countries under consideration gives rise to two questions of central interest. First, Figure 1 indicates a trend towards convergence of wage increases in the countries of the central European region since the late 1990s that may be the result of increased coordination efforts of unions. Therefore, compliance with the wage goals of the EMF bargaining coordination rule shall be tested systematically. On the other hand, wage convergence may be the result of the incorporation of the European goal of wage development within the Eurozone, as formulated in the ‘Integrated guidelines for growth and employment’. Thus, the compliance of wage developments with the goal of a stability-orientated wage policy will be addressed in regression analysis. Secondly, in relation to the analysis of the emergence of a coordinated cross-border approach on wage bargaining in the German, Dutch and Belgian metal sectors we shall ask whether – and, if so, to what extent – Belgian and Dutch unions have embarked on a policy of competition-oriented wage bargaining by negotiating wage increases that are systematically and significantly lower than those in Germany.

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<sup>5</sup> Reductions in working time are indicated by wage increases in Figure 1 as annual wage rates are harmonised on the basis of a 40 hours working week.

Figure 1:  
Hourly wage increases (%) in Germany, Belgium and the Netherlands



Sources: National trade unions and Federal Public Service Employment, Labour and Social Dialogue, Belgium

In the next section we present the evolution of wage coordination in the central western European metal sector before giving an economic interpretation of it and depict its relation to the European economic policy.

## 2 Institutions and instruments for wage coordination on the European level

In accordance with our two basic hypotheses two instruments for the transnational coordination of wage policy shall be presented. First section 2.1 briefly lays out initiatives of cross-border collective bargaining coordination launched by the *European Metalworkers' Federation*. Section 2.2 presents an economic interpretation of cross-border coordination activities by European unions. Secondly, in the forefront of the European Monetary Union a framework of *European macroeconomic policy guidelines* has been developed by the European Commission and the ECOFIN Council, which explicitly makes reference to wage negotiations. In its recommendations the Commission underscores that wage increases should be in line with price stability and productivity growth in the medium term in order to ensure that wage developments contribute to macroeconomic growth and stability (EC 2007, ECOFIN 2008). The implications of this 'stability-orientated' wage policy guideline for wage bargaining coordination promoted by trade unions are presented in section 2.3.

## **2.1 The ‘European’ coordination of wage bargaining policies in the metal sector: central western Europe as a regional cluster of firmly established coordination practices?**

The metal sector has been at the forefront of the transnational coordination of collective bargaining. Against the background of the forthcoming European Monetary Union (EMU), the European Metalworkers’ Federation (EMF) embarked on a cross-border approach on collective bargaining coordination with the formulation of its ‘statement of principle on collective bargaining policy’ adopted at the EMF Collective Bargaining Conference in 1993. The EMF and its member organisations agreed on a ‘regular annual compensation for price increases in order to protect real wages, workers have a share in productivity gains’ (EMF 1993). Finally, the adoption of the ‘European Coordination Rule’ (EMF 1998) that specifies quantitative and normative criteria for wage bargaining can be perceived as a further step towards an organised approach on collective bargaining coordination.

But not only procedural rules and guidelines for the cross-border coordination of collective bargaining have been adopted in the European metal sector. In parallel, a set of institutions for the transnational coordination of bargaining policies have been established. In 1997 the IG Metall district organisation North Rhine-Westphalia, the Belgian organisations of CCMB and CMB as well as the two sector-related Dutch unions FNV Bondgenoten and CNV Bedrijvenbond set up a transnational network for the exchange of collective bargaining information and trade union officials (Schulten 1998). Several other networks have been founded in other European regions, whereby the most active ones are the network in central and eastern Europe (Austria, IG Metall district of Bavaria, and metal sector unions from the Czech Republic, Slovakia, Slovenia and Hungary), Denmark, Sweden and the Coastal District of the IG Metall, as well as the Nordic IN network of manufacturing sector unions from Sweden, Norway, Finland, Denmark and Iceland (Gollbach and Schulten 2000, Glassner 2009).

The transnational collective bargaining networks of the EMF have been established with the aim to institutionalise information exchange and cooperation in the field of collective bargaining between unions from neighbouring countries. Although the role of national unions – and in particular of the German IG Metall, that can be regarded as the ‘backbone’ of the interregional network structure – has been decisive in creating the networks, the EMF as the European peak-level organisation strongly supports activities within the networks by providing financial, organisational and personnel resources. Thus, the establishment and functioning of the EMF collective bargaining networks are the result of both top-down and bottom-up processes (Glassner 2009). This implies that the networks provide an institutional framework for the implementation of the EMF’s ‘European Coordination Rule’ by national union bargainers. The functioning of such an institution primarily depends on the effort and engagement of national affiliates, and their readiness to address common policy issues and implement ‘European’ policy goals that were set in a rather ‘top-down’ fashion. The transnational bargaining network in the

region of North Rhine-Westphalia, Belgium and the Netherlands has been one of the most active ones in this respect (Glassner 2009). In the first years after the establishment of the network the cross-border activities have taken place on a continued and regular basis. For instance, union representatives met at least two times per year in order to exchange data on collective bargaining. Additionally, ad-hoc meetings in the form of annual theme-specific seminars on other important issues such as vocational training have been carried out. Occasionally, even the EMF as European Industry Federation has taken part in collective bargaining negotiations in these three countries and union observers have participated in negotiations in the neighbouring countries.

## **2.2 The actor-centred economic perspective: the rationale behind cross-border actions of trade unions in the field of wage bargaining**

The question of the macroeconomic performance of wage bargaining coordination – and, alternatively, centralisation – has been amply addressed in the literature (for example, Calmfors and Driffill 1988; Soskice 1990; Calmfors 1993; Flanagan 1999; Traxler and Kittel 2000; Traxler et al. 2001). With the step-wise establishment of EMU this topic has also been discussed on the basis of Optimum Currency Area Theory (see Heise 2002; Buscher and Gabrisch 2009, de Grauwe 2006) and neo-institutionalism (Mooslechner and Schürz 2001). The first theoretical strand makes it possible to judge the functionality of wage bargaining systems and coordination in an enlarged currency area.

The second strand of literature takes the actors' perspectives (or, in economic terms, their utility functions) into account and thus aims at an explanation of empirical developments after the introduction of the euro. In our analysis we combine these two strands as they refer to different actors' viewpoints in relation to our field of study. With regard to functionality, the aims and perspectives of European policy actors are clearly identifiable if one looks at such documents of European economic policy as the 'Integrated guidelines' (EC 2007), which will be introduced in the following section. For national trade unions the abovementioned literature and our interviews have shown that they are to some extent unfamiliar with these documents but rather follow their own national and European collective bargaining strategies. Thus, the aim of this section is twofold. First, we want to lay down the basis of the different concepts of wage policy guidelines in a more formal way. Second, and based on this, the interpretation of the interrelatedness of hypotheses formalised in the next section will be easier. We start the analysis, as in the preceding section, by taking an economic look at wage formation and coordination in a currency union.

Much of the macroeconomic literature about wage bargaining in EMU starts from consideration of the interaction between wage bargaining and monetary policy. Possible effects of the monetary regime shift to EMU have been addressed in a voluminous literature (see, for example, Guzzo and Valesco 1999; Cukierman and Lippi 1999; Jerger



2002). For example, Soskice and Iversen (2001) formalise the interaction between wage growth, international competitiveness and unemployment under the specific conditions of monetary union in a model that assumes a non-accommodating monetary policy. According to their model, it was feared that higher wage claims – especially in Germany (and to a lesser extent also in other countries) – might drive up unemployment in the Eurozone in connection with the monetary reaction.<sup>6</sup> These authors analyse a scenario in which German wage bargainers regain a strong influence in determining European wage and inflation dynamics. Following this line of argumentation, which assumes an interaction between wage setting and monetary policy, might be especially relevant for IG Metall as the perceived *major player* in wage negotiations in Germany (IG Metall 2010). However, the consideration of productivity and price increases in wage bargaining by metal sector bargainers was an established practice long before the transnational bargaining coordination networks in the European metal sector were set up (for example, Soskice 1990).<sup>7</sup> Furthermore, following Heise (2001: 116 pp), the interest in wage coordination may diverge between different unions. According to economic theory there is a rationale for an expansion of productivity-oriented wage policy by means of wage coordination from the viewpoint of large wage setters as they might be playing a game of ‘chicken’, at least among each other. Thus, large wage setters prefer to be cooperative and not to be in a competitive equilibrium. Although Heise (2001) does not explicate this case, it is reasonable that a competitive equilibrium in a game between IG Metall and Dutch and Belgian trade unions might be even more unfavourable for IG Metall. The larger union could gain little by wage competition with small unions and could lose the reputation of being a strong trade union with a signalling function for other bargaining units in Germany. This is of particular relevance in a system in which pattern bargaining is the predominant mechanism for the coordination of the collective bargaining process and its outcomes between sectors (see section 1.3).

For union bargainers from countries with a small domestic market, such as the Netherlands and Belgium, an interest in cross-border wage coordination is not entirely unambiguous. Especially for trade unions from the exposed sectors of small countries there might be an incentive for a non-cooperative strategy of wage restraint towards Germany. In doing so, employment could be expanded at the expense of employment in Germany. This point has been stressed repeatedly in the economic literature (for example, Heise 2002), as well as the sociological literature (for example, Traxler and Brandl 2009). In more formal terms, this reasoning can be derived from a conventional formula for trade union utility, of which Schnabel (1997: 26) gives an example:

$$U_G = e * f((1-t), W/P, h) + (n-e) * f((1-t), W'/P, h') + (n-e) * f'(O/P). \quad (1)$$

<sup>6</sup> Soskice and Iversen demonstrate this by using a monetary rule according to which the money supply does not completely accommodate price increases.

<sup>7</sup> Such an outcome can also be analysed on the basis of efficiency wage and negotiation theory; see *Blanchard and Katz* (1999) for a synopsis of the resulting wage equations. However, this is not the focus of our paper.

In this formula  $f(.)$  and  $f'(.)$  denote functional forms,  $W/P$  is the real wage in the sector,  $n$  the sectoral labour force,  $h$  working hours in the sector,  $W'$  wages outside the sector,  $h'$  working hours outside the sector and  $O$  the level of unemployment insurance payments. If the relative weight of employment in the functional form  $f$  is high as compared to the real wage, a scenario of wage restraint might evolve taking into account the price elasticity of demand for products from the sector. This tendency might also evolve if the elasticity of demand is just higher than the German one, for example due to the effects of the larger domestic market in Germany. Then the smaller country trade union's indifference contour could touch the sectoral employment demand curve at a point with a higher employment level and lower real wage.<sup>8</sup> Moreover, the state could interfere in wage-setting by making use of the strong real wage–employment trade-off in small countries by means of political reform or other forms of state interference in collective bargaining. In Belgium this has been tried by the introduction of an upper limit on wage increases through a central wage norm (see Section 1.1). This can be seen as a constraint on the trade unions' wage bargaining. Furthermore, a more indirect political alternative which refers to the logic of equation (1) is to influence the outside option of unemployment insurance benefits and other social benefits. Reforms like this were important in the Netherlands in the 1980s and the early 1990s (Hemerijck et al. 2000).

In fact, both small countries have a history of direct and indirect political interference in wage bargaining. However, in the case of Belgium state interference in wage bargaining was more recent and direct than in the Netherlands. In the Netherlands, circumstances have been different. The left-liberal coalitions in power since 1994 have put the emphasis less on social policy reforms aimed at limiting the power of trade unions than had been the case under the centre-right coalition reigning between 1981 and 1989. However, reforms of former governments were not reversed (see *ibid.*). Under these conditions it might be expected that trade unions try to demonstrate their strength by reaching higher wage agreements. The same applies to Belgium, where state interference in wage bargaining was rejected by trade unions (ABVV Metaal 2010).

We start from the assumption that one way of demonstrating bargaining strength is investment in a new institutional framework, such as transnational collective bargaining networks. Formally, this can be analysed using a game theoretical framework. In a signalling game two parties interact with each other. The first party, which can be weak or strong from the second actor's perspective, can make a strategic decision to influence the counterpart's perception of the first party's strength (see Osborne 2004: 332 pp.). The signal sender is the trade union in our case; the receiver is the employers' organisation, possibly backed by the government. However, it has to be noted that setting up the coordination network is only optimal in the signalling game if trade unions are in a position to conclude collective actions successfully. Otherwise, in the case of a weak trade union, an investment in the bargaining network does not pay off. The reason is that possible industrial action is overly costly. Furthermore, a coordinated approach to wage

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<sup>8</sup> See Figure 1 in Heise (2002).

bargaining based on a formal coordination instrument (such as a ‘wage formula’) limits flexibility in the negotiations with the employers, for example in the case of a pronounced upward movement of market wages due to wage drift. Second, an interesting conclusion can be drawn from the signalling game, as there are different possible equilibria. If the trade union is strong with a high enough probability from the viewpoint of the employers, it might switch to another equilibrium where coordination efforts are phased out. This is the pooling equilibrium of the game which illustrates the limits of transnational wage coordination.

### **2.3 Wage setting as an issue for European macroeconomic policy coordination: the ‘Integrated guidelines for growth and jobs’**

Along with the preparations for European Monetary Union, a framework of European economic policy coordination, including guidelines for growth and employment, was developed in the 1990s. The background is that governments in EMU are deprived of the exchange rate adjustment mechanism to counter imbalances in international competitiveness through currency devaluations. As a consequence, the burden of adjustment has shifted on to fiscal policy and wages. Thus, a connection can be drawn to the OCA theory.

In 2002, different EU economic and employment policy coordination procedures were subject to a streamlining process (EC 2002). As part of this the European Commission, together with the ECOFIN Council, has adopted a guideline for wage policy in the Eurozone that aims at ensuring non-inflationary wage growth, that is, wage increases in line with the target rate of annual inflation of close to 2 per cent and mid-term productivity growth. The aim of these ‘Integrated guidelines for growth and jobs’ (EC 2007; ECOFIN 2008) is to ensure macroeconomic stability within the EU and, in particular, the Eurozone.

Promoting far-reaching structural reforms in the social and economic spheres of the Member States, the guidelines underscore – among a whole package of different measures in various fields such as social, labour market, fiscal and budgetary policy – the importance of ensuring ‘that wages contribute to macroeconomic stability and growth’. The macro-economic goal of a ‘stability-orientated’ wage policy should be achieved by guaranteeing that wage increases are in line with the medium-term growth of productivity and price stability. They shall also consider local labour market conditions.

From a theoretical perspective the question arises whether wage coordination as promoted by the European trade unions is compatible with balanced economic development in terms of dynamic regional development and high employment levels in EMU (Heise 2002; Borghijs et al. 2003; Pusch and Heise 2009). This presupposes, first, a wage bargaining mechanism that is flexible enough to consider differences with regard to regional developments in productivity, and to balance possible asymmetric shocks deriving from divergently evolving business cycles or large imbalances in international

competitiveness between EMU countries. These assumptions can be analysed on the basis of Optimum Currency Area Theory (OCA theory).<sup>9</sup> According to this theory – and this is particularly challenging – wage coordination at the European level must rule out competitive, as well as inflationary wage developments, provided they do not aim at correcting asymmetric shocks or misaligned competitiveness.<sup>10</sup> However, it must be noted that OCA theory formulates optimal criteria for a currency area from a functional perspective. The *de facto* functioning of the currency area may differ from these criteria. In particular, it cannot be expected that the social partners refer to this theoretical framework in their wage negotiations. Thus, mechanisms as proposed by the ‘Integrated guidelines’ do not necessarily reflect the orientations of the social partners in the Eurozone in general and coordination initiatives in particular.

Although collective bargaining on wages is a competence of national social partners, wages are subject to ‘normative’ forces stemming from the ‘European’ goal of stability-orientated wage growth, as proposed by the European Commission and the European Central Bank. Even if some national wage bargainers contend that the goal of macroeconomic stability is not relevant in their negotiations, it is assumed that they may – at least implicitly – take the European macroeconomic guideline for stable development of wages into account. Thus, it will be tested whether wage increases in the three countries under consideration are in line with the ECB inflation target and medium-term productivity growth. Furthermore, in order to better address sector-specific conditions, factors such as employment and the export-dependence of the metal sector in Belgium, the Netherlands and Germany will be included in the analysis in addition to macroeconomic factors.

### 3 Hypotheses, model specifications and empirical findings

This section summarises the hypotheses that will be tested systematically through panel estimation techniques and other statistical methods (see Table 2). We shall pursue a step-wise approach in our empirical analysis. First, the basic hypotheses on the effectiveness of (i) the European coordination rule adopted by the European Metalworkers’ Federation, and (ii) the stability-orientated wage goal formulated in the ‘Integrated guidelines for growth and jobs’ are tested. Related hypotheses **H1** and **H4** state a positive relation between wage increases settled in collective agreements and the coordination criteria stipulated in the two coordination instruments, that is, current price in-

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<sup>9</sup> See Heise (2002) and de Grauwe (2006).

<sup>10</sup> The scope for asymmetric shocks is somewhat reduced in our context as we only deal with one specific branch (the metal sector) and it can be argued that shocks to the highly exposed metal sector are rather symmetric (controlling for wage developments). Misaligned competitiveness can be analysed on the basis of equilibrium competitiveness concepts. Empirically, this has been done by Fischer (2007) for EMU. However, his results for Germany, Belgium and the Netherlands are ambiguous, which leaves room for us to focus on the wage formula, which is assumed to be neutral for competitiveness.

creases (EMF coordination rule, **H1**), the ‘inflation target’ for the Eurozone (wage guideline of the European Commission, **H4**) and mid-term productivity growth as an indicator relevant in both coordination instruments. These are our two main hypotheses. Other related hypotheses comprise a ‘pattern-setting’ effect of the German wage increases on collectively settled pay rates in the Belgian and Dutch metal sector (**H2**), and an undercutting of German wage increases by smaller bargaining units (**H3**).

Table 2:  
Overview of hypotheses

Hypothesis:	Content of hypothesis/ effect tested:	Postulated relation (dependent variable, independent variables):
Hypothesis 1 (H1)	‘EMF Rule’	Positive relation between wage increases in the metal sector in BE, NL and DE and current inflation rate, as well as mid-term overall productivity growth
Hypothesis 2 (H2)	‘Pattern-setting effect’	Positive relation between wage increases in BE and NL and wage increases settled in DE.
Hypothesis 3 (H3)	‘Competitive wage bargaining’	Wage increases settled in BE and NL are lower than wage increases in DE
Hypothesis 4 (H4)	‘EMU Rule’	Positive relation between wage increases in the metal sector in BE, NL and DE and inflation target set by the ECB, as well as mid-term overall productivity (‘Integrated guidelines for growth and jobs’)

Our basic estimation equation takes the following form:

$$w_t = c + b_1 \text{EMF} \cdot p + b_2 \text{EMF} \cdot \text{prod} + b_3 p + b_4 \text{prod} + b_5 e + b_6 \text{tb}, \quad (2)$$

where  $w_t$  is nominal wage increases in period  $t$ , EMF is a time dummy which is 1 from 1999 onwards (the coordination or, alternatively, the EMU effect),  $p$  stands for price increases (**H1**) or the inflation target (**H4**),  $\text{prod}$  stands for mid-term economy-wide productivity increases (**H1** and **H4**),  $e$  and  $\text{tb}$  stand for changes in the sectoral employment level and trade balance, respectively. These controls are included in our preliminary estimations as they are grounded in economic theory (especially in the case of sectoral employment) and form part of the wage guidelines (see Annex).<sup>11</sup> Time series on the right hand side are lagged one period or moving average of first order (in the case of price increases), except for the EMF dummy and the inflation target.

<sup>11</sup> The sectoral employment level is especially important in the wage policy goal included in the ‘Integrated guidelines for growth and jobs’ and in light of economic theory on wage bargaining: see, for example, Schnabel (1997: 26) for a description of the ‘right to manage approach’ of sectoral wage bargaining. As regards movements of the trade balance, these might reflect movements of sectoral competitiveness and thus they could be regarded as a signal to which wage bargainers might react.

Empirical findings on the effects of wage coordination institutions and the EMF coordination goal (**H1** and **H3**) are presented in Section 3.1. The empirical analysis of the hypothesised relations between metal sector wages and other relevant economic and institutional factors, as proposed by the Commission in its ‘Integrated guidelines for employment and growth’ (**H4**), are presented in Section 3.2. The last subsection, 3.3, refers to empirical studies mentioned in Section 2.1 and addresses the possible relevance of German wage increases for wage developments in smaller bargaining units in Belgium and the Netherlands (**H2** and **H3**).

### **3.1 Testing the effectiveness of wage coordination instruments and institutions in the Belgian, Dutch and German metal sectors**

This section aims at empirically testing the existence of a coordination effect on wage formation in the metal sectors in Belgium, the Netherlands and Germany, which is based on compliance with the EMF wage rule. The empirical investigation of wage bargaining coordination effects across borders is a rather new field of research and, due to differences with regard to methodology and data, no clear conclusions can be drawn.<sup>12</sup>

Panel estimation techniques require some prior tests to rule out certain particularities of the data that would bias the results. In a first step, a test on stationarity has been carried out. Stationarity of the wage variable is a pre-requirement for panel estimation techniques because otherwise there could be a problem of spurious correlation in the estimations. However, for our data the presence of a unit root, which indicates non-stationarity, could not be confirmed (see Annex A2). Second, the data have been tested for endogeneity, which might be a problem as the influence of wages on prices and employment is widely discussed in economics.<sup>13</sup> Therefore, we checked to see whether these variables can be considered to be weakly exogenous (Greene 2008: 358). We also tested weak exogeneity of unfiltered productivity.<sup>14</sup> While productivity was unproblematic, sectoral employment was found to be endogenous in the Netherlands and Germany. Therefore, we used an instrumented employment variable *e1* in our further estimations (we used two stages least squares: for details, see Annex A3).

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<sup>12</sup> For instance, *Traxler et al.* (2008b) find a ‘pattern-setting’ effect of German metal sector wage accords on Austrian wage agreements settled in the metal sector one year later. Likewise, *Traxler and Brandl* (2009) find empirical evidence for a wage coordination effect in the metal sector in Germany and the Nordic countries, whereby Germany acts as the pattern-setter. However, these two studies are burdened with the problem of a small data set and a high number of independent variables. In another study, based on a larger data set and a correlation analysis, *Buscher and Gabrisch* (2009) found persistent asymmetries in nominal wage dynamics in the EU member states. However, nominal gross wages only partly reflect the outcome of collective wage bargaining.

<sup>13</sup> For example, in macroeconomic textbooks such as *Carlin and Soskice* (2006: 46) the dynamics are studied in the interaction of wage setting, price setting and monetary reaction curves. In the New Keynesian framework, increasing wage inflation eventually provokes a tightening monetary reaction and, thus, rising unemployment.

<sup>14</sup> For our later estimations we used HP-filtered productivity to smooth the productivity time series and depict a mid-term productivity trend, as required by **H1** and **H4**.

After checking for endogeneity, a dummy variable to measure the effect of the establishment of the EMF network on transnational bargaining coordination was included in wage equations for the three countries (results are presented in the Annex). It has been assumed that a de facto coordination effect will be felt from 1999 onwards, that is, two years after the foundation of the network in North Rhine-Westphalia, Belgium and the Netherlands. As the cross-border coordination of wage bargaining was a new practice for the actors involved, it is reasonable to assume that coordination effectively took place at first for wage increases settled in 1998 but paid out in the following year. It is important to note that statistical results for the EMF dummy of the panel estimations documented below can be interpreted in two ways. First, wage increases are equal due to cross-border coordination of wage bargaining, regardless of country characteristics. Alternatively, convergence in wage increases might be linked to the implementation of EMU that coincides with the year 1999, when the dummy turns active. As a next step of preliminary analysis we conducted single country wage equation estimations of equation (1). There it turned out that changes in the sectoral trade balance, a variable included to measure a possible ‘globalisation effect’, was insignificant and that it had an unstable sign (see Annex A4). Thus, this variable was not included in the subsequent estimations.

After having done the preliminary tests, as described above (results are summarised in annex A2–A4), the two main hypotheses could be addressed. Three panel estimations were carried out to test the effectiveness of the two basic wage coordination instruments, namely the EMF Coordination Rule and the European goal of a stability-orientated wage policy, as formulated in the ‘Integrated guidelines for growth and jobs’ (the latter will be discussed in the next subsection). As Table 3 indicates, it is investigated whether there is an ‘equalisation’ effect on wage growth in the three countries with the establishment of the EMF’s transnational collective bargaining network in the Belgian, Dutch and German metal sectors. For this purpose, a dummy (‘EMF’), which turns 1 with the beginning of the year 1999, was included in the analysis. The ‘time dummy’, however, is not significant, as column EMF (1) in Table 3 shows. This may be due to the fact that the wage policy orientation criteria, as included in the two coordination instruments, were not considered.

Furthermore, in order to address effects that can be observed before and after the establishment of institutions and instruments for the transnational coordination of wage policies in the European metal sector, *two specifications* of EMF wage guideline were included in the analysis. In our first specification we split the time series for the two variables relevant for cross-border wage coordination – that is, prices and productivity – into two sets: that is, before and after the establishment of the EMF bargaining network. The parameters were estimated separately, as shown in Table 3. Second, in a slightly modified approach a variable of the sum of productivity and price increases for the time span after the establishment of the EMF bargaining network was introduced by using an interaction term (see column 3 in Table 3). However, we have to bear in mind that significant interaction terms in such a procedure have to be interpreted carefully. Although

a complete structural break analysis is not eligible with our small data set, we did some additional tests which are documented in Annex A5. The tests show that there is a significant effect of coordination, even if the time series are not split. This confirms a significant influence of the EMF wage coordination formula.

Table 3:  
Fixed effects estimation of wage equations

Dependent variable: w	EMF (1)		EMF (2)		EMF (3)	
	Coefficient	t-Stat.	Coefficient	t-Stat.	Coefficient	t-Stat.
C	-0.86	-0.70	-2.12*	-1.89	-2.07*	-1.91
Coordination hypothesis						
EMF	0.88	1.52				
EMF*p			1.63***	4.58		
EMF*prod(-1)			1.43**	2.31		
EMF*(p+prod(-1))					1.55***	4.64
(1-EMF)*p			0.34***	3.20	0.33***	3.01
(1-EMF)*prod(-1)			2.24***	4.09	2.29***	4.32
p	0.48***	4.64				
prod(-1)	1.48**	2.63				
e1(-1)	0.23**	2.44	0.21**	2.38	0.21**	2.38
Fixed Effects (Cross)						
_NL--C	-0.62		-0.68		-0.68	
_BE--C	0.18		0.13		0.14	
_DE--C	0.44		0.56		0.54	
n*T	87		87		87	
Adjusted R-squared	0.40		0.45		0.46	
Durbin-Watson	1.95		2.07		2.06	
Redundant FE L-R (prob.)	0.02		0.004		0.004	

Variables: dummy for EMF coordination, MA(1) of inflation p, lagged trend-productivity growth prod(-1), wage increases (w), lagged instrumented sectoral employment increases e1(-1)

Sources: AMECO, OECD, national trade unions and Federal Public Service Employment, Labour and Social Dialogue (Belgium) and authors' calculations.



Results of the estimations are shown in Table 3. To control for country-specific variances an FGLS estimator was used.<sup>15</sup> We checked for the significance of fixed effects using the likelihood ratio statistic (random effects could not be applied due to the small panel size). The likelihood ratio tests indicate a joint significance of the fixed effects in all specifications at the 5% level. This means that there were upward and downward deviations of bargained wages in our country sample. For example, the result for the fixed effect of  $-0.62$  for the Netherlands, combined with the fixed effect of  $+0.44$  for Germany in Panel EMF(1) of Table 3, indicates that wage increases in the Netherlands have been lower than wage increases in Germany. This is the case to a lesser extent for Belgian wage increases and holds for all specifications EMF (1)–(3). Thus, hypothesis **H3** is confirmed by our estimations.

The coordination dummy EMF in panel EMF (1) is not significant. Interestingly, the two content-related specifications of a wage coordination effect make a difference. Both the inflation and the productivity wage coordination criterion are significant. According to the results shown in panel EMF (2) there was a more equal weight of the price and productivity goal *after* the EMF network was established. The parameters for the time period before the establishment of the network indicate that, formerly, productivity was of higher relevance. Second, this equal consideration of prices and productivity is in line with the EMF bargaining rule which was tested in panel EMF (3) as – according to the EMF rule – productivity and price increases shall be considered to an equal extent. Thus, our results confirm hypothesis **H1**.

The relatively high parameter values of the variables representing the coordination criteria do not necessarily indicate an overshooting of the EMF wage guideline as the estimated constants of our panels are negative. Specification tests (DW and Likelihood ratio) of this estimation indicate that it is comparable with panel (2). However, following the law of parsimony we prefer the simpler specification of panel (3).

### **3.2 Testing effectiveness and compatibility of coordination goals promoted by unions and the macroeconomic goal of a stability-orientated wage policy in the Eurozone**

As hypothesised above, this paper focuses on the relation between instruments and institutions aimed at the cross-border coordination of wage bargaining in the metal sector and macroeconomic goals of the ‘Integrated guidelines for growth and jobs’ (referred to as ‘EMU’ goal in Table 4). The crucial difference between the EMF wage guideline and the goal of a stability-orientated wage policy within the Eurozone is the conception of the price component. While the EMF considers actual price increases as an orientation criterion for wage-setting, the wage policy goal included in the ‘Integrated guidelines’ refers to price stability. The European Central Bank (ECB) defines price stability as an

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<sup>15</sup> See *Greene* (2008: 156 ff.).

inflation rate of ‘below but close to 2%’ (ECB 2004: 51). As a pragmatic interpretation of the ECB’s stability goal we chose an inflation target of 1.9% for our estimations.

Table 4:

Comparison of panel wage equations with EMF and EMU rule

Dependent variable: w	EMF (1)		EMU (2)		EMU (3)	
	Coefficient	t-Stat.	Coefficient	t-Stat.	Coefficient	t-Stat.
C	-2.07*	-1.91	-8.09***	-4.91	-3.25**	-2.18
EMF*(p + prod(-1))	1.55***	4.64				
EMF*1.9			6.03***	6.33		
EMF*prod(-1)			-0.25	-0.43		
EMF*(1.9 + prod(-1))					1.88***	4.16
(1-EMF)*p	0.33***	3.01	0.16	1.53	0.29**	2.49
(1-EMF)*prod(-1)	2.29***	4.32	5.10***	6.55	2.82***	3.97
e1(-1)	0.21**	2.38	0.13	1.58	0.16	1.61
Fixed Effects (Cross)						
_NL--C	-0.68					
_BE--C	0.14					
_DE--C	0.54					
n*T	87		87		87	
Adjusted R-squared	0.46		0.52		0.38	
Durbin-Watson	2.06		2.16		1.73	
Redundant FE L-R						
(prob.)	0.004		0.75		0.13	

Variables: dummy for EMF coordination, MA(1) of inflation p, lagged trend-productivity growth prod(-1), wage increases (w), lagged instrumented sectoral employment increases e1(-1)

Sources: AMECO, OECD, national trade unions and Federal Public Service Employment, Labour and Social Dialogue (Belgium) and authors’ calculations.

Table 4 presents a comparison of the EMF coordination rule – again specified on the basis of the combined goal of the sum of inflation and productivity growth and with the two indicators tested separately – with the macroeconomic goal of a stability-orientated wage development based on productivity and the inflation target for the Eurozone. In order to test the latter coordination instrument, two versions of the ‘EMU’ wage policy goal have been specified. Panel EMU (2) in Table 4 was estimated to give an impression of the relevance of the two components of the guideline for stability-based wage growth. As indicated in Table 4 – and contrary to the results for the EMF guideline in

Table 3 – price stability and productivity seem to have very different weights, according to this estimation. Employment  $e1$  is no more significant. Panel EMU (3) shows the results for the ‘EMU’ wage policy goal of wage increases in line with both the inflation target for the Eurozone and productivity growth. In general, the results are similar to the estimation of the EMF bargaining rule, documented in column EMF (1) for comparison. However, the latter has a better fit and shows a significant influence of employment on wage increases. Thus, it seems as if the EMF bargaining rule is better suited to explain wage coordination effects. Interestingly, one part of the EMU wage policy goal prescribes flexibility in case of job losses. This seems to be relevant in our preferred panel specification EMF (1), as the parameter for instrumented employment increases  $e1$  suggests. However, this result is plausible, according to economic theory (see footnotes 9 and 11), and can be interpreted as a result of pressures evolving from labour market conditions and not as the result of coordination efforts.

### 3.3 Testing for a pattern-setting effect by German union bargaining actors

Finally, we shall check the hypothesis of the emergence of a pattern-setting role for German wage bargainers with regard to union bargaining actors in Belgium and the Netherlands after the EMF bargaining network was established. For this purpose we compared three small panels for different coordination hypotheses. Germany had to be excluded as this country acts as the ‘pattern-setter’. Thus, the total number of observations has declined by one-third. Results of the estimations are shown in Table 5. The first specification (column 1) is a version of panel EMF (1) in Table 3, but including two countries instead of three. The panel (1) estimation tests for a general equal development of wage increases resulting from the adoption of the EMF coordination rule or, alternatively, from the consideration of the stability-orientated wage policy goals, as required in the EMU, while panel (2) is the ‘two-country’ version of the previous estimations in column (3) of Table 3, which tests for adherence to the EMF wage guideline from 1999 onwards. These panels were estimated for the purpose of comparing our different model specifications. In panel (3) of Table 5, the special coordination hypothesis of a pattern-setting effect of German wage increases on wage formation in Belgium and the Netherlands is tested.

The results of Table 5 indicate that there is only weak evidence for a pattern-setting effect of German wage increases on wage developments in the two neighbouring countries after the EMF bargaining network had been established. However, there seems to be strong evidence of a development of wage increases in line with the EMF rule after 1998, as the results in panel (2) show. Results are similar in panel (1), although the significance of the EMF dummy is lower than it is in panel (2). Thus, the results of our earlier three-country panel estimations are confirmed in estimations based on the smaller country sample. The joint significance of fixed effects in Tables 3 and 5 implies that we can also make a more definitive assessment of the assumption of a competitive wage policy pursued in the Netherlands (H2). As the fixed effects show, wage moderation in

the Dutch metal sector seems to be pronounced compared to wage developments in the metal sector in Belgium.

Table 5:  
Test of the pattern-setting hypothesis

Dependent variable: w	(1)		(2)		(3)	
	Coefficient	t-Stat.	Coefficient	t-Stat.	Coefficient	t-Stat.
C	-1.41	-1.02	-1.56	-1.18	-1.28	-0.94
EMF	1.44**	2.08				
EMF * (p+prod(-1))			1.34***	3.58		
EMF * w <sub>DE</sub> (-1)					0.47*	2.00
(1-EMF) * p			0.51***	3.82		
(1-EMF) * prod(-1)			1.59**	2.34		
p	0.57***	4.77			0.57***	4.74
prod(-1)	1.43**	2.13			1.39**	2.07
e1(-1)	0.25**	2.13	0.23*	1.91	0.27**	2.29
Fixed Effects (Cross)						
_NL--C	-0.38		-0.39		-0.39	
_BE--C	0.38		0.39		0.39	
n*T	58		58		58	
Adjusted R-squared	0.48		0.48		0.47	
Durbin-Watson	2.20		2.25		2.20	
redundant FE (prob.)	0.06		0.05		0.06	

Variables: dummy for EMF coordination, MA(1) of inflation p, lagged trend-productivity growth prod(-1), wage increases (w), lagged instrumented sectoral employment increases e1(-1)

Sources: AMECO, OECD, national trade unions and Federal Public Service Employment, Labour and Social Dialogue (Belgium) and authors' calculations.

## Conclusions

This paper investigates the effects of wage coordination in the metal sector in Belgium, the Netherlands and Germany. The further deepening of the internal market which was triggered by the adoption of EMU increased the need for the transnational coordination of wage determination. In the European metal sector, institutions and instruments for cross-border coordination are well established in comparison to other sectors. In the late 1990s, the 'European coordination rule' of the European Metalworkers' Federation

(EMF) was adopted, and the EMF bargaining network for the region of North Rhine-Westphalia, Belgium and the Netherlands was established. Furthermore, conditions for coordinating wage policies transnationally are particularly favourable in the three countries of the central western European region as they are characterised by a high degree of economic integration and important commonalities with regard to their industrial relations systems.

When testing the effectiveness of the EMF's European coordination rule, it becomes evident that macroeconomic indicators, such as inflation rate and mid-term productivity growth, were relevant for wage determination in the metal sector in the three countries under consideration even *before* the transnational network for collective bargaining coordination in Belgium, the Netherlands and the German region of North Rhine-Westphalia was established. However, different versions of panel estimations confirm changing weight with regard to the consideration of both fundamental orientation criteria for wage-setting – as stipulated in the EMF coordination rule – in the period *after* the establishment of the coordination network of the central western European region. Furthermore, the empirical analysis has addressed the relation between wage bargaining goals adopted by trade unions and another wage policy goal, that is, the 'European' goal of a stability-oriented wage policy in the Eurozone. Although in both guidelines the criterion of productivity is important, a certain degree of irreconcilability may derive from the different conceptions of how price increases should be incorporated in wage-setting. Empirical evidence from our country sample, however, shows that the goal of macroeconomic wage stability in the Eurozone does not stand in strong contradiction to the wage policy goal of compensation of price increases based on the current national inflation rate, as promoted by the trade unions in the metal sector. Thus, wage increases in the metal sector in the three countries considered in the study are broadly in line with the target for non-inflationary wage growth in the Eurozone.

This finding allows us to draw several conclusions. First, with regard to the stability-orientated wage policy goal, it might seem that the European Central Bank was quite successful in anchoring inflationary expectations in the central western European region. However, the relevance of 'European' macroeconomic goals for wage bargainers at the national level is strongly limited. The wage policy goal included in the 'Integrated guidelines for growth and jobs' is only partly known and considered as relevant by trade union wage bargainers in Belgium, the Netherlands and Germany. Thus, it seems more reasonable to assume that some degree of compliance with the guideline for a stability-based wage development in EMU was a side effect of wage coordination in line with the EMF wage guideline. However, this side effect is not just accidental due to common goals of both instruments, such as the consideration of mid-term productivity and the avoidance of downward pressure on wages resulting from competitive wage-setting.

Another important aspect that may account for the convergence of wage increases since the establishment of EMU has been addressed in the analysis. In economically strongly integrated neighbouring countries a coordination effect may also be the result of an ori-

entation of wage bargainers in Belgium and the Netherlands towards wage developments in their most important trading partner, Germany. A so-called ‘pattern-setting’ effect of German wage increases on wage bargaining in other countries may even be enforced through the establishment of structures and institutions that facilitate cross-border exchange of information on developments in collective bargaining. However, we found that empirical evidence for such a pattern-setting effect of German wage agreements within the central western European coordination network is fairly weak and lacks robustness. This corresponds to the findings obtained through expert interviews. Trade union bargainers from Belgium and the Netherlands state that they observe collective bargaining developments in Germany without, however, explicitly considering German wage agreements in their negotiations.

Finally, we have investigated whether there are empirical grounds for the highly disputed assertion that Germany pursues a systematic and continued policy of pronounced wage restraint in order to improve its relative competitive position vis-à-vis its trading partners. In fact, empirical evidence underscores a less dynamic wage development in the Dutch metal sector in the period of observation, that is, from 1980 to 2008, compared to wage growth in the Belgian and German metal sectors. Thus, the assertion that Germany pursues a ‘beggar-thy-neighbour’ wage policy is not confirmed by the development of collectively settled wages in the *metal sector*.

As the turmoil affecting the EU at the time of writing shows, the insufficient consideration of price developments within the Eurozone by national wage bargaining actors may result in imbalances. This is of particular relevance for exposed sectors, such as the metal industry. The question of how to restore and maintain stable wage growth that avoids protracted divergence between EU countries with regard to international competitiveness and productivity is extremely challenging, not only for trade unions but also for collective bargaining actors and institutions in general. Nevertheless, effective coordination of wage formation across borders can be regarded as an essential instrument for improving the conditions for cooperation among national and European macroeconomic actors.

## References

- ABVV Metaal (2010), Brussels, interview, 28 January 2010.
- Beguín, J.-M. (2005) *Industrial relations in the steel industry*. European Foundation for the Improvement of Living and Working Conditions.
- Blanchard, O. and Katz, L.F. (1999) ‘Wage dynamics: reconciling theory and evidence’, *American Economic Review*, Vol. 89, No. 2: 69–74.
- Borghijs, A., Ederveen, S. and de Mooij, R. (2003) *European wage coordination: nightmare or dream to come true? An economic analysis of wage bargaining institutions in the EU*, CPB Discussion Paper, No. 17, The Hague.
- Buscher, H. and Gabrisch, H. (2009): *Is the European Monetary Union an endogenous currency area? The example of the labour markets*, IWH Diskussionspapier, No. 7/2009.
- Calmfors, L. (1993) ‘Centralization of wage bargaining and macroeconomic performance: a survey’, *OECD Economic Studies*, 21: 161–91.
- Calmfors, L. and Driffil, J. (1988) ‘Bargaining structure and macroeconomic performance’, *Economic Policy*, Vol. 4: 14–61.
- Carlin, W. and Soskice, D. (2006) *Macroeconomics: imperfections, institutions and policies*, Oxford: Oxford University Press.
- Crouch, C. (1993) *Industrial relations and European state traditions*, Oxford: Clarendon Press.
- Cukierman, A. and Lippi, F. (1999) ‘Central bank independence, centralization of wage bargaining, inflation and unemployment: theory and some evidence’, *European Economic Review*, Vol. 43: 1395–1434.
- de Grauwe, Paul (2006): ‘What have we learnt about monetary integration since the Maastricht Treaty?’, *JCMS*, Vol. 44, No. 4: 711–730.
- Dølvik, J.E. (2002), ‘Industrial relations in EMU: re-nationalization and Europeanization. Two sides of the same coin?’, in A. Martin and G. Ross (eds), *Euros and Europeans: monetary integration and the European model of society*, Cambridge University Press.
- Ebbinghaus, B. and Visser, B. (2000) *Trade unions in Western Europe since 1945*. Basingstoke: Macmillan.
- ECOFIN (2008) Council Recommendation of 14 May 2008 on the broad economic policy guidelines for the Member States and the Community (2008–2010), (2008/390/EC).

- European Central Bank (ECB) (2004) The monetary policy of the ECB, 2nd ed., European Central Bank, Frankfurt am Main.
- European Commission (EC) (2007) Integrated guidelines for growth and jobs (2008–2010), COM(2007)803 final. Brussels.
- European Commission (EC) (2006) Industrial relations in Europe 2006. European Commission, Directorate-General for Employment, Social Affairs and Equal Opportunities. Manuscript completed in June 2006.
- European Commission (EC) (2004) Industrial relations in Europe 2004. European Commission. Directorate-General for Employment and Social Affairs. Manuscript completed in 2004.
- European Commission (EC) (2002) Communication from the Commission on streamlining the annual economic and employment policy coordination cycles, COM(2002) 487 final, Brussels.
- European Metalworkers' Federation (EMF) (1998) Collective Bargaining with the Euro, Resolution adopted at the 3rd EMF Bargaining Conference, Frankfurt am Main, 9–10 December 1998.
- European Metalworkers' Federation (EMF) (1993) Collective Bargaining Policy in a Changing Europe. Statement of principle on Collective Bargaining, adopted at the 1st EMF Collective Bargaining Conference, Luxembourg, 11/13 March 1993.
- Fischer, C. (2007) *An assessment of the trends in international price competitiveness among EMU countries*, Discussion Paper, Forschungszentrums der Deutschen Bundesbank, Frankfurt am Main.
- Flanagan, R.J. (1999) 'Macroeconomic performance and collective bargaining: an international perspective', *Journal of Economic Literature*, Vol. 37, No. 3: 1150–1175.
- Glassner, V. (2009) 'Transnational collective bargaining coordination at the European sector level: the outlines and limits of a 'European' system', *International Journal of Labour Research*, Vol. 1, Issue 2, Geneva : International Labour Office.
- Gollbach, J. and Schulten, T. (2000) 'Cross-border collective bargaining networks in Europe', *European Journal of Industrial relations*, Vol. 6, No. 2: 161–179.
- Greene, W.H. (2008) *Econometric analysis*, 6th ed., Upper Saddle River: Pearson International.
- Guzzo, V. and Velasco, A. (1999) 'The case for a populist central banker', *European Economic Review*, Vol. 43: 1317–1344.
- Heise, A. (2002) 'Theorie optimaler Lohnräume – Zur Tarifpolitik in der Europäischen Währungsunion', *Vierteljahrshefte zur Wirtschaftsforschung*, Vol. 71, No. 3: 368–383.



- Heise, A. (2001) *New Politics: Integrative Wirtschaftspolitik für das 21. Jahrhundert*. Münster: Westfälisches Dampfboot.
- Hemerijck, A., Unger, B. and Visser, J. (2000) 'How small countries negotiate change: twenty-five years of policy adjustment in Austria, the Netherlands, and Belgium', in Fritz W. Scharpf and Vivien A. Schmidt (eds), *Welfare and work in the open economy*, Volume II, *Diverse responses to common challenges in twelve countries*, Subsection, 'The political risks of welfare reform', Oxford: Oxford University Press.
- Houwing H. and Vandaele K. (forthcoming 2010) 'Different and changing trajectories: further divergence? The political economy of adjustment in the Low Countries', in U. Becker and K. van Kersbergen (eds), *Change and continuity in the small Western European countries*, Amsterdam: Amsterdam University Press.
- IG Metall (2010), Telephone interview, 17 March 2010.
- Jerger, J. (2002) 'How strong is the case for a populist central banker? A note', *European Economic Review*, Vol. 46: 623–632.
- Marginson, P. and Sisson, K. (1996) 'European collective bargaining: a virtual perspective?' Working Paper presented at the IREC Conference: 'Industrial relations in Europe: Convergence or Diversification?', Copenhagen, 19–21 September 1996.
- Marginson, P. and Sisson, K. (2004) *European integration and industrial relations*. Houndsmills: Palgrave Macmillan.
- Marginson, P. and Traxler, F. (2005): 'After enlargement: preconditions and prospects for bargaining coordination', *Transfer*, Vol. 11, No. 3: 423–438.
- Meinhold, H. (1969) 'Die Einkommensverteilung als wirtschafts- und gesellschaftspolitisches Problem', in Helmut Arndt (ed.), *Lohnpolitik und Einkommensverteilung*. Berlin.
- Mooslechner, P. and Schürz, M. (2001) 'The interaction of wage bargaining institutions and an independent Central Bank: a methodological reflection on current theories', *Empirica*, Vol. 28: 487–506.
- Osborne, M.J. (2004) *An introduction to game theory*. New York: Oxford University Press.
- Pusch, T. and Heise, A. (2008) 'Central banks, trade unions and reputation – Is there room for an expansionist manoeuvre in the European Union?', Working Papers on Economic Governance, University of Hamburg.
- Schnabel, C. (1997) *Tariflohnpolitik und Effektivlohnfindung: Eine empirische und wirtschaftspolitische Analyse für die alten Bundesländer*, Frankfurt am Main: Peter Lang.

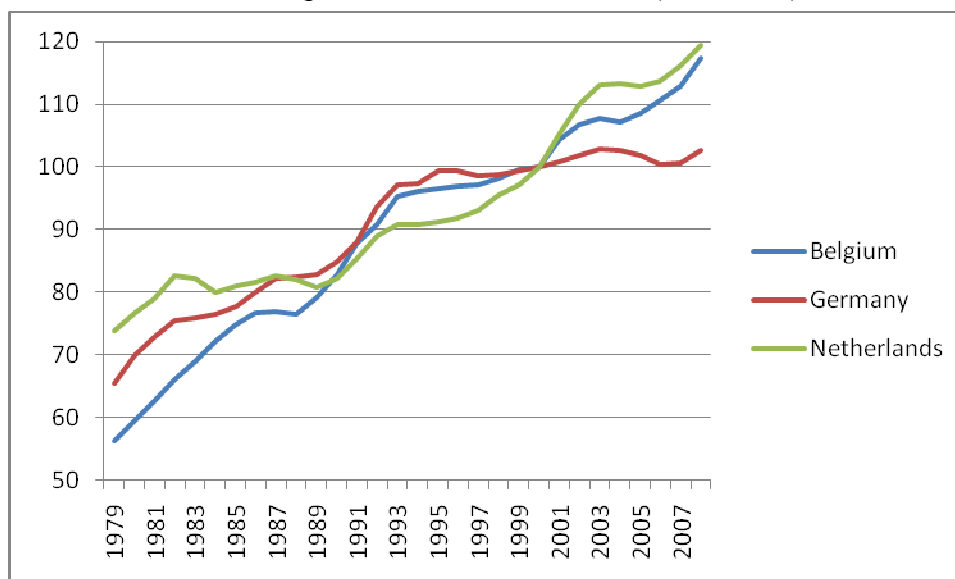
- Schulten, T. (1998) 'Collective bargaining in the metal industry under the conditions of the European Monetary Union', in T. Kauppinen (ed.), *The impact of EMU on industrial relations in the European Union*. Helsinki : Finnish Labour Association.
- Service Public Fédéral (SPF) (2010), SPF, Emploi, Travail et Concertation Sociale. Conventions collectifs de travail (CCT). Available at: <http://www.emploi.belgique.be>
- Sisson, K. and Marginson, P. (2002) 'Coordinated bargaining: a process for our times?', *British Journal of Industrial Relations*, Vol. 40: 197–220.
- Soskice, D. and Iversen, T. (2001) 'Multiple wage bargaining systems in the single European currency area', *Empirica*, Vol. 28: 435–456.
- Soskice, D. (1990) 'Wage determination: the changing role of institutions in advanced industrialized countries', *Oxford Review of Economic Policy*, Vol. 6: 36–61.
- Traxler, F. (2009) *Representativeness of the social partners: steel sector*. Dublin: European Foundation for the Improvement of Living and Working Conditions.
- Traxler, F. and Brandl, B. (2009) 'Towards the Europeanization of wage policy: Germany and the Nordic countries', *European Union Politics*, Vol. 10: 177–201.
- Traxler, F., Brandl, B. and Glassner, V. (2008a) 'Pattern bargaining: an investigation into its agency, context and evidence', *British Journal of Industrial Relations*, Vol. 46: 33–58.
- Traxler, F., Brandl, B. and Glassner, V. (2008b) 'Can cross-border bargaining coordination work? Analytical reflections and evidence from the metal industry in Germany and Austria', *European Journal of Industrial relations*, Vol. 14: 217–237.
- Traxler, F. (2003) 'European Monetary Union and collective bargaining', in B. Keller and H.-W. Platzer (eds), *Industrial relations and European integration*. Aldershot: Ashgate.
- Traxler, F., S. Blaschke and B. Kittel (2001) *National labour relations in internationalised markets*, Oxford: Oxford University Press.
- Traxler F. and Kittel, B. (2000) 'The bargaining system and performance. A comparison of 18 OECD countries', *Comparative Political Studies*, Vol. 33, No. 9: 1154–1190.
- Van het Kaar, R. (2003) 'Pay freeze agreed for 2004–2005', *EIROonline*, European observatory on-line. Available at: <http://www.eurofound.europa.eu>
- Van Ruysseveldt, J. and Visser, J. (1996) 'Weak corporatism going different ways? Industrial relations in the Netherlands and Belgium', in J. Van Ruysseveldt and J. Visser (eds), *Industrial relations in Europe*. London: Sage.
- Visser, J. and Hemerijck, A. (1997) *A Dutch miracle. Job growth, welfare reform and corporatism in the Netherlands*. Amsterdam: Amsterdam University Press.

## Annex

### A1 Economy-wide unit labour cost developments

Figure 1:

Unit labour cost developments in BE, NL and DE (2000: 100)



Source: AMECO.

### A2 Unit root tests

Table:

Unit root tests, 1980–2008, unit root tests with individual intercept

	Levin, Lin & Chu $t^*$	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
	Null: Common unit root p-value	Null: Individual unit roots p-values		
w	0.00	0.00	0.00	0.00
p	0.00	0.00	0.00	0.10
d(tb)	0.00	0.00	0.00	0.00
prod	0.00	0.00	0.00	0.00
e	0.00	0.00	0.00	0.09

Variables: dummy for EMF coordination, MA(1) of inflation p, lagged trend-productivity growth prod(-1), wage increases (w), lagged instrumented sectoral employment increases e1(-1), lagged difference of sectoral trade balance (tb).

Sources: AMECO, OECD, national trade unions and Federal Public Service Employment, Labour and Social Dialogue (Belgium) and authors' calculations.

### A3 Results of endogeneity tests

Table:  
Endogeneity checks, 1977–2008

	Block exo- geneity Test p-value	Jearque-Berra Test for normality of residuals p-value	Portmanteau Test (lag 2) for autocorrelation of re- siduals p-value
p <sub>DE</sub>	0.09	0.98	0.39
p <sub>BE</sub>	0.57	0.72	0.21
p <sub>NL</sub>	0.22	0.55	0.62
e <sub>DE</sub>	<b>0.01</b>	0.45	0.72
e <sub>BE</sub>	0.10		
e <sub>NL</sub>	<b>0.01</b>		
d(tb <sub>DE</sub> )	0.45	0.41	0.07
d(tb <sub>BE</sub> )	0.85	0.01	0.32
d(tb <sub>NL</sub> )	0.86	0.22	
prod <sub>DE</sub>	0.19	0.21	0.19
prod <sub>BE</sub>	0.13	0.74	0.83
prod <sub>NL</sub>	0.32	0.37	0.84
e1 <sub>DE</sub>	0.11	0.76	0.37
e1 <sub>BE</sub>	0.12	0.45	0.33
e1 <sub>NL</sub>	0.12	0.16	0.14

Notes: Variables: dummy for EMF coordination, MA(1) of inflation p, lagged trend-productivity growth prod(−1), wage increases (w), lagged instrumented employment increases e1(−1), lagged difference of sectoral trade balance (tb).

Sources: AMECO, OECD, national trade unions and Federal Public Service Employment, Labour and Social Dialogue (Belgium), authors' calculations,

As we can see from the table, there is a problem with the weak block exogeneity test for employment (e) which seems to be endogenous in Germany and the Netherlands, while increases in prices (p) and the sectoral trade balance (tr) seem to be unproblematic, apart from a problematic test statistic for the normality of residuals of the Belgian trade balance. We were successful in finding a two-stages least squares solution for the employment problem. For the two-stages least squares technique we estimated the sectoral employment development by using GDP values of one important trading partner (DE: FR, NL: DE, BE: NL) and the Bundesbank interest rate. After this had been done we successfully checked for weak exogeneity of the instrumented sectoral employment development (e1).

## A4 Single-country wage equations

Table:

Single-country wage equations, 1980–2008 (n=29)

Dependent variable: w	w_BE		w_NL		w_DE	
	Coefficient	t-Stat.	Coefficient	t-Stat.	Coefficient	t-Stat.
C	−3.38*	−1.86	5.67	0.77	1.52	0.64
EMF	2.96**	2.77	−0.87	−0.50	−0.46	−0.45
(p+p(−1))/2	0.53***	3.42	0.56**	2.45	0.19	0.94
prod(−1)	2.42**	2.79	−1.98	−0.54	1.09	1.10
e1(−1)	0.19	1.25	0.37	1.71	0.14	0.89
d(tb(−1))	−5.36	−0.74	1.42	0.15	−15.15	−1.18
N	29		29		29	
Adjusted R-squared	0.60		0.13		0.27	
Durbin-Watson	2.13		2.47		1.83	

Notes: Variables: dummy for EMF coordination, MA(1) of inflation p, lagged trend-productivity growth prod(−1), wage increases (w), lagged instrumented employment increases e1(−1), lagged difference of sectoral trade balance (tb).

Sources: AMECO, OECD, national trade unions and Federal Public Service Employment, Labour and Social Dialogue (Belgium), authors' calculations.

In the estimations of single-country wage equations it turned out that only the Belgian equation had a good fit and furthermore the sign of the EMF coordination, as well as trend productivity were unstable. However, we have to be aware of two factors which limit the explanatory power of these estimations. First, there is a small n (29) as compared to the number of regressors (6). Second, working time reductions were distributed quite unevenly, and it can be expected that wage growth in years of working time reductions fluctuates extraordinarily. This affects estimation results with small n (even if wage increases incorporate working time reductions, as in our data). This might be especially the case in Germany (with several working time reductions) and, to a lesser extent, in the Netherlands and Belgium. Working time reductions were a reaction to high unemployment, especially in the 1980s (years of working time reductions in Germany: 1985, 1988, 1989, 1993, 1995; Belgium: 1987; the Netherlands: 1985). With a small data set this might contribute to parameter instability. Thus, we also tried to do additional estimations without the effect of working time reductions. However, while checking for weak exogeneity of variables we found that the IG Metall wage agreements, excluding working time reductions, have an influence on prices. This might be due to a pattern-setting effect of IG Metall wage increases for overall German wage setting, as mentioned in Section 1. According to this hypothesis, higher wage increases in the metal sector lead to higher economy-wide wage increases and, eventually, to rising inflation. We did not take this route of investigation any further as this is not our main interest. Instead, we decided to expand our data base by means of panel estimations.

### A5 Additional tests of the significance of the EMF coordination rule

Table:

Simple structural break test, 1980–2008

Dependent variable: w	EMF (*)		EMF (**)	
	Coefficient	t-Stat.	Coefficient	t-Stat.
C	−2.12*	−1.72	−0.84**	−2.12
EMF * p	1.29***	3.15		
EMF * prod(−1)	−0.81***	−2.70		
EMF * (p+prod(−1))			0.27*	1.94
p	0.34***	2.77	0.46***	4.82
prod(−1)	2.24***	3.82	1.48***	8.46
e1(−1)	0.21***	5.36	0.22***	9.00
Fixed Effects (Cross)				
_NL--C	−0.69		−0.67	
_BE--C	0.13		0.20	
_DE--C	0.56		0.47	
n*T	87		87	
Adjusted R-squared	0.45		0.41	
Durbin-Watson	2.07		1.89	
Redundant FE L-R (prob.)	0.005		0.01	

This test was conducted to show a significant influence of the EMF coordination rule by including its content variables p as well as prod(−1), in addition to the same variables, only for the time span since the bargaining network has been established. This was done by the inclusion of an interaction term with the EMF dummy which turns 1 from 1999 on. If the wage rule had been adhered to before the establishment of the bargaining network, insignificant interaction terms could be expected. However, this is not the case. Additionally, we estimated two small panels for the time before and after the introduction of the bargaining network, which is documented below.

Table:

Estimations for two periods (1980–1998 and 1999–2008)

Dependent variable: w	1980–1998		1999–2008	
	Coefficient	t-Stat.	Coefficient	t-Stat.
C	–7.73***	–4.11	–0.19	–0.18
p	0.19	1.60	1.00***	3.41
prod(–1)	4.92***	5.54	0.84*	1.90
e1(–1)	0.18	1.58	0.00	–0.05
Fixed Effects (Cross)				
_NL--C			–0.70	
_BE--C			0.31	
_DE--C			0.38	
n	57		30	
Adjusted R-squared	0.55		0.22	
Durbin-Watson	2.24		2.61	
Redundant FE L-R (prob.)	0.48		0.09	

Estimations show differences in estimated parameters for the two periods which might stem from the effectiveness of the EMF wage coordination rule. Furthermore, we also checked the intersection of confidence intervals of the estimated parameters but could not confirm any intersection according to the results of the following table:

Table:

Check of confidence interval intersections (based on estimations for 1980–1998 and 1999–2008 of the preceding table)

Confidence intervals (one-sided, 95%)	1980–1998		1999–2008	
	lower	upper	lower	upper
C	–8.15	–7.32	–0.51	0.13
p	0.17	0.22	0.91	1.10
prod(–1)	4.73	5.12	0.71	0.99
e1(–1)	0.16	0.21	–0.03	0.02

Figures of one-sided 95%-confidence interval boundaries reveal that there is no intersection of the respective intervals. This further reinforces the evidence for a difference between the two periods, which might be due to wage coordination.