European Economic and Monetary Union's Perverse Effects on Sectoral Wage Inflation: Negative Feedback Effects from Institutional Change?

Abstract:

Public sector unions push for unmerited wage increases, exacerbating inflation and deficits. Despite this conventional wisdom, governments in several European countries successfully limited public sector wage growth during the 1980s and 1990s. It is argued in this paper that the recent rise in public sector wage inflation in the Euro-zone is an unintended consequence of the shift towards Economic and Monetary Union. I argue that monetary union's predecessors, the European Monetary System and Maastricht, imposed an institutional constraint on governments, which enhanced their ability to impose moderation: national-level, inflation-averse central banks that could punish rent-seeking sectoral wage-setters via monetary contraction. Monetary union's altercation of this constraint weakened governments' capability to deny inflationary settlements.

Keywords: European Monetary Union, Employers, Trade Unions, Sectoral Interests, Institutional Change

Corresponding author: Alison Johnston, Assistant Professor. Department of Political Science/School of Public Policy. Oregon State University. 307 Gilkey Hall, Corvallis, OR 97331. USA. Alison.Johnston@oregonstate.edu

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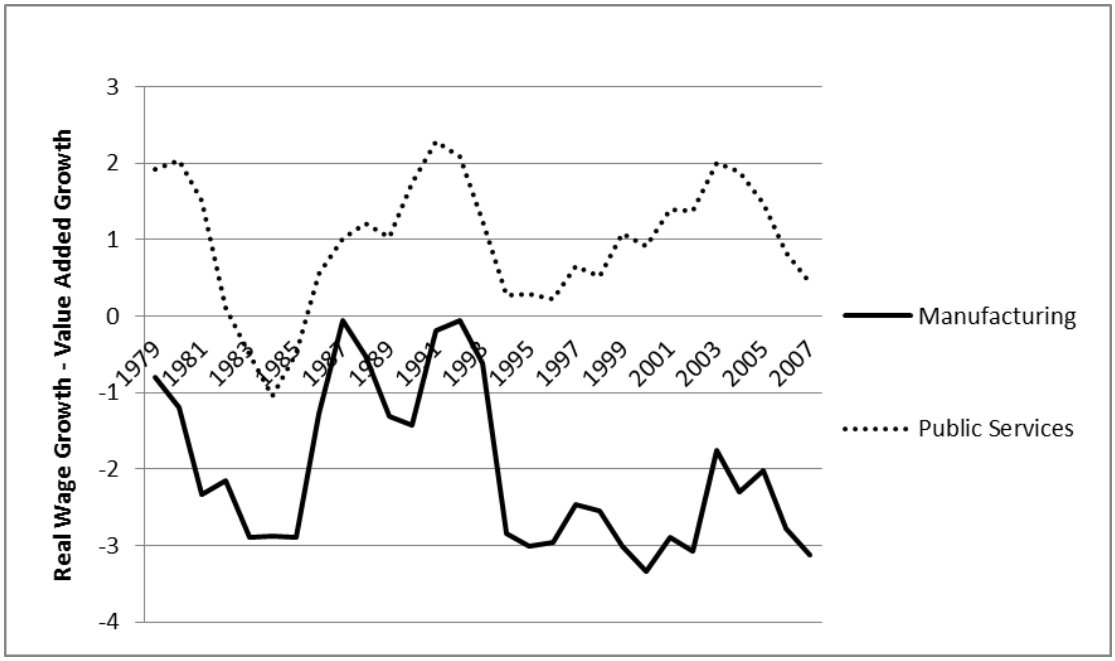
Many have addressed the implications of the public sector's sheltered status on unions' wage strategies vis-à-vis the government. Because the public sector is a monopoly provider of necessary and price-inelastic services, conventional wisdom suggests that its unions push for unmerited wage increases, exacerbating inflation and fiscal deficits. The argument in this paper challenges this conventional view, drawing upon the experience of countries that participated within the European Monetary System (EMS) and later Economic and Monetary Union (EMU). During the 1980s and the early and mid-1990s, differences in sectoral wage inflation (measured in terms of Blanchard's wage efficiency units - real wage growth minus changes in labour productivity) between the public and manufacturing sectors were relatively low within the EMU10 (the original EMU12 excluding Greece and Luxembourg[1], Figure 1).[2] Only in the late 1990s and 2000s did sectoral wage inflation divergence arise.

[1] Greece is excluded due to reliability concerns with sectoral compensation and productivity data from national accounts. If reliable sectoral data were available, it is anticipated that the country would conform to the empirical trends produced below, given recent developments. Luxembourg is excluded given its size.

[2] Wage and productivity data for the manufacturing sector (ISIC category D) and the public sector (an employment-share, weighted composite of public administration and defense, education, and health and social work, ISIC categories L, M and N respectively) stem from the EU KLEMS database. Sectoral data is available until 2007.

Figure 1: Sectoral Wage Inflation, EMU10 (Three Year Moving Average)



Source Data: EU KLEMS

The introduction of EMU coincided with significant sectoral divergence within its member-states. Were such developments linked or merely coincidental? This question merits exploration for two reasons. First, lack of sectoral divergence prior to late 1990s in EMU countries is puzzling in light of what has been said in the literature on sectoral interests. Much of the political debate which emerged in the 1990s focused predominantly on Sweden in the late-1970s/early-1980s, discussing the consequences of rent capture by public sector unions for centralisation. The inclusion of the low-productivity, public sector in centralised wage agreements placed inflationary squeeze on the export sector, limiting what manufacturing employers could pay their (more productive) workers. In contrast to Sweden, various EMS governments imposed austerity measures to enforce pay-freezes, or pay-cuts, on the public sector during the 1980s, while *all* EMU10 governments limited public sector pay growth during the 1990s to qualify for Maastricht. Instances of public sector pay restraint even arose in countries such as Italy, Spain, and Portugal that lacked

corporatist institutions deemed necessary to deliver wage moderation (Hassel, 2003). These experiences provide a sharp contrast to those witnessed in Sweden, which has emerged as a poster example of public sector militancy gone wrong.

Second, this divergence merits exploration because it suggests that EMU may have introduced an institutional arrangement that imposes lax constraints on governments to control rent-seeking public sector interests. Though EMU was predicted to be a constraining institutional regime via its removal of monetary and exchange rate policy, developments public sector labour markets indicate that monetary union, compared to its institutional predecessors, has not provided sufficient penalties to governments for limiting public sector wage expansion. Encompassing trade union organizations dominated by public sector interests, as argued by Garrett and Way (1999), produce deleterious consequences for private sector interests. If not countered with deflation in other sectors, public wage expansion produces inflationary pressures that ultimately lead to a less competitive real exchange rate, which under monetary union is purely a function of relative national inflation, to the detriment of exposed sector interests. Ironically, the move to EMU has further exacerbated this effect by removing national level institutions that previously offered governments leverage over public sector interests. In the current European debt-crisis, public sector unions continue to drag their feet on public wage adjustment. While such crises should provoke deterioration in the nominal exchange rate, either via depreciation or devaluation, providing some assistance to the export sector, a common currency precludes this option.

The institutional argument developed here, a theoretical and empirical expansion of that developed by Johnston and Hancké (2009), contrasts wage bargaining dynamics under EMU with its institutional predecessors, the European Monetary System's Exchange Rate Mechanism (ERM, 1979-1998) and Maastricht Regime (1992-1998). ERM and Maastricht imposed one important restriction upon governments that facilitated the enforcement of wage moderation: inflation-averse, *national-level* central banks. Under the European Monetary System (EMS), countries pegged their currencies to the German Mark, shadowing the Bundesbank's anti-inflationary stance. Because public sector wage-setters encompassed a significant portion of the labour force, their wage decisions, if inflationary, would provoke monetary tightening from inflation-averse central banks. Monetary tightening, while of relative insignificance to public sector unions with secure employment, held significant consequence for governments whose continued appeasement of public sector wage inflation could prolong contractionary pain. Once the commitment to a hard currency policy was made, public sector compliance was required to fulfil adjustment and, due to its lower productivity, involved lower wage allowances compared to those granted in manufacturing (Figure 2). In 1992, the Maastricht criterion further re-enforced this institutional constraint via stringent inflation and deficit criteria. Consequently, wage growth in public services, relative to the manufacturing sector, remained restrained.

Monetary union, however, altered the nature of this institutional constraint. While the European Central Bank (ECB) was also non-accommodating, national public sector unions no longer carried a significant weight within its reaction function, as they did for national central banks. Consequently, the monetary threat it posed to governments was dampened. While the Stability and Growth Pact (SGP) was meant to deter

governments' temptation to discontinue fiscal austerity, its penalties for breaching the 3% limit failed to include Maastricht's exclusionary-threat. The absence of inflationary-reactive ***national*** central banks did not impact exposed-sector employers, as competitiveness pressures continued to constrain their wage strategies. Employers in the public sector, on the other hand, inherited a less-constraining negotiation space with unions who had little to gain from wage moderation.

Section I includes a brief review of the literature on monetary union, wage inflation, and sectoral interests. Section II outlines the theoretical foundations of why the EMS and Maastricht regimes facilitated the deliverance of public sector wage moderation, while the introduction of EMU led to its (relative) unravelling. Section III presents the empirical method, a cross-sectional time-series regression analysis, and the results. A brief discussion about monetary union's asymmetric (bargaining) institutional design and the influence of national bargaining institutions in mitigating sectoral divergence under EMU concludes.

I. Monetary Union, Trade Unions, and Sectoral Wage Interests

Wage-setting behaviour under monetary union received much attention, both before 1999 and after. Some argued that in EMU, with its asymmetric structure consisting of a centralised monetary policy and separate wage-bargaining systems, national wage-setters would no longer be constrained in their wage demands by inflation-averse monetary authorities. Once monetary policy was transferred to the ECB, national unions would pursue high wage increases (Hall and Franzese 1998; Soskice and Iversen, 1998). EMU significantly reduces the size of individual wage setters in relation to the central bank, moving national-level wage-setting towards a situation

where national labour unions are strong enough to extract high wage increases yet small enough not to bear the full cost of inflation (Calmfors and Driffill, 1988).

These arguments were rooted in analysis on the impact of non-accommodating central banks on wage setters' decisions to control their wages. Scharpf (1991) advanced the notion that conservative/monetarist governments limit wage decisions of self-interested unions. An accommodating government committed to the pursuit of full employment is fundamentally defenceless against uncooperative unions, because it cannot respond to aggressive wage claims with contraction. However, once monetary non-accommodation is delegated to the central bank, wage moderation on the behalf of unions ceases to be a concession, and becomes a "self-interested union response" (Scharpf, 1991; 172). If central banks are non-accommodating, enforcing an inflationary rule or shadowing a central bank that has one, the unemployment costs of inflationary wage settlements increase, prompting unions to exert greater restraint in their wage demands (Hall, 1994; Iversen 1998; Franzese, 2001). Consequently, several anticipated that the removal of non-accommodating macroeconomic institutions from the national level would provoke wage inflation by unions (Hall and Franzese 1998; Soskice and Iversen, 1998; Hancké and Soskice, 2003).

While these arguments provide an explanation for increased wage moderation across EMU-candidates prior to 1999, they fail to explain developments under monetary union. At the aggregate level, wage inflation did not increase after 1999, and for the manufacturing sector, wage settlements remained below productivity developments. Literature on sectoral interests offers multiple reasons why sheltered sectors witness greater wage excess than exposed ones. The political economy stream of this

literature focused on competition's impact on employers' price mark-up strategies (Crouch, 1990; Iversen 1999). Wage inflation produces lower unemployment costs for public employees than for manufacturing employees, because increased labour costs can be financed through taxes or deficit spending rather than employment-shedding. Garrett and Way (1999) outlined that large public sector unions' pursuit of rent capture has repercussions on the exposed sector and the economy at large.

In the economics stream of this literature, dominated by Baumol's insights, sectoral divergence arises due to productivity differentials (Baumol and Bowen, 1965). Wages at the national level rise and fall together, yet sector productivity does not. Some sectors, such as services, experience static productivity growth while others, manufacturing, experience higher productivity growth. As a consequence of a wage equality "constraint" across sectors[3], services sectors, where productivity cannot be easily enhanced given the labour intensity of production, are subject to a "cost disease" that ultimately fuels inflation. Amalgamating trade integration into a dual sectoral framework, Balassa (1964) and Samuelson (1964) suggested that increased trade integration exacerbates wage divergence between dynamic, exposed sectors and sluggish, sheltered sectors, because competition further enhances productivity in exposed sectors.

Though one can question the accuracy of public sector productivity data, a similar EMU divergence pattern emerges when examining time-effects of sectoral wage *growth*. Figure 2 presents average differences in manufacturing and public sector (hourly) wage growth (i.e. ***not*** accounting for productivity) for eleven countries that

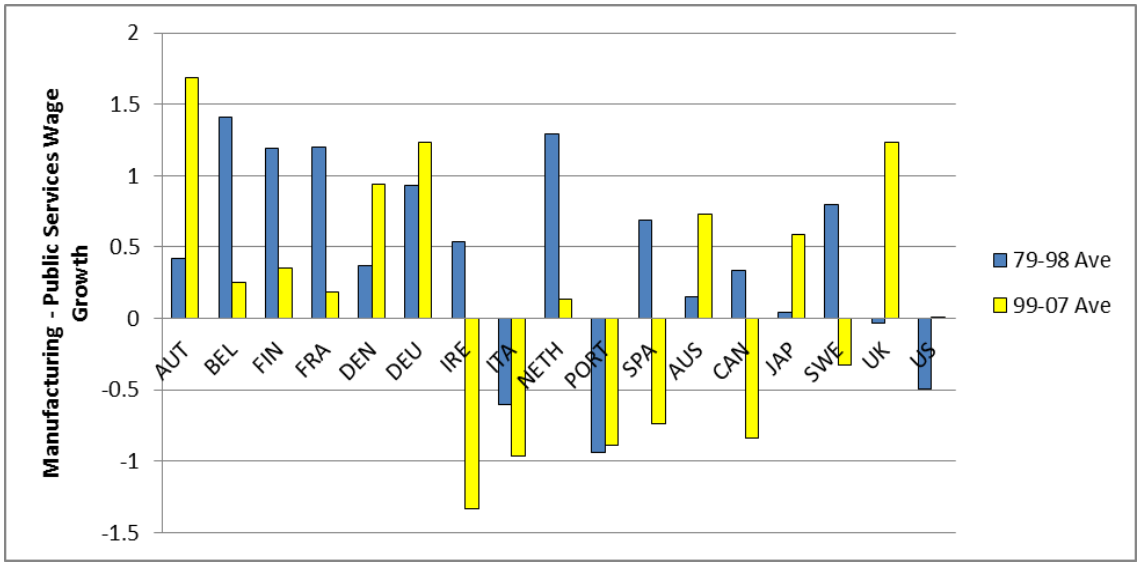
[3] One fundamental assumption of Baumol's cost disease is that wages across all sectors are equalised because persistent wage subversion in one would prompt movement of labour towards the sector with the higher wage premium.

participated in EMS either directly or indirectly during the 1980s and 1990s, as well as six non-participants (Australia, Canada, Japan, Sweden, the UK and the US), for two periods: the EMS/Maastricht period (1979-1998) and the EMU period (1999-2007). Negative differences indicate that wage growth in public services exceeds that in manufacturing, while positive differences indicate the contrary. With the exception of Italy, a country that failed to adjust towards the EMS's hard currency policy until the 1990s, and Portugal, a 1992-entrant, annual wage growth in EMS public sectors remained consistently below that in manufacturing between 1979 and 1998, leading to the rise of significant wage gaps. In contrast, the majority of non-EMS countries witnessed either minimal differences in sectoral wage growth (Australia, Japan and the UK) or negative differences in sectoral wage growth (US) during this time. Sweden's positive wage differentials can be justified by manufacturing employers' abandonment of centralised wage bargaining in 1982, which enabled them to grant more lucrative wage settlements to address labour shortages (Pontusson and Swenson, 1996).

The majority of EMS countries (Austria and Germany excluded) that joined EMU, however, witnessed a deterioration in manufacturing and public sector wage growth differentials *between the 1979-1998 and 1999-2007 periods*. For four EMU countries (Belgium, Finland, France and the Netherlands), manufacturing/public sector wage growth differentials remained slightly positive, yet relative to the EMS period, these difference had significantly declined. For Italy, negative sectoral wage growth differentials under EMS became *more* negative under EMU. In contrast to EMU member-states, the majority of non-EMS/EMU countries (with the exception of Canada and Sweden) witnessed an improvement in manufacturing and public sector

wage growth differences between the EMS/Maastricht and EMU periods. Considering Figure 1 and 2 simultaneously, EMU appears to have marked a wage shift where public sector unions were able to initiate catch-up with their manufacturing counter-parts *relative to the 1980s and 1990s*; this catch-up effort, however, does not overwhelmingly reveal itself in non-EMU member-states, where wage growth differentials disproportionately improved in favour of the manufacturing sector between the 1979-98 and 1999-2007 periods.

Figure 2: Differences in Sectoral Wage Growth



Source Data: EU KLEMS

Other institutional theories fall short of addressing these wage developments. From a Varieties of Capitalism perspective, several coordinated market economies (Belgium and the Netherlands) witnessed reductions in wage differences between the EMS and EMU periods, while others (Germany and Austria) and several liberal market economies (Australia, UK and US) witnessed improvements. Bargaining institutions may account for Germany's and Austria's improvements in manufacturing and public sector wage differences after 1999 (both have trade-led pattern bargaining systems with limited bargaining rights for the public sector), yet they fail to explain why

uncoordinated labour markets share similar trajectories. Aside from developments in Germany and Austria, there is some semblance of an EMU/non-EMU divide in wage dynamics before and after 1999. I argue that public sector pay restraint during the 1980s and 1990s in the EMS and the rise of public sector wage inflation under EMU can be understood if one contextualises the institutional constraints that the EMS/Maastricht regimes placed on public employers and how EMU altered the nature of these constraints. The next section outlines the theoretical argument.

II. A theoretical explanation of sectoral divergence under monetary union

II.1 Assumptions and Theoretical Foundations

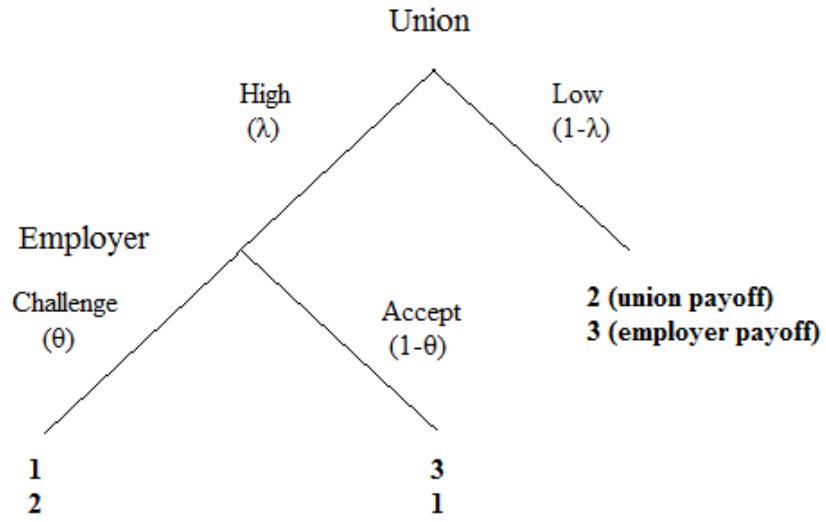
The discussion of the pre-EMU era as an institutional construct which facilitated public sector wage restraint begins with the assumption of a dual-sector economy consisting of an exposed sector and a public sector. Employers and unions in the exposed sector are presented with limited price mark-up abilities, given the presence of competition. Because competition increases unemployment costs associated with wage increases, unions in the exposed sector have greater (employment) incentive to exert wage moderation. Employers and unions in the public sector encounter minimal competition. They are (near) monopoly suppliers and because public services are universally provided, their services are relatively immune from concepts of price elasticity, though higher spending on such services should impose higher tax burdens. Public sector unions have little incentive to restrain wages, employment wise, as domestic demand for public services is relatively fixed.

It is important to emphasise that the bargaining game between employers and unions is located at the sectoral, not national, level. It is assumed that sectoral wage-setters

are large enough to impact national (inflation), yet are not so encompassing that they would internalise their actions (Olson, 1982). This implies that the game's underlying conditions place actors at the apex of the Calmfors-Driffill curve, which underlies the hump-shaped relationship between (national) union centralisation and unemployment/inflation. The *location* of this apex, however, differs according to sector. Outlined by Danthine and Hunt (1994), the Calmfors-Driffill curve becomes flatter as competition/trade-integration increases. Hence this apex should be *lower* for exposed sectors, because employers who are more limited in mark-up strategies will select employment shedding in response to rising labour costs, which should in turn prompt exposed-sector unions to internalise their wage decisions.

Beginning with a simple sequential bargaining game, unions propose either a high or low wage settlement. High/low wage settlements are defined as those where awarded nominal wage growth surpasses/falls-behind the sum of productivity and inflation. If a low settlement is proposed (call this LOW), the employer accepts and the game ceases. If a high settlement is proposed, the employer can either challenge the union and impose a low wage settlement at the expense of industrial action (call this STRIKE LOW), or they can accept the proposal either as a consequence of the union's success in an industrial dispute or in an attempt to pre-empt industrial action [call this (STRIKE) HIGH]. Figure 3 provides a simple game tree with all possible equilibria. Regarding preference rankings, employers, regardless of sector, prefer LOW to STRIKE LOW, which is preferred to (STRIKE) HIGH. Likewise, unions, regardless of sector, prefer (STRIKE) HIGH to LOW, which is preferred to STRIKE LOW.

Figure 3: Sequential bargaining game between sectoral wage-setters



Unions' strategy for proposing high versus low depends upon whether they are a "strong" (probability of λ) or "weak" (probability of 1-λ) type. Likewise, employers' strategy for challenging or accepting high wage settlements depends upon whether they are a "strong" (probability of θ) or "weak" type (probability of 1-θ). Both θ and λ are influenced by organisational strength and underlying economic conditions (i.e. labour shortages/surpluses, exposure to competition, etc.). Much of the political literature concludes that public sector unions are in a stronger bargaining position vis-à-vis employers than their private-sector counter-parts; hence in the public sector, the ratio of λ to θ should be larger than in the manufacturing sector, where competitiveness constraints endow employers with a higher value of θ. Accordingly, the resulting wage equilibrium for the public sector in Figure 3 should gravitate towards (STRIKE) HIGH, as employers' payoffs are larger for *lower values of θ* ($\theta \leq 1/3$), while that for the manufacturing sector should gravitate towards LOW.

In repeated bargaining games, actors can establish reputations which alter perceived values of θ and λ. Weak employers can establish a "strong-type" reputation if they repeatedly aberrate from their rational strategy of consent and challenge high settlements. Such behaviour yields lower pay-offs in the short-run, yet repeated aberration may fool unions that the employer is strong, convincing them to consent to moderation in the long-run. In perturbed reputational games, players may find the short-term loss from imitating aberrant strategies outweighed by long-term gains from spurring opponents' doubts about their motivations. If public sector unions are unaware of government's type, a weak government, in resisting the temptation to inflate, can develop a reputation for being anti-inflationary, decreasing inflation expectations in the future (Backus and Driffill, 1985). Institutions play a crucial role in this circumstance, if they introduce penalties for inflated wage settlements. Overtime, employers can defer to institutions which expand θ, hence increasing their probability of being a strong type.

In the transition from a Keynesian regime, where governments accommodate inflation, towards a monetarist one, where they do not, rent capture from unions can trigger central banks to raise interest rates, dampening aggregate demand and ultimately increasing short term unemployment (Iversen, 1998; Cukierman and Lippi, 1999). While Iversen (1999) and Franzese (2001) argue explicitly that monetary tightening is of little concern to public sector unions who possess secure employment, both authors miss incentives on behalf of the *state* to avoid macroeconomic contraction. Governments care a great deal about unemployment developments in the private sector, given implications for re-election. Governments can avoid unemployment consequences associated with public sector inflation via tax-financing.

Such moves, however, introduce political repercussions if the private sector is forced to adjust to a monetarist regime. The political consequences associated with increased short term unemployment and interest rates can induce governments to enforce moderation on unions, increasing θ and shifting the bargaining equilibrium towards that achieved within the manufacturing sector.

II.2. Institutions confining the state: ERM and Maastricht

EMU's institutional predecessors introduced a pivotal institution that facilitated governments' deliverance of public sector wage moderation: ***national-level*** inflation-averse central banks whose reaction functions allotted a significant weight to sectoral wage setters. The EMS sponsored inflation-aversion amongst is member-states' monetary authorities, not through central bank independence, but via participation in fixed exchange rate arrangements with the Bundesbank, which was highly anti-inflationary. The pursuit of a credible hard-currency stance required the imposition of pay restraint on the public sector. Because the public sector constituted a significant share of the national labour force, inflationary wage settlements could impact national inflation and consequently provoke monetary tightening from an inflation-averse bank. A monetarist regime imposed costs (higher interest rates and dampened aggregate demand) on inflationary (public sector) wage settlements, and consequently governments were pressed with higher penalties for consent. The *potential* for aggregate demand repercussions, in other words, prompted governments to change their bargaining stance; some did so earlier than others.

The Netherlands entered the ERM with a hard currency policy vis-à-vis Germany in place. Dutch private sector unions consented to wage adjustment under the 1982

Wassenaar Accord, while public sector adjustment required unilateral imposition of pay austerity in 1983/84. Austria also initiated a (bi-lateral) hard-currency policy with Germany in the late 1970s; public sector adjustment was internalised in the union movement, as Austria's monopoly union confederation, ÖGB, supported the peg to suppress shop-floor bargaining. Denmark announced its commitment to a hard currency policy in 1982; Schülter's government intensified its obligation to austerity via public sector real-wage cuts in 1984 and 1985. After a public sector wage freeze in 1982, an austerity program in 1983, and a national incomes policy in 1986, France incurred its last (major) devaluation with the German Mark, around 6%, in 1986. Walsh (1999) claims that Italian monetary adjustment began in 1988, although Weber (1991) doubts whether Italy moved away from a soft currency stance during the 1980s. Spain and Portugal, which entered EMS in 1989 and 1992 respectively, failed to make required adjustments in the 1980s, but succeeded in both endeavours during the 1990s.

One can question the endogeneity of non-accommodating central banks' influence on public sector wage adjustment. (Rightist) business-friendly governments are more likely to impose such institutions if they are predisposed to public sector austerity. While conversion to a hard currency policy was steered by right-of-centre coalitions for three of ERM's earlier converts (Belgium, Denmark and the Netherlands) partisanship did not dictate adjustment in all EMS countries, or the lack of it in non-EMS countries. France's Mitterrand and Austria's Kreisky governments demonstrated that leftist governments could initiate transition to a hard currency stance, while Thatcher battled British unions under an accommodating central bank. In countries where the conversion was initiated under right-of-centre governments,

non-accommodating central banks remained "sticky" once they left office; in Denmark, Rasmussen's Social Democrats further institutionalised the Danish Central Bank's hard currency commitment with a formal separation of powers arrangement in 1993.

The widening of the ERM's exchange rate bands to ±15% in 1992 dampened the EMS's hard currency conditions, yet the Maastricht inflation criteria further reinforced inflation-targeting. Some EMS member-states (Denmark) maintained strict exchange rate targets after the crisis. Maastricht's nominal criteria imposed two conditions which enhanced central bank non-accommodation. It introduced an explicit inflation target; inflation could be no higher than 1.5% of the EMU's top three performers. It also initiated banking legislation reforms which prompted several candidate countries to significantly enhance legal independence. Maastricht's 3% deficit criteria provided additional constraint for governments in public sector bargaining.[4] In addition to demand retraction repercussions for public sector wage inflation via an inflation-targeting central bank, Maastricht's inflation and deficit criterion held a further political advantage for binding governments' hands; penalties associated with reneging, EMU exclusion, were politically substantial. Countries with histories of public sector wage excess could not negotiate more lenient terms. If consolidation was not achieved, the country in question would be excluded from entry.

[4] While a 60% debt rule also existed, this criterion was loosened for a number of EMU candidate countries. The 3% deficit criteria, however, remained a prerequisite to join monetary union.

II.3. Central bank reaction functions and supranational institutional shift: Governments going alone

The conversion to a non-accommodating monetary policy, via the ERM and Maastricht, enhanced public employers' bargaining reputations by introducing institutional penalties for high public sector wage settlements. As public sector unions perceived these institutions as credible overtime, the public sector bargaining equilibrium in EMS member-states shifted from (STRIKE) HIGH to LOW. Monetary union was not intended to alter EMS's/Maastricht's design, and its institutions, the ECB and SGP most notably, bore striking resemblance their predecessors. One important feature that the ECB lacked, however, was the incentive and capacity to react to sectoral wage setters in member-states with monetary contraction. Likewise, the SGP was blunted relative to its Maastricht predecessor, as exclusion penalties became obsolete once countries gained membership.

Unlike a national framework, national public sector wage-setters, with the possible exception of those in larger member-states (i.e. Germany), were not encompassing enough to influence EMU aggregate inflation. This altered the bargaining game between governments and public sector unions, because the credible value of θ decreased. Under EMS/Maastricht, public sector wage inflation prompted monetary retraction from national central banks, because these wage-setters constituted a significant proportion (between 20% and 33%) of the labour force. Under EMU, however, the weight of national public wage-setters, relative to the *EMU labour force* as a whole, declined substantially. For EMU's small member-states, public sector influence in the central bank's reaction function, if measured as a proportion of these wage-setters to the relevant labour force, dropped from roughly 20-30% to less than

1% in the transition to the ECB. Public sector unions in EMU's largest member-state, Germany, witnessed similar decline (from 25% to 8%), although continued to carry some, albeit minor, weight in EMU wage-inflation outcomes. As public sector unions' wage decisions no longer featured into the central bank's reaction function, governments could no longer rely upon a credible threat of monetary tightening during pay negotiations.

Little changed for exposed sector wage bargaining actors under monetary union. Competitiveness pressures, reinforced by a common currency, continued to limit employers' mark-up abilities, leaving the ratio of bargaining power between manufacturing unions and employers relatively unchanged. Public employers, however, were devoid of a crucial institution which enabled them to enforce wage moderation. The ECB did not target national wage developments as did its nationally-domiciled predecessors, and EMU-entry rendered the political threat of exclusion for the failure to meet deficit/inflation criteria, obsolete. EMU's alteration of these institutions, which governments had relied upon to deliver wage moderation during the 1980s and 1990s, reduced the institutional penalties of public sector wage excess, altering the balance between λ and θ within public sector bargaining in favour of unions.

III. Empirical Model

A cross-sectional, time-series analysis is employed to test how EMU's altercation of economic penalties associated with public sector wage excess impacted wage differentials between the public and manufacturing sector after 1998. While growth models of wages-in-efficiency-units have become increasingly popular, *relative*

sectoral wage growth/inflation models are less common, due to data availability issues with sectoral productivity. The EU KLEMS database, the product of a major consortium of research and national statistics institutes across the EU, has produced standardised sectoral level data, including productivity data via growth accounting, for the EU25. The availability of this dataset makes it possible to scrutinise the above theory in greater detail, as it provides rough measures of productivity growth differentials between sectors. It limits the selection of non-E(M)U countries for control purposes, however, as data on only five non-EU countries are available (Australia, Canada, Korea, Japan, and the United States).

Baccaro and Simoni (2010) employ a WEU growth model to test the influence of collective bargaining institutions and their interaction with union governance on the delivery of national wage restraint. I depart from the authors' model, and introduce two slight modifications. First, a sectoral model, rather than a national one, is used, in line with the theory above. Second, I modify the construction of the dependent variable, examining only wage growth differentials between sectors, and hence moving sectoral productivity differentials to the left-hand-side. This is done to isolate the impact of EMU on wage dynamics alone, as the theoretical model above assumes that EMU's sectoral bargaining-power shift operates through wages rather than productivity developments. EMU may alter sectoral productivity differences through trade integration's enhancement of exposed-sector productivity (the Balassa/Samuelson effect). Hence, including both wage growth and productivity growth on the right-hand side captures two wage inflation "effects", one operating through wage bargaining power (argued above) and one through productivity. The

use of productivity differentials as a control on the left-hand-side rectifies this problem. The estimated equation is as follows:

$$(w_{p,i,t}-w_{m,i,t}) = \alpha_{i,t} + \beta_1(a_{p,i,t}-a_{m,i,t}) + \beta_2(MT_{i,t}) + \Sigma\, \beta_k X_{k,i,t} + \Sigma\, \beta_m Z_{m,i,t} + \varepsilon_{i,t}$$

$(w_{p,i,t}-w_{m,i,t})$ is the difference in log changes in the real public sector and manufacturing hourly wage for country i at time t, $(a_{p,i,t}-a_{m,i,t})$ is the difference in log changes in public sector and manufacturing productivity (where sectoral gross value added per hour worked serves as a rough proxy for sectoral productivity), and $MT_{i,t}$ is the monetary threat presented to governments for public sector inflation for country i at time t. $\Sigma X_{k,i,t}$ is a vector of economic controls and $\Sigma Z_{m,i,t}$ is a vector of institutional controls. Seventeen countries are included in the sample, eleven/ten EMS/EMU members and six/seven non-members: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Portugal, Spain, Sweden, the UK and US.[5] In order to avoid persistent reference to technical measurements within the text, a web Appendix provides definitions of variables and data sources.

III.1 Measuring Monetary Threats and Relevant Controls

The primary empirical objective is to examine whether EMU led to a widening of public and manufacturing sector wage differentials, due to its altercation of the EMS's monetary threat. I measure this "EMU effect" in two manners; via a (very crude) dummy variable (model I in Table 1) and via a *public-sector weighted* measure of

[5] Though complete sectoral data exists for Korea, it is dropped from the sample, given the lack of wage coordination data before 1998, and the complete lack of wage centralisation and sectoral union density data, all of which serve as controls in the baseline model (see Table 1 below).

Iversen's (1999) central bank non-accommodation index (models II-IV). Iversen's index, ranging from 0 to 1, provides a rough proxy for monetary non-accommodation towards inflation, with higher values indicating greater inflation-aversion. In order to assess non-accommodation (i.e. the *monetary threat* to inflated wage settlements), Iversen (1999) averages central bank independence (CBI) and (standardised) four year static-averages of the nominal effective exchange rate, which serves as a proxy for the commitment to low inflation. Under perfect capital mobility, monetary tightness, in response to output declines, raises confidence in a currency, causing it to appreciate. Therefore, if a central bank commits itself to low inflation, the success of such a commitment will be revealed over time via a (relatively) appreciating currency.

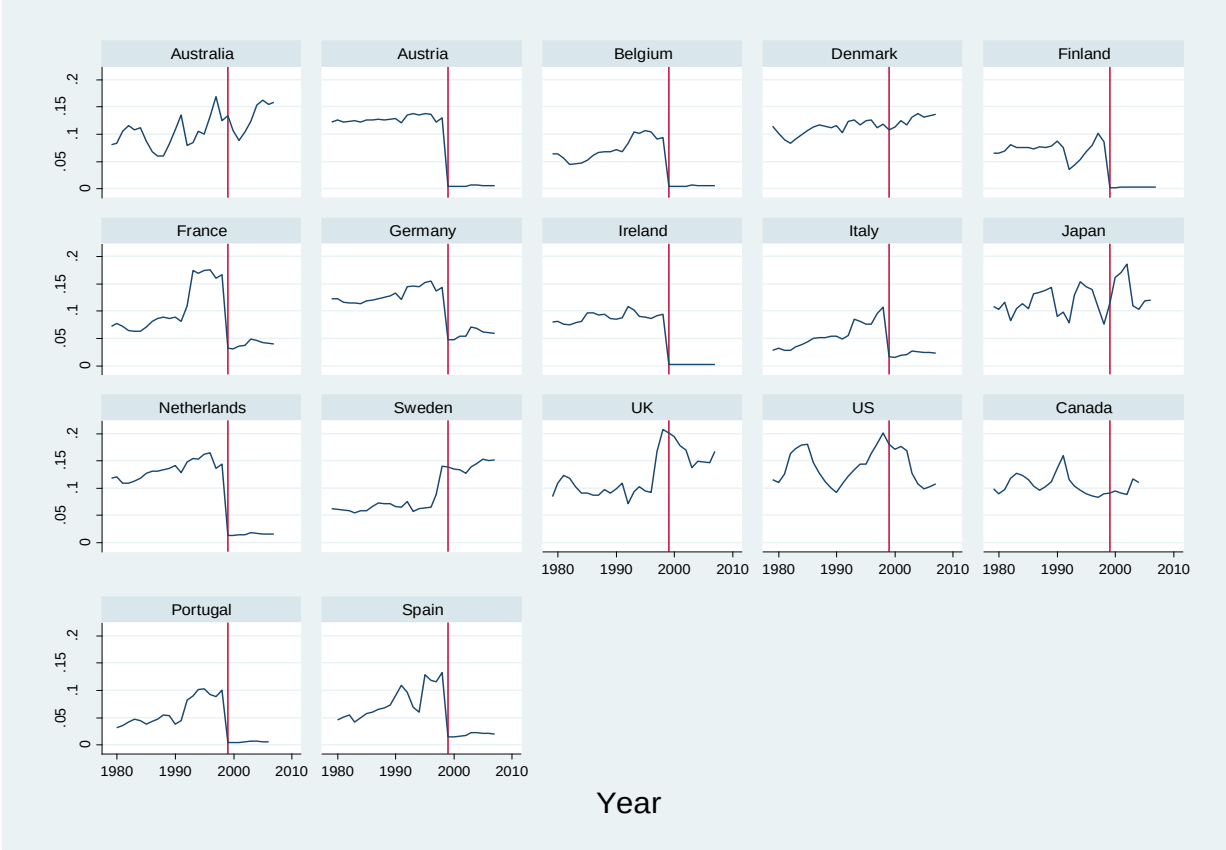
The measure for a monetary threat used here is constructed in an identical manner to Iversen's index, with three modifications. One, four-year *moving* averages, rather than static averages, are used, maintaining a larger sample size. Two, the normalised nominal effective exchange rate is averaged with the Cukierman (1992) CBI index only, as his is the most detailed and updated of the three that Iversen uses. Thirdly, in order to capture the EMU effect, the index is weighted according to the public sector employment share *within an economy which the central bank targets*. Weighting Iversen's non-accommodation index in this manner produces a *conditional* monetary threat; non-accommodating central banks matter to governments, ***only*** if their size is significant enough to generate monetary response.[6] If central banks, such as the ECB, are non-accommodating but public sector unions bear a minimal weight in their

[6] When the public-sector weighted monetary threat variable was included as an interaction term, similar results to those below emerged. While the interaction term was also significantly negative (and of higher magnitude than the weighted term in Table 1), the hierarchical terms (i.e. public sector employment as a proportion of total employment and Iversen's non-accommodation index) were not significant.

reaction functions, governments will come under less pressure from a monetary authority to reduce wage growth.

For countries under EMU, the ECB's (higher) non-accommodation index is weighted against national public sector employment relative to total employment within the EMU economy (see Figure 4). Weighting the non-accommodation index captures the feasibility of a monetary threat against public sector unions, because it accounts for their size in the relevant inflation aggregate. It also enables one to determine whether the EMU effect was heterogeneous according to country-size. German public sector unions, for example, may continue to observe wage moderation under EMU, given that they constitute a more notable (albeit much smaller compared to EMS) share of the central bank's targeted labour force. A monetary threat should be less acute for governments in countries with smaller public sectors because these unions carry a marginal weight in the bank's reaction function. This is crucial to examining the impact of monetary union on wage developments, as EMU substantially decreased the weight of public sector unions in aggregate inflation developments.

Figure 4: Central Bank Monetary Threat (weighted by public sector size)



Economic controls include differences in sectoral employment growth, net public lending, export share growth, and growth in foreign and direct investment (FDI). The lag of sectoral employment growth was included as a control, rather than its present value, in order to correct for endogeneity problems with the dependent variable - employment growth differentials also may be determined by wage growth differentials. A lag term of net public lending was used given endogeneity problems with the dependent variable. The beta coefficient on net public lending should be positive; past deficits (negative balances) should prompt governments to limit (present) public sector wage increases. Changes in the export share, also run on a lag to avoid endogeneity problems with manufacturing sector wage growth, were included as a proxy for international market exposure; positive export share growth

should increase differences in public and manufacturing sector wage growth, given its dampening effect on the latter. The sign on the beta coefficient of FDI growth, a proxy for capital mobility, is ambiguous given that capital flight may produce similar wage dampening effects on the public and manufacturing sector. GDP growth was specifically *excluded* given endogeneity problems with the dependent variable, and multicollinearity problems with sectoral productivity differentials.

Institutional controls include bargaining centralisation, wage coordination (assessed via two proxies; an aggregate measure and a pattern bargaining coordination dummy, a more specific measure of cross-sectoral coordination), partisanship and sectoral union density. Given that centralisation and wage coordination have been identified as promoting wage compression (Wallerstein, 1999; Kahn, 1998), the sign on both variables should be positive; public sector unions should secure higher wage growth relative to manufacturing, in more centralised/coordinated regimes than decentralised/uncoordinated regimes. Regressions were also run using a pattern bargaining coordination dummy, as this method of cross-sectoral coordination, compared to uncoordinated and centrally coordinated bargaining, enhances expose-sector unions' bargaining strength vis-à-vis the sheltered sector unions (Traxler and Brandl, 2010). Partisanship, measured as the proportion of legislative seats occupied by right-wing parties, should be negatively correlated with public sector wage growth, and hence differences in public sector and manufacturing wage growth. Finally, sectoral union density, measured as the ratio of membership of the three largest public-sector affiliates to the three largest exposed-sector affiliates in a country's largest union confederation, should be positively correlated with public and manufacturing wage growth differences. Because Traxler and Brandl's (2010)

sectoral organisation and pattern bargaining data are provided over three-year-average periods from 1985 to 2002, these regressions were run on three-year static average observations over 16 countries (data for Ireland is unavailable).

An ordinary least squares (OLS) regression method with panel corrected standard errors (PCSE) was applied to test the baseline model above, which corrects for both country-specific heteroskedasticity and spatial correlation of errors (Beck and Katz, 1995).[7] A Wooldridge test for autocorrelation indicated that the presence of serial correlation[8], so all models included a panel-specific Prais-Winsten autoregressive transformation.[9] (N-1) country dummies were included to control for country-specific omitted variables. Time dummies were omitted in the year-on-year regressions given clear multicollinearity problems with the Maastricht dummy and the weighted monetary threat variable. However, for the three-year-static average regressions, the Maastricht dummy was excluded as the period averages spliced Maastricht with the EMU and pre-1992 periods; hence (n-1) time-period dummies were used. A time-trend was included to test whether the widening of public sector and manufacturing wage growth differentials occurred in all countries overtime or was EMU-specific.

III.2 Results

Regression results are presented in Table 1. Column IV presents results from the three-year static average model; general economic controls were dropped in order to

[7] An LR test confirmed the presence of panel heteroskedasticity (Chi2(16)= 147.14)
[8] F(1,15)=5.307; prob>F=0.0360
[9] Plümper et al (2005) report that a Prais-Winsten transformation neither fails auto-correlation tests nor shows spherical distribution of errors, yet manages to absorb less time-series dynamics than a dependent lag. Results were not impacted by alternative means of controlling for autocorrelation.

preserve the (smaller) sample, as several countries lacked FDI and deficit data until the mid-1990s.

Beginning with model I, the crude EMU dummy is significantly positive, suggesting that wage growth in EMU's public sectors, relative to wage growth in manufacturing, was on average ***0.6% higher per year***, than it was in non-EMU and non-Maastricht years; given the inclusion of the Maastricht dummy in Model I, non-Maastricht ***and*** non-EMU years serve as the benchmark. This indicates that over ten years in monetary union, public and manufacturing wage differentials would widen by 6% within individual member-states, relative to the era of national central banks outside of Maastricht. A Wald test of the Maastricht and EMU dummies indicated that the EMU coefficient was also significantly higher than that for the Maastricht dummy [$Chi^2(1) = 6.73$; p-value = 0.010].

Table 1: Influence of Central Bank Non-Accommodation on Sectoral Wage Differences

Independent Variable	*Year-on-Year*	*Year-on-Year*	*Year-on-Year*	*3-Year-Static-Averages*
Maastricht	0.244	0.281	-0.106	
	(0.253)	(0.184)	(0.311)	
EMU	0.613*			
	(0.338)			
Monetary Threat		-5.92***	-4.645**	-3.81***
		(1.648)	(1.962)	(1.220)
Difference in Productivity	0.386***	0.388***	0.383***	0.204***
Growth	(0.036)	(0.036)	(0.033)	(0.053)
Difference in Employment	0.025	0.025	0.04	-0.022
Growth (lag)	(0.033)	(0.033)	(0.039)	(0.022)
Net Borrowing (lag)	0.048**	0.054**	0.056	
	(0.022)	(0.024)	(0.034)	
Change Export Share (lag)	0.001	-0.002	0.013	
	(0.019)	(0.020)	(0.018)	
Change FDI	-0.002	-0.002	-0.001	
	(0.003)	(0.003)	(0.005)	
Partisanship	-0.009	-0.009*	-0.02***	
	(0.006)	(0.005)	(0.006)	
Centralisation	5.234***	5.104**		
	(1.980)	(2.156)		
Coordination			0.445***	
			(0.157)	
Public / Exposed				0.327
Union Density				(0.216)
Pattern Bargaining				-1.11***
(1=yes; 0=no)				(0.207)
Constant	0.978	1.751	2.998***	-0.093
	(0.943)	(1.071)	(0.817)	(0.536)
Time Controls	Trend	Trend	Trend	Time Dummies
Country Exclusions	None	None	None	Ireland
Number of Countries	17	17	17	16
Years / Periods	29	29	29	6
Observations	377	377	398	87
R Squared	0.279	0.283	0.272	0.465

Dependent variable is the difference in log changes in the real public sector and manufacturing hourly wage. Model used was an OLS, including a panel-specific Prais-Winsten AR1 term, from 1979 to 2007. N-1 country dummies included but not shown. Panel corrected standard errors are in parenthesis. *, **, and *** indicate significance on a 90%, 95% and 99% confidence level.

The second measure of the EMU effect, the (weighted) monetary threat, also produced expected results. Between 1979 and 1998, EMS participants witnessed sweeping increases in central bank non-accommodation. This was due not only to the adherence of a currency peg with the anti-inflationary D-mark, but also, for some peripheral economies, due to the enhancement of legal central bank independence during the 1990s. The weight of public sector employment in national economies, on the other hand, was relatively stable during this period. Between 1979 and 1998, the weighted monetary threat increased by 0.063 in absolute terms, on average, for (current) EMU member-states. Taking the results from models II and III into consideration, this implies that this enhanced monetary threat led to, on average, a ***0.3-0.37% per year*** reduction in public and manufacturing wage growth differentials over the EMS period. Assuming a country made the hard currency transition to EMS in 1980, this indicates that public and manufacturing wage differentials would narrow by 5.7-7.0% by 1998.

The transition to EMU was more extreme. The average decrease in the weighted monetary threat in the transition to EMU, due ***solely*** to the reduced weight of national public sector wage-setters in the ECB's reaction function, was roughly 0.107 in absolute terms, ranging from a 0.095 decrease in Germany to a 0.13 decrease in the Netherlands. Using results from model II/III, such magnitudes of change imply that under the EMU period, annual public wage growth increased by a magnitude of ***0.64%/0.5% per annum*** vis-à-vis manufacturing wage growth, due to the reduced weight of public sector bargaining actors in the ECB's reaction function. Similar to the EMU dummy, this would amount to the rise of a 6.4%/5% differential in public and manufacturing wages after 10 years in EMU. These increases would have been

subtler for larger countries (i.e. Germany), although the predicted relative increase – ***0.57%/0.44% per annum*** - is still considerable.

Economic controls yielded expected significant results (differences in sectoral productivity growth and lagged net borrowing) or were insignificant (lagged sectoral employment growth, lagged export share and FDI growth). Institutional controls also exhibited expected results. Partisanship was negatively correlated with differences in public sector and manufacturing wage growth (yet significant for only two models). Centralisation and wage coordination were positively correlated with differences in public and manufacturing wage growth, and retained significance in all models. The ratio of sectoral unionisation was positively correlated with widening sectoral wage growth differences, as expected, yet its significance fell slightly below 90% (p-value of 0.129). The pattern bargaining dummy was significantly associated with reduced public sector wage growth, by over 1.1%, vis-à-vis the manufacturing sector; such a result may explain why Germany and Austria, the only two EMU countries with pattern bargaining systems, retained public sector wage moderation after 1999. The Maastricht dummy performed as expected vis-à-vis the EMU dummy, as indicated in the Wald-test for Model I, yet Maastricht sectoral wage growth differentials were not significantly different from those under non-Maastricht/EMU years. One explanation for the latter result could be the holistic nature of the constraint. The rush to qualify for Maastricht was a catalyst for national social pacts, whose effectiveness at producing wage moderation in the public *and* private sector was witnessed in countries that previously lacked the corporatist institutions to produce tri-partite deals (Hassel, 2003).

IV. Conclusion

Despite being a project that was widely supported by private employers and candidate-country governments (Sandholtz, 1993), EMU introduced an asymmetrical rift in bargaining constraints within national labour markets. Under the EMS and Maastricht wage setters in all sectors were constrained in rent seeking behaviour. Private employers relied upon competitive constraints to limit rent-seeking opportunism while governments utilised non-accommodating central banks and Maastricht's threat of EMU exclusion to enhance their bargaining reputations. By reducing the influence of public sector wages in the central bank's reaction function and attaching less severe political penalties to the inflation/deficit criteria, EMU altered the nature of these constraints, to the detriment of governments' hold-out capabilities. Private employers in the exposed-sector could continue to rely upon competitiveness constraints, which were further reinforced by a common currency, in bargaining negotiations. However, EMU indirectly penalised these employers by alternating rent-seeking dynamics in public sector labour markets; EMU promoted a shift from a symmetrical bargaining arrangement, where wage-setters in the exposed and sheltered public sectors were constrained by national institutions to an asymmetrical bargaining regime where one segment of the labour market continued to be constrained in their self-maximising behaviour by competitiveness, while another segment (the public sector) is less so.

Feedback effects of institutional change are not new. However, with the noteworthy exception of Thelen and Van-Wijnbergen (2003) who discuss the implications of negative feedback effects of wage militancy on employer bargaining coverage, much talk of feedback effects within the institutional literature focuses on their tenacity to

promote institutional resilience (Pierson, 1996) rather than their capacity to yield institutional instability. This analysis demonstrates the severity of negative feedback effects on actors who promote institutional change. Though Frieden's (1991) dissection of exchange rate policy preferences along sectoral lines teaches us important lessons about the role of preferences in instigating change towards fixed exchange rate regimes and monetary union, asymmetrical institutional design can lead to severe repercussions for these actors, forcing them to compensate for groups that find themselves unconstrained in their behaviour.

In countries where some level of public sector pay moderation was maintained, price competitiveness surged. Between 1999 and 2007, Germany and Austria witnessed the highest export share growth in EMU, thanks in part to the role of pattern bargaining and the lack of formal public-sector bargaining rights in enhancing state bargaining power. For countries that lacked these national institutions, however, the manufacturing sector was forced to compensate via significant deflation in order to remain competitive (Ireland, Finland and the Netherlands) or to accept competitive decline (Italy, Portugal and, the most extreme case of fiscal excess, Greece). EMU's corporatist countries were not exempt from rises in significant public sector wage excess. The Netherlands and Ireland witnessed a substantial rise in public sector wage growth in the early 2000s, yet both were able to rely upon traditional national tri-partite arrangements to eventually redress these excesses by 2003. EMU's southern countries, however, have proven less able to rely upon national bargaining intuitions to keep the public sector in check. Their decline in wage competitiveness could be indicative of the consequences of removed institutional constraints and the absence of national substitutes. Rather than temporary austerity measures, EMU

fiscal future may require a bridge between its (collective bargaining) institutional haves and have-nots.

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