Corporatism and Capital Accumulation: The Fate of the Social Corporatist Model

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Abstract

An extensive literature has examined whether corporatist national wage bargaining systems can deliver superior economic performance, but this has mostly focused on short run indicators. Such systems of industrial relations could provide incentives for investment if organized labour can credibly pre-commit to wage moderation. This paper examines this, building on monopoly union models that indicate the response of corporatist wage bargaining arrangements to investment. The paper estimates the response of wage bargaining to capital investment, conditional on outside options, in six key economies widely characterized as having sustained corporatist bargaining arrangements over 1970-2017. The econometric approach allows changes in regimes to be determined endogenously; these shifts appear consistent with wider evidence on changes in bargaining arrangements and financial integration of these economies.

1. Introduction

Since Calmfors and Driffill (1988) numerous studies have tested whether highly coordinated wage bargaining systems, broadly characterized as corporatist, can deliver superior economic performance. However, recent literature has focused almost exclusively on the effects of wage bargaining systems on unemployment. An earlier literature proposed that corporatist arrangements were able to sustain high levels of capital accumulation, particularly in the tradable sector, with post-war growth in European economies underpinned by national cooperative arrangements that ensured organized labour exercised wage restraint in the expectation of investment by firms.

There have been few direct attempts to test whether corporatist arrangements were effective at delivering wage restraint to support capital accumulation. Although it has been claimed that labour in corporatist economies would exercise wage restraint in response to capital accumulation, this paper tests this hypothesis directly by estimating the effects of capital accumulation on wage bargaining in six key European economies - the four main Nordic countries together with Austria and the Netherlands – over 1970-2017. Whereas cooperative arrangements between firms and organized labour were eroded in some European economies over the 1970s, these six economies are all widely held to have sustained cooperative wage bargaining systems and have been chosen because of similarities in their labour market institutions. The Nordic countries are frequently grouped together as a distinctive model, whilst Austria has a number of similar features to the Nordics. The Netherlands reconstituted corporatist arrangements from the early 1980s and has often been taken as an exemplar of cooperative industrial relations. Nevertheless, the sample countries have also seen changes in these

arrangements and this paper directly tests for the effect of capital accumulation on wages and determines endogenously structural breaks in this relationship using Bai-Perron tests for multiple break points. A few earlier studies have estimated the effects of capital accumulation on wage bargaining in countries with strongly regulated labour market institutions (Miaouli 2001; Kazanas and Miaouli 2014). Overall, this paper extends earlier work by directly testing for the impact of capital accumulation in countries where cooperative relations are claimed to have emerged. The paper tests and finds evidence for structural breaks in these relations over the sample period; shifts in these regimes indicate significant changes in the impact of capital accumulation on wages. The paper relates these regimes shifts to changes in both domestic labour market institutions and international financial integration.

Section two sets out the motivation of the paper and examines previous literature. Section three outlines the theoretical model underpinning the analysis. Section four describes the experiences of the six sample countries. Section five reports results from testing the effects of capital accumulation on wage bargaining. Section six concludes.

2. Motivation and Previous Literature

Since Calmfors and Driffill (1988), an extensive literature has attempted to relate national wage bargaining arrangements to macroeconomic performance. Much of this work has followed their paper in testing for a hump-shaped relationship between unemployment and the degree of coordination of wage bargaining. More broadly, social corporatism has been used to characterize small open European economies with highly coordinated wage bargaining systems; these arrangements saw the evolution of cooperative bargaining relations between organized labour and businesses combined

with relatively egalitarian wage structures and extensive welfare states (Katzenstein 1985; Pekkarinen *et al*. 1992; Barth *et al*. 2014). Highly decentralized wage bargaining arrangements may approximate to competitive conditions; with intermediate bargaining relations, insider-outsider relations may develop with organized groups strong enough to affect macroeconomic outcomes but able to externalize some of the costs of their actions. Highly coordinated wage bargaining systems may mitigate the effects of increased union power; larger unions have greater power to raise wages, but this also raises the general price level. At high levels of union power with strongly coordinated wage bargaining systems, the latter effect reduces the incentives to raise wages. As encompassing organizations collectively representing much of the workforce, highly coordinated unions may prevent insider-outsider relationships from developing. Tests of the Calmfors-Driffill hypothesis for unemployment have generally been inconclusive (e.g. Aidt and Tzannatos 2008), although some recent studies do find evidence that coordinated wage bargaining systems remain effective at delivering low unemployment (Garnero 2020; Sturn 2013).

An earlier literature theorized the operation of coordinated wage bargaining systems in a longer-term perspective. This emphasized the potential effect of corporatism on capital accumulation and growth and developed a range of models analysing non-cooperative games where organized labour bargains over wages and firms determine employment and investment levels (the 'right to manage' principle). Lancaster (1973) first formalized the 'dynamic inefficiency of capitalism' proposition, with the 'workers' dilemma' and the 'capitalists' dilemma'. The workers' dilemma is that if they do not exercise wage restraint they will be unable to realize future increases in income from investment, but conversely they have no guarantee that wage restraint will result in sufficient investment to bring about higher future incomes. The capitalists'

dilemma is that they cannot guarantee future returns on investment as labour may be able to use its bargaining power to appropriate gains from sunk investment (the 'hold-up' problem, cf. MacLeod and Malcomson 1993). Under quite general conditions, the socially optimal solution cannot be assumed to arise from repeated bargaining and, in the absence of credible pre-commitment devices, capital accumulation will be sub-optimal (e.g. Vartiainen 1992). Although much of the subsequent literature focused exclusively on wage bargaining, Lancaster (1973) notes that there may also be indirect means through which workers can appropriate returns from investment, notably through any political influence over government taxation and expenditure. Grout (1984) extended the sub-optimality result, but also found that even relatively simple models lead to complex solutions for the effects of marginal changes in the relative power of either side. Coordinated wage bargaining may be able to mitigate these dilemmas. Van Der Ploeg (1987) found that with indefinite bargaining it may pay for unions to develop a reputation for cooperative behaviour. Subsequent papers show that in infinite games, memory strategies can produce a perfect equilibrium where the two sides play a trigger strategy; these studies do note, though, that these models are unable to explain key features of the evolution of post-war industrial relations in developed economies (Haurie and Pohjola 1987; Seierstad 1993).

Social corporatism can be interpreted in these terms. It did not simply emerge as an arrangement to ensure sufficient wage flexibility to deliver low unemployment. Organized labour sought high investment to ensure high productivity-high wage jobs. Capital accumulation also had a significant positive impact on employment in these economies over the medium term (Arestis *et al*. 2007; Karanassou *et al*. 2007; Heimberger *et al*. 2017).

Eichengreen (2008) drew on this literature to argue that European economies were able to sustain high investment and growth in the post-war period through developing durable compromises between firms and organized labour based on the latter effectively trading wage moderation for expected investment (Eichengreen 2008; Eichengreen and Vazquez 2000). The ensemble of post-war institutions in these countries helped to underpin and sustain these bargains, but these arrangements came under pressure from the early 1970s and were eroded across Europe. This paper focuses specifically on six European economies widely regarded as having managed to sustain corporatist bargaining arrangements by testing the response of wages to capital accumulation.

Further effects on capital accumulation have been proposed as a result of wage compression policies associated with union bargaining in Nordic economies. Centralized wage bargaining in the Nordics was explicitly designed to minimize wage differences between firms; this can promote structural change as centrally determined wages in effect provide a subsidy to high productivity firms and a tax on low productivity firms. Solidaristic wage bargaining thereby promotes the expansion of more productive firms whilst less productive firms decline. Solidaristic wage bargaining equalizes wages within and between industries and thereby promotes creative destruction and raises productivity growth. This would promote investment in the most productive firms and, assuming a vintage model, lead to a more productive capital stock. In particular, the Swedish post-war trade union Rehn-Meidner model explicitly assumed that coordinated wage bargaining would promote the expansion of more productive firms and the creation of new firms (Barth *et al*. 2014; Erixon 2018).

Few previous studies have tested directly for any relationship between wage bargaining systems and capital accumulation. Chowdhury (1994) found evidence for a

U-shaped relationship between the degree of centralization of wage bargaining and capital accumulation for developed economies over 1960-90, with corporatism associated with higher investment shares. Landesmann and Vartiainen (1992) found that over the 1960-85 period the Nordic economies and Austria had high levels of investment compared to other European economies despite relatively low profitability and explained this in terms of their corporatist arrangements. Henley and Tsakalotos (1991) found that corporatist economies were better able to mitigate pressure on profitability during the 1970s and 1980s slowdown through management of potential distributional conflict, whilst investment in such economies (particularly the Nordics) remained relatively resilient to any falls in the profit share over this period. Guger (2001) also found strong investment levels in post-war Austria, where changes in union density did not appear to have a negative impact on growth (cf. Zagler 2000). Some studies of the Netherlands found that negotiated wage moderation in the Netherlands led to a recovery of profitability but without a commensurate revival in investment (Becker 2005; Jones 1999; Kleinknecht *et al*. 2006).

A few studies examined how far trade unions in corporatist economies exercised wage restraint in practice through their impact on the functional income distribution. Bengtsson (2014a) found that although higher union density was associated with higher wage shares across developed economies in the post-war period, the Nordics were generally an exception to this. Even here, though, Sweden saw wage rises in excess of productivity growth in the post-war period until the 1970s as union power rose, with a consequent rise in the labour share; the labour share fell thereafter (Bengtsson 2014b). Bengtsson (2015) found that wages rose faster than productivity in Scandinavian countries during the 1960s, although wage restraint was evident from the 1980s. During the period of the general decline in the labour share from the 1980s, corporatism

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appears to have ameliorated this fall (Holzner 2018). Van Zanden (2000) tested the Eichengreen hypothesis for the Netherlands, but found that the evidence did not support it for the post-war period. However, the Netherlands saw a breakdown in post-war bargaining arrangements, discussed below, which were only reestablished in the early 1980s.

Implicitly or explicitly earlier models assumed an economy closed to capital flows. With perfect capital mobility, in a small open economy the capital stock would be determined by the world interest rate and unions could not affect the real wage in equilibrium. This is a theoretical limit result, and in practice capital mobility is some way short of this (cf. Stulz 2005);[1] more generally, though, higher capital account openness would still be expected to raise the relative bargaining power of employers. In a world of economies with varying levels of union power, openness would be expected to lead to capital outflows from highly unionized economies and a decline in union bargaining power (cf. Aloi *et al*. 2009; Egger and Etzel 2014). Capital account liberalization is associated with a lower labour income share (Jayadev 2007; Furceri and Loungani 2018). The economies considered here embarked on extensive financial liberalization and openness during the 1980s; this is widely claimed to have undermined social corporatist bargains by increasing the relative bargaining power of firms (Huber and Stephens 1998; Kurzer 1993; Moses 1995).

3. Theoretical Model

Previous studies have found that the capital stock has a positive and significant impact on wages in European economies (Arestis et al. 2007; Kazanas and Miaouli 2014). Although there have been few direct attempts to test whether corporatist arrangements were effective at delivering wage restraint to support capital accumulation, there have

been some attempts to test the effects of capital accumulation on wages in southern European economies. These are characterized by rather different, less cooperative, wage bargaining arrangements and with higher levels of employment protection that have led to insider-outsider labour bargaining relations (Miaouli 2001; Kazanas and Miaouli 2014). Kazanas and Miaouli (2014) find evidence of a positive impact of capital accumulation on private wages in these economies, which they relate to changes in the power of organized labour to extract returns from past investment with shifts in labour market institutions. During periods of relatively strong employment protection legislation the long run elasticity of wages in response to capital accumulation was positive and significant; by contrast, after labour market deregulation this elasticity was significantly lower and, in some cases, insignificant. They suggest further research could examine how this relationship operates in economies with different wage bargaining regimes.

In the absence of binding wage agreements, Markov strategies can be derived under quite general conditions. Following Kazanas and Miaouli (2014), the monopoly union acts as a Stackelberg leader setting the real wage w_t; the union's intertemporal objective is:

$$max \sum_{t=1}^{\infty} \delta^{t-1}[l_t w_t + (n - l_t)b_t]$$

(1)

where δ is the discount rate, assumed constant, n is union membership, assumed to be given,[2] and b is the outside option. Firms then choose paths of employment, l_t, and end-period capital stock, k_t, to maximize profits. The firm's intertemporal objective is given by:

$$max \sum_{t=1}^{\infty} \delta^{t-1}[Ak_{t-1}^{\alpha}l_t^{1-\alpha} - w_t l_t - r_t k_{t-1} - \frac{\phi}{2}(k_t - k_{t-1})^2 - \frac{\psi}{2}(l_t - l_{t-1})^2]$$

(2)

where $A > 0$, $0 < \alpha < 1$; the last two terms represent capital and labour adjustment costs with $\phi \geq 0$ and $\psi \geq 0$. The real interest rate, r, is assumed to be exogenous and constant. Kazanas and Miaouli (2014) attempt to determine Markov strategies and Markov perfect equilibrium. They show that if there are solutions for the firm's problem it will be of the form:

$k_t = k(k_{t-1}.l_{t-1}; w_t, b_t, w_{t+1}, b_{t+1})$ (3)

$l_t = l(k_{t-1}.l_{t-1}; w_t, b_t, w_{t+1}, b_{t+1})$ (4)

Correspondingly, any solution to the union's problem will be of the form:

$w_t = W(k_{t-1}, l_{t-1}; b_t)$ (5)

Thus, the paths of wages, capital stock and employment are determined as functions of the endogenous variables, l_{t-1}, and k_{t-1} and the exogenous variable b_{t-1}. This operationalizes the non-cooperative game between unions and employers and thereby provides the basis for our econometric analysis. Capital accumulation is expected to have a positive impact on wages, as is the outside option.

4. Social Corporatism and Country Experiences

This paper examines six European countries characterized as corporatist, the four major Nordic economies together with Austria and the Netherlands. This section briefly reviews their wage bargaining arrangements.[3] Social corporatism is a multi-dimensional concept and there have been various attempts at classifying countries' wage bargaining systems. Corporatism operates as a coordination device for wage bargaining and

commitment mechanism for the parties. Nordic economies typically rank amongst the highest on indices of corporatism, together with Austria and the Netherlands (Jahn 2016). Jahn (2016) has Austria and Sweden as the two highest ranked countries on a composite corporatism index over 1960-2010. Wage bargaining arrangements are relatively coordinated and bargaining coverage extends to the clear majority of the workforce; further bargaining coverage has not declined over recent decades in contrast to other OECD countries (OECD/AIAS ICTWSS database). Garnero (2020) traces the evolution of bargaining systems since 1980, classifying Finland as predominately centralized and coordinated and our other five sample economies as having generally 'organized decentralized and coordinated' arrangements. As well as labour organization through unions, employer organization also remains high in these economies (Brandl and Lehr 2016). All six countries have also been characterized as having relatively high quality labour relations in terms of the development of cooperative relations between unions and firms (Blanchard and Philippon 2004), in contrast to those studied in Kazanas and Miaouli (2014).

The Nordic economies have typically been most closely associated with social corporatism in the post-war period. Unlike other developed economies, they have not seen large declines in union density since the 1980s – a majority of employees are union members (OECD/AIAS ICTWSS database). The core principles of the post-war Nordic wage bargaining system were based around centrally negotiated pay agreements between highly organized union movements and firm associations. Wage leadership was by the exposed tradable sector, with central pay settlements based on the norm of the sum of world inflation and productivity growth in the tradable sector (the EFO 'Scandinavian' model of inflation), a principle that would ensure approximate stability of the labour share over time, at least in the exposed sector. Vartiainen (2011) argues

that although Nordic countries' bargaining systems differ and have evolved in the post-war period, there remain both clear similarities between them and clear continuity in key aspects of them. Collective agreements and formalized mediating institutions remain. In particular, actors cannot initiate disputes at the local level, in contrast to Anglo-Saxon systems of industrial relations. Even at the height of post-war arrangements, although peak level wage bargaining negotiated core wage increases nationally, in practice wage drift in the private sector particularly meant that actual wage increases typically exceeded centrally negotiated rises, often by a considerable margin.[4] Nordic bargaining systems have become more flexible and decentralized after the 1980s, but key actors cooperated so that these systems have adapted to changed conditions whilst preserving core features. New patterns of coordinated bargaining have emerged, with sectoral pattern bargaining rather than peak bargaining, but generally in a manner that preserves wage leadership by the exposed sector. Although there has been some erosion of post-war Swedish arrangements, Wallerstein and Golden (2000) found little evidence of comparable declines in bargaining coordination amongst the other Nordic countries. Holmlund and Zetterberg (1991) found evidence of effective centralized wage determination in Nordic economies and an absence of insider-outsider effects. More broadly, Nordic arrangements can be seen as a durable political compromise. Organized labour has pursued a 'social wage' through expansion of welfare provision. Cautionary fiscal policies in the context of economies that were relatively closed financially enabled the authorities to keep real interest rates low. During the post-war period investment was supported by low interest rates and tax allowances for firms (Kosonen 1992).[5] As noted, these economies had high levels of investment in the post-war period. Since then Karanassou *et al*. (2008) find evidence of a large, but temporary, negative shock to capital stock growth in Denmark and Sweden

and a permanent shock to capital stock growth in Finland following the early 1990s
recession in these economies.

4.1 Sweden

Sweden has often been regarded as the exemplar of social corporatism and the Nordic
model. In the post-war period the Rehn-Meidner model provided a formalized model of
centralized wage bargaining based around wage leadership by the exposed
manufacturing sector (e.g. Erixon 2018). The 'solidaristic' element of wage bargaining
aimed to equalize wages within and, to some degree between, industries for work of
equal worth. Macroeconomic policy was directed at ensuring low inflation; full
employment could be ensured through active labour market policies.

These arrangements came under strain during the inflation of the 1970s and
1980s. Key manufacturing sectors in Sweden abandoned centralized bargaining
arrangements from 1983 and employer groups sought to undermine key aspects of post-
war bargaining arrangements (Barkbu et al. 2003, Swenson and Pontusson 2000). In the
event, though, this did not lead to a wholesale shift towards decentralized bargaining
and from the mid-1990s Swedish arrangements were reformed to (re)establish
principles of cooperative bargaining and effective wage leadership by the exposed
sector.

In common with other Nordic countries, Sweden undertook extensive financial
liberalization in the 1980s, which was followed by a credit boom and then a banking
crisis and major recession in the early 1990s.

4.2 Denmark

Danish post-war arrangements were similar to other Nordic countries, with centrally
coordinated wage bargaining based on leadership by the exposed sector. From the 1980s

there was a shift towards 'centralized decentralization' with greater sector-level bargaining within a national framework to provide greater flexibility; this shift was led by employer organizations in tradable industries. In particular, the period saw the re-emergence of an effective negotiated wage bargaining system based around ensuring private wages were competitive relative to Germany within a fixed exchange rate regime. Key measures were designed to keep public sector wage rises below private sector rises to help prevent wage leadership by the public sector and preserve exposed sector leadership. The Danish 'flexicurity' model, widely credited with delivering low unemployment, originated with labour market reforms from 1994 designed to improve incentives by reducing employment protection and the generosity of benefits, as well as expanding provision of active labour market policies.

Denmark had a similar pattern to other Nordic economies of financial liberalization in the 1980s opening up a previously regulated post-war system, although it initiated this process earlier than the other Nordics. Capital controls were eliminated earlier and more rapidly than in other Nordic countries and cross-border flows grew from the mid-1990s. Although Denmark also experienced a credit boom in the 1980s, followed by a downturn in the early 1990s.

4.3 Finland

Finland established centralized wage bargaining with exposed sector wage leadership from the late 1960s, with continued support from employers and unions. Whilst there has been some decentralization from the 1990s, coordination remains high and local wage bargaining is limited; there is clear continuity in post-war arrangements (Uusitalo and Vartiainen 2009). Garnero (2020) classifies Finland as a predominately centralized and coordinated collective bargaining system. National wage bargaining effectively sets reference points for wage rises with further negotiations at the industry level.

Similarly to the Swedish case, Finland liberalized its financial system in the 1980s followed by a credit boom and an overheating economy. The early 1990s saw a banking crisis and a severe recession; the recovery from this recession saw strong productivity growth.

4.4 Norway

The Norwegian post-war bargaining system was based around coordinated bargaining with wage leadership by the exposed sector and had similar solidaristic elements to the Swedish model (Barkbu et al. 2003; Dølvik and Steen 1997; Kahn 1998). Norwegian wage bargaining is relatively coordinated by OECD standards, although the degree of central coordination has fluctuated over time. Gjelsvik *et al.* (2015) find evidence of continued wage leadership by the manufacturing sector in Norway. Norway undertook financial liberalization in the 1980s and experienced a banking crisis in the early 1990s, although its effects on the wider economy were less severe than in Finland or Sweden.

4.5 Austria

Austria has one of the most highly developed and formalized corporatist systems, with strongly coordinated wage bargaining, and has achieved relatively low unemployment (Afonso and Mach 2011; Guger 1992; 2001). Open industrial conflict is rare. Over 90 per cent of the workforce is covered by collective bargaining arrangements. Membership of the Chamber for the Economy is mandatory for companies. Wage bargaining typically takes place at sectoral level but there is coordination between unions within the Austrian Trade Union Federation. The 'Benya formula' in post-war Austrian wage bargaining operated on similar principles to the EFO model, providing for wage rises to compensate for inflation and some share of productivity growth,[6] with continued wage leadership by the (exposed) metal industry (Traxler *et al.* 2008; Knell and Stiglbauer 2012). Compared to the Nordic countries, Austrian unions have been less

concerned with pursing egalitarian objectives; wage differentials are relatively high in Austria, although post-tax household inequality is relatively low (Polan 2009). Gender wage inequality is also significantly higher than in the Nordic economies. In the post-war period, the Austrian financial system was highly regulated, with limited international integration (Kurzer 1993: ch. 7). From the late 1980s the Austrian economy became more integrated internationally, notably with European Union accession in 1995. Capital controls were abolished by the end of the 1980s and cross-border flows grew from the mid-1990s.

4.6   The Netherlands

The Netherlands can be seen as an exemplar and pioneer of a wider development of new social pacts, where corporatist arrangements have recently emerged in a number of European economies (Acocella *et al*. 2009; Avdagic *et al*. 2011). After a breakdown of post-war arrangements, the 1982 Wassenaar Agreement saw the recrudescence of post-war Dutch corporatism and has been regarded as a template for a negotiated route to low unemployment through wage restraint and labour market reforms. A series of social pacts were negotiated between employers and unions, with direct or indirect government involvement, designed to deliver wage moderation in the expectation of higher employment; the arrangements typically covered much of the workforce. Coordinated wage bargaining has emerged that has limited wage differentials: studies find that Dutch corporatism has been associated with lower inter-industry wage dispersion and lower wage dispersion between firms; it has also operated with sufficient wage flexibility to ensure low unemployment levels in response to shocks (Visser and Hemerijck 1997; Teulings and Hartog 1998). In contrast to Nordic social corporatist arrangements, though, these agreements are less egalitarian in terms of both wages and

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social benefits (as has also been the case with more recent national social pacts in other European economies).

In contrast to the other sample countries, the Netherlands had a relatively developed and open financial system through the sample period (Kurzer 1993).

5. Econometric Results

This section sets out the modelling approach and reports our results. After examining the data series, we estimate a long run model of wage determination and then test for structural breaks and parameter instability in these estimates. Having found evidence of parameter instability we extend the long run model to allow for regime change and use the residuals from this to estimate an ECM and thereby obtain estimates of short run elasticities.

Drawing on the monopoly wage bargaining model in section 3, real wages in the private sector can be estimated as a function of past levels of the private capital stock, employment in the private sector and labour's outside option. Some studies have used unemployment benefits as a proxy for the last variable but for these countries it seems more appropriate to use wages in the public sector given the importance of public sector employment in these economies, particularly for lower skilled labour. Nordic countries in particular saw relatively high expansion of public sector employment in the 1970s and 1980s as political concerns to deliver low unemployment led to the state at times effectively operating as employer of last resort (Kahn 1998, 2008). There were concerns that the relative fall in exposed sector employment with deindustrialization together with the rise of heavily unionized public sector employment would undermine the

exposed sector's wage leadership underpinning the corporatist model (Garrett and Way 2000).

This study uses annual data over 1970-2017 for these countries (except for Norway where annual data are available for 1970-2014). Data on private and public wages and private employment are taken from the EU-KLEMS database (except for Norway where they are taken from the Norges Bank historical monetary statistics database). Real private capital stock data are taken from the IMF capital stock database. See the data appendix for further details.

We start by testing the order of integration of the data. Table 1 reports unit root tests for the variables. These produce mixed results, apart from the private labour force for which it is generally not possible to reject the null hypothesis of a unit root. However, we need to test further for unit roots in the data series allowing for a structural break. Table 2 reports results from Zivot and Andrews (1992) tests allow for a unit root in the presence of a structural break, where the break point is determined endogenously. With the exception of the Netherlands, it is not possible to reject the null hypothesis of a unit root for both private and public wages on these tests. With the exception of Finland, we cannot reject the null hypothesis for private capital per worker on these tests.

Following on from the theoretical model outlined in section 3, we estimate the following:

$$w_t = c_0 + c_1 k_t + c_2 l_t + c_3 g_t + \varepsilon_t \tag{6}$$

where w is the real product wage in the private sector, k is real private capital stock per private sector employee, l is total private sector employees and g is the real wage in the public sector (all variables in logs). Since all the variables are in logarithmic form the parameter estimates are elasticities. Following the theoretical model in section 3, capital

accumulation is expected to have a positive impact on wages outside the limit case of perfect capital mobility. Capital accumulation raises workers' output and generates rents. Organized labour may choose to limit its rent extraction in response to investment under repeated bargains, but higher capital per worker would still be expected to raise wages and wage moderation would be pursued as a strategy to maximize labour's rents over time. By testing for structural changes in this relationship we can test whether this relationship has changed over time; further, whereas previous studies of southern European economies simply related breaks to changes in labour market institutions this study also relates these to changes in financial integration. As noted above, under perfect capital mobility in a small open economy the capital stock would be determined by the global interest rate and unions would be unable to affect the equilibrium real wage; even if practice capital mobility falls short of this, a rise in capital mobility would be expected to reduce labour's bargaining power. The coefficient on public sector wages is also expected to be positive, as labour's outside option, although the estimates may indicate how far exposed sector wage leadership arrangements have mitigated this.

Table 3 reports results for estimates of (6). In each of these estimates the independent variables are initially lagged by one period. Given the evidence on the order of integration of our data we report both results for OLS estimations and for cointegrating relationships with Fully Modified OLS. The results are broadly in line with expectations. In particular, the coefficient on private capital is positive and significant in all cases. The coefficients on public sector wages are insignificant for Austria and Denmark, but are positive for the other sample countries.

We are particularly interested here in the stability of long run relationships. Initially we test for a structural break in long run relations using the Gregory and Hansen (1996) test for a one time endogenous structural break in a cointegrating

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relationship testing the residuals from estimates of (6). Gregory-Hansen extends traditional ADF, and Phillips Z_a and Z_t tests where the null hypothesis tested is of no cointegration against the alternative of cointegration with a regime shift. Table 4 reports tests for a structural break in these relations. With Denmark it is not possible to reject the null hypothesis of no cointegration, whereas for Sweden there is clear evidence of regime change; the results are more mixed for the other countries.

Rejection of the null hypothesis on a Gregory-Hansen test cannot simply be taken as indicating a cointegrating relationship with a regime change. Gregory-Hansen tests for one structural break. The Bai-Perron (1998) sequential test for multiple structural breaks permits testing for one or more break points; using this analysis permits us to examine for break points in these relationships. Table 5 reports the results from Bai-Perron (1998) sequential tests for multiple structural breaks where these are significant at the 5 per cent level. For each country this indicates the presence of at least one structural break. Given these results we re-estimate (6) to include dummy variables for the periods indicated by breakpoint tests, defined by D_1 and (where a second break point is indicated) D_2 and interaction terms between the regime shift dummies and the variables of interest as follows. This allows an examination of how the impact of capital accumulation (and the other variables) differed across the sub-periods. We then relate these results to wider evidence on changes in these countries' bargaining systems and degree of financial openness. Accordingly we estimate:

$$w_t = c_0 + c_1 k_t + c_2 l_t + c_3 g_t + c_4 Dn_t + c_5 Dn_t k_t + c_6 Dn_t l_t + c_7 Dn_t g_t + \varepsilon_t \qquad (7)$$

Estimates of (7) including dummy variables are reported in table 6. In each case the coefficient on capital remains positive and significant, but the results also point to changes in this relationship. There is also evidence of changes in the effects of public

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sector wages on private sector wage bargaining in some of the countries. We consider the results of these estimations for each sample country in turn.

For Austria, the results indicate structural breaks in 1988 and 1998. The interaction term between the regime shift dummies and the capital coefficient indicates a significant decline in the capital elasticity after 1988: whereas before 1988 the capital elasticity indicates a one percent rise in capital per worker was associated with a 0.51 per cent rise in real wages (ceteris paribus) subsequently this elasticity falls to 0.16. Although Austrian wage bargaining arrangements have been relatively stable over the sample period, Garnero (2020) characterized them as shifting from a predominately centralized and coordinated system to organized decentralized and coordinated arrangements during the 1990s (see also: Jahn 2016). Whilst collective bargaining coverage has remained over 90 per cent, union density was at least 50 per cent until the mid-1980s but has fallen since to below 30 per cent. Changes in Austria at this time may have reduced labour's bargaining power (Afonso and Mach 2011; Kurzer 1993): from the late 1980s the Austrian economy became more integrated internationally and policy commitments to full employment through a Keynesian macroeconomic framework were abandoned. From 1986 policy shifted to operate nationalized industries in accordance with commercial criteria and a major privatization program was undertaken in the 1990s; Austria previously had one of the highest levels of public ownership in Western Europe, including in manufacturing where unions were particularly strong.[7] The coefficient on public wages was insignificant and there was no evidence of a significant change in the coefficient on public wages. This is consistent with continuity in exposed sector leadership in wage bargaining arrangements,

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particularly as Austria sought to maintain competitiveness relative to other European economies.

Tests for Denmark shown in table 5 indicate a single break point in 1990. Re-estimation indicates the interaction term between the capital coefficient and the regime shift dummy was negative; indeed, this approximately offsets the coefficient on capital accumulation. This is consistent with developments noted above, both the shift toward more decentralized wage bargaining arrangements and financial liberalization in the Danish economy from the 1980s would be expected to weaken labour's bargaining power. The Chinn-Ito (2006) index indicates a rise in financial openness around 1988-89 as a key part of the financial liberalization program of the 1980s. The decentralization of bargaining arrangements was designed to increase wage flexibility and was combined with reforms to social security systems. The interaction term between the dummy coefficient on public sector wages was positive and significant; i.e. from 1990 a one per cent rise in government wages is associated with a 0.86 per cent rise in private real wages). As noted above, wage bargaining arrangements were designed to operate so that public sector wages adjust to private sector bargains with a lag and constrained to rise no faster than private wages. As a result, through the sample period public sector wages fell relative to private wages before stabilizing from the early 1990s. Bargaining arrangements ensured continued wage leadership by the exposed sector.

For Finland, tests indicate break points in 1985 and 1996 (see table 5). The interaction term between the capital coefficient and the regime shift dummy was positive and significant for the 1985-95 period. This period was initially one of rapid growth, with an overheating economy after financial liberalization, followed by a banking crisis and severe recession; labour's bargaining power may have been elevated

during the boom. The Chinn-Ito index indicates an increase in financial openness from 1992 as part of the financial liberalization program. As noted above, the recession caused a major negative shock to the capital stock and recovery was slow – the private capital-labour ratio peaked in 1994 and did not pass that level again until 2010. The period from the mid-1990s saw a particularly sharp fall in the labour share (Böckerman and Maliranta 2012). Although there had been some shift away from coordinated wage bargaining in the early 1990s, in contrast to other Nordics Finnish wage bargaining retained a high degree of central coordination designed to ensure external competitiveness. This is also reflected in an insignificant coefficient on public wages in this estimate with no evidence of a significant change in the coefficient on public wages. Coordinated wage bargaining restrained wage growth in the recovery from the early 1990s recession; productivity growth was particularly strong in the recovery as new technology industries emerged in Finland (Uusitalo and Vartiainen 2009), and this was central to the rise in the labour share. Further, Böckerman and Maliranta (2012) find evidence that high productivity plants had not hired labour up to the point where the labour share was equalized between low and high productivity plants and suggest that this was due to a higher share of foreign enterprises raising the required return on capital.

For the Netherlands, from table 5 the first break point indicated is in 1983 and the second in 1995. The first break point is just after the historic Wassenaar agreement, with a particular emphasis on restraining public sector pay as well as anchoring private wages to those in other major European economies. A series of social pacts were negotiated designed to moderate wage demands and decentralize wage bargaining arrangements, as well as reforming social security and employment contracts. The interaction terms on the capital coefficient were negative but not significant here,

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although during the 1984-94 period the capital stock per worker was largely flat (as noted above, higher profitability from wage restraint in the 1980s and 1990s did not lead to higher investment). Further, as noted earlier, the Netherlands had a relatively open capital account over this period. However, the interaction term on public sector wages was negative and significant for the second period. To be precise, in the period up until 1995 the public wage elasticity indicates that a one per cent increase in public sector wages was associated with a 0.74 per cent increase in the private sector wage by (ceteris paribus), but from 1995 the elasticity fell to 0.20 (i.e. 0.74-0.54). This is consistent with the impact of the social pact arrangements noted here designed to moderate public sector wages and tie wages to external competitiveness in the context of European monetary integration. The social pact negotiated in 1993 was designed to reduce wage growth to restore external competitiveness and reflected concerns that sheltered parts of the economy, including the public sector, were driving wage growth. Detail – public wages had been tied to private sector wages until 1992, costs of this (Visser and Van der Meer 2011)

For Norway tests indicate a structural break in 1998. The interaction term indicates a significant decline in capital elasticity from then so that it is no longer positive. The interaction term on public sector wages was also negative and significant. This was a period when Norway experienced a shift towards more decentralized wage bargaining arrangements (Jahn 2016; Garnero 2020). Unlike Sweden less of a public sector split. The Chinn-Ito index also indicates an increase in capital account openness around 1996. Norway also experienced a banking crisis in the early 1990s following financial liberalization, although the effects on output were more muted than in Finland or Sweden. As with other Nordic economies this had a negative impact on capital accumulation – the capital-labour ratio peaked in 1993 and did not pass that level again

until 2004. Taken together these developments may have significantly reduced labour's bargaining power.

Results for Sweden indicate structural breaks in 1980 and 2000, as shown in table 5. The interaction term on capital after the second break point is negative and significant, indicating that the capital elasticity is no longer positive after that point. Conversely, the interaction terms on public sector wages for the second period is positive and significant; from 2000 there is approximate unit elasticity of private wages with respect to public wages. As noted above the period after 1982 saw both a breakdown of the post-war centralized wage bargaining and, in common other Nordic economies, a program of financial liberalization leading to a credit boom followed by a banking crisis and recession. The negative shock to the capital stock from that recession was such that the capital-labour ratio peaked in 1994 and did not regain that level until a decade later. The fall in the capital coefficient is consistent with weaker labour bargaining power from financial openness – liberalization removed formal barriers to capital mobility and cross-border flows increased sharply from the mid-1990s. Garnero (2020) indicate instability in Swedish bargaining arrangements in the 1980s and 1990s (cf. Barkbu et al. 2003) but a clear shift to more decentralized arrangements from the latter part of the 1990s (Jahn 2016; Garnero 2020). After turbulence in the 1990s collective bargaining arrangements were reconstituted to achieve greater coordination focused on external competitiveness. These developments are consistent with a decline in labour's bargaining power to extract rents from private investment. The rise in the coefficient on public sector wages in the latter period, though, is also consistent with an erosion of the post-war model of wage leadership by the exposed sector and the rise in the role of public sector unions in wage bargaining (Garrett and Way 2000). The

decentralization of bargaining has allowed unions to bargain for wage increased in the public sector, particularly for relatively low paid workers.

Finally, a cointegrating relationship implies an ECM. Table 7 reports estimates of an error correction model using the residuals from estimates of (7). As expected, in each case the error correction parameter is negative and significant, except for Norway. Only for the Denmark and Finland did capital accumulation have a significant short run effect on wage growth. By contrast, public wages had a positive and significant short run impact on private wage growth in all cases except Finland (where arguably wage coordination designed to ensure exposed sector leadership was weakest; for the other countries, the effect was weakest in Austria, which also had a high degree of exposed sector wage leadership).

6. Conclusions

This paper has examined the effects of capital accumulation on wage bargaining in six European economies. It extended work on highly regulated economies to those corporatist economies hypothesized to have developed patterns of long term cooperative wage bargaining. The 'Eichengreen hypothesis' posited that cooperative bargaining emerged in post-war Europe where organized labour exercised wage moderation in response to investment. Eichengreen asserted that such cooperative relations largely broke down in the 1970s but this hypothesis has not been tested directly. Some earlier analyses had focused on economies with high regulated labour markets where protected insiders may be able use their bargaining power to extract rents from sunk investment. This paper focused instead on economies widely characterized as having sustained more cooperative wage bargaining relations between organized labour and firms and thereby provided a test for Eichengreen's hypothesis.

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The paper analysed this using a monopoly union model. The results here indicate that capital accumulation has had a significant impact on real wages in these countries. Further, the econometric analysis allowed break points in these relationships to be determined endogenously. These appear to be associated with shifts in wage bargaining arrangements and changes in financial integration. Both of these are likely to affect relative labour's bargaining power, and they are associated with shifts in the ability of labour to realize higher wages from investment rents. Whereas earlier studies of regulated economies focused simply on changes in labour market regulations this paper puts shifts in wage bargaining in the context of the evolution of bargaining arrangements and financial integration. In some cases there is also evidence of shifts in the impact of public sector wages, interpreted here as the key outside option for labour. These results provide new evidence for the original Eichengreen hypothesis and suggest a more nuanced interpretation. Labour was able to realize gains from investment, whilst shifts towards more decentralized wage bargaining arrangements have reduced its power to do so. International capital mobility would be expected to raise firms' relative bargaining power; shifts in the capital elasticity indicate that it fell in some of these economies following shifts to financial openness. Indeed, in the cases of Denmark, Norway and Sweden capital accumulation no longer has a positive impact on wages in later periods following a structural break.

There are a number of possible future directions for this research. Ideally work could be extended to cover earlier in the post-war period when these arrangements were thought to be at their height, although data limitations. Such work could be extended beyond the aggregate level to the industrial level, which might be able to exploit differences in unionization levels between industries. Investment could be modelled

more explicitly, which may address further how far financial integration leads to this being determined by global capital markets.

Data Appendix

w – log of real product wage in the private sector. Wage data from KLEMS database, compensation of employees in the market economy divided by number of employees. Deflator, KLEMS deflator for gross value added. For Norway, wage rate for manufacturing is used as a proxy for private wages from Norges Bank Historical Monetary Statistics for Norway https://www.norges-bank.no/en/topics/Statistics/Historical-monetary-statistics/ and value added deflator taken from OECD Stan database.

k – log of real private capital stock per private sector employee. Capital stock data from IMF Capital Stock Database https://www.imf.org/external/np/fad/publicinvestment/#5.
l – log of total private sector employees. Data from KLEMS database, employees in market economy, except Norway, private sector employment data derived from OECD Stan database.
g – log of real public sector wages. Data from KLEMS, compensation for employees in public administration, education, and health and social work divided by number of employees in these industries, except Norway, data for public services wages from Norges Bank Historical Monetary Statistics for Norway. Deflator as for private sector wages.

Table 1: Unit Root Tests

	w_t	k_t	l_t	g_t
Austria				
ADF Test	-2.33	-3.31**	-0.17	-5.17***
Phillips-Perron test statistic	-3.49**	-3.33**	-0.19	-6.99***
Denmark				
ADF Test	-3.22**	-2.13	-0.70	-1.08
Phillips-Perron test statistic	-3.55**	-2.20	-0.91	-1.23
Finland				
ADF Test	-1.89	-1.56	-3.14**	-0.72
Phillips-Perron test statistic	-1.84	-1.73	-2.00	-0.79
Netherlands				
ADF Test	-3.29**	-2.64*	-0.49	-0.48
Phillips-Perron test statistic	-2.95**	-3.24**	-0.24	-1.19
Norway				
ADF Test	-2.31	-2.31	-0.57	-2.125
Phillips-Perron test statistic	-2.39	-3.24**	-0.30	-2.74*
Sweden				
ADF Test	-0.44	-1.90	0.06	0.23
Phillips-Perron test statistic	-0.35	-2.40	0.05	0.26

Notes: null hypothesis is series has a unit root. ***, **, * significant at 1 %, 5% and 10% levels respectively.

Table 2: Unit Root Tests Allowing for a Structural Break

	w_t	k_t	l_t	g_t
Austria				
Break in the intercept	-3.04	-1.25	-5.10**	-3.71
	(1989)	(2010)	(1982)	(2009)
Break in the trend	-2.58	-1.92	-4.09	-3.62
	(2000)	(2004)	(1987)	(2000)
Break in intercept and trend	-3.32	-1.90	-4.73	-3.67
	(1990)	(2003)	(1982)	(2005)
Denmark				
Break in the intercept	-1.71	-3.05	-4.48	-3.57
	(2008)	(2010)	(1980)	(1995)
Break in the trend	-3.09	-3.96	-4.91***	-3.07
	(2004)	(2010)	(1981)	(2010)
Break in intercept and trend	-3.07	-4.44	-5.14**	-3.81
	(2003)	(2009)	(1984)	(1998)
Finland				
Break in the intercept	-1.88	-4.32	-6.94***	-3.25
	(1985)	(1990)	(1991)	(1990)
Break in the trend	-2.26	-4.44**	-3.87	-3.07
	(2009)	(1995)	(1997)	(2010)
Break in intercept and trend	-2.25	-6.19***	-6.89***	-3.40
	(2003)	(1991)	(1991)	(2010)
Netherlands				
Break in the intercept	-5.09**	-3.31	-2.83	-5.38***
	(1995)	(1988)	(1995)	(1981)
Break in the trend	-3.82	-2.76	-2.36	-5.46***
	(2005)	(2000)	(2002)	(1990)
Break in intercept and trend	-5.07*	2.80	-2.73	-5.32**
	(1995)	(2003)	(1995)	(1988)
Norway				
Break in the intercept	-2.59	-3.91	-6.04***	-3.71
	(2000)	(1994)	(1989)	(2000)
Break in the trend	-2.61	-3.11	-4.27*	-3.63
	(1994)	(1984)	(2000)	(1997)
Break in intercept and trend	-2.60	-3.13	-6.28***	-3.69
	(1992)	(1977)	(1991)	(2000)
Sweden				
Break in the intercept	-3.82	-2.80	-2.52	-3.05
	(2002)	(1997)	(1991)	(2002)
Break in the trend	-3.60	-3.49	-3.93	-3.48
	(1996)	(1993)	(1995)	(1996)
Break in intercept and trend	-4.06	-4.52	-5.48**	-4.06
	(1995)	(1998)	(1992)	(1995)

Notes: Unit root tests from Zivot and Andrews (1992). Estimated break date indicated in parentheses.
Null hypothesis is series has a unit root. ***, **, * significant at 1 %, 5% and 10% levels respectively.

Table 3: Linear Model Estimates

Linear model estimates $w_t = c_0 + c_1 k_t + c_2 l_t + c_3 g_t + \varepsilon_t$

OLS Estimations:

	c	k_t	l_t	g_t
Austria	-0.02	0.50***	0.53***	0.01
	(-0.03)	(7.12)	(10.89)	(0.12)
Denmark	4.41**	0.88***	0.61**	-0.35
	(2.69)	(4.83)	(2.40)	(-0.98)
Finland	-1.38**	0.46***	0.42***	0.69***
	(-2.39)	(4.70)	(3.90)	(8.63)
Netherlands	-0.58**	0.37***	0.41***	0.34***
	(-2.53)	(9.84)	(13.76)	(5.65)
Norway	2.24*	0.25**	-0.36***	1.12***
	(1.99)	(2.14)	(-2.82)	(8.89)
Sweden	-2.63***	0.43***	0.92***	0.32***
	(-3.35)	(7.55)	(6.01)	(3.49)

FMOLS Estimations

	c	k_t	l_t	g_t
Austria	0.08	0.46***	0.47***	0.10
	(0.10)	(4.24)	(7.24)	(0.66)
Denmark	6.61**	1.00***	0.488	-0.55
	(2.37)	(3.31)	(1.14)	(-0.92)
Finland	-0.39	0.39**	0.24	0.75***
	(-0.48)	(2.56)	(1.51)	(6.25)
Netherlands	-0.71**	0.32***	0.41***	0.36***
	(-2.44)	(6.57)	(10.84)	(4.75)
Norway	2.28*	0.22*	-0.49***	1.26***
	(3.34)	(1.85)	(-3.84)	(10.05)
Sweden	-2.76**	0.42***	0.95***	0.31**
	(-3.04)	(5.30)	(4.56)	(2.49)

Notes: *t*-statistics in parentheses. ***, **, * significant at 1 %, 5% and 10% levels respectively.

Table 4: Residual-based Tests

	ADF	Z_t	Z_a
Austria			
Level shift	-5.16*	-34.94	-5.22*
	(1985)	(1985)	(1985)
Level shift/trend	-6.55***	-40.27	-5.83**
	(1988)	(1988)	(1989)
Regime shift	-5.29	-35.74	-5.35
	(1985)	(1985)	(1985)
Denmark			
Level shift	-3.54	-20.83	-3.58
	(2006)	(2006)	(2006)
Level shift/trend	-3.90	-22.94	-3.85
	(1982)	(1980)	(1980)
Regime shift	-3.83	-22.60	-3.87
	(1988)	(1984)	(1988)
Finland			
Level shift	-4.58	-28.72	-4.39
	(2006)	(1990)	(1990)
Level shift/trend	-4.93	-28.64	-4.32
	(2009)	(2009)	(2009)
Regime shift	-5.82*	-36.33	-5.26
	(1995)	(1991)	(1991)
Netherlands			
Level shift	-4.52	-27.47	-4.42
	(2006)	(2006)	(1975)
Level shift/trend	-6.40**	-32.42	-4.71
	(2002)	(2001)	(2001)
Regime shift	-7.61***	-41.58	-5.70
	(1996)	(1997)	(1997)
Norway			
Level shift	-5.00	-24.91	-3.85
	(2006)	(1978)	(1978)
Level shift/trend	-5.01	-24.93	-3.89
	(2006)	(1978)	(1995)
Regime shift	-6.78**	-40.64	-6.58**
	(2002)	(2002)	(2000)
Sweden			
Level shift	-4.10	-25.29	-3.84
	(2009)	(2008)	(2008)
Level shift/trend	-5.09	-19.61	-3.48
	(2004)	(2002)	(2002)
Regime shift	-40.84***	-85.96***	-25.63***
	(1979)	(1975)	(1975)

Notes: residual tests of Gregory and Hansen (1996). Null hypothesis is no cointegration against the alternative of cointegration in the presence of a possible regime shift. Estimated break point year in parentheses. ***, **, * significant at 1 %, 5% and 10% levels respectively.

Table 5: Bai-Perron (1998) Structural Break Tests

	Sequential	Repartition
Austria		
1st break	1988	1988
2nd break	1998	1998
Denmark		
1st break	1990	1990
Finland		
1st break	1994	1985
2nd break	1985	1996
Netherlands		
1st break	1984	1983
2nd break	1995	1995
Norway		
1st break	1998	1998
Sweden		
1st break	2000	1980
2nd break	1980	1995

Table 6: Regime-Switching Model Parameter Estimates

OLS estimates of $w_t = c_0 + c_1 k_t + c_2 l_t + c_3 g_t + c_4 Dn_t + c_5 Dn_t k_t + c_6 Dn_t l_t + c_7 Dn_t g_t + \varepsilon_t$

	Austria	*Denmark*	*Finland*	*Netherlands*	*Norway*	*Sweden*
c	-0.96*	-1.19*	-3.69***	0.001	3.11**	0.91
	(-1.69)	(-1.69)	(-5.33)	(0.002)	(2.30)	(0.68)
k_t	0.51***	0.99***	0.33***	0.24**	0.37***	0.69***
	(5.06)	(10.64)	(4.11)	(2.47)	(3.43)	(3.14)
l_t	0.71***	1.16***	0.88***	0.14	-0.40**	1.05
	(7.49)	(8.62)	(7.80)	(1.52)	(-2.32)	(-1.22)
g_t	-0.12	-0.02	0.25	0.74***	1.04***	-0.45
	(-0.89)	(-0.14)	(1.33)	(5.59)	(7.72)	(-1.22)
$D1_t$	0.03*	-0.04*	0.04*	0.03	0.11**	-0.03
	(1.97)	(-1.87)	(1.77)	(1.43)	(2.41)	(-1.06)
$D1k_t$	-0.35**	-1.01***	0.94**	-0.49	-1.05***	-0.07
	(-2.31)	(-8.57)	(2.63)	(-1.13)	(-5.05)	(-0.32)
$D1l_t$	-0.28*	-0.86***	0.31	0.09	0.41**	-0.24
	(-1.85)	(-4.35)	(1.40)	(0.56)	(2.44)	(-0.76)
$D1g_t$	0.49	0.86***	-0.28	-0.39	-0.67***	0.33
	(1.68)	(3.71)	(-0.76)	(-1.58)	(-3.28)	(0.82)
$D2_t$	0.04*		0.10***	0.12***		0.03
	(1.81)		(2.87)	(3.55)		(0.50)
$D2k_t$	-0.11		0.10	0.03		-1.04**
	(-1.06)		(0.29)	(0.20)		(-2.17)
$D2l_t$	-0.02		0.04	1.86*		-1.17***
	(-1.18)		(0.22)	(1.39)		(-2.81)
$D2g_t$	0.22		0.03	-0.54**		1.40***
	(1.36)		(0.09)	(2.25)		(2.91)

Notes: Austria - D1: 1988-97, D2: 1998-2017; Denmark – D1: 1990-2017; Finland – D1: 1985-95, D2: 1996-2017; Netherlands – D1: 1983-94, D2: 1995-2017; Norway – D1: 1998-2017; Sweden – D1: 1980-99; D2: 2000-17. *t*-statistics in parentheses. ***, **, * significant at 1 %, 5% and 10% levels respectively.

Table 7: Error Correction Model Results

	Austria	*Denmark*	*Finland*	*Netherlands*	*Norway*	*Sweden*
c	0.01**	-0.002	0.004	-0.002	-0.001	0.003
	(2.38)	(-0.46)	(0.63)	(-0.55)	(-0.19)	(0.49)
Δw_{t-1}	-0.12	0.16	0.27	0.23**	0.04	0.09
	(-0.65)	(1.08)	(1.67)	(2.14)	(0.50)	(0.79)
Δk_t	0.02	1.81***	0.50**	0.26	0.08	0.11
	(0.05)	(3.98)	(2.00)	(1.31)	(0.44)	(0.32)
Δk_{t-1}	-0.26	-1.29***				
	(-0.53)	(-3.18)				
Δl_t	0.02	1.80***	0.55**	0.25	0.28	0.01
	(0.04)	(3.99)	(2.18)	(1.18)	(0.28)	(0.02)
Δl_{t-1}	-0.08	-1.52***				
	(-0.14)	(2.74)				
Δg_t	0.25**	0.31***	0.16	0.68***	1.00***	0.57***
	(2.16)	(2.74)	(1.49)	(7.15)	(15.43)	(5.28)
Δg_{t-1}	0.24*	0.05				
	(1.98)	(0.42)				
ecm_{t-1}	-0.37**	-0.49***	-0.64***	-0.76***	-0.09	-0.48***
	(-2.11)	(-3.46)	(-3.17)	(-4.33)	(-0.92)	(-2.91)
R^2	0.38	0.66	0.32	0.73	0.89	0.67
F-stat	2.81**	8.81***	3.77***	21.21***	62.18***	16.15***
AIC	-6.23	-5.86	-4.87	-5.83	-5.33	-4.81
SIC	-5.86	-5.50	-4.63	-5.59	-5.08	-4.57

Notes: *t*-statistics in parentheses. ***, **, * significant at 1 %, 5% and 10% levels respectively.

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[1] Even for the Netherlands, the most financially open of the sample countries over this period, Keuzenkamp and Van Der Ploeg (1991) found that investment behavior was not consistent with perfect capital mobility.

[2] As noted, union membership was relatively stable in these economies compared to the declines experienced in other developed countries.

[3] Characterizations here are drawn from cited sources and data from the OECD/AIAS ICTWSS database.

[4] See Holden (1998), Guger (2001) and Teulings and Hartog (1998) for the sample countries. Wage drift from central agreements is still significant in these economies (Schulten 2013).

[5] Although Danish interest rates were not particularly low over this period.

[6] Although Gerhartinger *et al*. (2017) find weak effects for productivity on Austrian real wages.

[7] Note that public wages here are wages for public administration and public services; wages for state-owned enterprises producing marketed goods would not be included in public wages here.