WORKING PAPER SERIES

No. 1/2006

POLITICS IN WAGE SETTING: DOES GOVERNMENT COLOUR MATTER?

Kåre Johansen
Ørjan Mydland
Bjarne Strøm

Department of Economics

Norwegian University of Science and Technology

N-7491 Trondheim, Norway
www.svt.ntnu.no/iso/wp/wp.htm

Politics in Wage setting: Does government colour matter?[*]

Kåre Johansen[#], Ørjan Mydland and Bjarne Strøm

Department of Economics, Norwegian University of Science and Technology

NO-7491 Trondheim, NORWAY

Abstract

This paper studies the relationship between wage formation and the political colour of the government in an economy with centralized wage bargaining. Ideological, organizational and personal ties between the central trade union and the social democratic political party suggest that the trade union may behave significantly different in wage negotiations under a social democratic than under a conservative government. Using time series data for Norway, we estimate that changing from a conservative to a social democratic central government significantly reduces manufacturing wages and makes wages more responsive to unemployment. This result is consistent with a wage bargaining model augmented by political preferences of the union leaders and suggests that the effect of bargaining coordination depends on the political colour of the government. The estimated effects are both robust with respect to model specification and stable over time.

Keywords: Wages, political regime, time series analysis.

JEL classification: J31, J51

[#] Corresponding author: Kåre Johansen, Department of Economics, Norwegian University of Science and Technology, Dragvoll, NO-7491 Trondheim, Norway. Email: kare.johansen@svt.ntnu.no

1. Introduction

A large theoretical and empirical literature has investigated the relationship between wage growth and wage setting institutions. An influential view, first formulated in the seminal paper by Calmfors and Driffill (1988), is that both fully decentralized and fully centralized wage bargaining provides wage restraint compared to the intermediate case with sectoral or regional bargaining.

While bargaining institutions themselves affect outcomes, the political environment within which these institutions operate may affect the way the bargaining parties (the central union and employer organization) behave in negotiations. In this spirit, political scientists have suggested that encompassing trade unions will moderate wage demands and internalize externalities in wage setting only to the extent that the trade union will get a share of the 'cake' to be induced by this moderation. The trade union movement and the Social Democratic (SD) parties are assumed to have common ideological goals, and the union have more confidence that a SD government will implement such a redistribution policy. The seminal paper by Lange and Garrett (1985) set out the main ideas and provide cross-country empirical evidence that the combination of SD government and centralized bargaining generates better macroeconomic performance in terms of inflation and growth compared to decentralized bargaining under conservative governments.

The present paper contributes to the literature by combining the insights from political science research with wage equations in the Layard-Nickell tradition. Most existing

research on the relationship between macroeconomic performance and political colour of government is based on cross country evidence. While cross-country research on this issue is clearly important, it has some important limitations. Countries may well differ in several important circumstances other than wage bargaining system and government type. Further, appropriate definitions of government colour may differ across countries and easily interpretable empirical country independent measures may be hard to define. Even in a situation where SD-parties are easy to define, definition of government type gets problematic in countries where these parties frequently form coalition governments with more conservative or center parties. Finally, indexes of actual wage setting systems with respect to centralization, varies considerably between studies (Mares, 2004).

An alternative to cross-country studies which is used in this paper is to extend well established and robust models of wage formation in a single country with variables capturing the type of government. Norway provides a useful case for such an investigation for several reasons. The institutions of centralized bargaining have been very stable throughout the post-war period, compared to many other countries, see Kahn (1998) and Padovano and Galli (2003). Further, the social democratic party in Norway has never been involved in coalition governments and implies that we can construct a relatively clean measure of government type.[1] We estimate structural wage equations using time series data for Norwegian manufacturing wages for the period 1968:1 to 2000:4, covering a period with both several shifts in government type and relatively large variation in important macroeconomic indicators as wage growth and unemployment.

---

[1] After the national election in September 2005, the Social Democratic party formed a coalition with the Center party and the Socialist Left party, but this event is outside the sample used in the present study.

The main issues will be to test whether or not changing from a conservative to a SD government affect the wage level as well as wage responsiveness to unemployment. We also investigate the stability of the relationship between wages and political colour of the government, and test the robustness of the results reported in Johansen and Strøm (1997) based on a rather short time period.

The rest of the paper is organized as follows: Section 2 discusses in more details the theoretical and empirical background for our hypotheses. Section 3 contains data description and presents the empirical specification. Section 4 gives the empirical results while Section 5 concludes.

2. Background and hypothesis

The point of departure is the large theoretical and empirical literature concerning the importance of labour market institutions and macroeconomic performance. The earlier studies like McCallum (1983), Tarantelli (1983), and Bruno and Sachs (1985) concluded that centralized bargaining had favourable effects on performance. Calmfors and Driffill (1988) questioned these results, showing that countries with *either* completely centralized bargaining *or* a completely decentralized bargaining system, performed better that countries with bargaining at the intermediate level. Recent evidence in Nunziata (2005) suggests that bargaining coordination may offset the adverse effects of unions since coordination have both a negative direct effect on wage costs and makes wages more

responsive to unemployment.[2] Evidence from Norway and Sweden in Barkbu *et al.* (2003) suggest that bargaining coordination is a multidimensional issue and that the actual impact on wage moderation depends on the degree of worker side coordination, firm side coordination and the degree of active income policy.[3]

Our approach is to extend this line of research and we hypothesize that the political colour of the government may influence the impact from bargaining coordination. An important feature of the Scandinavian countries and other countries with a centralized bargaining system is the close ties between the trade union movement and the SD parties (Rødseth and Holden, 1990, p 238). The possible implications of this relationship have largely been neglected by economists. Notable exceptions are Moene *et al.* (1993) and Detken and Gärtner (1992, 1993).

While economists have usually focused on the ability of centralized bargaining institutions to internalize externalities in decentralized wage setting, political scientists have long emphasized that the benefits from centralized bargaining will only occur under certain political circumstances. Lange and Garrett (1985, 1987), Garrett and Lange (1986, 1989), Alvarez *et al.* (1991), Beck *et al.* (1993) and Garrett (1998) argue that an encompassing trade union will moderate wage demands and internalize externalities in wage setting only to the extent that the trade union will get a share of the 'cake' to be induced by this moderation. The trade union movement and the social democratic parties

---

[2] See Layard *et al.* (1993, Ch. 9), Nickell (1997), Nunziata (2002) and the survey by Flanagan (1999) for further evidence.
[3] Recent studies also suggest that centralized wage setting has a strong effect on wage compression (Wallerstein, 1999).

are assumed to have common ideological goals, and the union have more confidence that a SD government will implement such a redistribution policy, cf. Detken and Gärtner (1992, 1993). They also provide cross-country evidence that SD governments generate wage moderation. In Norway, the former LO leader Konrad Nordahl recommended a "moderation contract" where LO was willing to accept wage moderation in exchange for a future welfare state (Nordahl, 1945). In the Scandinavian countries, there are also a number of examples that a person is a union boss one day and a minister in a SD government the next (Rødseth and Holden, 1990, p. 238). Thus, in these countries, union leaders may also have personal advantages of having a SD government.

The present paper contributes to this literature by offering an empirical analysis of wage formation in Norwegian manufacturing. Most of the empirical evidence on the relationship between economic performance and political colour of the government cited above relies on cross-section time-series evidence from OECD-countries. While cross-country models are clearly valuable in producing evidence on this issue, these models also have some important shortcomings. First, the cross-country studies in most cases investigate the effect of political colour of the central government and degree of bargaining centralization on broad measures of macroeconomic performance like GDP-growth and price inflation. Since wage setting is the key mechanism in providing these relationships, a more direct and natural approach is to study the pure effect of these institutional features on wage development. Second, countries may differ in several circumstances other than wage bargaining system and political colour of the government, and to the extent that the level and changes over time in such features are not captured in

the model, it is a real possibility that the estimated effects are plagued with omitted variable bias. Examples are different development in economic open-ness and exposure to energy prices. Third, it is not always clear how to provide definitions of political colour of the government and degree of bargaining centralization which is meaningful and consistent across countries. Fourth, a usual assumption in cross country models is that the parameters in the estimated equations are constant across countries. While this restriction is often necessary to impose due to limited sample size in the time dimension in cross-country data sets, it is nevertheless rather unlikely to be fulfilled in reality.

An alternative approach to the multi-country analyses is to base the investigation on well-established and robust models of wage formation in a single country with stable bargaining institutions over time and extend these models with political variables. This is our empirical strategy in this paper, and the main issues will be to test whether or not Norwegian wages are affected by a change from a SD to a conservative central government, and whether or not wage responsiveness to unemployment depends on the colour of the central government.

Norway provides an interesting case with a fairly stable centralized bargaining regime throughout the whole post-WW-2 period, while other countries denoted as centralized wage setting countries such as Sweden which experienced a substantial decentralization in the 1980's, see Hibbs and Locking (2000) and Kahn (1998). Earlier evidence provided by Johansen and Strøm (1997) suggest that a SD government has a substantial wage

moderation effect in the manufacturing industry.[4] This evidence was based on a rather

short time period (annual data 1964 – 1991), with limited variation in key variables such

as wage growth and unemployment. Our present paper extends the time period

throughout the 1990's which make it possible to test the robustness of our earlier results

with respect to the inclusion of a period with relatively large swings in the unemployment

rate. As one objection to our story is that the ideology of the bigger political parties in

many countries seems quite similar and has approached each other through time, we test

whether the effect of having a SD government has been reduced over time.

Some multi-country analyses investigate how labour market institutions affect the degree

of wage responsiveness to unemployment. Layard *et al.* (1991, Ch. 9) and Nunziata

(2005) report results which indicate that the unemployment effect on wages increases

with the degree of centralization and coordination. One may argue that also the

importance of centralization for wage responsiveness depends on the political colour of

the government. A key innovation in the present paper will be to test whether or not wage

responsiveness to unemployment is higher under a SD government. Such an investigation

seems worthwhile for at least two reasons. First, if wage responsiveness to

unemployment is higher under a SD government, the output stability with respect to

exogenous shocks is higher under such governments than more conservative or center

governments. Second, such an interaction effect from SD-government may add to the

lower equilibrium unemployment already implied by the level effect on wages.

---

[4] The empirical results in that paper indicate that changing from a conservative to a SD central government
significantly reduces wage growth in the Norwegian manufacturing sector where LO has played a major
role, whereas we find no *direct* effect of changing central government in the private service sector, which is
less unionized and has a larger share of trade unions not affiliated to LO.

3. Data and empirical specification

In this study we use quarterly data from the national account statistics for the period 1968:1 to 2000:4 for manufacturing wages, product prices and productivity. The wage rate is defined by wage costs per hours worked whereas the product price is defined by the factor income deflator. Manufacturing productivity is defined by value added at constant factor prices divided by hours worked.

The modelling strategy will be to formulate a general equilibrium correction model for manufacturing wages, w_t, that serves as a starting point for testing and further simplification. The general version of the wage equation is based on previous empirical research on Norwegian wages using quarterly or annual data, and takes the form[5]

$$\Delta_4 w_t = \Delta_4 \mathbf{x} \boldsymbol{\beta} - \alpha \left(w - p - pr \right)_{t-4} + \gamma \left(cpi - p \right)_{t-4} + f\left(\mathbf{U} \right) + \delta STOP_t + \lambda SOC_t + const \quad (1)$$

The equilibrium correction term, $\left(w - p - pr \right)_{t-4}$, is the log of the wage share where p is the log of product prices and pr the log of labour productivity. The term $\left(cpi - p \right)_{t-4}$, is the log-transformed wedge between consumer prices, *cpi,* and producer prices. The long run level part of the model includes current and lagged values of the unemployment rate. The term $f\left(\mathbf{U} \right)$ contains both the log-transformed unemployment rate and the inverted square of unemployment taking possible non-linearities into account; cf. the results in

---

[5] See Bårdsen *et al.* (2004) and Nymoen (1989, 1991) for results using quarterly data and Johansen (1995, 1997) and Johansen and Strøm (1997) for results using annual time series.

Johansen (1995, 1997). The short-run part, $\Delta_4\mathbf{x}$, includes current and lagged annual growth rates of the two prices, productivity, the income tax rate and payroll taxes. Changes in normal working time, $\Delta_4 nh_t$, are included to control for short-run compensation effects of reduced normal hours, whereas the composite dummy variable, $STOP_t$, is included to control for the effects of the wage and price freeze 1978-79, and the wage law 1988-89. Finally, to test whether or not wage pressure is lower under a SD government, we include a dummy variable, SOC_t, equal to 1 if the SD party is in office and 0 otherwise. In all, there have been eight changes from a SD to conservative government, or from a conservative to a SD government during our sample period.[6]

The next section presents empirical results based on the general specification and parsimonious versions.[7] To test whether or not wage responsiveness to labour market conditions depends on the colour of the central government, we estimate versions of the wage equation expanded with an interaction term between the social democratic dummy variable, *SOC*, and the unemployment rate.

4. Empirical results

Basic results

We first estimated the unrestricted version of the wage equation. As shown in Table 1, the estimated short run effect of the SD dummy variable is -0.012 and statistically significant from zero whereas the long run estimate is -0.044.

---

[6] See Appendix A for detailed definitions and sources.
[7] Results based on alternative specifications are documented in Mydland (2004).

Detailed results for a parsimonious version of the general wage equation which only includes variables with statistically significant effects, are reported in Table 2, cf. Model 1. The model is a valid simplification as an F-test of 35 restrictions imposed to the general model is well below the critical value (p-value = 0.64). Also, the diagnostic test statistics indicate that the model is well specified.

The estimated short run effect of the SD dummy variable is -0.010 and highly significant with a t-value of 4.16. The derived long run effect based on the estimates in Model 1 is – 0.033 which means that permanently changing from a bourgeois to a SD government will reduce manufacturing wages by 3.3 percent. This effect is above the corresponding estimate in Johansen and Strøm (1997) who report a long run effect of 2.3 percent. Interestingly, when Model 1 is estimated using data for the period 1968:1 to 1991:4, the long run effect is 2.2 percent.

Our result is strictly opposite to the evidence for Greece presented in Alogoskofis and Phillipopoulos (1992) who estimate Phillips-curves augmented with the government variable. Their results indicate that wage growth is significantly higher under a socialist as compared with a conservative government, a finding which may be interpreted as support of the partisan theory, cf. Hibbs (1992).

Turning to the effects of economic variables we first note that most estimates are in accordance with previous empirical results for Norwegian wages, cf. Bårdsen *et al*. (2004), Johansen (1995, 1997) and Nymoen (1989, 1991).The estimate of the equilibrium

correction term, $w - p - pr$, is negative and statistically significant whereas the estimates of both log unemployment and the inverted square are significant from zero. These results imply that the Phillips curve is rejected, and the long run wage curve given by

$$w - p - pr = 0.208 \left(cpi - p \right) - 0.056u + 0.020U^{-2} - 0.033SOC + const \qquad (2)$$

is rather steep for low levels of unemployment. The long run part also contains a significant estimate of relative prices which means that the consumer price level affects the long run wage path while the long run elasticity of the product price is below unity.

The short run part of the model contains a significant effect of lagged wage changes which can be interpreted as nominal wage rigidity. The short run effects of product prices and productivity are small whereas the compensation effects of consumer price inflation and reduced working time are more substantial. Finally, we note a significant wage dampening effect of the income policy dummy, *STOP*, which may be an important control for identifying the partial effect of government type.

The next issue will be to test whether or not wage responsiveness to unemployment is affected by changing the colour of the central government. We therefore expand Model 1 with an interaction term between the SD dummy variable and the log-transformed

unemployment rate. The interaction term is given by $SOC_t \times \left(u_{t-3} - \overline{u} \right)$, where the term

within parenthesis is the deviation of log unemployment from the sample mean.[8]

Model 2 in Table 2 reports results for the expanded wage equation. The level effect of the

SD dummy variable is unaffected whereas the estimate of the interaction term is negative

and highly significant from zero.[9] The estimate of the interaction term is substantial, and

implies that the effect of log unemployment is more than two times as large under a SD

central government, than otherwise. This conclusion remains unchanged also when the

inverted square of unemployment is excluded.[10] Taken literally, this implies that the

economy's own ability to adjust to shocks is higher under SD-governments than under

more right wing or center governments.

The estimates of most economic variables are barely affected; the most important change

being the estimate of relative prices which can also be seen from the derived long run

solution given by

$$
\begin{aligned}
w - p - pr = 0.394 \left(cpi - p \right) - 0.042u + 0.027U^{-2} - 0.030SOC \\
- 0.055SOC \times \left(u - \overline{u} \right) + const
\end{aligned}
\tag{3}
$$

---

[8] We use deviation from sample mean of log unemployment to make comparison with the results for Model 1 easier.

[9] Strictly speaking, the estimate of *SOC* is unaffected when $u_{t-3} = \overline{u}$.

[10] The estimate of u_{t-3} = -0.013 and the estimate of $SOC_t \left(u_{t-3} - \overline{u} \right)$ = -0.014 when the inverted square is excluded.

13

Robustness of results

While the evidence so far clearly suggest that SD governments implies wage moderation, we now present several robustness checks on this conclusion. We ask whether the estimated effect may represent active income policy, other dimensions of government and investigate the stability of the relationship over time and across different definitions of the unemployment variable.

Active income policy

One potential mechanism behind the estimated effect of the SD dummy variable may be that it represents the effect of income policy since a SD central government is more likely to use an active income policy. Although the income policy dummy, *STOP*, control for such effect, we now investigate this issue in more details. We first estimate Model 2 without any control for income policy, i.e.: we exclude the *composite* dummy variable. Thereafter, we include twelve *separate* dummy variables for every quarter with any kind of active income policy. Somewhat surprisingly, Table 1 shows that the estimates of both SOC and the interaction term are almost entirely unaffected by this experiment. This evidence suggests that differences across government type in the propensity to use active income policies do not explain the relationship between wages and government type.

Stability over time

In order to investigate the stability of the estimated effects, we estimated Model 2 using data for the period 1968:1 - 1991:4. The results reported in Table 1 shows that the

estimated sub sample effects are marginally larger than the full sample estimates, but the differences are very small. Further evidence of stability of Model 2 over time is presented in Figure 1 and 2. Figure 2 shows that the equation standard error varies little and there are no obvious outliers. Moreover, the recursive Chow-statistics looks very comfortable. Figure 2 reports recursive estimates with $\pm$ 2 estimated standard errors of the equilibrium correction term, the unemployment variables, the SD dummy, and the interaction term. All of these estimates are reasonably stable, and the estimates of both SOC and the interaction term are always significantly below zero. Hence, our conclusions that having a SD central government both dampen wage pressure, and makes wages more responsive to unemployment, seems robust to changes in the estimation period. In Section 2 we discussed the possibility that the importance of having a SD central government has been reduced over time. Our empirical results, and particularly the tests of stability over time, suggest that this is not the case.

Alternative definitions of unemployment

So far we have used open unemployment as the key labour market tightness variable, neglecting any effect of active labour market policy. If expanding labour market programs has a wage dampening effect, and the SD central government is more likely to use active labour market policies, the estimates presented above may be biased due to excluded variables. In Model 3 we therefore include total unemployment, *UT,* instead of open unemployment, and expand the wage equation with the program participation rate, *LMP*. The results for Model 3 in Table 2 show that the estimates of total unemployment are close to the corresponding estimates of open unemployment. The short run effect of

the program participation rate is negative whereas the long run effect is positive, but statistically insignificant. Most important, the estimates of the SD dummy variable and the interaction term are both unaffected by the re-specification of the manufacturing wage equation.

Other characteristics of government

A possible criticism could be that the SD dummy variable acts as a proxy for government strength. If this interpretation is correct, other variables likely to reflect government strength should appear in the wage equation and eventually make the effect of the SD dummy variable small and insignificant. We therefore included a set of dummy variables representing minority/majority and coalition/non-coalition governments. However, these variables were far from having significant effects, and the estimates of both SOC and the interaction term, $SOC_t \times \left(u_{t-3} - \overline{u} \right)$, were almost entirely unaffected.[11]

5. Concluding comments

A neglected feature of countries with relatively centralized wage bargaining system is the close ties between the trade union movement and the SD political parties. The paper provides a study of the empirical relevance of this relationship for Norway and suggests that having a SD central government significantly reduces wage growth and makes wages more responsive to labour market conditions. We argue that these two findings are consistent with a wage bargaining model augmented by political preferences of union

---

[11] A test of the null hypothesis that all dummies for government strength were equal to zero returned at p-value of 0.85.

leaders and it suggest that the ability of bargaining coordination to offset the adverse affect of trade unions depends on the political regime.

The finding that political colour of the government affects the impact of unemployment on wages is of particular interest since it implies that that the economy's own ability to absorb short and medium run shocks is higher under a SD central government. Moreover, the combination of a downward level effect of SD governments and more wage flexibility suggest that such governments may generate lower equilibrium unemployment than right-wing governments.

Finally, the analysis provides fresh evidence on the stability in the relationship between wages and political colour of the government as it extends the data used in earlier published work with nearly a decade with unusual high variation in wage growth, inflation and unemployment. The results show that the relationship between wages and political colour of the government is remarkably robust with respect to this extension.

References

Alogoskoufis, G. S. and A. Phillipopoulos (1992): "Inflation, Expectations, Political Parties and the Exchange Rate Regime: Greece 1958-1989", *European Journal of Political Economy*, Vol. 8, 475-99

Alvarez, R. M., G. Garrett and P. Lange (1991):"Government Partisanship, Labor Organisation, and Macroeconomic Performance", *American Political Science Review*, Vol. 85, 539-56.

Beck, N., J. N. Katz, R. M. Alvarez, G. Garrett and P. Lange (1993): "Government Partisanship, Labor Organization, and Macroeconomic Performance: A Corrigendum", *The American Political Science Review,* Vol. 87, 945-48.

Barkbu, B. B., R. Nymoen and K. Røed (2003): "Wage Coordination and Unemployment Dynamics in Norway and Sweden", *Journal of Socio-Economics*, Vol. 32, 37-58.

Bruno, M. and J. Sachs (1985): *The Economics of Worldwide Stagflation.* Basil Blackwell, Oxford.

Bårdsen, G., Ø. Eitrheim, E. Jansen and R. Nymoen (2004): *The Econometrics of Macroeconomic Modelling*. Oxford University Press, Oxford.

Calmfors, L. and J. Driffill (1988): "Bargaining Structure, Corporatism and Macroeconomic Performance" *Economic Policy*, Vol. 3, 13-61.

Detken, C. and M. Gärtner (1992): "Governments, Trade Unions and the Macroeconomy: An Expository Analysis of the Political Business Cycle", *Public Choice,* Vol. 73, 37-53.

Detken, C. and M. Gärtner (1993): "Are German Unions Rocking the Economy? A Reappraisal of the Supply-side Political Business Cycle", *Applied Economics,* Vol. 25, 1345-53.

Flanagan (1999): "Macroeconomic Performance and Collective Bargaining: An International Perspective", *Journal of Economic Literature,* Vol. 37, 1150-75.

Garrett, G. (1998): *Partisan Politics in the Global Economy.* Cambridge University Press, Cambridge.

Garrett, G. and P. Lange (1986): "Performance in a Hostile World: Economic Growth in Capitalist Democracies, 1974-1982", *World Politics,* Vol. 38, 517-45.

Garrett, G. and P. Lange (1989): "Government Partisanship and Economic Performance: When and How does "Who Governs" Matter?", *The Journal of Politics*, Vol. 51, 676-693.

Hibbs, D. A. (1992): "Partisan Theory after Fifteen Years", *European Journal of Political Economy*, Vol 8, 361 – 73.

Hibbs, D. A. and H. Locking (2000): "Wage Dispersion and Productive Efficiency: Evidence for Sweden", *Journal of Labor Economics*, Vol. 18, 755-82.

Johansen, K. (1995): "Norwegian Wage Curves", *Oxford Bulletin of Economics and Statistics*, Vol. 57, 229-47.

Johansen, K. (1997): "The Wage Curve: Convexity, Kinks and Composition effects", *Applied Economics,* Vol. 29, 71-78.

Johansen, K. and B. Strøm (1997): "Wages, Prices and Politics: Evidence from Norway", *Oxford Bulletin of Economics and Statistics,* Vol. 59, 511-522.

Lange, P. and G. Garrett (1985): "The Politics of Growth: Strategic Interaction and Economic Performance in Advanced industrial Democracies 1974-1980", *The Journal of Politics*, Vol. 47, 792-827.

Lange, P. and G. Garrett (1987): "The Politics of Growth Reconsidered", *The Journal of Politics,* Vol. 49, 257-74.

Layard, R., S. Nickell and R. Jackman (1991): *Unemployment. Macroeconomic Performance and the Labour Market*. Oxford University Press, Oxford.

Mares, I. (2004): "Wage Bargaining in the Presence of Social Services and Transfers", *World Politics,* Vol. 57, 99-142.

McCallum, J. (1983): "Inflation and Social Consensus in the Seventies", *Economic Journal*, Vol. 93, 784-805.

Moene, K. O., M. Wallerstein and M. Hoel (1993): "Bargaining Structure and Economic Performance", in Flanagan, R. J., K. O. Moene and M. Wallerstein (Eds.), *Trade Union Behaviour and Economic Performance*. Oxford University Press, Oxford.

Mydland, Ø. (2004): *Lønnsdanning og regjeringstype: En empirisk av norsk konkurranseutsatt sektor (Wage formation and government type: An empirical analysis of the Norwegian traded sector).* Master thesis, Department of Economics, Norwegian University of Science and Technology, Trondheim.

Nickell, S. (1997): "Unemployment and Labour Market Rigidities: Europe versus North America", *Journal of Economic Perspectives,* Vol. 11, No. 3 (Summer), 55-57.

Nordahl, K. (1945): "Fagorganisasjonen og lønnspolitikken" (The trade union and the wage policy). Published by Arbeidernes Opplysningsforbund, Oslo.

Nunziata, L. (2005): "Institutions and Wage Determination: A Multi-Country Approach", Oxford Bulletin of Economics and Statistics, Vol. 67, 435 – 66.

Nunziata, L. (2002): "Unemployment, Labour Market Institutions and Shocks", unpublished paper, Nuffield College, University of Oxford.

Nymoen, R. (1989): "Modelling Wages in the Small Open Economy: An Error Correction Model of Manufacturing Wages", *Oxford Bulletin of Economics and Statistics*, Vol. 51, 239-58.

Nymoen, R. (1991): "A Small Linear Model of Wage- and Price-inflation in the Norwegian Economy", *Journal of Applied Econometrics*, Vol. 6, 255-69.

Padovano, F. and E. Galli (2003): "Corporatism, Policies and Growth", *Economics of Governance,* Vol. 4, 245-260.

Rødseth, A. and S. Holden (1990): "Wage Formation in Norway", in Calmfors, L. (Ed.), *Wage Formation and Macroeconomic Politics in the Nordic Countries,* Oxford University Press, Oxford.

Tarantelli, E. (1983): "The Regulation of Inflation in and Unemployment", *Industrial Relations,* Vol. 25, 1-15.

Wallerstein, M. (1999): "Wage-setting Institutions and Pay Inequality in Advanced Industrial Societies", *American Journal of Political Science*, Vol. 43 (3), 649-80.

Appendix A: Data definitions and sources

All economic data are taken from RIMINI, the quarterly model used in Norges Bank (The Central Bank of Norway). The data are seasonally unadjusted.

W = wage cost per hour in the manufacturing industry.

P = factor income deflator for the manufacturing industry.

PR = labour productivity in the manufacturing industry. Computed as value added at constant prices per hour worked.

CPI= consumer price index.

NH = normal working time

U = open unemployment rate. Computed as the number of openly unemployed divided by the labour force.

UT = total unemployment rate. Computed as the number of openly unemployed pluss participants on labour market programmes divided by labour force.

LMP = participation rate. Computed as the number of participants on labour market programmes divided by total unemployment.

STOP = composite dummy variable for wage freeze and wage regulation law. Equal to 1 in 1979:1 – 1979:4, 1988:1 – 1988:4, 0.5 in 1989:1 – 1989:4, and 0 otherwise.

SOC = dummy variable equal to 1 when there is a social democratic government, 0 otherwise. The dummy variable is equal to 1 1971:2 – 1972:3, 1973:4 – 1981:3, 1986:3 – 1989:3, 1996:4 – 1997:3, 2000:2 – 2000:4.

Table 1: Estimated effects of SOC and $SOC \times \left(u_{t-3} - \bar{u} \right)$

Model	SOC	$SOC \times \left(u_{t-3} - \bar{u} \right)$
Maintained	-0.012 (3.35)	-
Model 1	-0.010 (4.16)	-
Model 2	-0.010 (4.54)	-0.018 (4.93)
Model 2 without income policy dummies	-0.012 (5.37)	-0.017 (4.41)
Model 2 with 12 separate income policy dummies	-0.011 (5.10)	-0.017 (4.93)
Model 2 1968:1 – 1991:4	-0.013 (3.70)	-0.023 (4.78)
Model 3 (total unemployment and program participation rate)	-0.010 (4.47)	-0.017 (4.51)

Notes: Estimation period is 1968:1 – 2000:4 unless otherwise noted. T-statistics are reported in parentheses.

Table 2: Detailed results 1968:1 – 2000:4

Variable	Model 1	Model 2	Model 3
$\Delta_4 w_{t-1}$	0.315 (6.04)	0.244 (4.90)	0.228 (4.36)
$\Delta_4 p_t$	0.107 (2.73)	0.077 (2.10)	0.093 (2.48)
$\Delta_4 pr_t$	0.114 (2.84)	0.137 (3.71)	0.158 (3.87)
$\Delta_4 pr_{t-4}$	-0.114 (2.88)	-0.122 (3.40)	-0.125 (3.29)
$\Delta_4 cpi_{t-1}$	0.385 (7.26)	0.259 (7.37)	0.345 (6.93)
$\Delta_4 nh_t$	-0.684 (7.26)	-0.759 (8.69)	-0.721 (8.15)
$\left(w-p-pr\right)_{t-4}$	-0.302 (9.04)	-0.330 (10.62)	-0.348 (9.51)
$\left(cpi-p\right)_{t-4}$	0.063 (1.88)	0.130 (3.86)	0.124 (2.83)
u_{t-3}	-0.017 (4.70)	-0.014 (4.07)	
U_{t-1}^{-2}	0.006 (2.80)	0.009 (4.29)	
ut_{t-3}			-0.016 (3.68)
UT_{t-1}^{-2}			0.012 (2.76)
Δlmp_t			-0.010 (1.77)
Δlmp_{t-1}			-0.008 (1.62)
lmp_{t-3}			0.008 (1.55)
$STOP_t$	-0.018 (3.65)	-0.019 (4.25)	-0.021 (4.17)
SOC_t	-0.010 (4.16)	-0.010 (4.52)	-0.010 (4.47)
$SOC_t \times \left(u_{t-3}-\bar{u}\right)$		-0.018 (4.93)	
$SOC \times \left(ut_{t-3}-\overline{ut}\right)$			-0.017 (4.51)
Diagnostics:			
σ	0.0123	0.0113	0.0114
Restr	F(35,78)=0.89 [0.64]	-	-
AR 1-5	F(5,112)=2.84 [0.02]	F(5,111)=1.85 [0.11]	F(5,108)=2.16 [0.06]
Normality	$\chi^2(2)$=1.09 [0.58]	$\chi^2(2)$=3.04 [0.22]	$\chi^2(2)$=0.67 [0.71]
Heteroscedastisity	F(25,91)=1.42 [0.11]	F(27,88)=1.34 [0.16]	F(33,79)=1.16 [0.59]

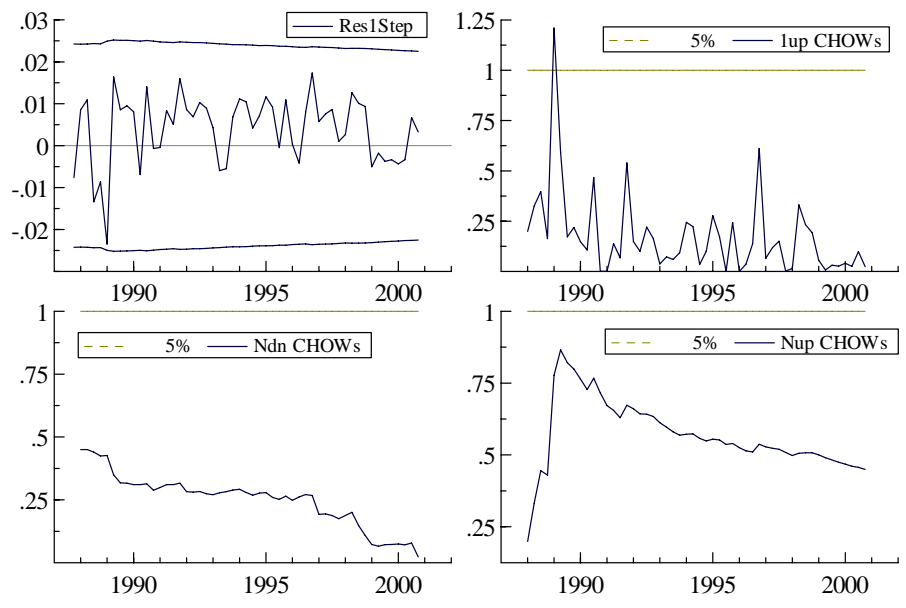Notes: Estimates with t-statistics in parentheses.

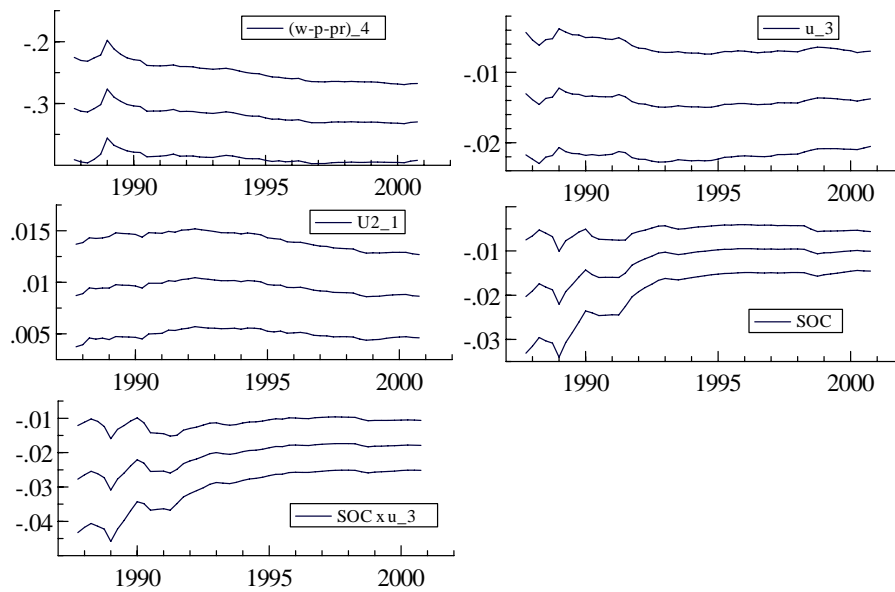**Figure 1: Recursive constancy statistics, Model 2**

Figure 2: Recursively estimated coefficient with +/- 2 estimated standard errors, Model 2