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Higher Economic Growth through Macroeconomic Policy Coordination? The Combination of Wage Policy and Monetary Policy

by Klaus-Jürgen Gern, Carsten-Patrick Meier and Joachim Scheide

CONTENTS

- Strengthening potential output is high on the agenda for economic policy in the European Union. While there is widespread agreement that structural policies have a positive impact on long-term growth, there is a controversial discussion whether coordination of macroeconomic policies can contribute to this goal. Against the background of the new economic conditions in the euro area, we analyze what could be gained from a combination of wage policy and monetary policy.
- Using a small theoretical macroeconomic model, we show that coordination between wage policy and monetary policy can be beneficial under certain assumptions. A policy of sustained wage moderation results in an increase in employment and potential output. Assuming that expectations are not completely forward-looking and prices are sticky, the upward shift in potential output will not be matched by a similar increase in aggregate demand. To prevent an output gap from emerging, the optimal monetary policy is to lower interest rates. However, a central bank aiming at price stability will only do so when the announcement of a policy of sustained wage moderation is credible.
- Simulations with a large macroeconometric multi-country model confirm that a coordination of German wage policy and ECB monetary policy would help to realize the beneficial effects of wage moderation somewhat faster, although the quantitative effect is relatively small. The long-run gain in employment would accrue regardless of a coordination with monetary policy. According to the simulations, employment in Germany would increase by about 750,000 persons in the long run if wages increase one percentage point slower than usual over a period of five years.
- Frequently, countries with a particularly positive economic development are said to have benefited from a coordination of macroeconomic policies. However, only a small part of the growth and employment success in these countries can be accounted for such a coordination. In the case of the United States, it is hard to see any evidence of ex ante policy coordination at all. In the Netherlands and in Ireland, a consensual strategy of wage restraint for improving the competitiveness of the economy and stimulating employment has been a significant factor of the economic success. It was important in both cases that significant supply side reforms were implemented by the governments at the same time, whereas monetary policy played no active role.
- Coordination of macro policies is severely complicated by the pronounced differences in national wage bargaining systems. The systems would have to be harmonized and centralized to create a single European wage policy. It is, however, unlikely that centrally designed harmonization of labor market institutions in the EU can cope with the differences across Euroland regarding productivity and employment.
- In the framework of the European Union, the presumed positive effects of policy coordination are stressed over and over again, for example in the Broad Economic Policy Guidelines. However, clear definitions and mechanisms how such a coordination can be achieved are missing. The fundamental difficulty concerning a coordination between wage policy and monetary policy arises from two facts: First, there is no such thing as “the” wage policy at the European level. Second, the statute of the ECB does not allow a binding commitment by the central bank.
- This does not mean, however, that the ECB would not take account of what is happening, for example, to wage developments. According to the monetary policy strategy, it should react if there is an increase in the growth rate of potential output as a result of wage moderation. For example: If the social partners in a large country such as Germany give a credible signal that wage increases will be moderate for several years, the ECB could accommodate this change. However, such a strategy cannot be reversed in that the ECB moves first hoping that wage moderation will follow.

Contents

This paper summarizes the results of the research project "Möglichkeiten zur Stärkung des Potentialwachstums durch den Einsatz makroökonomischer Instrumente" commissioned by the German Federal Ministry of Finance.

1 What Does Coordination Mean?

Strengthening potential output growth is high on the agenda for economic policy in the European Union. In the economic literature there is, of course, a dispute on how this target of high growth may be achieved. The discussion whether a coordination of macroeconomic policies can contribute to higher growth of potential output is subject of the present paper. We explore the possibilities against the background of the new economic setup in the euro area: While there is a single monetary policy, other areas of economic policy are left to policy makers at the national level. There is a large amount of statements stressing coordination in the EU, such as in the Broad Economic Policy Guidelines (BEPG).[1] Our focus is on wage developments on the one hand and monetary policy on the other. In this context, we sometimes refer to "wage policy," a term which is commonly used in Germany but not in many other countries.

Given this framework, a few other preliminary remarks may be necessary at the outset. First of all, we focus on potential output growth. This means that we do not discuss issues of short-term macroeconomic stabilization policies in the context of coordination although our results will have implications for such questions as well. Furthermore, while there is a large variety of definitions for potential output or related measures,[2] we define this variable as " ... the sustainable aggregate supply capabilities of an economy, as determined by the structure of production, the state of technology and the available inputs" (ECB 2000a: 37). This is a generally accepted economic interpretation, as opposed to definitions of capacity output in a technical sense. By using the term "sustainable," this definition expresses the condition that an acceleration of inflation is excluded. For example, in most models an expansionary monetary policy typically leads to higher investment; the consequent increase of the capital stock, however, is not sustainable as this policy leads to more inflation. Finally, our paper takes as given that many measures of structural policies which raise the efficiency and the flexibility in a market economy have a positive impact on potential output. This applies also to fiscal policy which can contribute to higher potential output by cutting taxes and cutting unproductive government expenditures.

Given these preliminaries, the paper is organized as follows. In Section 2, we start to discuss the coordination issue in a simple theoretical macroeconomic model which covers both the demand side and the supply side of the economy and in which the effects of macro policies are demonstrated in benchmark simulations. The model is then used to discuss the changes of important variables if the policy measures are not taken individually but are coordinated. In particular, we interpret wage moderation as a posItive supply shock. In the next step, we look at the effects on output if monetary policy responds to this shock in an ideal fashion, i.e., we assume that the central bank has full knowledge about the size and the nature of this shock. The quantitative effects of wage moderation are then estimated on the basis of a large macroeconometric model (NiGEM). Here, too, we analyze the effects of the wage shock in Germany combined with alternative strategies for monetary policy in the euro area.

These simulations are supplemented by an analysis of the experience of other countries in Section 3. The examples of the United States, the Netherlands and Ireland are chosen because these countries have experienced a very good performance in recent years. In particular, we discuss whether this success in terms of higher potential output growth was due to macroeconomic policy coordination. In Section 4, we explore the possibilities of macroeconomic policy coordination within the framework of the European Union. As monetary policy plays an im-

1 The BEPG are updated annually. For 2002, see European Commission (2002a).

2 In the literature, concepts of equilibrium output, natural output, normal output, trend output etc. are often used interchangeably although they may have different meanings and policy implications. The same holds for definitions related to unemployment (natural, equilibrium, NAIRU etc.).

portant role for such an analysis, we discuss whether the European Central Bank (ECB) could be included in such a process. As far as wages are concerned, it seems important to discuss whether a coordination of wage developments on the European level is realistic; in this context we describe the different institutional arrangements of wage setting in individual countries. A brief summary of the findings is given in Section 5 where we draw some conclusions for economic policy.

2 The Effects of Macroeconomic Policy Coordination

There is a widespread consensus that potential output is determined by structural factors. Among these the most important are the institutional framework, technological progress and factor inputs. The former two factors can raise potential output growth by increasing efficiency. Technological progress is especially dependent on the formation of human capital and an environment which is conducive to innovations. As far as labor and capital inputs are concerned, sufficient incentives to work and the profitability of investment are essential.

Macroeconomic instruments can contribute to a stronger growth of potential output in various ways. The main contribution of monetary policy is to maintain price level stability and to reduce the fluctuations of inflation. Monetary policy alone cannot raise potential output. In fact, a sustained expansionary monetary policy would be counterproductive, as it would lead to higher inflation which distorts the resource allocation via prices. In contrast, fiscal policy can stimulate potential output growth by lowering taxes and duties on factor incomes and cutting subsidies in order to reduce distortions of private decisions and thus increase overall efficiency. However, these measures are normally not regarded as macroeconomic policies since they are intended to change behavior at the microeconomic level. Short-run variations of the structural budget deficit, which are usually regarded as the macroeconomic part of fiscal policy, will affect long-run economic growth. Fiscal policy should therefore not try to fine-tune the economy.

Given the high number of unemployed in Germany and in the euro area, there is, however, scope for wage policy – possibly combined with structural reforms on the labor market and a move to more wage differentiation – to increase potential output growth. A policy of wage moderation which would imply that real wages grow less than labor productivity for an extended period of time would result in higher labor demand and consequently higher labor input in aggregate production and an upward shift in potential output.

However, it may be the case that this increase in potential output is initially not matched by an increase of demand by the same amount. In such a situation, a negative output gap would arise and inflation would fall below the target of the central bank. Central bank intervention could prevent this. By lowering interest rates, monetary policy could raise aggregate demand to the level of aggregate supply and thus stabilize GDP and inflation. What makes such a reaction difficult for the central bank, however, is that an increase of potential output cannot be observed directly. It usually becomes apparent in the macroeconomic data only after a substantial period of time.

Here coordination between macroeconomic policies comes into play. Social partners could bridge the information gap of the central bank, in that they make clear that they have embarked on a policy of sustained wage moderation. If such a statement is credible, the monetary authorities can infer from it that potential output will rise in the future and can act accordingly, which may include lowering interest rates even before the increase is observed. Credibility of the announcement is, however, important. Monetary authorities will only be inclined to lower interest rates if they can be sufficiently confident that an upward shift in potential output has in fact occurred. If the announcement of the social

partners is not credible, the central bank will take a wait-and-see attitude and react only when the shift in potential output can be observed in the data. In this case, the economy experiences more macroeconomic instability than with a credible announcement. Coordination between wage policy and monetary policy, in this view, implies a credible announcement of wage policy regarding its future course.

2.1 Policy Coordination in a Small Theoretical Model

To illustrate this idea of macroeconomic coordination, we use a small dynamic macro model. The closed-economy model consists of an equation for aggregate demand, an equation for price adjustment dynamics in the goods market, a condition of equilibrium for the money market and an equation for production potential. The model is formulated in discrete time and is denoted by the following equations:

(1) Aggregate demand:
$$y_t = \alpha(i - \Delta p_t)$$

(2) Production potential:
$$x_t = A + \omega x_{t-1}$$

(3) Price adjustment hypothesis:
$$p_t = \beta(y_t - x_t) + \sum_{i=1}^{n}, \kappa_i p_{t-i}$$

(4) Money market equilibrium:
$$m_t - p_t = y_t - \gamma i_t .$$

The variables are denoted as follows: *y*: aggregate demand, *x*: production potential, *i*: nominal interest rate, *p*: aggregate price level, *m*: nominal money supply. α, β, ω, κ, γ, A are parameters. With the exception of the nominal interest rate *i*, lower-case Latin letters represent the natural logarithms of the macroeconomic variables.

Equation (1) describes aggregate demand for goods as depending on the real interest rate, $i_t - \Delta p_t$. Real interest rates affect aggregate demand via private investment activity and the income effect, but it is also conceivable that private consumption of durable consumer goods is influenced by the real rate of interest. Potential output, x_t, given in (2), is assumed to be influenced predominantly by factors which do not depend on cyclical dynamics and are consequently regarded as exogenous in this model. These are summarized for simplicity in *A*. In the numeric simulations for the economic model implemented in the following section, A is treated as a shock variable, representing changes in the determinants of production potential, triggered for example by wage and labor market policy measures. The model assumes that changes in potential output do not occur instantaneously; instead, it takes several periods before the shocks exert their full effect on production potential.

In (3) the assumptions of the model with regard to the dynamics of price adjustment on the goods market are formalized. The equation indicates that the aggregate price level, p_t, depends positively $(\beta > 0)$ on the difference between aggregate demand for goods, y_t, and aggregate supply of goods, x_t, that is on the output gap, $y_t - x_t$. By including lags the equation accounts for the fact that, in reality, price adjustments are usually serially correlated due to longer-term contracts.

Money market equilibrium is represented by (4). The supply of money, m_t, deflated with an aggregate price level and exogenously given by the domestic central bank, equals the demand for money which depends on aggregate demand for goods and the nominal interest rate, i_t. While this dependence of the demand for money on income encapsulates the transactions motive, the domestic rate of interest reflects the opportunity costs of holding cash. Consequently, $\gamma > 0$ applies.

Policy Rules for the Reaction of Monetary Policy to an Upward Shift of Potential Output

To analyze the potential benefits of macroeconomic coordination, the model is simulated under alternative assumptions regarding the reaction of monetary policy. Starting point in all simulation exercises is a given exogenous shock

on production potential, caused by wage and labor market policies which increase efficiency.[3] This is represented by a permanent increase in the size of A, which, with some delay, affects actual production potential x_t. The central bank now reacts to this shift in potential output by following different rules for the money supply.

Under the first rule, monetary policy does not react to the supply shock at all:

$$(5) \qquad m_t = \overline{m}, \quad \forall t.$$

The central bank does not consider the supply disturbance in its decisions and thus keeps the money supply constant in all periods t.

Under the second rule, the money supply is linked directly to potential output, that is[4]

$$(6) \qquad m_t = x_t .$$

In this case, the central bank reacts immediately to the supply shock with a proportional expansion of money supply. This, of course, requires the bank to have information on the upward shift of potential output. Since the latter is not observable, the only way the bank can get it is from a credible announcement of the wage policy authorities. So in a way, (6) represents the "full coordination" case.

Finally, we analyze an intermediate case, where money supply is increased in proportion to potential output, but only with a substantial delay of k periods:

$$(7) \qquad m_t = x_{t-k}, \qquad k \geq 1 .$$

The delay arises from the fact that the central bank only acts after information on increased potential output appears in the data. The delay will be influenced by the degree of credibility of the announcement of the wage policy authorities. The lower the credibility, the longer will the central bank wait in order to see data that convinces it that wage policy is in fact moderate and the upward shift in potential output can be expected.

Results of the Model Analysis

The results of the dynamic simulations are presented in Figure 1.[5] The upper part shows the reaction of the output gap under alternative monetary rules. It is largest when money supply is not adapted to higher potential output. In this case, there is at first no stimulus to demand, so a relative large negative output gap arises. With some delay prices then start to fall and inflation falls below the central bank's target level (lower part of Figure 1). The fall in the price level increases real money supply and thus lowers the interest rate. As the interest rate decreases, aggregate demand rises and the output gap diminishes. Eventually, the new equilibrium is reached where inflation is on target and the output gap is closed.

In the case the central bank reacts immediately to the change in potential output by raising the money supply by the same magnitude, interest rates fall immediately. Aggregate demand is thus increased and as a result the output gap is far smaller and inflation deviates less from the central bank's target than in the first scenario.

In the intermediate case, where the central bank waits for k periods – for the simulation we assumed $k = 4$ – the output gap first falls for the first k periods as strongly as under the first scenario. Then the monetary authorities increase the money supply, the interest rate falls and aggregate demand starts increasing. So from that point onwards, the absolute output gap is smaller than under the first scenario and converges even faster to equilibrium than under the second scenario. The reason is that in addition to the increase in nominal money supply engineered by the central bank, interest rates fall even more than in the second scenario by the fall in the price level and the ensuing increase in the real money supply.

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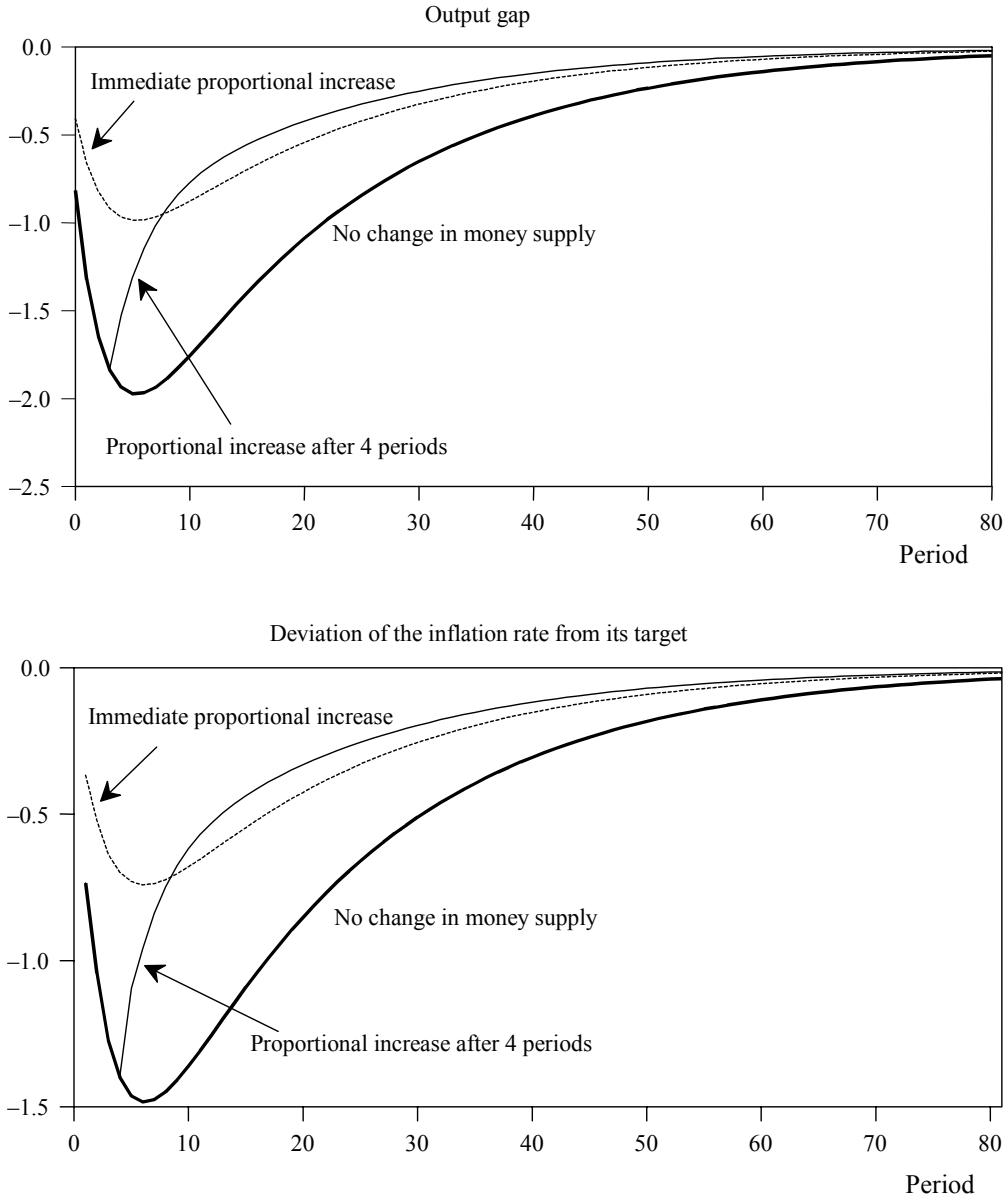
3 The cause of the increase in production potential is irrelevant for the further analysis. The increase could also be caused by a favorable fiscal policy or other exogenous factors.

4 In reality, the trend change of velocity and the central bank's target rate of inflation should also be taken into account when formulating a money supply rule. For the sake of simplicity, this model assumes a constant value of 1 for velocity and a value of 0 for the target rate of inflation.

5 The following parameterization was used for the model simulations: $\alpha = -0.5$; $\beta = 0.2$; $\gamma = 0.5$; $\kappa_1 = 0.8$; $\kappa_2 = 0.2$; $\omega = 0.8$.

Figure 1: Effect of an Increase of Production Potential on the Output Gap and Inflation under Alternative Rules for Money Supply



2.2 The Quantitative Impact of Coordinating Wage and Monetary Policies – Simulations with a Macroeconometric Model

The previous section clarified the potential for coordinating wage policy and monetary policy. The results, however, were deduced from a very simplified theoretical model. No conclusions can be drawn for the realistic, anticipated magnitude of the effects of the different policy scenarios, although this is required for a comprehensive evaluation of the scenarios. Consequently, in the present section, the analytical apparatus has been changed. Instead of using a small theoretical model, we will investigate the effects of coordinating wage and monetary policies as part of a detailed macroeconometric model whose estimated parameters are based on empirical data, the NiGEM model. The advantage of this model's realistic nature comes with the disadvantage of having less transparency and that results are strongly influenced by the

model's theoretical "philosophy," which is not completely identical to the theoretical analysis in the previous section in all cases.

The NiGEM model was developed by the National Institute of Economic and Social Research (NIESR). The following will first provide a short presentation of the model and clarify the parts of the model relevant for the simulations. After that the results of a policy of sustained wage moderation in Germany for GDP growth, employment and other variables will be presented for the both cases of coordination and no coordination between wage policy and monetary policy.

2.2.1 The NiGEM Model

The NiGEM model is a comprehensive structural macroeconometric model of the world economy. It consists of interlinked submodels for all important industrial countries or regions – including Germany and the euro area – and for a number of emerging markets and developing countries, each with a complete demand and supply side. In the current version there are about 3,000 equations (NIESR 2001).

The macroeconomic philosophy of the model follows the new-Keynesian approach, which has emerged as a consensus of the academic debate in the past years (Clarida et al. 1999) and on which the theoretical model is also based. A crucial characteristic of this approach is that prices only have a delayed reaction to exogenous changes. Economic agents have rational (model-consistent) expectations (Barrell et al. 1993).[6]

Determining GDP: The Demand Side of the Model

The NiGEM model follows standard practice in modeling aggregate demand in the respective national economies, along the lines of the national accounts. The starting point is the identity equation according to which gross domestic product is the result of private consumption expenditure, government consumption, investment, stock building and net trade in goods and services (exports less imports).

Government consumption is fixed exogenously by fiscal policy. For each of the remaining demand components there is a stochastic behavioral equation. In the model, private consumption is determined by real disposable income of private households, short-term interest rates (3 months), consumer prices and the aggregate assets of private households. Investment is determined by the capital stock and the costs of capital utilization, whereby separate functions are estimated for housing investment and other investments. For stock building, a dependency on the short-term interest rate, on consumer prices and on gross domestic product is assumed. Imports are linked to domestic final demand and the price competitiveness of the domestic economy, exports are linked to import demand in the trading partner country and price competitiveness. The price competitiveness is derived from effective, country-specific exchange rates which are based on the regional foreign trade structure of the respective country. In general, NiGEM models foreign trade integration among the individual countries in great detail in order to guarantee the most precise picture of international business cycle transmissions. However, since this aspect is of lesser importance for our investigation, it will not be the subject of further examination.

Production Potential

In NiGEM, production potential is represented by a macroeconomic production function with constant elasticity of substitution (CES func-

6 NiGEM is regularly used by the National Institute for producing quarterly forecasts of the world economy. In addition, the model can be used to simulate the effects of various exogenous shocks, such as changes in the exchange rate or the price of raw materials as well as monetary and fiscal policy measures or other economic policy shocks. Since all countries in the euro area are represented, NiGEM is one of the few macroeconometric models which allows monetary policy issues and macroeconomic coordination within the euro area to be quantitatively examined. Barrell and Whitley (1992) used the model to analyze the issue of policy coordination in connection with the European Currency System, Barrell et al. (1993) investigated the impact of Maastricht criteria on employment and interest rates in Europe and Barrell and Pain (1996) used the model to simulate how the European Monetary Union affect employment. Also see Barrell, Morgan and Pain (1996), Barrell and Sefton (1995) and Barrell, Pain and Sefton (1996).

tion). Production factors are labor and capital. The production function shows constant returns to scale. Labor-augmenting technical progress (represented by λ) assumed, this function can be written as:

$$(8) \qquad Y = \gamma\left[\delta K^{-\rho} + (1-\delta)\left(L e^{\lambda t}\right)^{-\rho}\right]^{-\frac{1}{\rho}},$$

where K and L stand for production factors capital and labor (measured in hours per employee), γ and δ are the scale parameters of the production function and the elasticity of substitution is $\sigma = 1/(1+\rho)$. For $\rho = 0$, the constant elasticity of substitution is 1 and it represents a Cobb–Douglas production function.

Production potential X results from the production function (8) if its potential value L^* is used for labor input. The latter is defined as

$$(9) \qquad L^* = E(1-U^*)H^*,$$

where E stands for the number of employees, H^* for the potential or equilibrium number of hours per employee and U^* for the "natural" level of unemployment. Potential labor input is derived as a product of potential employment (calculated as the number of employees less natural unemployment) and the equilibrium number of working hours per employee. The latter is assumed to be decreasing exogenously at a declining rate.

The Labor Market

The labor market, which also determines the natural level of unemployment, is represented in NiGEM as follows. Demand for labor is determined in a profit-maximizing representative firm, which demands labor services until the marginal product of labor corresponds to the real wage. Formally, the labor demand function is derived by differentiating the production function (8) with respect to labor, the result (the marginal product of labor) is equated with the real wage and this expression is solved for L (logarithmic representation):

$$(10) \qquad \ln\frac{L}{Y} = \alpha - \sigma \ln\frac{W}{P} - (1-\sigma)\lambda t,$$

where W/P stands for real employee remuneration per hour.[7] Accordingly, aggregate economic demand for labor is a negative function of real wages and the rate of (labor-augmenting) technical progress.

Nominal wages are determined as part of a negotiation process between unions and employer representatives. The magnitude of the wage increase depends on the relative negotiating power of the unions, which again depends on the cyclical situation, labor productivity, the level of unemployment and the expectations concerning future inflation. From an ex post perspective, the real wage is, therefore, the higher, the higher the level of labor productivity and the smaller the level of unemployment, that is

$$(11) \qquad \ln\frac{W}{P} = \mu + \ln\frac{Y}{L} - \beta U\ .$$

The demand for labor function and the wage settlement function together produce a natural rate of unemployment, U^*: When (11) is substituted for (10) and then solved for the rate of unemployment, one is left with the following expression:

$$(12) \qquad U^* = \frac{1}{\beta}\left[\frac{\sigma-1}{\sigma}\left(\frac{Y}{L} - \lambda t\right) - \frac{\alpha}{\sigma} + \mu\right].$$

In the special case, where $\sigma = 1$, the constant parameters of the labor demand function and the wage settlement function alone determine the natural rate of unemployment. In general cases, where $\sigma \neq 1$, labor productivity, the rate of technical advancement and substitution elasticity also play a role.

Prices

In the NiGEM model, consumer price levels are determined by import prices, production costs and a profit markup, which depends on the degree of capacity utilization. Production costs are a function of wage costs per employee and of capital utilization costs. The latter is calculated

7 In NiGEM, wages are regarded as net wages less employer contributions to social security, that is employer remuneration.

from the long-term real interest rate, adjusted for the effects of taxation.

Monetary Policy Rules

Interest rates are determined as part of monetary policy. In the NiGEM model, changes in the rate of interest have – as in the theoretical model above – effects on aggregate demand, both via the real-balance effect and via the exchange rate: A cut in interest rates results in a temporary real depreciation of the domestic currency and, thereby, improves the price competitiveness of domestic manufacturers.

The model facilitates the simulation of a number of rules for the ECB. These rules determine which target variables the central bank is aiming at with its interest rate policy, in order to attain a long-term stabilization of price levels or of interest rates. In addition they establish by how much the interest rate should be changed when the target variable deviates from its target path by a particular magnitude. Typical target variables are the money supply, which except for changes in velocity should increase at the same rate as nominal GDP, or the rate of inflation. A typical, implicit rule for the money supply would be:

$$(13) \qquad r_t = \gamma_1\left[\ln(P_t Y_t) - \ln(\overline{P}_t \overline{Y}_t)\right],$$

where a bar indicates a target value. According to this rule, the rate of interest is changed when the nominal GDP deviates from its target value. A rule for inflation targeting may be formulated as follows:

$$(14) \qquad r_t = \gamma_2\left(\Delta \ln P_t - \Delta \ln \overline{P}_t\right),$$

with Δ as an indicator for the rate of change against the previous period.

The two-pillar strategy of the ECB can be interpreted as a combination of a money supply target and inflation targeting. In the NiGEM model this strategy is implemented through a combination of (13) and (14), i.e.

$$(15) \qquad r_t = \gamma_1\left[\ln(P_t Y_t) - \ln(\overline{P}_t \overline{Y}_t)\right] + \gamma_2\left(\Delta \ln P_t - \Delta \ln \overline{P}_t\right),$$

or

$$(15a) \qquad r_t = \gamma_{11}\left(\ln P_t - \ln \overline{P}_t\right) + \gamma_{12}\left(\ln Y_t - \ln \overline{Y}_t\right) + \gamma_2\left(\Delta \ln P_t - \Delta \ln \overline{P}_t\right),$$

where for a nominal GDP target $\gamma_{11} = \gamma_{12}$ applies. The consumer price index is used to measure the price level empirically.

2.2.2 Estimating the Effects of Coordination between Wage Policy and Monetary Policy

The aim of the simulation[8] is to estimate how large the effects of a policy of wage moderation in Germany might be on real GDP, employment and inflation in Germany given different degrees of coordination between wage policy and ECB monetary policy. In the model, a policy of wage moderation is represented by a change in the behavior of trade unions and employer representatives over a particular period of time. Specifically, it is assumed that as a result of the change in wage policy nominal hourly wages over a period of 5 years increase by one percentage point less than they would without the policy change. After this five-year period, trade unions and employer representatives return to their old wage policy so that hourly wages, after a short adjustment period, again increase just as quickly as in the base solution without a moderate wage policy.

The structure of the simulation differs somewhat from the theoretical model in the previous section where to simplify a policy of permanent wage restraint was assumed, which correspondingly led to an ever-lasting increase in production potential. The simulation here, with its temporary wage moderation, is based on the following considerations. A moderate standard wage policy can only lead to a reduced increase in effective wages as long as there is excess supply on the labor market. As soon as this no longer exists, real effective wages can be expected to approach the market clearing level. This would exhaust the possibilities for an increase in production potential. In order to allow for these circumstances, in the simulation it is assumed that

8 Simulations were kindly provided by the National Institute of Social and Economic Research (NIESR).

after 5 years of moderate growth, wages will again increase at the base solution rate.

Technically this is implemented in NiGEM through a temporary reduction in one of the parameters of the wage settlement function. Economically, this parametric implementation does mean that wage settlements may continue to be influenced by other factors. Wage increases in the simulation period are approximately one percentage point below the base solution. Compared to the basic scenario, real wages are lower due to the policy of wage moderation, which can be represented by a permanent reduction in the constant μ in equation (11). Then from equation (12) it follows that a moderate wage policy leads to a lower level of natural unemployment. From (8) and (9) it can also be concluded that in this case production potential increases. NiGEM does not allow for the effects of policy measures on the growth of production potential to be quantified.

Wage Moderation Policy Without Coordination With Monetary Policy

At the start of the scenario, trade unions and employer representatives in Germany have agreed on a course of moderate wage policy. There is no coordination between the policy areas because sufficient information about the future course of wage policy is not available. The ECB relies solely on historical data. Consequently it adapts monetary policy rule (15a) based solely on the information for output and inflation. In the theoretical framework outlined above, this would be compatible with rule (7). Based on the theoretical results, it is expected that production, employment and production potential will increase. However, production will increase less than potential due to the delayed reaction of monetary policy and, consequently, inflation falls below its target rate.

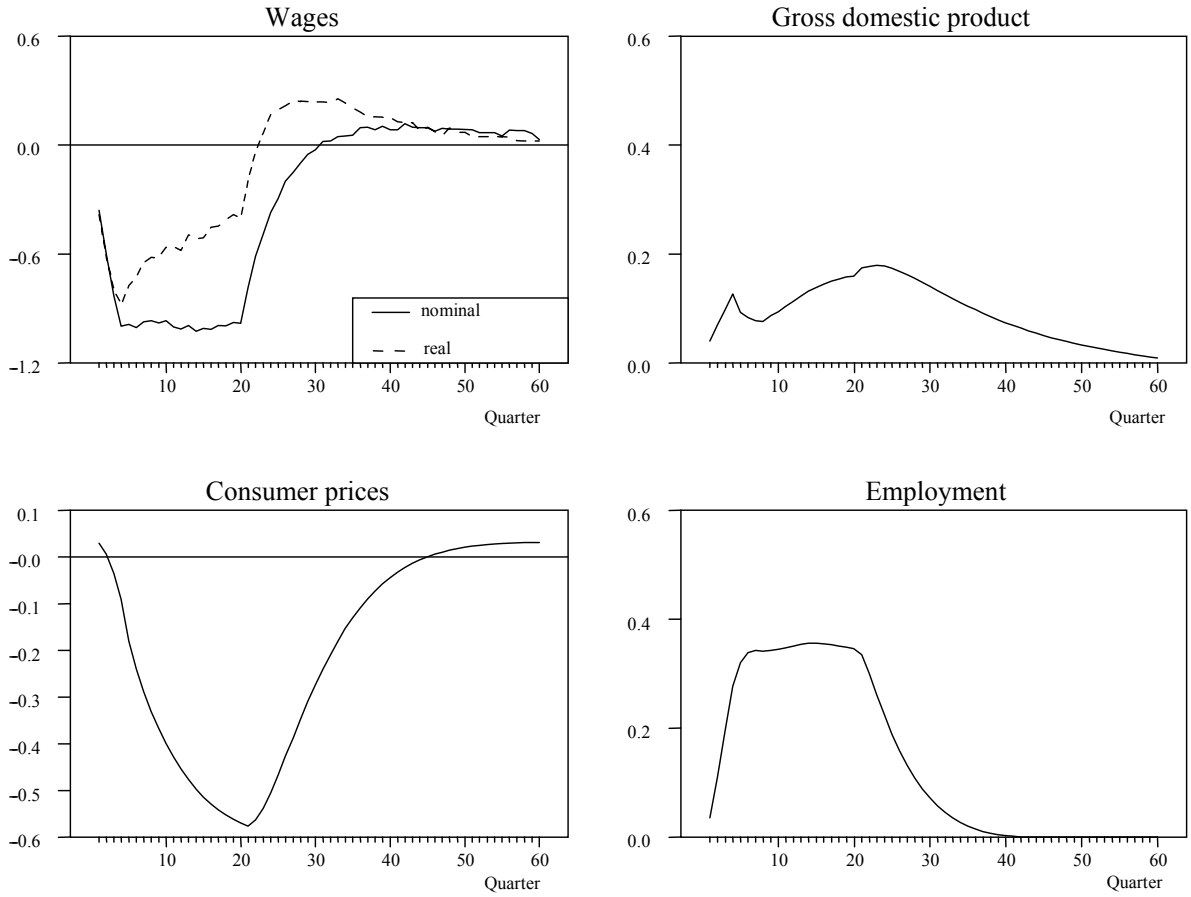
The assumptions and results of the simulation for growth rates of nominal and real wages, consumer prices, real GDP and employment are shown in Figure 2. Wage development is de-picted in the top left. The growth rate of nominal wages is about one percentage point below the rate in the base solution over 5 years, abstracting from two adjustment periods at the beginning. In real terms, wage moderation is lower since inflation falls at the same time. After three years the increase in real wages remains just half a percentage point below the increase in the base solution. The rate of inflation reaches its lowest point at the end of the wage moderation period. Then it is 0.6 percentage points lower than in the base solution, in which the costs of living in Germany for the simulation period increase annually by 1.3 to 2.0 percent. The reduction in inflation does, thus, not lead to an absolute fall in the price level (deflation).

As a consequence of the wage moderation policy, real GDP grows more rapidly over the entire simulation period than it would have done in the absence of this policy. The transmission mechanism differs from that in the theoretical analysis. In NiGEM, the primary stimulus of wage moderation on gross domestic product exclusively affects the net trade in goods and services at the beginning of the simulation. The price competitiveness of domestic products depends directly on the development of unit labor costs compared to those abroad. The restricted growth of wages leads to an improvement in the net trade in goods and services and to an increase in GDP. Consumer prices are influenced by both unit wage costs and the degree of capacity utilization. At the beginning of the simulation, capacity utilization increases due to the increase in gross domestic product, while the limited increase in unit wage costs suppresses consumer prices after a slight delay. The result is that, at the beginning of the simulation, the rate of inflation increases slightly compared to the basic scenario, before falling below the baseline.

At its maximum level, which is reached 6 years after the beginning of the policy, the growth rate of GDP is by almost 0.2 percentage points higher. Of particular note is the initial acceleration in growth at the beginning of the simulation, which then slows down after about one year.

While the effects of a moderate wage policy on GDP are rather restrained, employment clearly profits from this policy. The expansion of employment accelerates immediately after the

Figure 2: Wages, Prices, Real GDP and Employment with Wage Moderation and no Coordination with Monetary Policy[a]



[a]Quarterly deviation from the rate of growth compared with the previous year in the base scenario in percentage points.

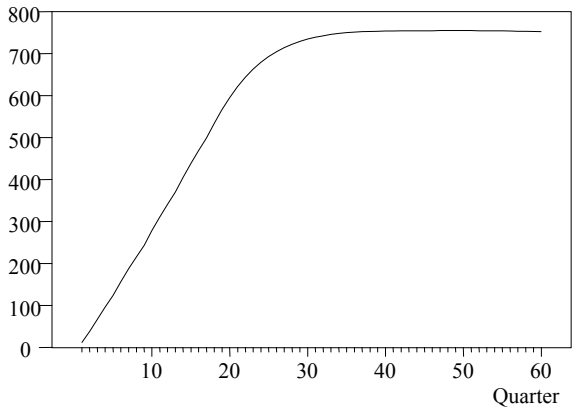
Source: Simulations with NiGEM.

beginning of the policy by 0.3 percentage points compared to the base solution, due to the increase in real wages being lower than the base solution. It retains this value until the end of the wage moderation period. Then the rate of increase returns to its level for the base solution. However, it does not fall below it, that is, the gains in employment achieved are retained. In absolute figures around 750,000 long-term jobs are created through wage moderation (Figure 3). It would take 7 years until the full extent of employment gains is reached.

Wage Moderation Policy with Coordination with Monetary Policy

The second scenario assumes that German wage policy and ECB monetary policy are coordinated. German social partners are now able to credibly signal the ECB that they have embarked on a moderate course. The ECB assumes from this that a passive policy on its part would lead to inflation falling below the target. In order to avoid this, the ECB increases the target value for nominal GDP by the anticipated increase of real gross domestic product in the euro area. As part of the two-pillar strategy, this would correspond to an increase in the reference value for

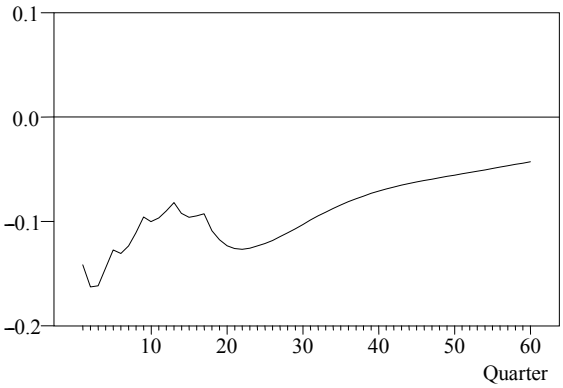
Figure 3: Employment in Germany with Wage Moderation in Germany and no Coordination with Monetary Policy[a]



[a]Quarterly deviations from the base scenario in thousands of people.

Source: Simulations with NiGEM.

Figure 4: Money Market Interest Rate in the Euro Area with Wage Moderation in Germany and Coordination with Monetary Policy[a]



[a]Quarterly deviations from the base scenario in percentage points.

Source: Simulations with NiGEM.

the money supply growth (M3) and a subsequent fall in the interest rate.

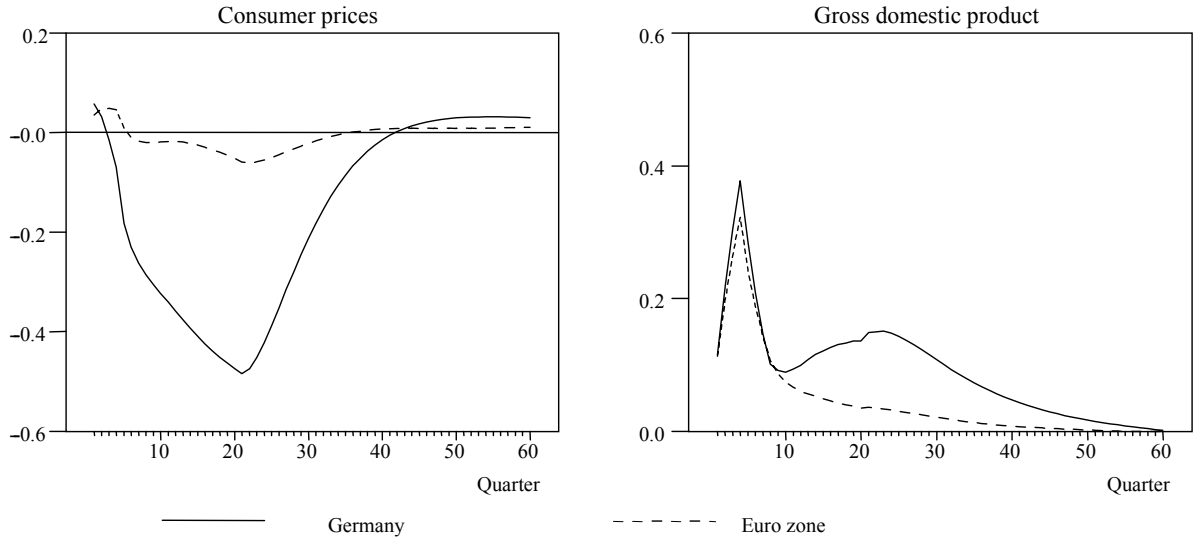
The implications of this form of coordination between wage and monetary policy for the interest rates within the euro area are shown in Figure 4. During the entire simulation, the interest rate remains below the base solution level. Monetary policy has a stimulating effect on overall economic demand. In contrast to a situation where monetary policy is not coordinated with wage policy, the ECB must not wait for the actual fall in the rate of inflation before it can cut interest rates. The temporary increase in the rate of inflation within the euro area at the beginning of the simulation period (Figure 5) will not prevent the ECB from reducing the interest rate. Compared to the situation without coordination, in the first few years of the simulation interest rates are now one quarter of a percentage point lower. Compared to the base solution, the cut in interest rates is rather moderate. Still, it is sufficient to keep the rate of inflation in the euro area close to the base solution and thereby close to its target value.

The rates of growth of the remaining variables in Germany, compared to the base solution, are presented in Figure 6. The wage increase in this simulation does not fall to the targeted level of one percentage point below the base solution, since the stronger expansion of GDP has a positive effect on the wage increase. Equally, in this simulation the real wage shortfall below the base solution is less than in the previous simulation without coordination. Due to the monetary stimulation, real GDP increases more than in the situation without coordination. At its maximum value, it increases half a percentage point faster than in the base solution.

Employment is also more dynamic than in the situation without coordination. The fact that real wages fall less than in the first scenario is more than compensated for by the more rapid increase in GDP and the associated increase in labor productivity. In this scenario also, approximately 750,000 jobs are created. Employment gains occur somewhat earlier than without coordination between the policy areas. Note, however, that the long-run increase in employment is hardly influenced at all by the assumption of coordination between wage and monetary policy (Figure 7).

Conclusions may be drawn from the long-term increase in employment as regards the effects of policy alternatives on production potential. As can be seen from the increase in employment, potential output also rises. However, the long-term effects do not depend on whether wage and monetary policy are coordinated. What is crucial for the long run is wage moderation. Coordination is relevant only for ex-

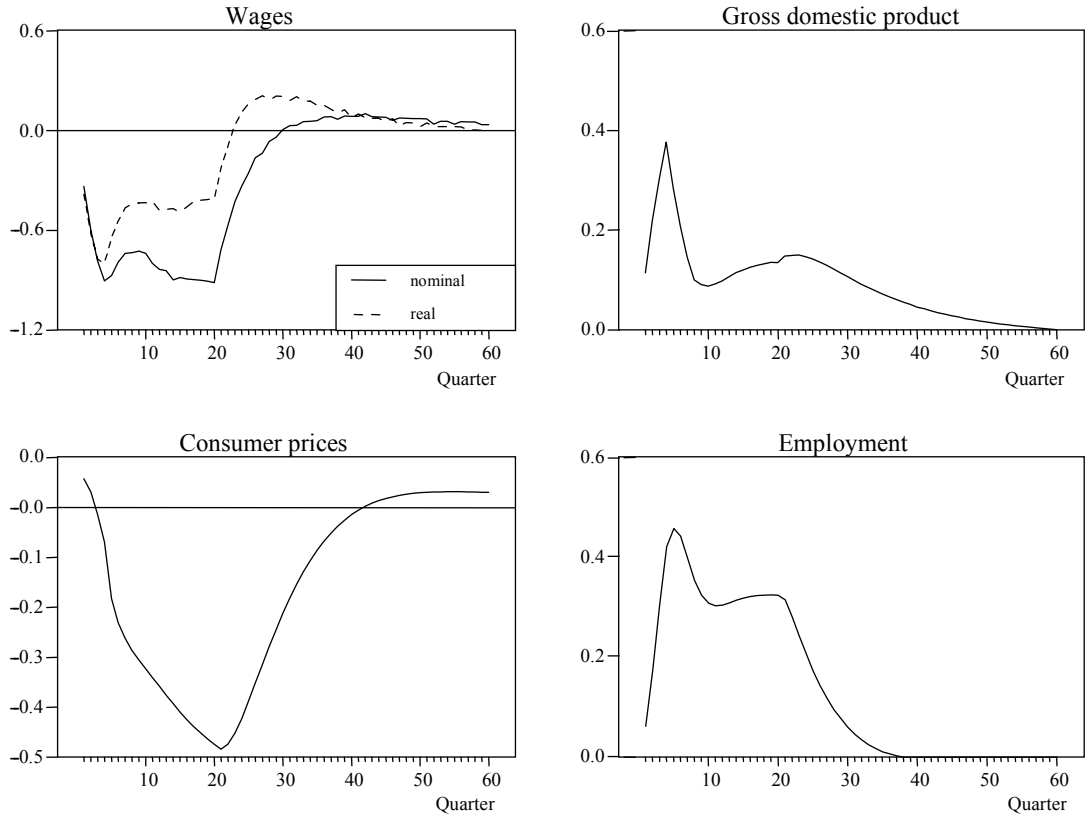
Figure 5: Consumer Prices and Real GDP in Germany and in the Euro Area with Wage Moderation in Germany and Coordination with Monetary Policy[a]



[a]Quarterly deviations in the growth rate from the base scenario in percentage points.

Source: Simulations with NiGEM.

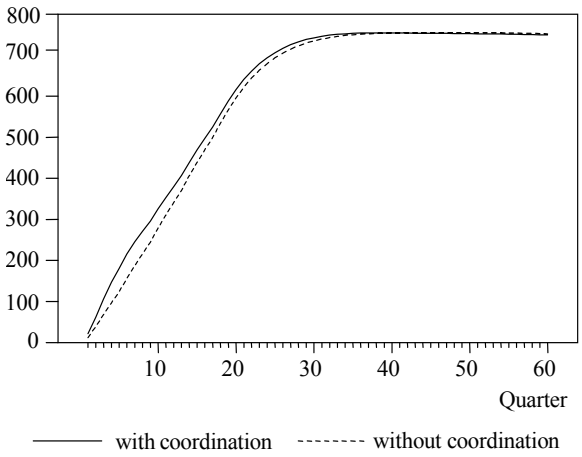
Figure 6: Wages, Prices, Real GDP and Employment in Germany with Wage Moderation in Germany and Coordination with Monetary Policy[a]



[a]Quarterly deviations in the growth rate from the base scenario in percentage points.

Source: Simulations with NiGEM.

Figure 7: Employment with Wage Moderation in Germany under Alternative Assumptions Regarding Coordination with Monetary Policy[a]



[a]Quarterly deviations from the base scenario in thousands of people.

Source: Simulations with NiGEM.

ploiting potential output in the short term. In this respect, the results of the quantitative analysis support the findings of the theoretical analysis.

2.3 Summary

The preceding analysis has argued that a policy of sustained wage moderation could give rise to an acceleration of potential output growth and a substantial increase in employment. If such a policy were implemented, there would be scope for a coordination of wage policy with monetary policy. As long as private agents do not completely anticipate the increase in potential output caused by the wage moderation policy, aggregate demand will fall short of aggregate supply for some period of time. In this case a more expansionary monetary policy would be needed to fully reap the benefits of the wage moderation policy. Monetary authorities will, however, be reluctant to ease the monetary policy stance as long as there are no clear signs of the increase of potential output. In this case, a credible announcement of the social partners to the monetary authorities, signaling that the former have embarked on a wage moderation policy, could make the latter react faster. The result would be that output rises faster than without this kind of "coordination."

One considerable obstacle to this kind of coordination between wage and monetary policy is that wage policy announcements may not appear credible. The aim of trade unions is probably not overall economic welfare but the short-term maximization of wage income for the trade union members without sufficiently taking into account the interests of the unemployed. It may therefore be optimal for wage policy to deviate from an announced policy of sustained wage moderation by implementing higher wage increases than announced, as soon as the central bank has switched to an expansive policy. In this case, the employed receive wage increases without having to expect dismissals, since the economy is undergoing a period of cyclical boom caused by monetary policy. In the medium term, this strategy certainly leads to higher inflation and higher unemployment. If this increased unemployment is irrelevant to wage policy because it occurs after several years and the time frame for wage policy is shorter, then the announcement of moderate wage policy will be time-inconsistent. The central bank will then attach no credibility to it, irrespective of the intentions of wage policy, and instead will prefer a cautious strategy of monetary policy which does not rely on the announced wage policy. In order for coordination to work, it is important to solve the problem of credibility or at least to keep it small. This could, for instance, be achieved by institutions which result in a wage policy not exclusively being oriented towards the interests of employees but also towards the interests of the unemployed.

It should be noted, however, that the beneficial effects of coordination on output found above relate only to the short run. In the long run, potential output as well as employment increase regardless of coordination, given that the wage moderation policy is sustained.

3 International Experience with Macroeconomic Coordination

When calling for the coordination of macro policies, it is frequently argued that countries with a particularly positive overall economic development have benefited from an agreement on the macroeconomic policy mix. The countries most frequently mentioned in this respect are the United States, the Netherlands and Ireland. In this section we will examine to which extent coordination of macro policies might be credited with growth and employment successes in these countries.

3.1 United States: Prolonged Expansion without Coordination

In the nineties the United States experienced its longest boom in post-war history. There was a sustained expansion of economic activity from May 1991 until March 2001. However, it should be noted that the average rate of growth during this expansion was not higher than during earlier long periods of economic expansion in the sixties or in the eighties (Zarnowitz 2000). The sustained growth led to a strong increase in employment and to a pronounced reduction of unemployment from 7.5 percent in 1992 to below 4 percent in 2000. But again, the employment growth was not exceptionally strong in historical comparison.

Remarkably, the boom of the nineties was not accompanied by a pronounced upsurge in inflation. This is the most striking difference to earlier sustained expansions which each time ended in a marked acceleration of inflation that had to be countered by pronounced monetary restriction.

These favorable developments of the nineties are often traced back to a successful combination of macroeconomic policies (Heilemann et al. 2000). Even accepting the argument, which can be disputed, there can be no talk of explicit macroeconomic policy coordination. To start with, there are no institutions in place to achieve this. A coordinated wage policy is not possible due to the decentralized wage bargaining system. And there are also no institutions for explicit agreements on monetary and fiscal policy. Certainly, at the beginning of the nineties, when the recession was bottoming out and the recovery was slow, both monetary and fiscal policy were expansive in order to revive the economy. But as early as in 1993, when the recovery was still hardly to be felt, the Clinton administration switched towards a policy of fiscal consolidation by passing the so-called Omnibus Budget Reconciliation Act. In particular, with this initiative growth in government spending was strictly limited. In addition, taxes where increased modestly.

This turn in fiscal policy towards restriction corresponded to the expectations of the financial markets and led to a subsequent drop in long-term interest rates. And while it was welcomed by the central bank, which was critical of the high budget deficit and the associated rapid rise in government debt (Mackenzie and Thornton 1996), it did not prevent the Fed from raising key interest rates only months later towards a course which was judged as being neutral or even dampening (Gern et al. 1995). Subsequently this led to a substantial slowing of growth in an economy that had seemed to just have started to recover. Thus the change towards consolidation in fiscal policy cannot be regarded as part of a deal with the central bank that in turn would have had to keep interest rates low for an extended period of time.

Therefore, a closer look at monetary and fiscal policy decisions during the nineties leads to the conclusion that they were not the result of a deliberate and coherent policy coordination. Rather, they have to be characterized as individual and discrete reactions to events (see also Blinder and Yellen 2001).

An unusual feature of the almost ten-year period of economic expansion in the nineties was that the strongest growth was recorded in the latter years. And most remarkably, inflation did not accelerate, but even declined temporarily, although unemployment was falling below what was generally believed to be the NAIRU, the

rate of unemployment that is associated with stable inflation (Solow 2001).

This unusual behavior of inflation can be explained by a series of exogenous factors. To mention some of them: In the second half of the nineties, the real effective exchange rate of the dollar rose sharply, in addition the terms of trade improved as a result of a drop in the price of raw materials and crude oil in particular. Furthermore, the increase in labor cost was muted since nonwage labor costs fell, for example health insurance premiums. Also changes in methods for the statistical measurement of inflation showed a lower inflation rate. Finally, and probably most important, there was an acceleration of productivity which was unusual for the later stages of a boom (Gern et al. 2000). This surge in productivity was associated with the increasing importance of information technologies in the economy but was obviously not accounted for in the wage negotiations. As a result, wages rose below productivity, which checked unit labor costs, leading to a leveling off of the upward trend in prices (Ball and Moffitt 2001). All this had nothing to do with macroeconomic policy coordination.

3.2 The Netherlands: Success by Consensus

In the eighties and nineties, the macroeconomic performance of the Netherlands was significantly better than the performance in Germany and also that in the European Union as a whole. Real GDP rose faster and inflation was lower, but most strikingly, employment increased strongly and the unemployment rate fell sharply. What role did macroeconomic coordination play in these developments?

To start with, it should be noted that monetary policy was effectively not available as a policy tool in the Netherlands. The scope for a national monetary policy was limited due to the obligation to keep the exchange rate within tight bands in the European Monetary System. Since 1988, the Dutch central bank closely followed the Deutsche Bundesbank in setting its interest rates.

As concerns fiscal and wage policies, contrary to widely held beliefs, there were no formal agreements between these policy fields either. However, under the umbrella of the *Stichting van de Arbeid* (literally: Foundation for Labor) there were regular discussions between trade unions, employees' associations and the government about the general conditions for supply and demand in the labor market, the aims of labor market policy and labor procurement programs.

In general, the so-called Wassenaar Accord from 1982 is seen as the foundation for the Dutch model. This agreement between employers' associations, trade unions and the government gave employer representatives and trade unions the responsibility for negotiating wages. Government influence on wage settlements was reduced significantly, and not increased, compared to the preceding period of wage planning and control.

According to the Wassenaar Accord, the wage bargaining process consists of two levels. As part of the *Stichting van de Arbeid* a basic consensus of the leading associations of employers and employees on targets for wage increases and other labor conditions is negotiated. In this process, government and the Central Planning Bureau provide their ideas on economic conditions and the scope for changing the income distribution. On this basis, wage negotiations at company and sector levels are conducted, so that sector and regional characteristics can be taken into account.[9]

However, there remains the government option to intervene in the collective bargaining process. For example, in emergency situations the government can insist on wage targets that differ from the wage increase of the basic consensus, something that happened the last time in 1993/4 (Krätke 2001). Or the government can refuse to declare a wage agreement as binding for outsiders, or can explicitly declare it as nonbinding (Schrader 2000). The threat of exercising this right alone was enough to ensure a cer-

9 Empirical work on the European labor markets show that a low degree of wage differentiation inhibits employment growth (Siebert 1999).

tain degree of discipline between employer representatives and trade unions.

With the reforms in the wage bargaining system, social partners agreed on a policy of reducing working hours and promoting part-time work in order to increase employment. In return, trade unions accepted moderate wage increases. The government reduced corporate taxes as well as employers' contributions to social security. At the same time, the minimum wage was cut drastically and frozen over a long period, so that minimum wages decreased significantly relative to average wages (Barrell and Genre 1999). Since many social benefits are linked to the minimum wage, this led to a decrease in many social benefits too. In order to make trade unions accept wage moderation, successive decreases in income tax and social contributions were helpful, which raised after-tax labor income by almost 15 percent between 1983 and 1998 (Tille and Yi 2001).

The strategy to promote employment in the Netherlands had a medium-term perspective and wage moderation continued until the late nineties. The result was a sustained improvement in the international competitiveness of the Dutch economy. Unit labor costs declined significantly relative to the most important trading partner countries. Wage moderation is frequently viewed as the main reason for the success of the employment policy, which is supported by quantitative studies (Nickell and van Ours 2000; IMF 1999a). More recently, however, wage rates have increased considerably (EUROFRAME 2001), reflecting the fact that in the meantime unemployment has reached a low level and that human resources are becoming increasingly scarce.

The increase in the number of employed since 1982 is largely due to a reduction in average working hours. The total volume of labor has risen significantly only in recent years. The number of part-time workers increased strongly and the share of part-time jobs in all jobs almost doubled since the early eighties and is now extremely high in international comparison.[10] There is a break in the statistics on part-time jobs so that the share of part-time jobs in 2000 is not directly comparable to that in 1983, but it is evident that the share has further risen since 1996. The large increase in the number of part-time workers is a particular characteristic of the labor market in the Netherlands. It was part of the employment policy strategy and was supported by social partners as well as the government. From the beginning, it was crucial that a legal framework guaranteed comprehensive social security for part-time workers. This increased employees' acceptance. The percentage of part-time employees wishing to work full time is relatively small in international comparison (OECD 1999a: 33). Employers increasingly offered more part-time jobs, mainly in the expanding service sector. Generally these jobs were new, not split-up full-time positions (OECD 1998: 36).

However, the picture of the labor market in the Netherlands painted by the official unemployment statistics is too positive. Particularly in the eighties, the labor market was relieved by public labor procurement programs and early retirement for older and less qualified employees.[11] Specifically, disability insurance schemes effectively worked to reduce labor supply.

A thorough look at the Dutch model shows that the success of economic policy can only partly be traced back to explicit economic policy coordination. Sustained wage moderation has supported employment growth. However, wage moderation was implemented as part of a free collective bargaining between employers and trade unions, even though it was facilitated by the government that granted tax relief. But the example shows that a unanimously agreed employment strategy can be successful if employers, trade unions and the government consistently deploy suitable measures within their particular areas of responsibility. In this regard, the main task of the government is to implement reforms of general institutional conditions rather

10 The number of part-time workers has almost doubled since 1982. The ratio of part-time jobs to all jobs rose from 21 percent in 1983 to 36.5 percent in 1996 (OECD 1997). Since then it has continued to increase although it is difficult to measure since there is a break in the time series. The figure according to the new definition was 32.1 percent for 2000, the corresponding value for 1996 was 29.4 percent (OECD 2001a).

11 For details see Schrader (2000).

than demand-orientated fiscal policy. As a result, it was possible to increase labor supply and tap on the pool of the inactive population by increasing the number of part-time jobs. When transferring this approach to other countries, it should be kept in mind that, compared internationally, the Netherlands had started from an extremely low female participation rate at the beginning of the eighties.

3.3 Ireland: Consensual Fiscal Consolidation and Wage Restraint

Another country with an impressive macroeconomic performance is Ireland. After a drastic u-turn in economic policy towards stabilization, both in monetary policy (as part of the EMS) and fiscal policy, the Irish economy has experienced an impressive boom since the mid-eighties. From 1986 to 2000, real GDP rose at an average 6.7 percent annually, and by almost 10 percent annually in the latter half of the nineties. This compares with average annual growth in the seventies and early eighties of less than 4 percent. The standardized rate of unemployment fell from 16.8 percent in 1986 to 4.2 percent in 2000. At the same time, the rate of inflation, which regularly reached double-digit figures in the seventies and early eighties, stabilized at a relatively low level. Consumer prices on average have risen by only 2.7 percent annually since 1986. Meanwhile, the general government finances were consolidated very quickly. The budget deficit was reduced from a sizeable 10 percent in relation to GDP in 1986 to 1.7 percent in 1989. In every year since 1997 the government achieved budget surpluses. In 2000 the surplus was 5.7 percent of GDP. Government debt, which had risen to 112 percent of GDP until 1987, fell to under 40 percent in 2000 and to around 30 percent in 2001 (OECD 2001b).

In Ireland's case, the change in monetary and financial policies was a decisive factor for the following strong economic growth. General economic conditions for the private sector were improved considerably through the shift of monetary policy towards price stability and a consistent strategy of fiscal consolidation. Therefore, overall demand rose sharply in the second half of the eighties despite the significant reduction in government spending. The main feature of the Irish fiscal consolidation was that it heavily relied on spending cuts.[12] In relation to GDP, government spending was reduced from 50.2 percent to 38.6 percent in only three years between 1986 and 1989. The period from 1987 to 1994 can be regarded as a phase of stabilization which, although accompanied by comparatively strong economic growth, saw only a gradual decrease in unemployment. The second half of the nineties by contrast was a period of very strong growth and an extremely rapid increase in employment (average annual growth of 5.3 percent from 1995 to 2001), which led to a fall in the level of unemployment from 14.7 percent (1994) to 4 percent (2001).

The turning point in Irish economic policy came in 1987 when a social pact was agreed upon in the form of the "Programme for National Recovery."[13] This program established the basis of the consensual (cooperative) approach to implementing economic policy. The strategy consisted of strengthening the competitiveness of the domestic economy through wage moderation and at the same time to reform institutions of the welfare state (Auer 2000: 53). This partnership approach to wage settlement significantly improved the social climate and general economic conditions in Ireland (Sexton and O'Connel 1997).

In the 1987 program, wage increases from 1988 to 1990 were limited to 2.5 percent. In the following years, further multi-year social pacts

12 There is a rising body of literature on so-called non-Keynesian effects of fiscal consolidation, according to which fiscal consolidation can lead to expansionary effects even in the short run due to expectations in the private sector of lower future taxation. For a survey see Giavazzi et al. (2000), on developments in Ireland in particular see Giavazzi and Pagano (1990). There is evidence that the structure of consolidation matters, i.e., that particularly consolidation from the expenditure side can create positive expectational effects (Alesina and Perotti 1995, 1997). There is, however, also the view that the fiscal consolidation program had dampened demand significantly, while the Irish economy was pulled along by buoyant external demand on the back of a world economic upswing (Fitzgerald 2000).

13 There were previous attempts to improve the government finances in 1982–1984 which, however, failed.

Table 1: Social Pacts in Ireland

	Years covered	Target for annual wage growth (percent)	Actual annual wage growth (compensation per employee)
Programme for National Recovery	1988–1990	2.5	5.8
Programme for Economic and Social Progress	1991–1993	3.8	5.8
Programme for Competitiveness and Work	1994–1996	2.7	2.6
Partnership 2000	1997–1999	2.3	4.6
Programme for Prosperity and Fairness	2000–2002	4.9	8.5

Source: Tille and Yi (2001); European Commission (2002b); own calculations.

were successively agreed upon. In the meantime, they appear to be a long-term feature of Irish wage policy. As to the central feature of wage growth limits, Table 1 compares the targets for wage increases with actual increases in compensation per employee. Although this measure might not be a perfect reference, it is evident that actual labor costs over most of the period increased faster than targeted in the programs. Particularly, in recent years the extremely tight labor market has led to a strong wage drift. This illustrates that even in an institutional environment which supports centralized wage setting it is difficult to determine economy-wide wage developments, as market forces will shape actual outcomes considerably. Nevertheless, the Irish policy resulted in wage moderation inasmuch as real unit labor costs fell absolutely and in relation to the EU as a whole.

In addition to wage increases, the social pacts included the commitment of the government to increase disposable incomes through cuts in income tax and social contributions. As a result, the average tax burden for employees fell from 35 percent in 1987 to 31 percent in 1994 and 29 percent in 1996. In addition, the government committed itself to increase spending on social infrastructure (education, public health, housing construction). In the course of the consensual reform policy, the level of unemployment benefits was also reduced and the entitlement requirements were tightened up. In return, active labor market policy was extended.

The policy of protracted wage moderation, with wage increases remaining below productivity growth, has contributed to the period of strongest employment growth in Ireland and has strengthened companies' propensity to invest (Blanchard 2000). However, it seems difficult to argue that moderate wage policy and the underlying labor market reforms have been the main sources of the boom of the second half of the nineties. Another important factor appears to be the rapid increase of foreign direct investment, which occurred after 1993 (OECD 1999b). Since the early seventies, the Irish government has attempted to attract foreign direct investment. Foreign investors were granted tax breaks. Improvements in the economic environment with the switch to stability-oriented economic policies provided an additional prerequisite for becoming an attractive destination of foreign direct investment. By the end of the nineties almost half of all jobs in the processing industry were at production plants owned by foreign companies, which contributed around 30 percent to GDP (OECD 1999b: 62). In the nineties, Ireland became increasingly attractive as a production location for internationally operating companies, as a large number of well-trained workers entered the labor market. This was partly the result of the return of emigrants, but above all this was the long-term result of introducing free general secondary education. Employees entering the labor market in the nineties had considerably better skills than newcomers in the seventies and eighties (IMF 1999b). Finally, it should be noted that one feature of Ireland is that the country received massive financial support from the EU Structural Funds.[14]

[14] Since 1985 financial aid totalled between 2 and 3.5 percent of GDP annually (O'Connel 1999).

3.4 Summary

In general, coordination of macroeconomic policies can only to a small part account for the growth and employment success in the countries discussed here. In the case of the United States, it is even hard to see any evidence of ex ante policy coordination at all. In the Netherlands and in Ireland the development and implementation of a consensual strategy of wage restraint with the aim of improving the competitiveness of the economy and stimulating employment has been a significant factor behind the economic success. The role of the government included providing tax cuts to support disposable incomes and to facilitate the implementation of wage moderation. It was important in both cases that significant supply-side reforms were implemented at the same time, and monetary policy played no active role. But there were also special factors at work which significantly contributed to the developments in both countries and complicate drawing conclusions for other countries.

4 Coordination under the Conditions of the European Union

In the framework of the European Union, the necessity and the assumed positive effects of policy coordination are stressed in practically all documents of the European Union. In the context of this paper, we discuss the feasibility of an ex ante coordination between monetary policy on the one hand and wage developments on the other: Is it possible that policy makers and wage setters can make a credible commitment so that the positive results shown in the model simulations can indeed materialize?

The most important document for economic policy coordination in the European Union are the Broad Economic Policy Guidelines (BEPG) which are decided upon annually by the European Council.[15] In these BEPG, there is a clear assignment of the targets and instruments of economic policy: The main objective for the ECB is to secure price stability; fiscal policy should aim at the balanced budget as described in the Stability and Growth Pact and should promote economic growth; wage developments should support employment and the profitability of investment; and finally, structural policies should enhance the flexibility of markets. In this sense, there is a clear assignment of the responsibilities of the various areas of economic policies to the respective targets. However, no precise statements are made as to whether or how the various areas of economic policy should be coordinated.

While clear prescriptions of macroeconomic policy coordination in the usual sense are missing, one can analyze whether the framework could be made more precise in order to define such mechanisms. When we discuss the possible coordination between monetary policy and wage policy, the role of the ECB in such a process is of great importance. In the next step, we will look at the conditions for wage policy.

The statute and the targets of the ECB are described in the Treaty establishing the European Community.[16] The independence of the ECB is clearly defined. According to the Treaty, "neither the ECB, nor a national central bank, nor any member of their decision making bodies shall seek or take instructions from Community institutions or bodies, from any government of a Member State or from any other body" (quoted from ECB 2000b: 52). Accordingly, the mentioned bodies, i.e., all other institutions of eco-

15 These guidelines can be viewed as the summary of the various coordination processes at the European level, in particular the Stability and Growth Pact, which describes the rules for fiscal policy, the policies for more employment in the framework of the Luxembourg process, structural policies in the framework of the Cardiff process, and the Macroeconomic Dialogue, which was established in Cologne in 1999. For a description of the various areas of coordination, see ECB (2001).

16 Article 105 of the Treaty defines the tasks and prerogatives of the monetary authority, Article 108 defines the independence.

nomic policy making, should not try to influence the ECB in any way. According to the ECB, the status of independence implies "clear limits to the degree of engagement between Community institutions and bodies on the one hand and the ECB on the other" (ECB 2000b: 52). As far as the interaction in the field of economic policies is concerned, the ECB interprets the Treaty in such a way that "the ECB's relations with other policy making bodies cannot go beyond a non-binding dialogue" (ECB 2000b: 52). This interpretation was supported at the Helsinki European Council in 1999. In short: An ex ante coordination in the form of a binding commitment is excluded for the monetary authority.

This does not mean, however, that the ECB does not or should not take into account the measures of other areas of economic policy. In fact, the ECB participates in the discussions at the EU level, for example, in the meetings of the European Council, and it is involved in the Eurogroup, the Economic and Financial Committee and the Macroeconomic Dialogue, all of which are contacts which are understood as meetings for the exchange of information and of views and which take the form of a nonbinding policy dialogue (ECB 2001: 64). While one may not expect commitments from any side, it is obvious that the ECB would take into account any statements of, for example, the social partners. If there are clear signals concerning wage moderation in the future, the ECB would – in fact, it should, given its mandate to maintain price stability – take this message into account in its monetary policy strategy. In particular, in the context of the second pillar, the ECB would then see less of a risk for price stability and positive effects on potential output growth which would in turn influence its policy decisions. However, an ex ante commitment is not possible for various reasons. For example, it may not be clear whether the social partners can credibly announce a policy of wage moderation.[17] Also, it is possible that risks for price stability come from other sources; in this case, the ECB would have to react accordingly, which may then be wrongly interpreted by the social partners as a violation of the agreement.

4.1 Nationally Diversified Wage Setting Processes

In the EU countries there are different wage bargaining systems that have historically developed and vary in different respects.

As concerns wage bargaining levels, wage bargaining on sector and company levels can be found in every country (Table 2). This is supplemented by wage bargaining on the central (national) level in five countries, covering either the whole economy (in Finland and Ireland), the private sector (in Belgium and Greece) or the industrial sector (in Denmark). An additional central element exists in a number of countries in the form of minimum wages.[18]

The central level is the predominant level of wage bargaining in Belgium and Ireland, while the importance of the central level varies in Finland from wage round to wage round and matches the importance of the sector level in Denmark. The company level is the predominant level of wage bargaining in France and in the United Kingdom and is important in Luxembourg also.

In the remainder of the EU countries, the sector level is predominant. At the same time, there are significant differences in the meaning and scope of sector wage bargaining across countries. In Ireland and the United Kingdom, sector wage bargaining is restricted to a small number of branches; in other countries, such as France, the Netherlands, Portugal and Spain, it is particularly the small and medium-sized companies that are covered by sector-wide wage agreements, while large companies tend to have a company agreement. There are also differences with respect to geographical coverage: while in most countries sector-wide agreements cover the whole country, coverage is restricted,

17 This is discussed in the following paragraph.

18 Minimum wages in various forms exist in Belgium, France, Germany, Greece, Ireland, Luxembourg, the Netherlands, Portugal, Spain and the United Kingdom (see EIRO 2000).

Table 2: Levels of Wage Bargaining in the EU Countries

	Central level	Sectoral level	Company level	Overall assessment
Austria	*	xxx	x	centralized
Belgium	xxx	x	x	centralized
Denmark	xx	xx	x	intermediate
Finland	xx	xx	x	centralized
France		x	xxx	decentralized
Germany		xxx	x	intermediate
Greece	x	xxx	x	intermediate
Ireland	xxx	x	x	centralized
Italy		xxx	x	intermediate
Luxembourg		xx	xx	intermediate
Netherlands	*	xxx	x	centralized
Portugal		xxx	x	intermediate
Spain		xxx	x	intermediate
Sweden		xxx	x	intermediate
United Kingdom		x	xxx	decentralized

x = Level of wage bargaining existent, but not important. – xx = Level of wage bargaining important, but not dominant. – xxx = Dominant level of wage bargaining. – *Important central coordination.

Source: EIRO (2000); Dohse and Krieger-Boden (1998); own compilation.

at least formally, to certain regions in France, Germany and Spain.

Furthermore, there are differences in the relationship between the different wage bargaining levels. In a number of countries, sector and company levels supplement each other in that agreements on the sector level define a minimum wage which may be exceeded by company agreements. By contrast, in Belgium and in Ireland, there is a maximum wage increase agreed upon on the central level which sets the margin for wage negotiations on the sector and company levels, respectively.

When categorizing the national wage bargaining systems according to their degree of centralization in the tradition of Calmfors and Driffill (1988), most of the wage bargaining systems have to be grouped as intermediate.[19] Central wage bargaining systems prevail in Belgium, Finland and Ireland and also in Austria and the Netherlands, where wage negotiations take place predominantly on the sector level, but coordination on the central level has a strong influence.

Wage bargaining systems are also characterized by the degree of unionization of workers and employers and the share of workers that are covered by negotiated wage contracts. Countries vary considerably also in this respect (Table 3). The Scandinavian countries typically have a high degree of unionization of workers combined with a relatively low share of enterprises organized in employers associations. Coverage of wage agreements is intermediate relative to the other EU countries. The instrument of mandatory extension of wage agreements to nonorganized companies exists only in Finland. The type of wage bargaining system predominant in the EU, by contrast, consists of a relatively low (and falling) share of workers organized in trade unions and a relatively high degree of organization among employers leading to generally high levels of coverage of bargained wage agreements. The power of trade unions is increased in some countries by the possibility of extending bargained wage agreements to the nonorganized part of the economy by law.

Wage policy is coordinated on the macro level by different means (OECD 1997, EIRO 2000). In the United Kingdom and in France, the setting of minimum wages, which can be seen as a form of state-imposed coordination, is the only form of central coordination. Wage indexation mechanisms as in Belgium and in Luxembourg represent a stronger form of government inter-

19 For a slightly different rating see OECD (1997).

Table 3: Unionization of Employees and Employers, Coverage of Bargained Wages and Incidence of Mandatory Extension of Bargained Wages in EU Countries[a]

	Unionization (percent)		Coverage (percent)	Mandatory extension of bargained wages
	Employees[b]	Employers[c]		
Austria	37	96	97	significant
Belgium	40	80	82	significant
Denmark	68	48	52	not existent
Finland	65	58	67	significant
France	< 7	71	75	limited
Germany	25	76	80	significant
Greece	< 15	n.a.	97	significant
Ireland	37	44	n.a.[d]	insignificant
Italy	32	40	90	not existent
Luxembourg	n.a.	n.a.	n.a.	n.a.
Netherlands	19	80	79	limited
Portugal	< 20	n.a.	80	limited
Spain	< 15	70	67	limited
Sweden	77	60	72	not existent
United Kingdom	21	57	40	not existent

[a]Mid-nineties. – [b]Share of employees that are members in trade unions. – [c]Measured as proportion of employees in enterprises that are members of employers associations. – [d]The coverage in Ireland is very high but figures are not available. – n.a.= not available.

Source: Auer (2000: 58); Dohse and Krieger-Boden (1998: 68); own compilation.

ference.[20] In the other countries there is a coordination of wage policies between the employers associations and the trade unions. This is done explicitly in some countries (Belgium, Finland, Ireland, the Netherlands, Spain) with top-level associations of employers and trade unions setting a target wage increase on the central level. In other countries, including Austria, Denmark, Germany and Sweden, the coordination is performed implicitly with sectoral or regional wage bargaining partners following a leader in some kind of convoy system.

A more recent development is the establishment of cross-sector or national tripartite agreements, so-called social pacts. Such kinds of "round table talks" have already been established in 10 EU countries.[21] Design and relevance of these agreements, however, vary strongly across countries, reaching from nonbinding statements of general principles of wage policy (such as with the *Bündnis für Arbeit* in Germany) to legally binding rules for wage setting (as in the case of the Irish consensus programs).

4.2 Summary

All in all, differences in national wage bargaining systems in the EU are very pronounced. Against this background, it seems inappropriate to think of wage setting in the EU (or in the euro area) in terms of a single wage bargaining system or even a single wage policy. For institutional reasons it currently seems impossible to obey a certain target path for wages in the euro area as a whole. It has to be recognized that wage increases in the euro area trace back to different national wage developments that can be centrally controlled only to a limited extent.

This means that it is hard (or even impossible) to coordinate macro policies on the EU level or in the euro area as is sometimes proposed in order to improve the growth performance in Eu-

20 Wage increases are generally tied to inflation; in Belgium, however, the development of labor costs in important trading partner countries has played the decisive role in the determination of wages.

21 For a compilation see EIRO (2000), for more detailed information see Fajertag and Pochet (1997), Hassel (1998) and Kuntze (1998).

rope. National wage bargaining systems would have to be harmonized and centralized to create the precondition for a single European wage policy. That said, there is no sufficient agreement on how the necessary institutions should look like. There are additional fundamental reasons that we think that harmonization of wage bargaining systems is inappropriate.

The different institutions relevant in the wage bargaining process have developed historically in the individual countries, at least to some extent reflecting different national preferences. It is not clear that labor market institutions that have born good results in some country will also work satisfactorily in any other country (Freeman 1988). It is at least doubtful whether centrally designed harmonization of labor market institutions in the EU can cope with different national requirements. Consequently we suggest to rely on a process in which superior institutions develop and prevail in a process of competition between different alternatives (Hayek 1968).

Given that the national labor market institutions differ substantially, a centralized EU-wide wage policy which would be necessary for a macroeconomic coordination strategy is not possible. But it is also not necessary, as the example of the Netherlands shows. The Netherlands reached a higher growth path and halved their unemployment under the condition of a de facto monetary union with Germany and without a wage policy coordination in Europe (see Section 3.2). In addition, wage setting requirements vary across Euroland significantly, reflecting different situations with respect to productivity growth and full employment.

A single wage policy for the euro area would significantly reduce the flexibility of national labor markets, which is increasingly important since the nominal exchange rate has ceased to exist with the monetary union. This seems to be widely accepted in academic and political circles. Political calls largely are limited to the proposal to set minimum wage standards. Summing up, wages should be set according to the needs of the national labor market. International coordination would impede the functioning of the labor markets and reduce growth and employment in the medium term.

5 Conclusions for Economic Policy

In economic literature, there is widespread consensus that potential output is determined by structural factors. The supply side of an economy can be strengthened by measures which improve efficiency. Wage policy can be seen as an example given that a large part of the high unemployment today is due to too high a wage level or a lack of differentiation of wages. Against this background, the analysis in this paper deals with the question to what extent a coordinated approach of macro policies such as wage policy and monetary policy would be helpful to improve the outcome. In the theoretical model, wage moderation is interpreted as a positive supply shock raising potential output. The optimal response of monetary policy – i.e., when stabilizing the output gap and inflation – is to lower interest rates (or raise the money stock) in the period in which potential output increases. In the model, it is assumed that the wage shock is persistent and that this is immediately known to the central bank. In practice, the latter condition is not fulfilled, so there is one argument for a particular form of coordination between wage policy and monetary policy. If social partners could signal the monetary authorities in a credible way that they are pursuing a strategy of wage moderation, the central bank could immediately react to the positive supply shock and lower interest rates. In reality, the appropriate size of the change may be uncertain given the variety of economic models and would depend, for example, on other factors relevant for inflationary expectations. Without this form of commitment, the short-run beneficial effects of wage moderation will be smaller; the long-run effect of wage moderation on output and employment,

however, will be the same, regardless of whether it is coordinated with monetary policy or not.

The quantitative analysis in the framework of a large macroeconometric model (NiGEM) shows that a persistent wage moderation has a significantly positive effect on both potential output and employment in Germany. Under the (not unrealistic) assumption that wage increases are one percentage point lower than in the baseline for a period of five years, the number of employed persons would increase by 750,000 in the long run (equivalent to an increase of about 2 percent). This effect is independent of the reaction of the monetary authority. The difference lies in the short run: If the ECB accommodates this shock in order to meet its inflation target, the positive effects on output and employment are realized faster. In this sense, coordination raises economic welfare.

The main question, however, is how such a strategy can be pursued in reality. Experiences in those countries which have been successful in reducing unemployment in recent years show that a coordination between wage policy and monetary policy usually did not exist.

The conditions prevailing in the monetary union also suggest that an ex ante coordination of monetary policy and wage setting is not possible. One reason is that the institutional framework is simply not given. Most importantly, the statute of the European Central Bank implies that it cannot accept directives or make commitments about its policy. Moreover, such commitments would also not make sense. For example, there may be risks for price stability from other sources calling for restrictive actions of monetary policy which would then appear to contradict the commitment made earlier. Consequently, a conflict may arise concerning the responsibilities with respect to the targets of economic policy. Nevertheless, the ECB would not be passive if there is a fundamental change in the behavior of wages. On the basis of its monetary policy strategy, it would consider and react to such changes affecting potential output growth and the outlook for inflation.

Another obstacle to an explicit ex ante coordination lies in the fact that there is no such thing as "the" wage policy (or "the" wage behavior) in the euro area. The wage bargaining mechanisms are very different between the countries, especially as far as the degree of centralization is concerned. An EU-wide centralized wage policy which would be necessary for the coordination with other areas of economic policy is simply not possible. In fact, it would also not be desirable, as wages should be able to respond to the conditions within the individual countries. A coordination of wage formation would imply severe shortcomings and reduce the flexibility of labor markets in the countries. In addition, it must be remembered that, for example even in the Macroeconomic Dialogue, a large number of "players" are already involved; the social partners of 12 member countries would have to agree on some kind of common behavior – leaving aside the large number of other individuals or institutions responsible for wage formation not present in such institutions.

Nevertheless, one should not completely dismiss the possibility of a combination of wage moderation and an accommodating monetary policy which could then bring about the positive results already in the short run as described in the model simulations. The Macroeconomic Dialogue could play an active role in this respect by agreeing on the fact that – as long as unemployment is considered too high – wage moderation is useful as it raises employment and potential output. It should be made clear that a policy of wage moderation is credible and should not be questioned over and over again. This would not necessarily require a rule-like behavior by all countries; it would be sufficient if individual, possibly large, countries followed such a strategy.

For example: The social partners in Germany could announce that wage increases will be moderate in the future, and it should be clear that this announcement remains valid for several years. This would alter the conditions for monetary policy: The ECB could attach a high probability to the assumption that the target of price stability is not jeopardized from this side, and that the expected rate of potential output growth could be revised upwards. By reacting early, the central bank could raise the (already positive) short-run effects of wage moderation,

which could have the beneficial effect that it would make a continuation of this strategy more likely. Chances would increase that other countries follow. However, this combined strategy should not be reversed: It cannot be recommended that the ECB moves first hoping that wage moderation will follow. Such a policy would run the risk of higher inflation and would thus be counterproductive for both employment and potential output.

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