

**Unemployment, Wage Developments
and the Economic Policy Mix in Europe**

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The paper considers the importance of wage formation for the policy mix in Europe. When monetary policy is committed to price stability, unit labour costs are a crucial factor in achieving this objective. Traditional Phillips curve or modern NAIRU models focus on labour market flexibility to achieve coherent wage developments because they take a short run perspective where the capital stock is fixed. However, in a long term perspective, the capital stock adjusts to profit opportunities and they depend on the portfolio choices of investors which are influenced by monetary policy. The time path of the price level depends then on a trend that is set by unit labour costs and a mean reverting profit mark-up that is dependent on capital costs. Monetary policy can become growth-supporting, if unit labour costs remain consistent with the central bank's price objective.

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With the start of European Monetary Union questions about the optimal policy mix in Euroland have gained prominence, especially on the background of persistent high unemployment. Monetary policy is now centrally controlled by the independent European Central Bank (ECB), whose primary objective is to maintain price stability. Yet, most other policy responsibilities remain at the national level, notably fiscal policy and wage bargaining. Traditionally, the issue of policy mix has focused on the interaction between monetary and budget policies². But in view of Europe's high unemployment, it is necessary to bring wage developments into the picture (Welfens and Jungmittag, 1997). Most of the literature on EMU and labour markets focuses on the need for structural reforms in order to increase flexibility,³ but little has been said on wage bargaining. On an institutional level, the European Council in Cologne in June 1999 has complemented structural reform policies pursued in the labour (Luxembourg-process) and product markets (Cardiff-process) by a Macroeconomic Dialogue (Cologne-process) which involves wage bargainers, governments and the ECB. Its purpose is to increase economic growth and employment. However, the theoretical foundations for integrating wage bargaining into the policy mix are not always clear. This paper aims at contributing to such a theory, first by looking at some of the theoretical questions involved in the dominant view, followed by considerations of capital accumulation and finally some policy conclusions.

¹ The author works in the German Ministry of Finance. However the views expressed in this paper engage only himself.

² See notably Hughes Hallet and Jue Ma, 1996; Thygesen, 1996; Gros and Thygesen 1998; Collignon, 1996; Weale, 1996. For theoretical models see Sargent, 1986; Mead and Weale, 1995.

³ See for exemple Eichengreen (1993); Jackman (1997)

1. Wages and the labour market in the short term perspective

Traditionally, wage developments were brought into macroeconomics through the Phillips curve. Labour market equilibrium is determined by an upward sloping supply curve and a labour demand curve that reflects the marginal product of labour. Modern developments have shifted the focus on wage bargaining and the concept of the non-accelerating inflation rate of unemployment (NAIRU). Both theories primarily focus on labour market rigidities for the explanation of unemployment, rejecting a lasting role for monetary policy in the combat against unemployment. However, by bringing investment into a model of wage and price developments, it can be shown that money can matter also in the long run.⁴

The neoclassical synthesis

In its simplest form, the Keynesian-neoclassical-monetarist synthesis can be summarised as follows:⁵

$$(1a) \quad y^* = F(K, L) \quad | \quad F_K, F_L < 0 ; F_{KK}, F_{LL} < 0$$

$$(1b) \quad y = y^D(g, M^S/P)$$

$$(1c) \quad \hat{y} = y - y^*$$

$$(2) \quad \Delta w = \Delta p^e + \Delta h + \alpha \hat{y} \quad | \quad \alpha > 0$$

$$(3) \quad \Delta p = \Delta w - \Delta h + \Delta c$$

$$(4) \quad u = f(\hat{y}) \quad | \quad u^* = f(0), f' < 0$$

The first equation (1a) represents aggregate supply (potential output) as a function of capital and labour. (1b) is aggregate demand in the IS-LM equilibrium, where g stands for the budget deficit and M^S/P for real money holdings. (1c) stands for excess demand or the output gap. Equation (2) is the expectations-augmented Phillips curve with Δh as productivity growth and (3) reflects mark-up pricing with Δc as the change in the average mark-up on labour cost.

Equation (4) relates (un-)employment to output. When actual output is equal to potential ($\hat{y} = 0$), unemployment is at its natural rate. It is important to note that this labour market equilibrium depends on a crucial assumption: labour demand is determined by the marginal product of labour, implying that the capital stock is constant - presumably

because it is at its steady state equilibrium. When we abandon this premise, we will obtain very different results.

Because of (2) and (3), $\dot{y} = 0$ implies that in the steady state expected equals actual inflation, so that both the rate of inflation and the size of the mark-up are constant. Real wages grow at the rate of labour productivity and the wage share is stationary. Money supply increases at the same rate as steady inflation plus potential output. Furthermore, if potential output is determined by the production function (1a), monetary policy will in the long run only determine inflation. In the short term, however, it affects aggregate demand (1b) and real wages and mark-ups may deviate from the steady state; expected real wages will then vary procyclically ($\alpha > 0$) and the mark-up anticyclically, because wage bargainers respond to slack and tightness in the labour market. Hence, money is neutral in the long run, but not in the short run. Output effects are only temporary, while unemployment always returns to its long run "natural" level (u^*), which is defined as the labour market equilibrium where inflation does not accelerate.

The NAIRU-model

In the 1980s and '90s unemployment remained abnormally high and deviations of actual from the natural rate appeared to be more persistent than seemed compatible with the neoclassical synthesis. The NAIRU-model was an attempt to explain this new phenomenon through the structures and behaviour of wage bargains. The new theory also aimed at providing microfoundations to the macro-phenomenon of unemployment. It was assumed that *firms* set prices as a mark-up on wage costs (unit labour costs) and wages are set by *trade unions* as a mark-up over the reservation wage (Layard, Nickell and Jackman, 1991, 1994). If these two mark-ups are inconsistent, the rate of inflation accelerates, because this "is the mechanism that reconciles the struggle for shares of the national cake, by cheating both price-setters (capitalists) and wage setters of what they intend" (Layard, Nickell and Jackman, 1994, p. 28). Equilibrium is achieved when both actors settle for a wage share (or profit mark-up) that is consistent with their expectations. The variable that brings about this result is unemployment. The persistence of high unemployment is then due to rigidities in the labour market which prevent wage setters from lowering real wages to the "consistent" level.

The NAIRU-model can be formulated in terms of (1) - (4) as:

$$(5 \text{ a}) \quad p - w^e = c - h + \alpha_1 \dot{y} \quad | \quad \alpha_1 \geq 0$$

$$(5 \text{ b}) \quad w - p^e = ws + h + \alpha_2 \dot{y} \quad | \quad \alpha_2 > 0$$

⁴ Blanchard (1990) reminds us that the long-run neutrality hypothesis is imposed on models out of theoretical considerations and is a matter of faith rather than empirical evidence.

(5 b) is the wage setting equation. Trade unions are assumed to aim for a wage share ($w - p - h$) that increases with excess demand ($\alpha_2 \hat{y}$). The average or stationary wage share (ws) which is the long term objective of trade unions is often supposed to be determined by a generous social system (minimum wages, replacement ratio, duration of unemployment benefits etc.) and by trade union power.⁶ The latter extends to "insider" power where the competition from unemployed "outsiders" does not lower wages to the level where the required profit margin can be realised. However, as Hahn and Solow (1995) have shown, the reason why wages do not come down despite excess labour supply may have to do less with labour market structures than with simple considerations of fairness.

(5 a) is the price setting equation. If $\alpha_1 = 0$, normal or constant mark-up pricing under perfect competition is the rule. However, usually the mark-up is derived from imperfect competition, oligopolistic models and near-rationality theories (Carlin and Soskice, 1990) and is a function of the firm's market power. It is seen as a more or less fixed add-on to marginal cost and is independent of capital cost. Again this argument is only valid in the short run when the capital stock is constant.

When $\hat{y} = 0$ and actual prices and wages equal expectations, we have the equilibrium wage share $ws = w - p - h$. The profit mark-up c is then the reciprocal of the wage share, hence $ws = -c$. Thus, in equilibrium price-setters (5 a) and wage-setters (5 b) agree on the distribution of national income and both price and wage expectations are realised. If, however, prices diverge from expectations, and we assume that price and wage surprises are similar, then we obtain, given $\Delta p = \pi_t$ and rational expectations $p^e - p_{t-1} = \pi_{t-1}$:

$$(6) \quad \Delta p = \frac{a_1 + a_2}{2} y + \frac{c + ws}{2}$$

Hence, as before, inflation is non-accelerating at the natural rate of unemployment [$u^* = f(0)$], with $ws = -c$. But while inflation dynamics in the Phillips curve model are aggregated in α , they are now separated in product and labour market elasticities. It is clear, that the higher price flexibility (α_1) and real wage flexibility (α_2), the higher is the inflationary impact of excess demand. Thus, in this simple model, real rigidities support price stability ($\alpha_1 + \alpha_2$ are low), but they also make disinflation more expensive in terms of output loss. Because it is usually assumed that $\alpha_1 < \alpha_2$, focusing on labour market reforms and real wage elasticity has prominence over product market flexibility

⁵ Unless specified differently, small letters indicate logs.

⁶ At least this is the standard story for Europe. In the USA efficiency wage considerations may prevail. See Layard, Nickell and Jackman, 1994.

when addressing employment issues. If, however, the income shares resulting from wage bargainers' objectives are inconsistent, so that $c + ws \neq 0$, inflation will not remain constant and output (\hat{y}) would have to adjust in order to stabilise price developments. Consequently, if labour markets are inflexible in the sense that they do not adjust flexibly to the required profit share, unemployment will remain persistently high and the NAIRU will exceed the "natural" rate. Put differently, a central bank aiming to stabilise prices has to keep money tight so that the resulting negative output gaps will slow down or stabilise inflation.

Evidence seems to support the model when comparing the economies of Europe to the USA. While the ratio of positive to negative output gaps measured by OECD (1998) over the last 20 years was 11 : 9 in the USA, it was only 5 : 15 for Euroland and 4 : 16 for Germany. Hence the model must conclude that labour market rigidities and the excessive welfare state in Europe should have been the cause for high and persistent unemployment in the EU. However, the explanation is one-sided. As Solow (1998, 1999) has pointed out, European unemployment has risen in shock waves that cannot be correlated with structural changes in the labour market. If anything, European markets have become *more* flexible in the 1990s, not less. Why, then, is Europe's natural unemployment went so high?

2. Wages and capital accumulation: the long term perspective

The NAIRU approach gives prominence to labour market structures and a microeconomic interpretation of the profit mark-up under the assumption of a fixed capital stock. It does not take into account the effects of stabilisation policy for investment and the development of productive capacities which are necessary to achieve full employment. If we abandon the idea of a fixed capital stock, the demand for labour does not only change with the real wage (which equals the marginal product of labour), but also with capital accumulation.

The investment function

Abstracting from technological progress, we can interpret (1a) in a simple neoclassical growth model. Potential output is on the balanced growth path when actual investment equals the (net) increase of the capital stock required to keep the labour force growing at its natural rates. Hence, we must specify an investment function. We will use a simple form taken from Tobin and Brainard (1977):

$$(7) \frac{I}{PK} = n^* + \Phi[q(i) - 1]$$

Here, n^* is the rate of growth of the labour force and $q(i)$ is Tobin's q . When $q(i)=1$ capital accumulation proceeds at its balanced growth path. However, this does not necessarily imply full employment. For if the capital stock at any point in time happens to be lower than what is required to absorb the given labour force, the resulting unemployment will become „natural“, if the capital stock grows from now on at the rate n^* . Thus the natural rate of unemployment is not exogenous, but path dependent. This is a very simple explanation for hysteresis in unemployment. Hence, we need a theory to explain the deviations of $q(i)$ from 1.

We can start with simple national accounting identities. Total factor income is:

$$(8a) \quad P^* Y^* = WL + rP_k K = C + S^e$$

where W is the wage rate, L employment, $P_k K$ is the value at which capital was purchased at the previous period and r is the net cost of capital, equal to its normal rate of return.⁷ Of course, factor income is identical to total consumption and planned savings. However, the absorption of output consists of consumption and investment:

$$(8b) \quad PY = C + I$$

The difference between actual and factor income are aggregate excess profits reflecting a disequilibrium between saving and investment (Keynes, 1930):

$$(8c) \quad Q = PY - P^* Y^* = I - S^e$$

This is not the same as the output gap, because excess demand is defined as volume in (1c) and as value in (8c). Yet, what matters for capital accumulation are profits and they are defined in value terms. These Keynesian Q -profits can be transformed into Tobin's q .⁸ The latter is defined as the ratio of the market value of the enterprise to capital replacement cost, or simply the ratio of the internal rate of return of an investment project to the risk-free money market interest rate (Bofinger et al., 1996, p. 556).⁹ Thus, when entrepreneurs expect to realise a profit on productive investment above the risk-free interest rate i , they borrow money, rise aggregate investment above the level of expected savings and therefore realise in aggregate the return they expect. Formally the q -ratio is

⁷ If the price of capital goods increases at the rate of inflation, $P=P_k(1+\pi)$, r should be interpreted as the real interest rate at which capital purchases are financed.

$$(9) \quad q = \frac{1 + i_K}{1 + i} = \frac{1 + i_K - E(\mathbf{p})}{(1 + i - \mathbf{p}_t)} \approx \frac{R}{r} \quad |_{q_i < 0.} \quad q(i^*) = 1$$

where i_K is the internal rate of return, R the expected real return on investment and $r = i - \mathbf{p}_t$ the real short-term interest rate. \mathbf{p}_t is the current rate of inflation and $E(\mathbf{p})$ is the expected average rate over the life of the capital equipment. Entrepreneurs compare the rate of return from productive investment to alternative investment opportunities in risk-free domestic monetary assets. Hence the investor's portfolio is in equilibrium at $q = 1$.¹⁰ In models with neo-classical production functions like (1a), R is equivalent to the marginal product of capital (F_K), a technical variable dependent on the size of the capital stock.

With diminishing returns investment will be determined by the growth of the capital stock to the point where the marginal product of capital ($F_K \circ R$) is equal to r and $q = 1$. Hence, q represents entrepreneurial quasi-rents or excess profits which tend to disappear over time if interest rates remain unchanged. The speed of this arbitrage depends on the cost of adjustment: if these costs were zero, q would instantaneously jump to \bar{q} . Once the capital stock has adjusted, the prevailing interest is the "natural rate of interest" (i^*) and $q(i) = \bar{q}(i^*) = 1$. It corresponds to the natural rate of unemployment.

Monetary Policy

We will now assume that the risk-free monetary interest rate (i) is set exogenously by the central bank. This simplification can be justified under ceteris paribus conditions.¹¹ It follows from (9) that a rise in short term interest rates (i) will lower q and inversely. Therefore a change in monetary policy will change the desired portfolio allocation of assets and this will ultimately affect the volume of productive investment.¹² Consequently, the level of the capital stock and, at given technology, of employment is no longer independent of interest rates and ultimately of the central bank.

⁸ See Collignon, 1998.

⁹ For simplicity, this definition abstracts from time-varying term premia and default risk.

¹⁰ In reality, investment may already stop at an earlier rate, say $\bar{q} > 1$, if a minimum profit rate is required for investment, especially, when firms add oligopolistic mark-ups to marginal cost. Because R and r are not easily measured, empirical studies prefer the formulation whereby q is the ratio of the market value of an investment project to the replacement cost. Under certain assumptions the two formulations are identical, but what matters for investment is the q ratio on the margin, i.e. the increment of market valuation for the cost of the associated investment. Average q values for existing capital stock may be quite different from the supposed equilibrium value 1. But at the margin, q should be close to unity (Tobin and Golub, 1998).

¹¹ For a more realistic description see Goodfriend, 1998.

¹² At least this is the unambiguous result if we assume R independent from i . For more complex dynamics, see Collignon, 1998.

The question is then, what determines the interest rate policy of the central bank? The answer is, of course: the objective of price stability. Therefore we must show, how interest rates affect the aggregate price level. By inserting (8c) into (8a) and dividing by Y^* we obtain the aggregate price equation:

$$(10) \quad P = W/H + rq(i)P_k K/Y^*$$

with $H = Y/L$ as labour productivity. Thus the *price level* responds to excess profits resulting from interest rate deviations from the equilibrium rate $q(i^*)=1$.

The set of the two equations (7) and (10) form what we may call a monetary-Keynesian model. It provides us with a theory for the average profit mark-up which is only dependent on capital markets. Dividing P by unit labour cost (W/H), assuming $P=P_k$, and taking logs, we get the average profit mark-up:¹³

$$(11) \quad p - w + h = \ln(1 + rq K/y)$$

which is again the inverse of the wage share.

Under neoclassical assumptions q is always unity and the mark-up c is exclusively a function of the cost of capital per unit of output. It can therefore be treated as exogenous. With a Keynesian investment function, q can deviate from unit value as a consequence of portfolio shifts in asset markets. Monetary policy will affect both, investor's portfolio decisions and capital costs. This has important implications for policy.

1. Because the average profit mark-up is determined by capital markets, the wage share is independent of labour market developments and wage bargaining. The reason is that a change in the interest rate (i) will shift the aggregate price level initially and thereby change the wage share. As investment and competition respond to excess demand, the price level returns to its steady state path where $q = 1$. If capital costs remain unaffected, the wage share and the average profit mark-up return to their original value. Otherwise they are stationary around the long term trend set by capital markets.¹⁴
2. The time path of the price level is determined by two factors: unit labour cost and the average profit mark-up. Given that the profit mark-up is stationary, the price level is also stationary around the trend which is determined by unit labour cost. Hence wage bargaining is important not for the determination of the wage share, but because it sets the inflationary trend.

¹³ If $P=P_k(1+\pi)$, r should be interpreted as the real interest rate at which capital purchases are financed.

¹⁴ Blanchard (1997) has observed the increase in the capital share in Europe, and tried to explain it by shocks to labour supply and demand. As his discussant W. Nordhaus pointed out, he ignores the cost of capital but finds this reasonable in view of „the unprecedented rise in Tobin's q “. Our discussion could clarify this point: Even though $q > 1$, the capital share could be fairly stable, as long as r and k/y remain stable. In Europe, evidence

3. Under these conditions, monetary policy must observe two developments: a) excess profits as reflected in Tobin's q because they will shift the price level up or down. b) the development of unit labour costs because they determine the inflation trend. In order to maintain price stability, the interaction between a) and b) is crucial. As long as unit labour cost do not increase faster than the price objective set by the central bank, there exists room to lower interest rates and stimulate investment and employment. But if nominal wages grow faster than productivity plus the inflation target, monetary policy has to tighten. In this case q falls below unit and net investment becomes negative. Output and employment will fall.
4. However, if subsequently unit labour cost stabilise, and the central bank simply keeps (real) short term interest rates constant, the capital stock will adjust to the new, lower equilibrium level, where $q(i) = 1$. As a consequence the natural rate of unemployment has permanently increased. It will only come down again, when (possibly repeated) interest rate cuts have allowed persistent excess profits without unit labour costs increasing at a rate, that is incompatible with the central bank's objective for price stability.

3. Conclusions

Our analysis has shown that from a short term perspective unemployment is a problem of inflexible labour markets. Because the capital stock is assumed fixed, the wage share can only be varied by different wage claims relative to the price level. If, however, the capital stock changes over time as a function of investment, natural unemployment also becomes variable and may exhibit hysteresis. Because investment depends on profits and the portfolio dispositions of investors, policies to improve economic growth and employment must create the perspective for high real returns (R in equation 9) and conditions that allow the central bank to lower (real) interest rates. The first set of measures is presently covered in Europe by product market reforms under the Cardiff-process and labour market reforms under the Luxembourg process. However, for an optimal policy mix, it will be crucial that wage developments remain consistent with the price objective of the central bank. It is often argued that the United States have better succeeded on both accounts because of higher labour market flexibility. However, the more corporatist models in Europe and Japan used to produce lower unemployment until recently. It seems more likely that Europe's high real interest rates and the overvalued yen in Japan have contributed to these developments than a sudden rigidification in labour market structures. However, in this case, the mix between monetary, fiscal and wage policies will become crucial in creating a

suggests that real interest rates were systematically higher than in the US during the 1990s. Hence the capital share would have risen, even though $q < 1$ over many years.

new growth dynamic in Europe. The purpose must be to stabilise unit labour costs over time, so that monetary policy can become more accommodative¹⁵.

More concretely we may derive the following: the ECB has declared that price stability means an inflation rate between 0 and 2 percent. Assuming that errors are independent and normally distributed, this implies that the actual reference target is 1 percent inflation with a standard deviation of 1 percent. Given that average labour productivity has been growing at a deterministic trend of 2 percent, average European wages should not increase more than 3 percent p.a. in nominal terms. This leaves Tobin's q an average margin of 1 percent in the short term without violating the ECB-norm of price stability. However, following such orientation would gradually also reduce capital cost (r) and thereby improve the margin for q over time.

It seems that such a development could explain the „new economics“ of the USA. It may also be that this was achieved by „flexible“ labour markets as in the US. But Europe is different. Not only in the way labour markets operate, but also because the price stability objective of the ECB appears more ambitious than the Fed's. Given that regional price developments diverge sometimes quite significantly, there exists no intrinsic mechanism to ensure that regional (national) deviations could not push the average above the tolerable limits. This is in particular true for the three or four largest countries in Euroland. Thus, opening a Macroeconomic Dialogue and setting wage bargaining up as a co-operative game has a convincing logic. There is no reason why Europe's culture of social consensus and dialogue could not produce the same or better result than atomistically flexible labour markets in the USA.

¹⁵ See also Modigliani, 1997.

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