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AGGREGATE SUPPLY AND DEMAND FACTORS IN OECD UNEMPLOYMENT: AN UPDATE

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ABSTRACT

The paper analyzes the change in unemployment in 12 OECD countries over the period 1970-83 in terms of underlying aggregate supply and demand shifts. Earlier evidence on wage gaps (given by Bruno and Sachs) is revised and extended. For most European countries a process of reduction in gaps is taking place in the 1980's, but the average absolute levels, when weighted by country size, are still sizeable, thus a 'classical' element of unemployment remains. However, most of the large additional increase in unemployment after 1980 (as well as the profit squeeze and investment slowdown) is ascribed to the contractionary stance of macro policy in Europe, in contrast to the subsequent expansion and sharp fall of unemployment in the U.S. The large U.S. deficit coupled with monetary restraint and the resulting dollar appreciation also account for the sharp difference in the behavior of import prices in the U.S. and Europe which in turn may explain the considerably slower inflation deceleration in Europe and the reluctance to expand activity more rapidly.

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AGGREGATE SUPPLY AND DEMAND FACTORS IN OECD UNEMPLOYMENT: AN UPDATE*

Introduction

Unemployment in the OECD countries has continued to rise to unprecedented levels. The EEC countries, which on average ended the turbulent 1970's with an unemployment rate of close to 7 percent are now, in the mid 80's, approaching an 11 percent level. The U.S. is virtually the only country for which the changes in unemployment during the 1970's have not been systematically upward and for which the 1984 rate was, more or less, back to where it had been both ten years and five years earlier (see Figure 1).

The reasons for the sustained increase in unemployment during the 1970's as well as the possible reasons for differences in patterns across industrial countries have been studied but question marks undoubtedly remain. Our own emphasis in an earlier study has been on the combination of the great supply shocks of the previous decade and the contractionary macro-policy response of most OECD countries to these shocks as well as on the more recent policy co-ordination problem between the U.S. and Europe. With a few more years that have elapsed and quite a few percentage points of additional unemployment there is obviously room for both an update and a reappraisal.[1]

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[1] See Bruno and Sachs (1985). The period covered in that study extended only up to 1981 for which the coverage in terms of data for individual countries was still incomplete. It is worth pointing out that between 1981 and 1985 the number of unemployed in Europe increased by almost 50 percent!

Starting from a fairly conventional aggregate supply (AS) and aggregate demand (AD) macro-framework an increase in unemployment may come about as a result of a leftward shift of either the AS curve or the AD curve or a combination thereof (see Figure 2). The first 'pure' case of a supply shock brings about both unemployment and inflation and is generally understood to have characterized the period both immediately before and after the first oil shock (1973-74), the extent of resulting stagflation in various countries depending on the extent of real wage rigidity. Such shift from southwest to northeast in the unemployment-inflation framework (see Figure 1) has also characterized the second oil shock (1979-80). An added leftward bias of the AS curve in the 1970's may have been caused by the depressive effect of the profit squeeze on capital accumulation. All of these have imparted a 'classical' element to the unemployment which has certainly not been present in earlier, cyclical unemployment episodes. However, even the developments immediately following the two oil shocks cannot be understood without explicit regard being paid to contractionary forces coming from leftward shifts in the AD schedules of countries (see Figure 2).

The period immediately following the first oil shock (1974-77) certainly looks more like a conventional northwest to southeast movement down a short-run Phillips curve (see Figure 1). In terms of the story for the 1970's this could be explained as a combination of the depressing effect of oil and raw material prices on real income, the anti-inflationary response of macro policy to the first oil shock and the interaction of depressed world markets on export demand in the individual countries. A similar story, with some variations, could still be told for 1980-81. From

that phase onwards the differential movement of unemployment in the U.S. and Europe has become a central issue which requires analysis in its own right.

In the coming sections we take up the main issues pertaining to the role of AS and AD factors in the rising unemployment. Section I reconsiders the concept of the real wage gap, and applies alternative measures to the data up to and including 1983. Our general finding is that by the end of the period considered wage gaps for most countries recorded have come down from their peak levels in 1979-81, but are still sizable on average in Europe. Section II takes up the role of the profit squeeze. We find that while profits have played a very important role in the investment slowdown the main reason for the profit squeeze has come from depressed demand conditions and less from the direct effect of high real wages. While the slowdown in capital growth may provide an eventual constraint on rapid growth in the manufacturing sector it is unlikely to be an obstacle to expansion at the present moment due to excess capacity.

Section III takes a summary overview of the demand for labour in the manufacturing sector applying a neoclassical demand curve for labour with some Keynesian AD elements superimposed on it. Section IV reconsiders the overall unemployment performance of countries in terms of the basic underlying AS and AD components reinforcing the argument that the more recent rise in unemployment is primarily an AD contraction phenomenon. The last section (V) discusses the dilemma of individual country expansion and reconfirms the argument that there is a serious policy co-ordination problem between the U.S. and Europe in which the large U.S. deficit coupled with monetary restraint and the European fear of renewed inflation have simultaneously provided the conditions for rapid U.S. expansion and the

sluggishness of revival in Europe. The policy proposals recently put forward,[2] calling for co-ordinated, more active expansion in Europe with some incomes policy hedges, thus receive added support.

I. The Rise and Gradual Fall of Wage Gaps

Several studies have produced evidence that for a number of countries during the 1970s, at least, an important supply factor has been a persistent excess of real wage levels above the marginal product of labour at full employment.[3] It is therefore important to update and reconsider the evidence from the vantage point of the mid-1980s.

Assuming a well-behaved production function in terms of value added: $V = F(L, K; t)$, and suppose one can measure the marginal product at full employment (L^f), $F_L(L^f, K; t)$. Under output-market clearing and competitive firms $(W/P_v)^f = F_L(L^f, K; t)$ is the level of product wage at which labour demand will equal L^f. The wage gap, w^x, is the percentage deviation of the actual product wage W/P_v over $(W/P_v)^f$ or, in log-linear approximation, $w^x = (w - p_v) - (w - p_v)^f$.

The notion that the marginal product of labour may mean something in the aggregate or that the aggregate demand for labour may depend on the real wage is, of course, controversial, mainly because of the competitive assumption implied for firms. We here proceed under the supposition that

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2 See, for example, Layard et al. (1984).

3 See Sachs (1981), Bruno and Sachs (1985), Artus (1984), Lipschitz and Schadler (1984), McCallum (1984), and OECD Economic Outlook, miscellaneous issues.

like many artifacts in applied macro-economics, the notion of a wage gap could, under certain circumstances and with some caveats, perform a useful diagnostic function. When based on a sub-sector like manufacturing it may, perhaps, be less controversial than otherwise, since for most economies this is a highly tradable industry and one that is reasonably competitive.[4]

Under a CES production function with elasticity of substitution σ between L and K the elasticity of demand for labour with respect to the product wage is σ/s_k, where s_k is the capital share in value added. Thus, a log-linear approximation of the employment shortfall in the short run (i.e., at <u>given</u> capital stock, k[5]) due to a positive wage gap is given by

$$(1) \qquad \ell^d - \ell^f = -(\sigma/s_k)w^x \qquad (\ell^d = \ell^f \text{ when } w^x = 0).$$

The main problem of measurement lies in estimating the marginal product of labour at full employment. In principle, one could estimate the production technology directly and calculate F_L for L^f. Such estimates must usually assume market clearing on a year-to-year basis, which is obviously problematic. The alternative procedure followed here is to suggest a range of estimates of w^x under alternative assumptions from which, it is argued, a general picture nonetheless emerges.

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4 Note that as long as marginal revenues of firms move with prices (i.e., there is a constant 'degree of monopoly'), the notion of a wage gap could still remain valid even under monopolistic competition.

5 The importance of this caveat will be further clarified below.

The simplest assumption for calculating w^x is the Cobb-Douglas technology ($\sigma = 1$) for which the marginal product moves parallel to the average product and the problem then boils down to measuring the gap between $(w - p_v)$ and the trend of the average product at full employment $(v^f - \ell^f)$, namely, a corrected relative wage share measure, normalized by some base-year benchmark. Table 1 gives this first measure for 12 OECD countries taking the benchmark for w^x $[= w - p_v - (v^f - \ell^f)]$ to be 0 on average during the period 1965-69 and taking the average growth rates of $v - \ell$ during 1960-73 and 1973-85 to represent the respective "full employment" trend $(v^f - \ell^f)$.[6]

The findings based on the simplest measure of the gap suggest that after a rise in the gap in the early 1970s and a very sharp rise during the first oil shock, to a weighted average of 11 percent by the end of the decade, there was a gradual fall in most countries from about 1980 onward. The move in a downward direction seems to have become more marked during 1982-83. The table also underscores the fact that there are sharp differences among countries both for the peak years and for the deceleration. The U.S. and Canada importantly show very little variation during the oil shock, and only the Netherlands and Sweden were the exception to an otherwise real wage-resistant Europe.[7] The U.K. and Belgium stand out as two

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[6] While 1960 and 1973 probably represented cyclical peaks, 1983, which is the last observation in our data, is obviously not. The alternative followed in Bruno and Sachs (1985) took 1979 to be a cyclical peak and extrapolated through that year. Both procedures are problematic, and an alternative trend measure of $v^f - \ell^f$ after 1973 is given below (Table 2).

[7] See Bruno and Sachs (1985) for an extensive discussion of the difference between nominal and real wage rigidity. French data on the low wage gap shown here may be misleading (see discussion op. cit. and also Table 2).

countries with large remaining gaps by the end of the period. Japan's 1979 figure, one can argue, is misleading since the reference period, 1965-69, probably did not reflect an equilibrium in its labour market.[8] Anyway, it shows substantial reduction after 1979.

We consider two major sensitivity tests for the basic measure used in Table 1, one having to do with the technology and the other with the hypothetical measure of $v^f - \ell^f$ during the recent unemployment years.

The first argument against findings based on the simple measure of w^x comes from the assumed unitary elasticity of substitution. We know that when $\sigma < 1$ a rise in real wages will also show in a rising labour share in value-added, which would have nothing to do with disequilibrium. The sharpness of the rise in w^x in the mid-1970s and its subsequent fall towards the early 1980s would cast doubt on such explanation, but it is nonetheless important to see how sensitive this result is to the size of σ. Various recent studies of the production function for manufacturing across countries suggest the assumption of Harrod-neutral technical progress and a range of estimates of σ between 0.5 and 1, with an average of about 0.7.[9]

We recalculated $v^f - \ell^f$ on the two alternative assumptions $\sigma = 0.5$ and $\sigma = 0.7$ using the approximation formula[10]

$$(2) \qquad v_\ell = (v - \ell) + [(1 - \sigma)/\sigma][s_k/(1 - s_k)](k - v)$$

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[8] See Lipschitz and Schadler (1984) for discussion of this point.

[9] See Artus (1984), McCallum (1984), Sneessens (1984).

[10] If ℓ' is the (log) labour input in intensity units, we have

$$(v - \ell') = [s_k/(1 - s_k)](k - v).$$

(cont.)

and again applying it to the trend between the 'peak' years 1960, 1973, 1983.

The above approximation obviously requires knowledge of capital stock figures, which were available for only 8 of the countries in question. The last three lines of Table 1 give a summary average estimate for these 8 countries (Belgium, Denmark, Italy, and the Netherlands are excluded here) for the 3 assumptions on σ, from which we can see that the 1979 and 1981 peak estimates of w^x are only slightly modified. There is a somewhat larger difference in the subsequent years - the smaller σ, the larger is the estimated reduction in the gap by 1982. There are, of course, differences for individual countries (these data are not reproduced here), but the general result holds on average.

The second sensitivity test involves an alternative estimate for $v^f - \ell^f$ which attempts to correct for the effect of the unemployment level and changes thereof on full employment productivity growth. The method used[11] was to run for each country a regression of labour productivity on unemployment, the current and lagged change in unemployment and time, with a time shift factor after 1975:

(note 10 continued:)

But for CES, $v_{\ell'} = \sigma^{-1}(v - \ell')$, and thus:

$v_\ell = (v-\ell) - (v-\ell') + v_{\ell'} = (v-\ell) + [(1-\sigma)/\sigma][s_k/(1-s_k)](k-v)$ Q.E.D.

Under Hicks-neutrality we would similarly get

$v_\ell = (v - \ell) + [(1 - \sigma)/\sigma]s_k(k - \ell)$. Here the correction would be larger, since $k - \ell$ changed by more than $(k - v)$.

[11] See Bruno and Sachs (1985), chap. 9.

$$(3) \qquad v - \ell = \alpha_0 + \alpha_1 t + \alpha_2 t_{7583} + \alpha_3 U_t + \alpha_4 \Delta U_t + \alpha_5 \Delta U_{t-1}$$

Generally, as one would expect, $\alpha_3 > 0$ and α_4, $\alpha_5 < 0$ (the regressions are not reproduced here).

By setting $U_t = \Delta U_t = \Delta U_{t-1} = 0$ in the estimated equation one gets an estimate of $v^f - \ell^f$ which was used instead of the simple trend, again normalized to zero in '65-'69.

The resulting adjusted estimates are given in Table 2. It is interesting to note that on the whole the previous general finding remains intact, both concerning the size of the increase in 1976 and the gradual fall after 1979. The two extreme cases, Belgium and the United Kingdom, now look even worse, and it seems that France too is in much worse shape once the correction for unemployment is made. We note that the weighted mean for Europe, when Belgium and the U.K. are excluded, shows a lower peak but only a very mild slowdown.

An important question that arises relates to the sources of these changes in the measured wage gap. At least a partial answer is provided by a breakdown of changes in the wage gap ($\dot{w}^x$) into the parts attributable to the real consumption wage ($\dot{w}_c$), the changes in relative consumption to product prices ($\dot{p}_c - \dot{p}_v$), where the latter include changes in relative import prices, and assumed productivity trend ($\dot{v}^f - \dot{\ell}^f$).

Table 3 provides a breakdown of $\dot{w}^x$ by sub-period (using the basic measure of Table 1) using the identity

$$(4) \qquad \dot{w}^x = \dot{w}_c + (\dot{p}_c - \dot{p}_v) - (\dot{v}^f - \dot{\ell}^f) \ .$$

The table suggests that real wage moderation has attenuated the effect of

real import prices (as reflected in $\dot{p}_c - \dot{p}_v$) on w^x in the second oil shock (see 1978-80, unlike 1970-74). The deceleration of relative import prices in 1980-83 is the main explanatory factor behind the concomitant fall in w^x. We shall come back to the role of this negative supply shock in Section V.

II. The Role of the Profit Squeeze

The general picture that emerges from the data shown in the last section suggests that during the depression years of the early 1980s the wage gap has most probably been reduced in all but two or three countries. What this implies is that at given capital stock levels (providing the estimated wage gap is also applicable to the whole economy, and not only to the manufacturing sector), the demand for labour would come closer to maintenance of full employment. The emphasis on the word <u>given</u> is important because both the labour force and the capital stock normally grow at some balanced rate from which we have abstracted so far. The point is that when the capital stock levels depart from their previous growth paths this could be an additional argument for a gap between labour demand and full employment, quite apart from Keynesian arguments to which we turn later. A fall in investment demand could be linked to a profit squeeze which, in itself, may have been caused by an increase in the price of other factors of production (material inputs and labour), by depressed demand conditions, or (as in fact was the case) by a combination of both.

In the absence of full-fledged investment demand functions based on a q-measure of rationally expected profits, we here apply a rather simple-

minded approach in which capital stock growth is expressed as a function of past profits (a three-year average is used in the data below) and the real rate of interest. The real rate of profit, in turn, is expressed as a function of the real product wage (based on the factor-price-frontier) and a measure of demand pressure.

Let r denote the logarithm of the real rate of profit (where profits are deflated by GDP prices and the capital stock by investment goods prices) and w_v the logarithm of the product wage. A log-linear approximation of the factor price frontier (FPF) can be written in the form

$$r = a_0 + a_1(w_v - \lambda t) + a_2 d \tag{5}$$

where a_1 should equal minus the ratio of the labour and capital shares, and λ is the labour augmenting technical progress parameter (for the case of Harrod-neutral technical progress which is assumed here).

For deviations from the FPF due to short-term demand fluctuations we add a term $a_2 d$ to equation (5) and also allow for a drop in productivity growth after 1974 by adding a slope dummy (D7582) to the equation for estimation. The regression equation and the estimates for eight countries are given in Table 4. For the d variable a proxy was used in the form of the ratio of manufacturing output over its ten-year moving average.[12]

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[12] This procedure was followed in a recent OECD memo. We also experimented with monetary, fiscal, and world-trade variables to represent aggregate demand (see below). For some countries, the unemployment rate as well as its first difference, using two-stage least squares for w_v, serves the same purpose. Broadly similar results are obtained, but d seems a better aggregate proxy for all countries. For the basis of adding a demand variable to the FPF see Bruno (1984). There the ratio of hours worked to the employment level was used as a proxy for d, which also works reasonably well.

For all countries the a_1 coefficient comes out negative, as expected, though in the case of France and Italy it is statistically insignificant. As to its relative size, the average for the eight countries, 1.62, seems reasonable as it implies a labour share of 0.62. The average elasticity for the d coefficient (a_2) is 3.02. The implied technical progress coefficients can be got from the ratio $-a_3/a_1$ (corrected by the slope a_4 after 74) for the various countries. Running a cross-section regression for the first differences of all countries (with country intercept dummies) gives a lower coefficient for the wage elasticity (-0.82 with s.e. 0.27) and about the same for the output coefficient (2.69 with s.e. 0.19), the $\bar{R}^2$ for the overall regression (136 observations) is 0.62.

Next consider the relationship between investment and profits. A glance at the average data by sub-period suggests that the slowdown in capital accumulation both across countries and over time is correlated with the extent of the profit squeeze. A cross-section regression of period averages for the rate of change of the capital stock with the average rate of profit and the real rate of interest gives the following two alternative regressions for a linear or logarithmic specification (the data are 4-period averages times 8 countries = 32 observations):

$$(6) \qquad \dot{k} = (\text{country dummies}) + \underset{(0.062)}{0.467}R - \underset{(0.137)}{0.098}i_r \qquad \bar{R}^2 = 0.81$$

$$(6') \qquad \ell n(\dot{k}) = (\text{country dummies}) + \underset{(0.272)}{1.101}r + \underset{(0.081)}{0.077}[\ell n(1 + i_r)] \qquad \bar{R}^2 = 0.64.$$

Both equations show a very strong effect of the profit rate and an insignificant effect of the real rate of interest. The economic reasoning behind the former could be via the effect of present profit rates on the expectations of future profits or else may be a the result of financing constraint on firms which enhances investment from retained earnings when the latter increase. Whichever the channel it is obviously a strong relationship. It is further borne out by individual country regressions given in Table 5. These are based on annual data and a logarithmic specification (with the exception of the U.K. in which only the linear form gave significant results). There the profit variable ($\bar{r}$) stands for the log average profit rate for the last three years.

Table 5 shows the elasticity of capital stock growth with respect to profits to be highly significant in almost all cases (the U.S. is a possible exception), the average value being 1.46. The coefficient for the real interest rate is significantly negative in only three cases[13] (only one case with a significantly positive coefficient, France, makes no economic sense).

Writing the investment equation in the form

$$\ell n\, \dot{k} = b_0 + b_1 \bar{r} + b_2 i_r \tag{7}$$

and substituting for $\bar{r}$ from r in equation (5) we can express the growth in the capital stock as a function of the real product wage (level), the demand variable (d) and the real interest rate (leaving out time shifts):

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13 The limited role of interest rates may be due to the fact that they are much more volatile than profits [see Ueda and Yoshikawa (1985)].

$$(8) \qquad \ln \dot{k} = b_0 + b_1 a_0 - b_1 a_1 w + b_1 a_2 d - b_2 i_r$$

Looking at the size of the implied elasticities and the actual change in the underlying variables one major conclusion emerges - the real wage could not but have a relatively small direct role in the slowdown of capital accumulation while the output contraction (from the demand side) played the dominant role in the profit squeeze and the resulting contraction in investment.

The product of the average a_1 (1.6) and the average b_1 (1.5) gives an elasticity of 2.4. A permanent increase in w_v of 5 percent over its equilibrium level would thus imply a fall in $\dot{k}$ of 12 percent.[14] We know from Section I that in the mid 70's there were temporary increases of w_v which on average were twice that but by the beginning of the 1980's the gap for most countries had already come down substantially. At the same time the rate of growth of the capital stock was cut to less than half its rate over the decade for most european countries for which data are recorded here. The total elasticity for the d variable, on the other hand ($b_1 a_2$), amounts to 4.5 and the relative fall in its level over the period was of the order of 20 percent ,thus being capable of 'explaining' drops of up to 90 percent in $\dot{k}$.

This general assessment of the relative importance of the two factors (as well as a minute role for the real rate of interest) also emerges when an analysis of components is carried out by individual country (not reproduced here). We may thus conclude that while the profit squeeze probably

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[14] The average product of $a_1 b_1$ (rather than the product of the averages) is 2.22. The highest product of $a_1 b_1$ by half the wage gap in 1976 (see Table 1), from among the eight countries recorded, is 0.24 for Germany with all other countries far below that.

played an important role in the investment slowdown, for most countries and for most of the time, high real wages played only a small direct role in the latter. Indirectly, of course, the contractionary bias of macroeconomic policy was probably related to wage rigidity (fear of inflation), but this is another matter to which we shall return. First we take a summary overview of the factors affecting employment in manufacturing.

III. An Analysis of the Demand for Labour in Manufacturing

To take a summary view of the factors affecting employment in manufacturing we modify the conventional demand curve for labour by assuming gradual adjustment $[\ell - \ell_{-1} = \beta(\ell^d - \ell_{-1})]$ as well as a short-run role for aggregate demand factors. For the latter three variables were used - the government deficit (d_f, corrected for full employment and inflation), deviations from the trend in world trade (d_w) and the real money stock (m, lagged). For most countries there is considerable positive correlation between the fiscal and monetary variables and only for the U.S., where the two conflicted, did the monetary variable play an important separate role (M_2 was used and the world trade variable was not included). The log linear equation that was fitted for most countries (see Table 6) is the following:

$$(9) \qquad \ell - k_{-1} = c_0 + c_1(\ell_{-1} - k_{-1}) + c_2 w_v + c_3 d_f + c_4 d_w + c_5 t + c_6 D_{7582}$$

We note that with the exception of the U.S. and Canada all other

countries show significant negative coefficients for the product wage variable. The 'long-run' elasticity (but at given capital stock) of labour demand varies from about one half for Belgium and Norway to two and above for Japan, Denmark, France and the Netherlands (these values are obtained by dividing c_2 by $1-c_1$). The implied elasticity of substitution can be obtained by multiplication of these values by the share of capital which for most countries is of the order of 1/3 (somewhat higher for Japan). The world trade variable is significantly positive in most cases as is the deficit variable for those countries for which data could be included.

The direct role attributed to aggregate demand in these regressions is certainly not negligible and if we add the indirect role working through the investment slowdown it is quite sizable. In the way we have specified the model it is constrained to show constant returns to scale in labour and capital and thus any factor accounting for a 1 percent cut in the rate of change of k also, ceteris paribus, indirectly accounts for the same in terms of the rate of change in manhours. At the same time,the fact that the demand slowdown played a direct role in the regression provides evidence that by the end of that period (after considerable demand slowdown) there was probably no capacity constraint. This is also borne out by direct measurements of capacity utilisation [see European Community business surveys quoted in European Economy, 1983, and in Layard et al. (1984)].

IV. An Analysis of Overall Unemployment

So far the analysis dealt only with the manufacturing sector. There are obvious advantages to a consideration of that sector both for analytical

reasons (a neoclassical labour demand framework is more defensible for this sector, at least in a typical European open economy context) and because such data as product wages and capital input are more readily available. We do not, at the moment, have a satisfactory aggregate macroeconomic model formally combining demand and supply factors in a way that could be used for econometric estimation of labour demand, especially in an imperfectly competitive setting. In the absence thereof, we make do with an ad-hoc formulation, which follows the logic of the preceding discussion and could also be given justification on the basis of gradual adjustment to aggregate demand and aggregate supply within a disequilibrium setting.[15]

We write down a reduced form in which unemployment is expressed as a function of the lagged real wage gap, and the aggregate demand factors with two lags for each. The more distant lags could be rationalized on the basis of delayed effects working either on the aggregate demand schedule or via profitability and capital investment on the aggregate supply side. It is in that 'hybrid' sense that the results of Table 7 should be interpreted.

Table 7 presents unemployment regressions for eight countries. Only in the case of the U.S. both the monetary and fiscal variables appear (without the world trade variable). In the case of the other countries the addition of a fiscal variable did not make any significant difference and the lagged real money stock variables seemed to do all of the action on the domestic demand side.[16] We note that the signs of coefficients are, in

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[15] See Bruno and Sachs (1985), chap. 10.

[16] We have no explanation as to why the fiscal variable seems to perform better in the manufacturing labour demand equation and the monetary variable works better here.

most cases, the 'right' ones,[17] although they are not always significant at the 1 percent level.

Because of the statistical problems that are attached to this type of single equation estimation for each country, there is some advantage to also taking an overall cross-section view of the rise in unemployment using the same underlying model. The following is the resulting regression (20 years x 8 countries = 160 observations) of first differences:

$$(10) \qquad \Delta U = \underset{(0.08)}{0.32} + \underset{(2.30)}{6.84}\Delta w^{x}_{-1} + \underset{(2.37)}{7.47}\Delta w^{x}_{-2} - \underset{(1.08)}{5.75}\Delta m_{-1} + \underset{(1.00)}{0.61}\Delta m_{-2}$$

$$- \underset{(1.57)}{9.56}\Delta d_{w} - \underset{(1.71)}{6.26}\Delta d_{w-1}$$

$$\bar{R}^2 = 0.51$$

With the exception of the second lag on money (which could be left out), all coefficients have the right sign and are highly significant (numbers in brackets are standard errors of coefficients). The assumption underlying (10), that the elasticities are the same across countries, is, of course, problematic, but it is reassuring to find such a strong overall qualitative result. If one adds dummy variables for countries and/or each time period, none of these dummies come out significant, and the overall regression is not improved.

The average quantitative implications that could be read into the regression is that for each 1 percent rise (fall) in the wage gap, the unemployment rate rises (falls) by 0.15 percent within two years, while

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[17] Only one of the 16 coefficients of the wage gap is significantly negative, for the case of the regression for France which is suspect anyway (see discussion below). Most of the coefficients on the demand variables are negative as expected.

for each 1 percent drop in the rate of growth in real money stock, unemployment rises by 0.06 percent after a year.

Consider, for example, the average drop in real money growth between 1974-78 and 1978-82, which was about 4 percent in annual average terms. The regression would thus attribute an annual average rise of 0.24 percent in the unemployment rate to this factor alone in the last period.[18]

Table 8 gives a summary analysis of the analogous regressions that were based on the adjusted wage gap measure (these regressions are not reported here). It indicates the role of the major factors accounting for the increase in unemployment in each country. For each period the average cumulative change in the average unemployment rate since 1965-69 is given, as well as the estimated role of the adjusted wage gap (with its two lags) and the sum total of the aggregate demand factors. The table reinforces the earlier finding that wages played an important role mainly in the mid-seventies and primarily for three of the countries recorded (the U.K., Belgium and Denmark) and that its relative importance for most countries diminished during the last sub-period, 1978-82, where most of the incremental increase in unemployment can be attributed to aggregate demand shifts (subtract the second column of Table 8 from the third or fourth column). However, by 1982 the average remaining effect of the wage factor still remained high for the 5 European countries recorded in this table.

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[18] The 'world trade' factor here appears separately, although it, too, could ultimately, in a world model, be attributed to 'domestic' contraction in all countries combined. Its implied response coefficient of 0.16 'explains' a rise in unemployment of 0.4 percent annually during 1974-78 and 0.3 percent during 1978-82.

V. Inflation, Exchange Rates and the Co-ordination Problem

The previous discussion has highlighted the dominant role of contractionary macro-policy in the recent further rise of unemployment in Europe. The same framework is also consistent with the concomitant fall in unemployment in the U.S., given the extensive fiscal expansion in that country since 1981. We conclude the discussion by noting that it is the combination of fiscal expansion and monetary contraction in the U.S. which, at least in part, may indirectly account for the reluctance to expand in Europe on account of sluggish inflation deceleration. The causal link is provided by exchange rate developments during the same period.

The rise in real interest rates and net capital flows into the U.S. account for the large dollar appreciation since the beginning of 1981 (of the order of 50 percent nominal and 38 percent in real terms). This has had a dramatic effect on the relative import price developments in the U.S. as compared to Europe which, we would argue, is the dominant reason for the differential inflation performance on the two sides of the Atlantic (see Figure 1).[19] The evidence for this is so striking that it is hard to understand why it often gets overlooked.

Consider the following two sets of numbers for annual rates of change in import prices and consumer prices for the U.S. and the average for the EEC countries since 1980:

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[19] The drop in world relative commodity prices is the dominant factor in the overall inflation slowdown while exchange rates have respectively enhanced or weakened their effect. For cross-section analyses of inflation in the OECD countries emphasizing the key role of import prices and exchange rates see Bruno (1980), and Beckerman and Jenkinson (1984). See also Gordon (1977).

		1981	1982	1983	1984
Import prices:	U.S.	5.5	-1.6	-3.7	0.3
	EEC	15.6	7.1	4.2	8.5
Consumer prices:	U.S.	10.4	6.2	3.2	4.3
	EEC	11.1	9.8	7.5	6.3

A simple reduced form inflation equation for the years 1961-80 (based on a pooled regression prepared two years ago) gives a fairly close post-sample prediction of 1982-84 developments for both the U.S. and the EEC. It considers the inflation rate as a sum of lagged inflation (with a coefficient of 0.66) and current import price change (with a coefficient of 0.18) along with a capacity term which is ignored here. This gives the predicted rates of 7.1, 3.9, 2.7 for the U.S. during 1982-84 and 9.0, 7.6, 6.9 for EEC. The predicted mean inflation during 1982-84 for the U.S. and EEC is 4.6 and 7.8, respectively, while the actual rates were 4.6 and 7.9, not a bad fit, on the average.

The real depreciation of European currencies relative to the dollar thus explains why inflation slowed down so much less fast on the European continent. It may also help to explain why Europe as a whole was reluctant to expand and rather adopted contractionary macro policies until very recently. These helped to support the slowdown in inflation but at a formidable cost in terms of unemployment. Each country by itself will not expand because it risks running into balance of payments problems and added pressure on its exchange rate (with inflationary consequences) and for all countries to expand simultaneously requires more co-ordination than seems politically feasible, especially since the U.S. must agree to

cut its own fiscal deficit pari passu. A turn around in exchange rates, such as occurred in 1985, could of course alleviate some of the pressure. On the other hand, too rapid expansion in the OECD countries as a whole would risk the possibility that relative prices of industrial raw materials will rise again, but it is a trade-off worth considering.

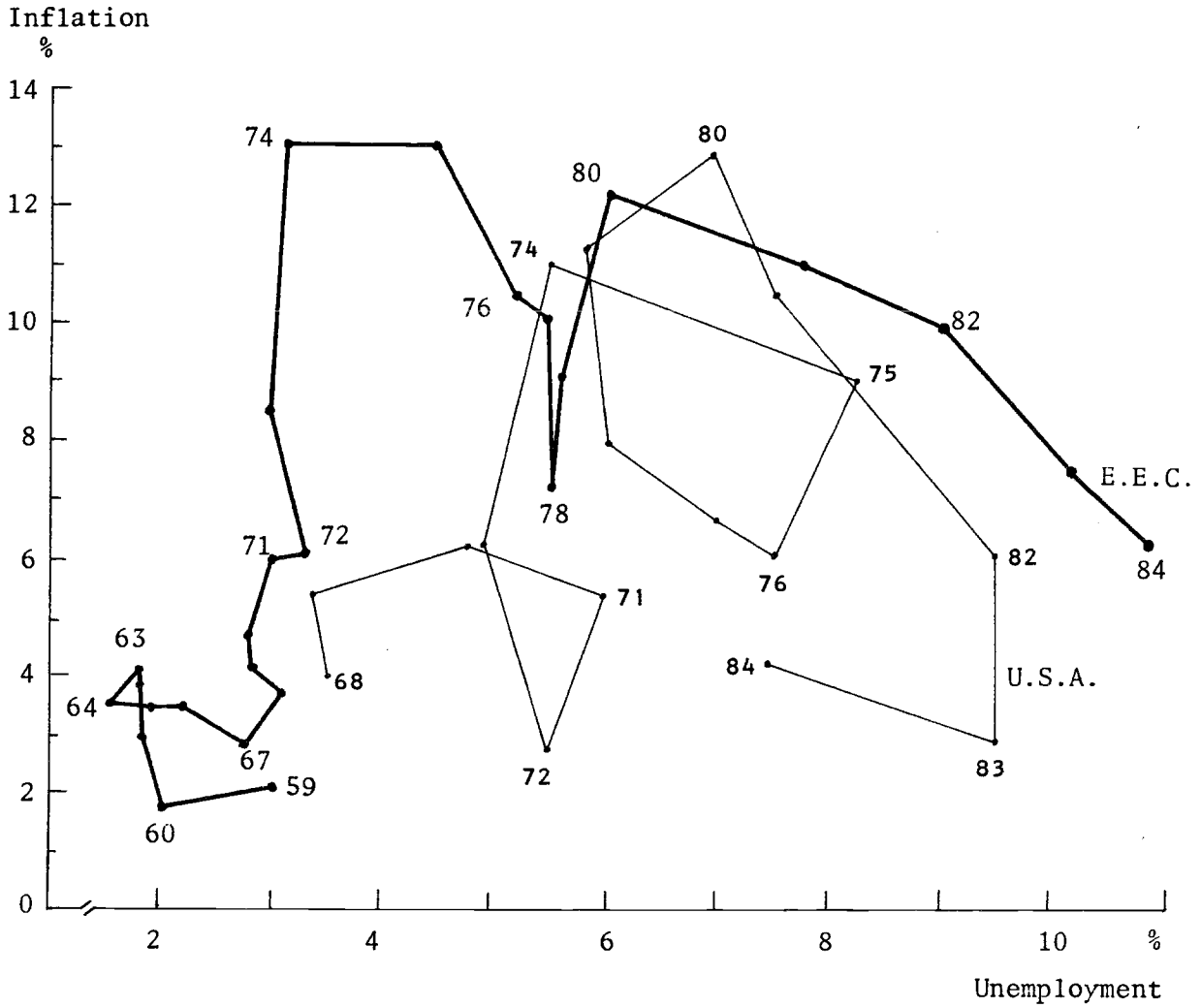

Figure 1. E.E.C. Inflation and Unemployment, 1959-1984
U.S.A. Inflation and Unemployment, 1968-1984

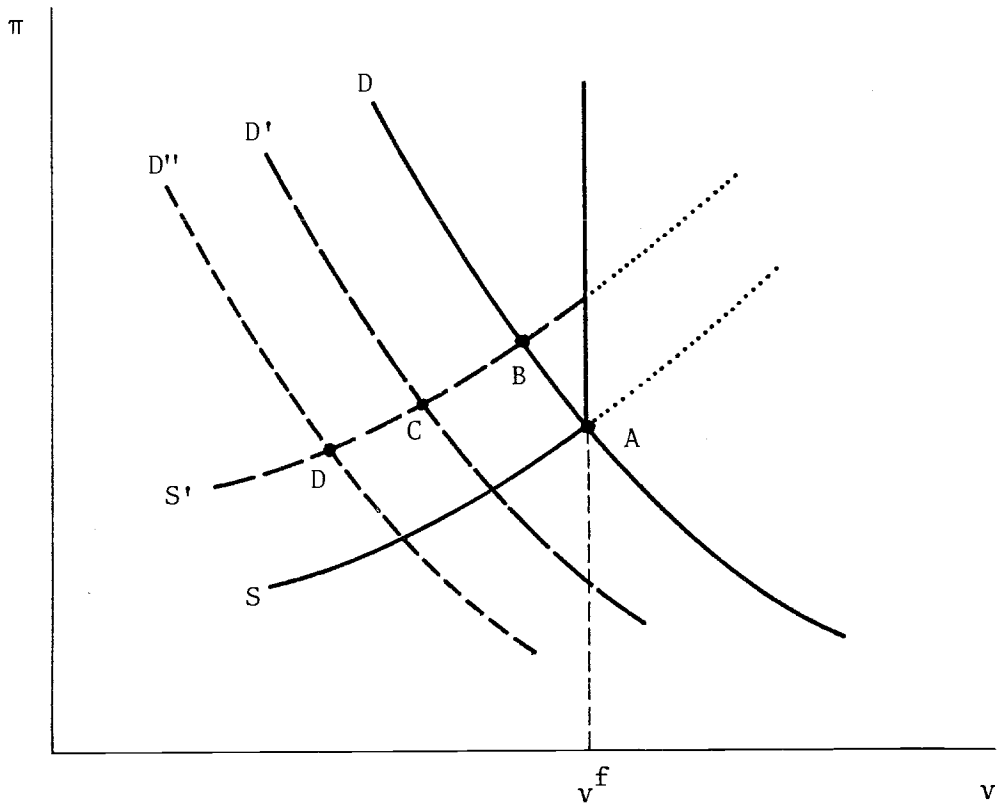

Figure 2. AD and AS Framework for Individual Economy

π = Final goods terms-of-trade

v = GDP.

Table 1. Wage Gaps, 12 OECD Countries, 1965-1983, Unadjusted

(Percentages over 1965-69 average)

	1965	1970	1973	1976	1979	1981	1982	1983	Country weights[a]
U.S.	1.2	-1.3	3.1	0.6	4.0	5.0	5.3	4.9	28.9
Canada	-1.7	1.5	-1.4	4.6	0.9	1.5	1.8	2.0	3.1
Japan	2.3	4.1	9.8	21.5	24.1	23.4	20.2	16.4	20.6
Europe									
U.K.	-1.5	1.5	3.1	8.1	9.3	14.3	13.9	13.9	11.0
Belgium	0.4	1.7	18.7	32.7	33.0	31.9	24.2	-	1.6
Denmark	-2.4	2.6	8.5	14.3	16.1	13.1	9.5	4.1	0.8
France	0.3	-3.8	-0.3	4.9	2.6	2.7	4.1	-	8.9
Germany	1.7	1.9	8.0	14.0	14.6	17.1	13.3	9.6	12.6
Italy	3.8	4.2	10.9	17.8	9.6	6.5	4.8	2.9	8.4
Nether-lands	2.1	0.2	-2.2	-1.5	-6.5	-16.1	-20.4	-	1.8
Norway	-3.2	-3.4	0.6	17.4	19.4	8.8	7.1	6.4	0.7
Sweden	3.4	-2.2	-7.4	3.3	-3.9	-7.6	-11.4	14.5	1.6
Mean (weighted)	1.2	1.7	5.3	10.1	10.7	11.1	9.7	-	100.0
Partial mean[b]	1.3	1.4	5.8	10.5	11.4	12.1	10.6	8.8	
Mean 8 countries[c]									
$\sigma = 1$	1.0	0.6	4.7	9.1	10.7	11.7	10.5	-	
$\sigma = 0.7$	0.9	0.7	4.9	9.1	10.3	11.1	9.8	-	
$\sigma = 0.5$	0.8	0.9	5.3	9.0	9.8	10.3	8.9	-	

Notes on following page.

[a] Relative size, based on 1975 manufacturing employment levels (percentages).

[b] Weighted mean of 9 countries for which 1983 observations are recorded.

[c] Weighted mean of 8 countries (for which capital stock numbers exist) under alternative CES assumptions (4 countries excluded are Belgium, Denmark, Italy, and the Netherlands).

Table 2. Adjusted Wage Gaps, 12 OECD Countries, 1965-1983

(Percentages over 1965-69 average)

	1965	1970	1973	1976	1979	1981	1982	1983
U.S.	0.2	0.1	6.0	2.9	6.8	8.1	8.6	8.4
Canada	-1.9	1.9	-0.5	3.3	0.8	2.2	2.9	3.5
Japan	2.2	4.3	10.1	18.2	20.7	19.8	16.6	12.7
Europe								
U.K.	-2.0	2.2	4.6	11.0	16.4	24.1	25.0	26.4
Belgium	2.1	-0.8	13.6	30.2	37.2	40.7	35.2	-
Denmark	-2.3	2.5	8.1	13.0	17.6	16.4	13.7	9.2
France	0.0	-3.4	-0.4	7.9	10.7	14.3	17.4	-
Germany	2.0	1.5	7.2	13.0	15.3	19.1	15.9	12.9
Italy	2.3	6.4	15.4	19.5	11.8	9.1	7.6	5.9
Netherlands	2.8	1.0	-4.4	-6.7	-11.7	-21.3	-25.7	-
Norway	-2.5	-4.3	-1.3	13.9	17.3	7.7	6.4	6.2
Sweden	2.7	-1.1	-5.2	3.7	-1.6	-4.0	-7.1	-9.6
Mean (weighted)[a]	0.8	1.6	6.6	10.5	12.6	14.0	13.1	-
Partial mean[b]	0.8	2.2	7.4	10.8	12.8	14.2	13.0	11.6
Mean Europe	0.7	1.4	5.9	12.3	13.3	15.8	14.9	-
Mean Europe excluding the U.K. and Belgium	1.5	1.2	5.9	11.9	11.2	12.0	11.3	-

[a] Weighted by 1975 employment levels.

[b] Mean of 9 countries for which 1983 observations are recorded.

Table 3. Decomposition of Changes in the Wage Gap, 1964-1983

(Annual percentage rates of change)

	1964-70				1970-74				1974-78				1978-80				1980-83			
	$\dot{w}^x$	$\dot{w}_c$	$\dot{p}_c - \dot{p}_v$	$-(\dot{v}^f - \dot{\ell}^f)$	$\dot{w}^x$	$\dot{w}_c$	$\dot{p}_c - \dot{p}_v$	$-(\dot{v}^f - \dot{\ell}^f)$	$\dot{w}^x$	$\dot{w}_c$	$\dot{p}_c - \dot{p}_v$	$-(\dot{v}^f - \dot{\ell}^f)$	$\dot{w}^x$	$\dot{w}_c$	$\dot{p}_c - \dot{p}_v$	$-(\dot{v}^f - \dot{\ell}^f)$	$\dot{w}^x$	$\dot{w}_c$	$\dot{p}_c - \dot{p}_v$	$-(\dot{v}^f - \dot{\ell}^f)$
U.S.A.	-0.8	1.5	1.2	-3.5	0.9	1.1	2.9	-3.1	-0.1	2.0	-0.1	-1.9	1.7	-1.5	5.3	-1.9	-0.2	0.6	1.1	-1.9
Canada	0.9	3.4	2.1	-4.7	-0.9	3.4	-0.4	-3.9	1.2	2.1	0.5	-1.5	-2.0	0.5	-1.0	-1.5	1.1	1.8	0.8	-1.5
Japan	0.4	8.6	2.1	-10.4	2.8	8.9	3.4	-9.5	1.9	2.3	6.2	-6.7	1.5	0.7	7.3	-6.7	-3.0	2.1	1.4	-6.7
Europe																				
U.K.	0.6	3.8	1.0	-4.3	2.2	5.0	1.0	-3.8	-2.2	2.3	-1.9	-2.6	4.2	5.0	1.9	-2.6	1.4	2.7	1.3	-2.6
France	-0.6	4.3	0.8	-5.8	1.9	5.6	1.8	-5.5	0.0	4.4	0.1	-4.5	0.0	2.6	1.9	-4.5	0.0	2.0	1.7	-4.5
Germany	0.5	6.3	-0.2	-5.5	2.3	7.0	0.6	-5.3	0.8	5.2	-0.2	-4.1	0.8	3.4	1.5	-4.1	-2.1	0.5	1.4	-4.1
Italy	-0.7	6.9	-0.4	-7.3	2.3	9.3	-0.6	-5.3	-0.4	4.0	-1.2	-3.2	-3.3	0.3	-0.4	-3.2	-0.7	2.9	-0.4	-3.2
Neth.	-0.6	7.2	-0.4	-7.4	0.4	8.0	-0.7	-6.9	-1.9	3.2	-0.4	-4.7	-2.9	1.1	0.6	-4.7	-4.5	-0.3	0.6	-4.7
Norway	0.0	5.1	-0.7	-7.4	2.0	5.8	0.0	-3.8	4.4	4.7	1.8	-2.1	4.4	0.1	-2.5	-2.1	-2.2	-0.8	0.7	-2.1
Sweden	-1.3	5.2	-0.2	-6.4	-0.1	5.5	-0.2	-5.4	0.4	4.1	-1.0	-2.7	-2.8	-0.9	0.8	-2.7	-2.6	-0.8	0.8	-2.7
Belgium	0.3	7.3	-0.1	-6.9	4.8	12.4	-0.5	-7.1	2.7	8.3	0.4	-6.0	1.0	5.6	1.2	-6.0	-4.8	-0.9	1.8	-6.0
Denmark	0.9	5.5	2.0	-6.5	2.6	7.1	1.4	-5.9	-0.1	2.7	0.8	-3.6	1.6	0.3	5.0	-3.6	-3.9	-0.6	0.3	-3.6
Mean (weighted)[a]	-0.1	4.9	1.0	-6.0	1.8	5.5	1.8	-5.4	0.3	3.1	0.9	-3.7	1.0	1.1	3.6	-3.7	-1.1	1.4	1.1	-3.7

[a] Weighted by 1975 employment level.

Table 4. Rate of Profit Equations for Manufacturing, Eight Countries, 1965-82[a]

$$r = a_0 + a_1 w_v + a_2 d + a_3 t + a_4 D_{7582}$$

Country	a_0	a_1	a_2	a_3	a_4	ρ	$\bar{R}^2$	D.W.
U.S.	2.88 (0.22)	-3.41 (1.26)	2.37 (0.44)	0.12 (0.05)	-0.05 (0.02)	0.57 (0.30)	0.90	1.87
Canada	-5.15 (2.94)	-2.28 (1.06)	2.96 (0.50)	0.15 (0.05)	-0.10 (0.04)	-0.03 (0.48)	0.84	1.65
Japan	4.48 (0.51)	-0.61 (0.14)	1.88 (0.01)	0.07 (0.01)	-	—	0.97	1.70
U.K.	0.87 (0.76)	-1.75 (0.59)	2.08 (0.50)	0.06 (0.03)	-	0.63 (0.24)	0.94	1.63
France	1.10 (0.66)	-0.21 (0.67)	3.48 (0.53)	0.04 (0.04)	-	-	0.78	1.97
Germany	1.51 (0.35)	-1.06 (0.46)	1.70 (0.27)	0.07 (0.03)	-0.01 (0.01)	0.43 (0.31)	0.95	1.73
Italy	4.33 (1.36)	-0.44 (0.35)	3.08 (0.41)	0.07 (0.02)	-	0.65 (0.24)	0.78	1.38
Sweden	12.48 (3.08)	-3.17 (0.82)	6.65 (0.81)	0.22 (0.05)	-0.07 (0.04)	-	0.95	2.23

[a] Numbers in brackets are standard errors.

Sources: Real Rate of Profit (r): Calculated from Operating Surplus over capital stock in manufacturing, corrected for relative GDP to investment goods prices, all from OECD data [Chan-Lee and Sutch (1985)].

Real Product Wage (w_v): Nominal wage in manufacturing, BLS data deflated by GDP prices, OECD.

Demand proxy (d): Manufacturing output divided by ten year moving average, OECD data.

Table 5. Investment Equations for Manufacturing, Eight Countries, 1965–82

$$\ell n\, \dot{k} = b_0 + b_1 \bar{r} + b_2 i_r$$

Country	b_0	b_1	b_2	ρ	$\bar{R}^2$	D.W.
U.S.	-0.90 (1.46)	0.79 (0.50)	-9.00 (3.15)	0.61 (0.21)	0.55	1.83
Canada	-1.30 (1.23)	1.07 (0.47)	2.95 (3.06)	0.55 (0.23)	0.60	1.29
Japan (67–82)	-4.47 (0.89)	2.00 (0.27)	0.62 (1.42)	0.33 (0.29)	0.88	1.74
U.K.[a]	1.14 (0.42)	0.20 (0.04)	-0.77 (5.06)	-0.89 (0.16)	0.62	2.37
France	-1.57 (0.68)	1.13 (0.25)	10.60 (2.41)	-	0.65	1.82
Germany	-7.72 (1.41)	3.22 (0.51)	-0.47 (6.03)	0.64 (0.21)	0.91	1.32
Italy	-3.86 (2.74)	1.83 (0.96)	-6.29 (2.00)	0.85 (0.14)	0.78	1.70
Sweden	-1.81 (0.72)	1.45 (0.33)	-12.74 (5.50)	_	0.56	1.32

[a] The regression for the U.K. is linear in $\dot{k}$ and $\bar{r}$.

Source: $\bar{r}$ = log of three year mean rate of profit (OECD Economic Outlook: rate of operating surplus over capital stock)

i_r = log(1 + real rate of interest), where real rate equals nominal rate minus rate of consumer price inflation (IMF)

$\dot{k}$ = percentage rate of change, real capital stock (OECD)

Table 6. Demand for Labour in Manufacturing, 1961-82, Eleven Countries

$$\ell - k_{-1} = c_o + c_1(\ell_{-1} - k_{-1}) + c_2 w_v + c_3 d_f + c_4 d_w + [c_4' m] + c_5 t + c_6 D_{7582}$$

Country	c_1	c_2	c_3	$c_4[c_4']$	c_5	c_6	D.H.[a]	NSE
U.S.	0.34 (0.13)	0.17 (0.30)	1.16 (0.80)	[0.61] (0.10)	-0.06 (0.01)	0.02 (0.05)	-0.84	.0023
Canada	1.12 (0.16)	-0.29 (0.25)	1.19 (0.55)	0.50 (0.18)	0.02 (0.01)	-0.014 (0.010)	-1.34	.0037
Japan	0.62 (0.20)	-1.03 (0.35)	1.41 (0.73)	0.24 (0.16)	0.07 (0.03)	-0.02 (0.01)	-0.35	.0033
U.K.	0.41 (0.17)	-0.59 (0.21)	0.46 (0.26)	0.26 (0.19)	-0.00 (0.01)	-0.022 (0.005)	1.41	.0839
Belgium[b]	0.45 (0.12)	-0.25 (0.24)	-	0.53 (0.09)	0.015 (0.005)	-0.024 (0.006)	-0.01	.0018
Denmark[b]	0.41 (0.12)	-1.20 (0.24)	-	0.61 (0.13)	0.08 (0.02)	-0.04 (0.01)	-1.88	.0027
France	0.71 (0.11)	-0.57 (0.12)	0.67 (0.39)	0.23 (0.08)	0.017 (0.009)	-0.011 (0.003)	-1.40	.0014
Germany	1.00 (0.18)	-0.64 (0.22)	1.98 (0.74)	0.70 (0.16)	0.044 (0.021)	-0.012 (0.008)	1.59	.0026
Italy[c]	0.25 (0.23)	-0.76 (0.28)	-0.00 (0.00)	0.20 (0.18)	0.026 (0.20)	-0.04 (0.02)	1.30	.0034
Nether.[b]	0.76 (0.10)	-0.40 (0.17)	-	0.28 (0.09)	0.019 (0.010)	-0.015 (0.009)	-0.169	.0026
Norway[b]	0.79 (0.17)	-0.104 (0.056)	-	0.035 (0.098)	0.004 0.003)	-0.008 (0.005)	1.17	.0027

[a] D.H. is the Durbin H-coefficient.

[b] For these four countries there are no capital stock or deficit data in the regression.

[c] 1965-82.

(cont.)

Source: ℓ = (log) manhours in manufacturing, BLS data. k = capital stock (see table 3). w_v = product wage (op.cit.). d_w = deviations from world trade trend [see Layard and Nickell (1984)]. m = log of real money stock (IMF). d_f = inflation corrected structural deficit (EEC data)

Data in brackets are standard errors of coefficients.

Table 7. Unemployment Equations for Eight Countries, 1962-1982

$$[U = h_0 + h_1 w^x_{-1} + h_2 w^x_{-2} + h_3 m_{-1} + h_4 m_{-2} + h_5 d_w + h_6 d_{w-1} \; (+ h'_5 d_{f-1} + h'_6 d_{f-2}) + \text{time shift}^a]$$

	h_1	h_2	h_3	h_4	$h_5[h'_5]$	$h_6[h'_6]$	D.W.	NSE
U.S.	20.11 (4.06)	-1.44 (4.89)	-4.95 (1.66)	-11.05 (1.67)	[-0.27] (0.11)	[-0.05] (0.11)	1.76	0.051
Canada	20.34 (7.32)	8.52 (8.47)	2.31 (3.01)	-7.58 (2.68)	-7.01 (5.57)	1.02 (5.25)	1.99	0.069
Japan	2.46 (0.70)	1.44 (0.76)	0.26 (0.45)	0.01 (0.34)	-2.02 (0.48)	-0.83 (0.62)	2.49	0.035
U.K.	8.48 (6.20)	13.77 (7.51)	-3.27 (3.62)	-1.48 (2.95)	-10.03 (5.05)	-4.25 (4.72)	1.88	0.087
Belgium	3.67 (2.63)	7.32 (2.92)	-3.62 (1.97)	0.89 (1.71)	-11.76 (2.03)	-10.62 (2.02)	1.77	0.045
Denmark	1.70 (14.53)	45.04 (15.38)	-10.03 (4.99)	13.49 (4.66)	-17.12 (5.66)	-1.27 (9.50)	1.91	0.109
France	1.70 (2.53)	-5.91 (2.76)	-3.20 (1.58)	2.42 (1.38)	-2.38 (1.33)	-3.82 (1.50)	2.00	0.047
Germany	7.75 (3.99)	3.62 (4.03)	-4.83 (1.97)	-5.58 (2.39)	-7.27 (3.06)	-3.79 (2.55)	1.70	0.124

[a] The regressions include separate time shift factors for the period 1962-74 and 1975-82 and were run using AR_1.

Sources: Unemployment (U) - OECD standardized unemployment data.

Wage gap (w^x) - See Table 1.

Real money balances (m) - IMF data; for Canada and the U.S. M_2 (of the U.S.) was used.

Government deficit (d_f) - See Table 6.

World trade (d_w) - See Table 6.

Table 8. Adjusted Accounting for the Rise in Unemployment Since 1965–1969 (percentages of the labour force)

	1970–1974	1974–1978	1978–1982	1982	1970–1974	1974–1978	1978–1982	1982
	U.S.				Belgium			
Total	1.7	3.5	3.7	5.8	0.3	4.5	8.1	10.8
Adj. wage gap	-0.1	0.1	-0.1	0.0	0.7	3.4	5.6	12.2
Aggregate demand	1.5	3.2	4.0	5.7	-0.2	1.3	2.3	-1.3
	Canada				Denmark			
Total	1.9	3.7	4.4	7.0	0.6	8.0	8.2	10.2
Adj. wage gap	0.4	0.1	0.3	0.4	2.5	7.8	11.0	6.3
Aggregate demand	1.5	3.4	4.3	6.2	-1.5	-0.5	-2.4	4.6
	Japan				France			
Total	0.1	0.8	1.0	1.1	0.7	2.6	4.8	5.9
Adj. wage gap	0.3	0.9	1.1	1.1	-0.2	0.6	1.4	1.6
Aggregate demand	-0.2	-0.1	-0.2	0.0	0.9	2.0	3.3	4.3
	U.K.				Germany			
Total	0.9	3.1	6.1	9.5	0.2	2.7	3.3	5.3
Adj. wage gap	0.6	2.5	3.7	5.5	0.3	1.2	1.7	1.9
Aggregate demand	0.3	0.8	2.0	3.9	-0.1	1.4	1.6	3.4

REFERENCES

Artus, J. A. "The Disequilibrium Real Wage Hypothesis: An Empirical Evaluation," IMF Staff Papers, Vol. 31, No. 2, June 1984, pp. 249-302.

Beckerman, W. and T. Jenkinson, "Commodity Prices, Import prices and the Inflation Slowdown: A Pooled Cross-country Time Series Analysis," July 1984, Draft, Balliol College, Oxford.

Bruno, M. "Import Prices and Stagflation in the Industrial Countries: A Cross-Section Analysis," Economic Journal, Vol. 90 (359, Sept. 1980), pp. 479-492.

-------. "Raw Materials, Profits and the Productivity Slowdown," Quarterly Journal of Economics, Vol. XCIX, No. 1, Feb. 1984, pp.1-29.

------- and J. Sachs, Economics of Worldwide Stagflation, Harvard University Press, 1985.

Chan-Lee, J. H. and H. Sutch. "Profits and Rates of Return in OECD Countries," Working Paper No. 20, OECD Economics and Statistics Department, May 1985.

Gordon, R. J. "World Inflation and Monetary Accomodation in Eight Countries," Brookings Papers on Economic Activity, 1977: 2, pp. 409-468.

Layard, R., G. Basevi, O. Blanchard, W. Buiter, and R. Dornbusch, "Report of the CEPS Macroeconomic Policy Group-Europe: The Case for Unsustainable Growth," ECE Economic Papers, No. 31, April 1984.

------- and S. Nickell, "Unemployment and Real Wages in Europe, Japan and the U.S." Centre for Labour Economics, LSE, Working Paper No. 677, October 1984.

Lipschitz, L., and S. M. Schadler, "Relative Prices,Real Wages and Macroeconomic Policies: Some Evidence from Manufacutring in Japan and the U.K.," IMF Staff Papers, Vol. 31, No. 2, June 1984, pp. 303-338.

Malinvaud, E. Profitability and Unemployment, Cambridge Univeristy Press, 1980.

McCallum, J. "Wage Gaps, Factor Shares, and Real Wages," University of Quebec, November 1984.

Sachs, J. "Wages, Profits and Macroeconomic Adjustment: A Comparative Study," Brookings Papers on Economics Activity, 1979:2, pp. 269-319.

Sneessens, H. "Keynesian vs Classical Unemployment in Western Economies: An Attempt at Evaluation," Lille, Feb. 1984.

Ueda, K. and H. Yoshikawa, "Financial Volatility and the q Theory of Investment," Economica (forthcoming), 1985.

Appendix Table A-1. Average Unemployment Rate and the Rate of Change in Product and Real Money Supply by Subperiod, 1965-1982 (percentages)

	1965-70			1970-74			1974-78			1978-82		
	U	$\dot{v}$	$\dot{m}$	U	$\dot{v}$	$\dot{m}$	U	$\dot{v}$	$\dot{m}$	U	$\dot{v}$	$\dot{m}$
U.S.	3.9	3.7	1.1	5.4	3.5	0.3	7.2	3.7	-0.3	7.5	0.7	-2.7
Canada	4.2	5.1	9.0	5.8	6.0	2.4	7.6	3.1	0.5	8.3	0.8	-4.4
Japan	1.2	11.3	9.9	1.3	5.3	8.9	2.0	4.5	2.9	2.2	4.3	-0.5
Europe												
U.K.	2.8	2.5	-0.3	3.7	2.8	0.9	5.8	2.2	0.7	8.8	0.2	-2.0
France	2.1	5.4	2.3	2.7	5.0	4.4	4.6	3.0	0.5	6.9	1.6	-1.0
Germany	0.8	4.5	4.8	1.0	3.1	3.5	3.6	2.6	6.6	4.2	1.2	-2.0
Italy	5.5	5.7	13.1	5.8	4.0	7.1	6.6	1.7	3.9	8.1	2.1	-1.4
Neth.	1.1	5.3	3.9	2.1	4.3	2.8	5.3	3.4	3.4	7.8	0.2	-1.7
Norway	1.8	4.0	4.8	1.6	4.8	5.8	1.8	4.8	-0.6	2.1	2.8	-0.1
Sweden	1.7	4.2	1.8	2.4	2.6	3.1	1.8	0.9	0.8	2.4	1.4	2.3
Belgium	2.3	5.0	0.6	2.7	4.7	2.6	6.8	1.8	0.8	10.4	1.0	-4.3
Denmark	3.2	4.4	3.8	3.8	2.7	0.4	11.2	2.4	4.8	11.4	1.4	0.4

U Unemployment rate (OECD, standardized data).

$\dot{v}$ Percentage change of GDP/GNP (OECD, National Income Accounts).

$\dot{m}$ Percentage change of real money (M1/CPI from IMF data).

GDP: U.K., France, Italy, Sweden, Norway, Denmark.

GNP: U.S., Germany, Canada, Japan, Belgium, Netherlands.

Appendix Table A-2. Average Rate of Change of Product, Labour, and Capital Inputs in Manufacturing, by Subperiod, 1965-1982 (percentages)

	1965-70			1972-74			1975-78			1979-82		
	L	K	V	L	K	V	L	K	V	L	K	V
U.S.	1.7	4.2	3.3	1.0	2.9	4.7	0.7	3.6	3.7	-2.7	4.3	-1.6
Canada	1.2	5.7	5.3	1.8	4.6	6.9	-0.1	4.0	1.8	-1.7	3.8	-1.8
Japan	1.9	15.5	13.8	-0.2	11.3	7.2	-2.0	4.8	6.0	0.9	5.5	7.6
Europe												
U.K.	-0.9	3.8	2.8	-2.2	2.9	2.3	-2.3	2.4	-0.6	-7.1	2.1	-4.0
France	0.1	5.6	6.5	0.6	6.1	5.7	-2.4	3.8	2.9	-3.2	4.4	0.1
Germany	0.7	6.1	6.0	-2.9	4.7	2.6	-3.3	2.0	1.6	-2.4	2.1	0.2
Italy	0.7	4.7	8.0	-1.5	5.5	5.5	-0.5	2.6	1.7	-2.1	2.5	2.6
Neth.	-2.1	nc	7.2	-3.6	nc	4.5	-4.0	nc	1.2	-2.5	nc	0.7
Norway	-0.1	nc	4.8	0.0	nc	4.6	-2.4	nc	-1.4	-1.9	nc	0.0
Sweden	-1.6	4.7	5.0	-1.7	4.5	3.4	-3.0	3.5	-2.0	-2.4	1.8	0.4
Belg.	-0.9	nc	6.6	-1.8	nc	6.6	-5.6	nc	0.7	-4.8	nc	0.1
Denm.	-1.6	nc	4.6	-2.4	nc	4.4	-3.4	nc	1.0	-1.0	nc	1.8

L - Percentage change of manhours (BLS).

K - Percentage change of Capital (OECD).

V - Percentage change of Product (BLS).

Appendix Table A-3. Mean Wage Gap, Gross Return to Capital in Manufacturing and the Real Interest Rate, by Subperiod, 1965-1982 (percentages)

	1965-70			1972-74			1975-78			1979-82		
	w^x	R	i_r	w^x	R	i_r	w^x	R	i_r	w^x	R	i_r
U.S.	-0.2	22.4	1.6	0.9	17.3	0.7	0.8	16.9	0.7	5.0	12.7	1.5
Canada	0.3	14.2	2.8	-0.2	14.4	1.1	3.1	12.1	0.2	0.7	11.2	2.2
Japan	0.7	37.0	1.4	9.7	31.0	-3.2	22.6	20.0	-0.3	23.3	21.1	3.5
Europe												
U.K.	0.2	12.6	3.0	3.8	9.3	0.4	4.6	6.7	-2.2	11.8	5.7	0.6
France	-0.6	16.7	2.1	-0.1	18.8	0.3	4.5	13.1	-0.6	3.4	12.0	0.9
Germany	0.3	19.3	4.6	6.8	16.4	2.6	14.2	14.4	2.8	15.2	12.9	3.4
Italy	0.7	18.1	3.7	8.6	16.1	-1.5	15.8	13.4	-2.1	6.5	17.5	0.3
Neth.	0.0	nc	1.7	-1.6	nc	-0.2	-2.8	nc	0.8	13.6	nc	4.1
Norway	-0.6	8.3	0.5	1.4	9.6	-1.0	17.8	nc	-1.7	12.1	nc	nc
Sweden	-0.4	11.2	2.0	-4.9	9.5	-0.1	0.6	6.0	-0.8	-7.4	5.9	1.7
Belg.	0.3	nc	3.2	15.7	nc	0.3	32.0	nc	0.4	30.7	nc	5.0
Denm.	0.4	nc	2.1	7.7	nc	2.3	13.5	nc	3.3	13.6	nc	6.5

w^x - Wage gap - calculated from manufacturing data (see Table 1).

R - Return to capital in manufacturing (OECD, Economic Outlook data).

i_r - Real interest rate on government bonds (IMF).