EMU: What If the Shocks Are in the Labor Markets?

Gil Mehrez and Natacha Valla

This paper argues that labor markets across Europe vary dramatically in their fundamental features and rigidities across Europe. Thus, any discussion of an optimum currency area should focus on the differences and the idiosyncratic changes in the labor markets. After demonstrating the vast differences and changes in the labor markets across Europe, we construct a model with differential goods, monopolistic competition, free trade and labor market rigidities. We show that a change in labor market features in one country, such as a change in the unemployment benefits, affects the equilibrium unemployment and real wages in both countries. Independent monetary policy, i.e., having distinct currencies, can be used to control the speed of adjustment to the new equilibrium. An active monetary policy can speed the adjustment to an equilibrium with low unemployment following a positive change in the labor market.

I. Introduction

The debate over the applicability of a monetary unification for Europe has focused on the comparison between adjustments associated with country specific productivity shocks and the reduction in the transaction costs allowed by a common currency. That is, forming a currency union reduces the transaction costs associated with the trade of goods between countries with different currencies but increases the adjustment costs in response to country specific shocks. A key element in determining an optimum currency area is, therefore, the correlation in the shocks that each country experiences, the extent of nominal and real rigidities, and labor mobility. Consequently, a large empirical literature has studied the mobility of labor and the correlations in the business cycles across potential EMU members.

The empirical findings are not decisive on whether the observed correlation in the business cycle within Europe are large enough to support a common currency.[1] Regarding labor markets, however, the empirical findings suggest the following: First, labor mobility is very low between countries and even between different regions in the same country. Second, there are vast differences in the various labor markets features, such as the level and duration of unemployment benefits, minimum wages, hiring and firing costs, union membership, the wage bargaining process and so on. For example, unemployment benefits amount to 26% of the average pay for a period of 6 months in Italy but amount to 73% of the average pay for 30 months in Denmark. Third, labor market features in each country change frequently, and these changes are uncorrelated across countries.

The distinct labor market features, their dynamics in the last decades and their great effect on unemployment and the participation rate suggest that the debate over the EMU should focus on labor market rigidities across countries (in addition to the correlation in productivity shocks). This is especially important for Europe given the persistently high

Gil Mehrez, Department of Economics, Georgetown University, Washington, D.C. 20057. **Natacha Valla**, Department of Economics, European University Institute, Florence, Italy.

unemployment rates and the extent of labor market rigidities. Surprisingly, however, the debate has concentrated mainly on business cycle correlation and technology shocks and paid very little attention to the changes in labor markets rigidities. Shocks to labor market characteristics, such as an increase in unemployment benefits or a change in the bargaining process (due, for example, to the recent change of government in France), have large and permanent effects on both equilibrium unemployment and the participation rates. Nickell [15], for example, finds that high unemployment is associated with the following labor market rigidities: generous unemployment benefits that are allowed to run on indefinitely, combined with little pressure on the unemployed to find a job or increase their ability; high unionization with wages bargained collectively but without coordination between unions or employers; high overall taxes impinging on labor; and low educational standard of the unskilled workers. He estimates that an increase of six months in the duration of unemployment benefits would increase unemployment by five percent and would decrease the participation rate by about one percent. From a base line unemployment of 10 percent and participation rate of 60 percent, this would represent an increase in unemployment of half percentage point to 10.5 and a decrease in participation rate by about half percentage point to 59.5 (See also Layard, Nickell and Jackman [12]).

Making inferences from the past experiences in the labor markets suffer, of course, from the fact that the pattern of labor market rigidities may change with the EMU. In other words, the Lucas critique applies to any such inference since the EMU, no doubt, will affect the labor market features across Europe. This, however, does not imply that labor market rigidities should not be the center of the discussion about an optimum currency area. To the contrary, the discussion should focus on two main issues concerning labor markets features: First, what are the consequences of having a common currency when labor markets features are distinct and dynamic. Second, what will be the effect of the EMU on the labor market features, that is will labor market rigidities change following the onset of the EMU.

In this paper we address the first issue, namely the consequences of having a common currency when countries experience specific shocks to their labor market features. To this end we develop a macro labor model of monopolistic competition, international trade and a wage curve -- the relationship between the unemployment rate and the real wage as a function of labor markets rigidities. In equilibrium -- where demand is equal supply and trade is balanced -- unemployment and real wages in each country are determined by labor market rigidities in both countries. That is, if, for example, the recently elected socialist government in France decides to increase unemployment benefits in France, unemployment would increase in France as well as in the rest of Europe.

Under a common currency, nominal wages has to adjust to a new equilibrium. Under distinct currencies, however, the exchange rate can carry the adjustments as in Mundell [14] seminal work. Thus, the speed and path of the adjustment following a change in the labor markets rigidities can be influenced by the monetary authorities. For example a decline of unemployment benefits in Denmark would cause the unemployment rate in Denmark and in the rest of Europe to fall, and would cause a decline in wages in Denmark and an increase in wages in the rest of Europe. Given some nominal rigidities, that is, wages are slow to adjust, an expansionary monetary policy in Denmark could improve welfare by increasing the speed of adjustment to the new low unemployment equilibria.

This paper is organized as follows: section 2 describes the key characteristics of the

labor markets fundamentals across Europe emphasizing their differences and dynamics. In section 3 we develop a model of international trade with monopolistic competition, immobile labor, and a wage curve that depends on labor market's features. Section 4 discusses the advantages of an independent monetary policy following a change in the labor markets. Section 5 concludes and summarizes the results.

## II. Labor Markets Outcomes and Features in Europe

While often presented as a homogeneous whole, "the" European labor market may not be as integrated as the literature and the political discourse suggest. In spite of some similarities, especially when compared to the U.S.A., the national labor markets in Europe are very distinct and heterogeneous. There are large differences across Europe in the fundamental labor market features -- tax rates, unemployment benefits, hiring and firing regulations and costs, unions' density, the bargaining process, government expenditure on training, minimum wage, and so on -- and in the labor market outcome -- the participation rate, the rate of unemployment and the fraction of the long term unemployed. To highlight the extent of these differences we exhibit some of the features and outcome of labor markets in Europe. We start by describing the differences in the outcomes -- the labor supply and the unemployment rate. Then we present the differences in the labor markets features, and finally we demonstrate the extent of their change over time.

III. Labor Markets Outcomes in Europe

Altogether, the European labor force amounts to 165 million workers which constitute about 56% of the whole population (Eurostat 1992).[2] The composition of the labor force, however, varies from one country to the other. The participation rate varies from about 50 percent in Spain, Italy and Ireland to around 70 percent in Scandinavia and Portugal (OECD Employment Outlook (1996)). These differences are even more apparent when we compare the women participation rate and the gender wage gap. The female participation rate varies from about 50 percent in Finland and Denmark to less than 30 percent in Spain and Ireland (see figure 1).

One might note that no regional north/south type of cliche can be made. In addition, the gender wage ratio varies greatly across Europe as one might suspect given the large dispersion in the women participation rates. For example, Blau and Kahn [7], estimate that in 1990, the female/male earning ratio was 88 percent in Sweden, 83 percent in France, 70 percent in the U.K. and 68 percent in Ireland.

Mehrez and Valla

Figure 1
Proportion of women in total employment – 1983 and 1992
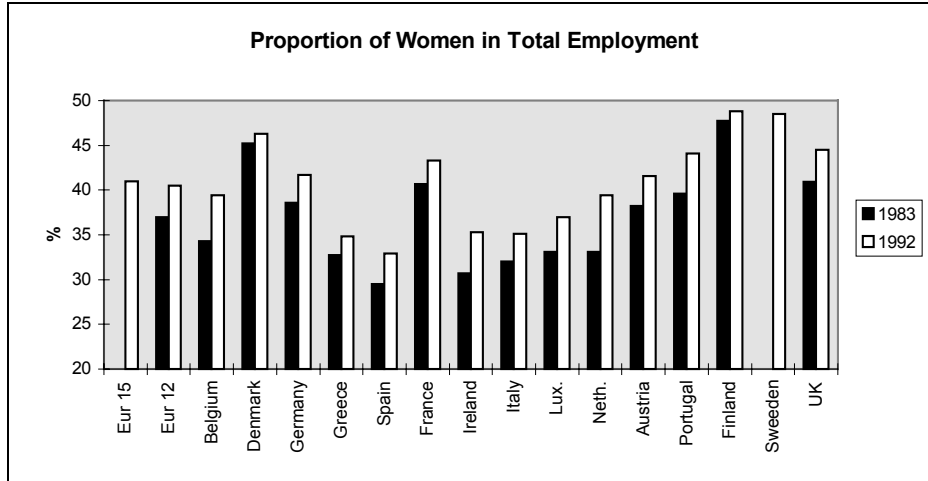
Source: *Eurostat* 1992.

Figure 2
Seasonally adjusted unemployment rates in the European countries, June 1996
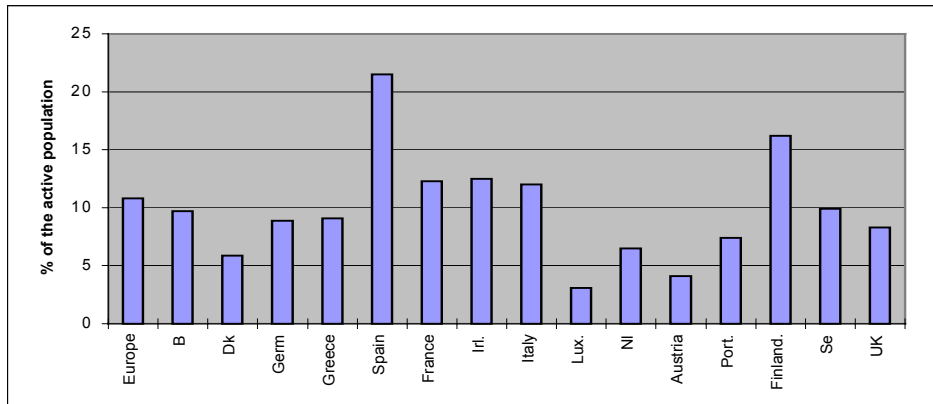

Source: *European Economy* #56, p. 25.

    The variation in unemployment rates across Europe is astounding. Figure 2 presents the unemployment rates across Europe. The unemployment rate is around 5 percent in Luxemburg, Austria, Denmark, Netherlands and Portugal; close to 10 percent in the U.K.

Germany, Belgium, Greece and Sweden; over 10 percent in France, Ireland, Italy, Finland; and over 20 percent in Spain.

A major difference between the unemployed in Europe is the share of the long-term unemployed. (Those who have been out of work for one year or more.) Figure 3 presents the fraction of the long-term unemployed in 1992. The difference is astonishing. The share of the long-term unemployed varies from 8 percent in Finland, 27 percent in Denmark, 35 percent in France and Germany, 44 percent in Austria and almost 60 percent in Belgium, Ireland and Italy.[3]

Figure 3
Long-term unemployment as a percentage of total unemployed
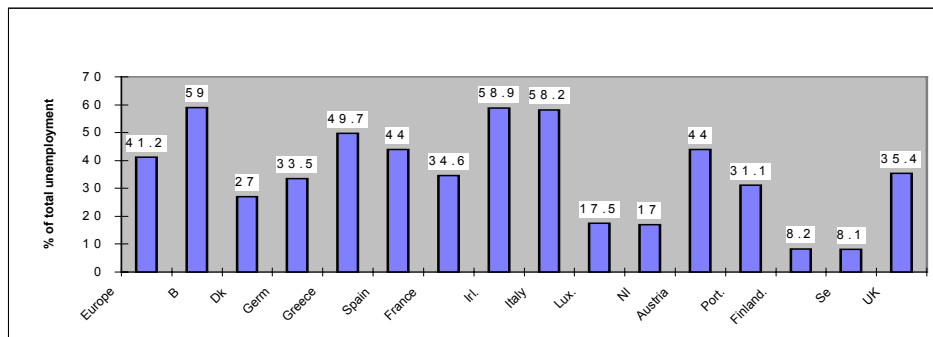
Source: *Eurostat* 1992.

This, in and by itself, constitutes a symptomatic characteristic of intrinsic labor markets differences. It is virtually impossible to ascribe the rise and persistence of the European unemployment solely to external causes. Europe should then be analyzed in the light of endogenous causes such as regional or national differences associated with the particular functioning of each labor market, as well as the nature of the shocks to which these markets are subject. Thus, instead of looking for differences between the "European" labor market as a whole and, say, Japan or the U.S., it might be more fruitful to analyze differences among European labor markets themselves.

IV.   Labor Markets Features

The main cause of large unemployment rates in Europe as well as the vast differences in this rate across Europe is the extent of labor market rigidities such as adjustment costs, unemployment benefits, the bargaining process, non- wage labor costs and so on. Our purpose is not to identify the exact causes of the unemployment rate in each country but rather to demonstrate the large variations in the labor markets features that affect the unemployment rate. (For an attempt to identify the exact causes see Nickell [15] and Layard, Nickell and Jackman [12].)

Non-wage labor costs (indirect costs paid by the employer and consisting of social

security contributions and other expenses such as costs for vocational training) rank among the most spectacular data that illustrate the large discrepancies between countries in Europe. Figure 4 presents the dispersion of non-wage labor costs as a percentage of total labor costs in 1988. Non-wage labor costs vary from 17 percent in Denmark, 27 percent in the U.K., 44 percent in Germany and over 51 percent in Belgium.

Figure 4
Non-wage labor costs as a percentage of total labor costs in 1988
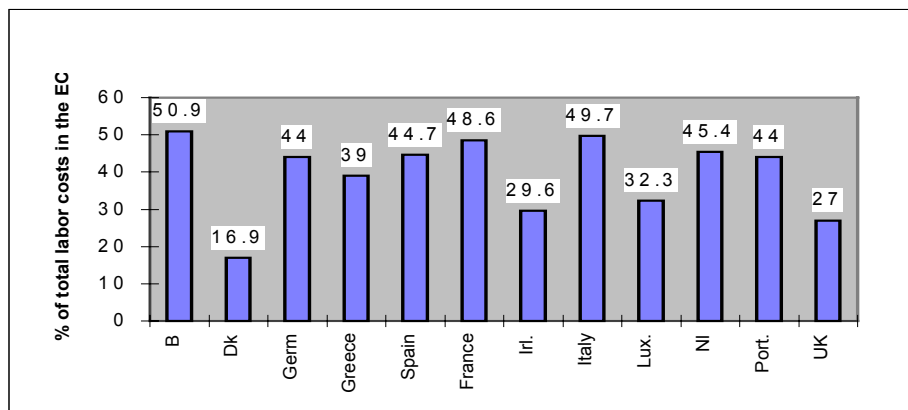
Source: European Economy #62, 1996.

As a passive labor market measure, unemployment benefits are often considered to be one of the factors that caused the increase in the natural rates of unemployment in Europe over the last decade or so (Layard, Nickell and Jackman [12]). Yet once again, there are large dispersions in the durations and level of unemployment benefits. Unemployment benefits, for example, amount to 73 percent of previous earnings for up to 30 months and 63 percent indefinitely in Danmark; 63 percent for 12 months and 56 percent indefinitely in Germany; 23 percent indefinitely in the U.K.; and 26 percent for 6 months in Italy (see Table 1).

Another important feature of the determinations of the unemployment rate is the unions' density and the extent of coordination in wage bargaining, on part of both unions and employers. The proportion of trade unions members as percentage of all wages and salary earners varies greatly across Europe from 10 percent in France to over 80 percent in Sweden.[4] The effect of unions membership, however, depends also on collective bargaining and institutional settings. The extent of coordination in wage bargaining on part of both unions and employers differs greatly. In Austria and Scandinavia (less so in Sweden) both unions and employees coordinate their bargaining while in the U.K., Ireland and Spain on the other hand there is very little collective bargaining and institutional forces in wage settings.

Table 1
Unemployment benefits in Europe: value and duration

|	% of earnings during the first period	Duration in months	% of earnings during the 2nd period	Duration in months
Belgium	79	12	55	Indefinite
Denmark	73	30	63	Indefinite
Germany	63	12	56	Indefinite
Greece	28	12	0	n.a
Spain	80	6	70	18
France	80	12	67-33	Indefinite
Ireland	41	12	32-35	Indefinite
Italy	26	6	0	n.a.
Luxembourg	85	12	46	Indefinite
Netherlands	74	24	49	Indefinite
Portugal	81	21	44	21
UK	23	12	23	Indefinite
EC Average	61	14	42	

Source: *European Economy*, # 62, 1996.

Some countries in Europe have opted for active employment policies. The creation of civil servant positions financed by the budget is being considered and proposed in France, as the other left-wing Jospin government aims to send a strong signal in that direction.[5] Yet, such a choice entails a combination of policies that might have a mitigated effect on employment. All in all, labor market interventions in Europe are far from being homogeneous. Some states spend significant share of their government spending on reinsertion and training programs, while others do not intervene in the labor markets. For example public spending on reinsertion as a percentage of GDP amounts to 0.72 percent in Italy, 2.81 percent in France, 4.44 percent in Ireland and 6.53 percent in Denmark! (See Figure 5).

Having already assessed the extent of labor market rigidities in Europe, we can turn now to the dynamic aspects of these features. Figure 6 presents the change in wage relative to productivity between 1989 and 1993 in twelve European countries. On average wages outpaced productivity by 1.9 percent in Luxemburg, and by 0.9 percent in Belgium, while in Germany, Portugal, Denmark and especially Greece, real wages lagged behind productivity growth. To further illustrate the dynamic structure we present a sketch of some of the changes in labor market institutions that occurred in France, Germany, Italy, Netherlands and the U.K. as presented in Siebert [17] (see table 2). Note that we do not attempt to report any possible change that occurred, but mainly demonstrate the extent of these changes and the dynamic aspects of labor markets regulations. As shown in Table 2 each of the five countries presented have gone through large changes in its labor market features. Whereas during the 1960s and 1970s most European countries increased labor markets regulations,
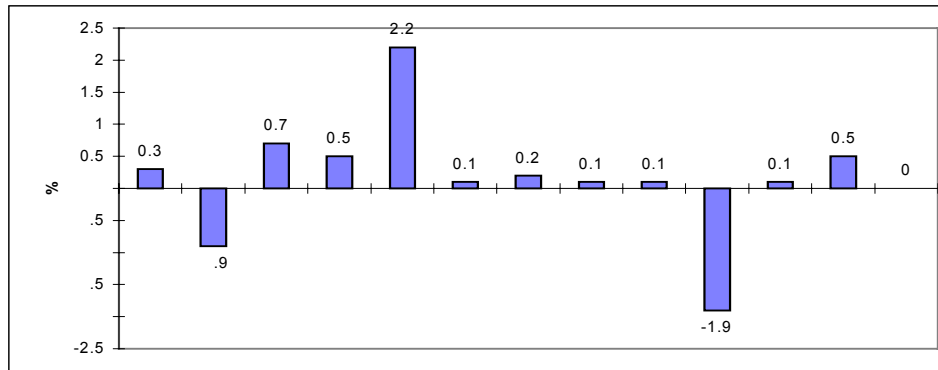
there are vast differences in the dynamics and the institutional approach since the mid 1980s.

Figure 5
Labor market policy expenditures as a percentage of GDP
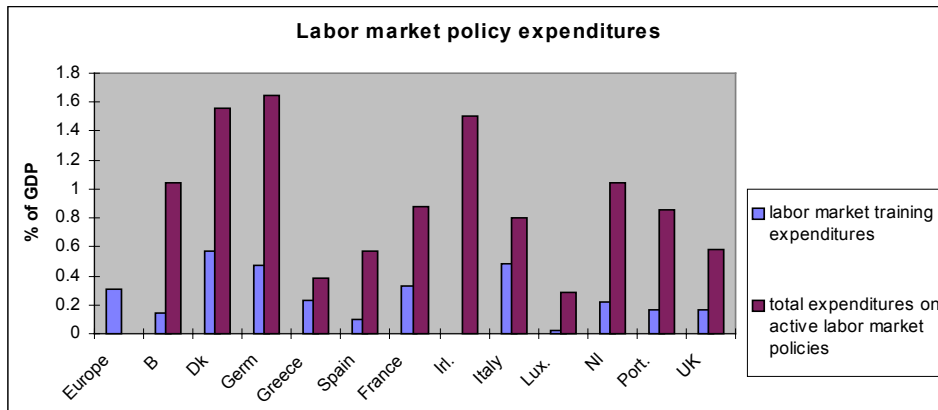
Source: *European Economy*, 1996.

Figure 6
Difference between productivity and real wages in percentage change.
1989-1993 average

Source: *European economy*, #62, 1996.

On the one hand, Britain (and to some extent also the Netherlands) has gone through a continuous decline in labor markets rigidities such as a decrease in benefit replacement rates between 1980 and 1992 and recurrent disincentives to unionization. This is best illustrated by the Employment Act of 1988 which takes away some remaining union immunities, followed by the decision to allow for the "selective dismissal of unofficial strikers" (Siebert [17]). On the other hand, such a sequence of deregulations in such a short period of time -- 10 to 15 years -- including a sudden reduction in the duration of unemployment benefits (from 1 year to 6 months decided by the Major government in 1996), could never have taken place in France. Indeed, one can conclude from the major institutional changes to the French labor market during the same period teaches that the philosophy of the successive governments was fundamentally different from the British one. To this respect, the surprise election of a left-wing government induces more pressure from unions to actively intervene in the labor market.[6] The position of a new government regarding its national labor market, especially with an underlying high unemployment level, is in itself a shock to labor market institutions as the proposal to suppress the Robien Act as of January 1, 1998 illustrates this point.[7][8]

The picture which emerges from these stylized facts is that labor markets in Europe are very distinct and heterogenous and are frequently subject to asymmetric changes in their fundamentals features and consequently in their employment level. The monetary union, no doubt, will affect these differences and the changes in the labor market features across Europe. The differences, however, are so large that Europe is bound to face many heterogenous changes in the national labor markets features regardless of the monetary arrangements.

Shall these facts and asymmetries between national labor markets in Europe constitute arguments against EMU under present circumstances? If indeed labor markets are subject to asymmetric shocks as these facts tend to show, the remedies these shocks require call for are country specific. Thus, distinct currencies may facilitate the adjustment of the economy in response to changes in the labor market fundamental features. In the next section we develop a macro labor model of monopolistic competition with free trade and labor markets rigidities. We use this model to analyze the effects of a change in labor market features on the equilibrium unemployment and the required adjustments under a common currency and under distinct currencies.

V. The Model

Consider a world with two countries, say Home and Foreign, where each country produces n differential goods. Home produces n differential goods denoted by x_i i$\hat{I}$ (1..n), and the foreign country produces n differential goods denoted by y_i, i$\hat{I}$(1..n). Assume that the goods are imperfect substitutes and that each good is produced by one producer who acts as a monopolistic competitor, choosing the nominal price and level of production given the demand it faces. Let the demand for each good in each country depends on both its price relative to the aggregate price level and on real income in each country. Specifically, demand in the home country for any good i is given by

$$c_i = \frac{I}{P}\left(\frac{P_i}{P}\right)^{-\theta} \qquad c_i = (x_i, y_i) \qquad\qquad (1)$$

where I is nominal income (e.g., the money supply or real output times the price level), P is the price level, p_i is the price of good i, and θ is the demand elasticity that is assumed to be greater than 1 so that a well defined maximization exists. The demand for each good is symmetric, that is the notation x or y defines only the location of production but bears no effect on demand.

Similarly, demand in the foreign country for each good is given by

$$c_i^* = \frac{I^*}{P^*}\left(\frac{P_i^*}{P^*}\right)^{-\theta} \qquad c_i^* = (x_i^*, y_i^*) \qquad\qquad (2)$$

where I*, P* and p_i* are nominal income, the over all price level and the price of good i in the foreign country respectively. (See Blanchard and Fischer [4] for a derivation of such demand function from consumers' preferences.)

Equations (1) and (2) incorporate several assumptions about consumers' behavior (utility) in both countries. First, as mentioned above, consumers do not distinguish between home produced goods and foreign produced goods. Second, the demand of each good is symmetric. In other words, the demand elasticity is the same for every good and is equal to -θ. Finally, demand depends on real income, which in turn is nominal income (which is determined by the monetary authorities), over the price level.

Production is being taken by n firms in each country where each firm produces a specific good and enjoys a monopolistic power given the demand for its products (equations (1) and (2) above). Each firm faces the same technology that is linear in labor:

$$q_i = l_i \qquad q_i = (x_i, y_i) \qquad\qquad (3)$$

where l_i denote the amount of labor employed in the production of good i.

The symmetry in demand and production, specifically the fact that demand elasticity is constant and the same for each good, implies that all prices are a constant mark-up over wages (marginal costs). That is, the price of all goods produced in the home country is the same, and the price of all goods produced in the foreign country is the same. Thus, for simplicity we can view each country as if it produces only one good: the home country produces good x and the foreign country produces good y. Demand for each good is

$$x = \frac{I}{P}\left(\frac{p_x}{P}\right)^{-\theta}$$
$$y = \frac{I}{P}\left(\frac{p_y}{P}\right)^{-\theta} \qquad\qquad (4)$$

in the home country and

$$x^* = \frac{I^*}{P^*}\left(\frac{p_x^*}{P^*}\right)^{-\theta}$$

$$y^* = \frac{I^*}{P^*}\left(\frac{p_y^*}{P^*}\right)^{-\theta} \tag{5}$$

in the foreign country, where x (y) denotes the producers location (i.e., weather home producer or foreign producer), and * denotes the consumers location (i.e., home consumption or foreign consumption). Finally, given the production functions above the supply of each good is determined by total employment in each country:

$$X = L$$
$$Y = L^*$$

where L is employment in country x and L* is employment in country y.

Employment in each country is determined by the labor markets feature and by the real wage. We assume that a higher unemployment rate is associated with lower wages and larger labor market rigidities. That is, the higher the unemployment rate the lower the wage for a given level of labor market rigidities.

Before we go on to discuss the solution of the model, it is worth commenting briefly on this assumption since it is not consistent with the neoclassical model of the labor market. Unemployment in the neoclassical framework is given by the difference between labor supply and labor demand. Thus, the higher the wage the larger unemployment. That is, wages and unemployment are positively associated and not negatively as we assume. The assumption, however, is consistent with the Neoclassical model of the labor market if we view unemployment as a voluntary choice by workers, or if labor supply is fixed. Under these settings, a higher wage is associated with lower unemployment either because fewer people decide to join the labor force or because labor demand is higher (and hence wages and employment are higher). Even though, in the model, labor force is fixed and hence our specification is consistent with the conventional view of labor market where employment is determined by demand equal supply, we view the assumption as implicitly assuming that labor market equilibria are determined by noncompetitive structure. Three of the leading theories that yield positive association between unemployment and wage and are very appropriate for Europe are: Bargaining models such as the insider outsider model (Blanchard and Summers [5], Lindbeck and Snower [13]); efficiency wage models (Shapiro and Stiglitz [16] and Yellen [20]), and fair wage models (Akerlof and Yellen [1]). A common theme to these approaches is that unemployment is determined by noncompetitive considerations. Unemployment and wages are determined by unions' size and bargaining power in the insider outsider model; by firms' ability to increase effort in efficiency wage models, and by the perceived fair wage in fair wage models. In these models an increase in

the unemployment rate decreases wage (through a decline in unions bargaining power in the insider outsider model; an increase in the workers incentive to perform well in efficiency wage model and in workers' perception of the fair wage in fair wage models). Thus high unemployment is associated with low wages.[9]

An empirical support for the negative association between wages and unemployment is provided by Blanchflower and Oswald [6] and Layard, Nickell and Jackman [12]. Blanchflower and Oswald use data on over three million people from twelve countries to analyze the link between wage and unemployment. They estimate that on average the wage curve is

$$\ln w = -0.1 \ln U + \text{Other characteristics of the worker or her(his) sector} \qquad (6)$$

where ln w is the log of the wage, and ln U is the log of the unemployment rate (source: Blanchard and Oswald (1994), p. 5). These findings imply that doubling unemployment is associated with a 10 percent drop in wage.

The unemployment rate and the exact relationship between wages and unemployment -- the wage curve -- depends on labor market features such as the level and duration of unemployment benefits, minimum wages, hiring and firing costs, training, union power and so on. For example, Nickell [15] estimates that a 50 percentage point increase in unemployment benefits would increase unemployment by 5 percent. From a base line unemployment of 10 percent this would represent an increase of half percentage point to 10.5. Thus, specifically we assume the following relationship between unemployment in each country, the real wage and labor market rigidities:

$$\frac{W}{P} = b(1-u) \qquad (7)$$

$$\frac{W^*}{P^*} = b^*(1-u^*) \qquad (8)$$

where W and W* are the nominal wages in the home and foreign country respectively; W/P and W*/P* are the real wages in each country; u and u* are the unemployment rates in each country, and b and b* represent the labor market features (rigidities) in the home and foreign country respectively. Equations (7) and (8) imply that an increase in labor market rigidities -- higher b-- increases the wage for a given unemployment level, and that higher wage is associated with lower unemployment.

Next, we derive the equilibrium unemployment and wages in each country as a function of the labor market features (rigidities) -b and b*. As presented in section 2 above, the fundamental features of the labor markets vary greatly across Europe. In other words, b and b* are distinct and change frequently. Thus, we solve for the equilibrium unemployment in each country as a function of b and b* and then analyze the effect of a change in labor markets features (b and b*) on unemployment and wages in each country.

VI.   Equilibrium

Equilibrium is defined by real wages in each country such that the goods market clears and

trade is balanced (each country consumes according to its income). Normalizing the labor force in each country to one (L=1 and L*=1), the equilibrium conditions are:

$$x + x^* = X = 1 - u \tag{9}$$

$$y + y^* = Y = 1 - u^* \tag{10}$$

and

$$x^* p_x = y p_y. \tag{11}$$

where X and Y are total production of good x and y in the home and foreign country respectively; x and y are demand (consumption) for each good in the home country, and x*, y* are demand (consumption) for each good in the foreign country. Equation (9) states that the world demand for good x, the demand in both countries, is equal to the supply of X -- 1-u. Equation (10) states that the world demand for good y is equal to its supply -- 1-u*, and equation (11) states that export of the home country is equal to its import.[10]

Equilibrium is solved as follows: first, notice that the demand elasticity is constant and the same for every good. Thus, the monopolistic price is a constant mark up over nominal wages (marginal cost). Therefore, the price of good x at home and abroad is

$$p_x = \frac{\theta}{\theta - 1} W \tag{12}$$

and

$$p_x^* = \frac{\theta}{\theta - 1} \frac{W}{e} \tag{13}$$

respectively, where e is the nominal exchange rate. Likewise, the price of good y in each country is

$$p_y = \frac{\theta}{\theta - 1} W^* e \tag{14}$$

in the home country (the country that produces x) and

$$p_y^* = \frac{\theta}{\theta - 1} W^* \tag{15}$$

in the foreign country (the country that produces y). The exchange rate, e, is defined as

$$e = \frac{p_x}{p_x^*} = \frac{p_y}{p_y^*} = \frac{P}{P^*}, \tag{16}$$

and the nominal price level in each country, P and P*, is defined for simplicity as the average price level in each country. That is

$$P = (W + W^* e) \frac{\theta}{\theta - 1} \tag{17}$$

in the home country and

$$P^* = (\frac{W}{e} + W^*) \frac{\theta}{\theta - 1} \tag{18}$$

in the foreign country. Plugging (4), (5) and (12)-(18) in (9) and (10) yields the employment ratio as a function of the real wages:

$$\frac{1 - u}{1 - u^*} = (\frac{W}{eW^*})^{-\theta} = (\frac{w}{w^*})^{-\theta} \tag{19}$$

Next, use the labor market equilibrium, equations (7) and (8) to derive the employment ratio as a function of the real wage:

$$\frac{W}{eW^*} = \frac{w}{w^*} = \frac{b}{b^*} \frac{1 - u}{1 - u^*} \tag{20}$$

Finally, equations (19) and (20) yields the relative employment as a function of the labor market features in each country, b/b*:

$$\frac{1 - u}{1 - u^*} = (\frac{b}{b^*})^{-\frac{\theta}{1 + \theta}} \tag{21}$$

Equation (21) states that relative employment depends on the relative labor rigidities. The larger the labor market rigidities in a country (the larger b or b*), the larger the unemployment in this country relative to the other country's unemployment rate. In other words, an increase in labor market rigidities in the home country (e.g., an increase in hiring and firing costs in France), increases the unemployment rate in that country relative to the unemployment in the other country.

The unemployment rate and the real wage in each country can be derived as functions of labor market rigidities in each country, b and b*, by substituting (11) -(17) in (7) or (8) and using (20) and (21). The resulting unemployment in the home country is

$$1 - u = \frac{\theta}{\theta - 1} \frac{1}{b(1 + (\frac{b^*}{b})^{\frac{1}{1 + \theta}})} \tag{22}$$

(The unemployment in the foreign country is symmetric.)

Equation (22) implies that the unemployment rate in each country depends positively on the labor market rigidities in both countries. In other words, an increase in labor market rigidities in one country would increase the unemployment rate in that country as well as the unemployment in the other country.

Finally, the real wage in home country is given by substituting (22) in (7):

$$w = \frac{\theta - 1}{\theta} \frac{1}{1 + (\frac{b^*}{b})^{\frac{1}{1+\theta}}} \tag{23}$$

Real wage depends on the relative labor market rigidities. An increase in labor market rigidities in one country, higher b (b*), increases real wages in the country were the change occurred and decreases the real wage in the other country.

VII. Comparative Statics

The model above can be used to analyze the effect of a change in labor market features on unemployment and real wages in each country. As noted above, an increase in labor market rigidities in one country (i.e., an increase in b or b*) affects unemployment and real wages in both countries -- unemployment increases in both countries (more so in the country where the change occurred), and wages increase in the country where the increase in the rigidities occurred and decreases in the other. Intuitively, suppose there is an increase in the labor market rigidities in one country (e.g., an increase in unemployment benefits in Belgium). As a result, employment and output decline in this country. Hence the supply of the good it produces declines as well as the demand for both goods. Thus, there is an excess demand for its good and an excess supply for the other country good. Consequently, employment and wage decline in the other country until the economy returns to equilibrium with lower employment in both countries, higher wages in the country where the change occurred and lower wages in the country where there was no change in labor market rigidities.

VIII. Distinct Currencies Versus a Common Currency

Consider now the required adjustments following a change in the labor markets features. For example, consider a decrease in unions' power in the home country. Such a change causes employment to rise in both countries and wages to fall in the home country and rise in the foreign country. If there is a common currency to both countries, nominal wages need to adjust for the economy to reach the new equilibrium. Hence, the adjustment to the new equilibrium with lower unemployment depends on nominal rigidities. If there are large nominal rigidities, then the adjustment will be slow, and hence the economy will experience high unemployment for a long period of time. Under distinct currencies, however, the change in real wages does not necessarily require a change in nominal wages since the exchange rate can carry the adjustment burden. Thus, the adjustment to a new equilibrium can be much faster. An expansionary monetary policy can speed up the adjustment process

by stimulating demand and effecting the exchange rate. That is, a country that experiences a decline in labor markets rigidities can take an expansionary monetary policy that would cause a depreciation in the exchange rate and increase demand and thus decreases the required adjustments to reach the new low unemployment equilibrium. For example, suppose that the French government decides to reduce some of the labor market rigidities in France. (E.g., minimum wages, unemployment benefits and so on.) As a result, equilibrium wage and unemployment fall in France, while equilibrium wage rises, and unemployment falls in the rest of Europe. (Due to the increase in demand and supply in France.) Now, suppose that there is a common European currency. Thus, the new equilibrium requires nominal wage to fall in France or rise in the rest of Europe. The adjustment process, therefore, depends on the speed by which nominal wages adjust in France (and in the rest of Europe) to the change in labor market rigidities. If wages are slow to adjust, the adjustment to the low unemployment equilibrium may be very slow, until finally wages and unemployment reach their equilibria. Consider now the case where France has a distinct currency. In this case, there is no need for any changes in nominal wages in order to reach the new low unemployment equilibrium. That is, a change in the exchange rate is enough for wages to reach their new equilibria. Moreover, the monetary authorities (especially in France) can undertake an expansionary monetary policy and hence increase the speed of adjustment even further through its effect on aggregate demand and the exchange rate.

Given the extent of future changes in labor markets' features Europe is bound to go through many adjustment episodes in response to changes in labor market rigidities. Thus, giving up distinct currencies and independent monetary policy might entail large adjustment costs in terms of unemployment and output.

IX. Conclusions

We argue in this paper that even if Europe is an optimum currency area in terms of production and technology, it is not in terms of its labor market features. There are large variations in labor markets' outcome such as the unemployment rate and the participation rates mainly because of large dispersions in labor markets' features such as unemployment benefits, unions' density, institutional bargaining structures, hiring and firing costs, taxes and other non-wage costs, and so on. Given the large dispersions and the past changes in the labor markets' features, Europe is bound to experience many changes in the national labor markets due to changes in the political power, union power, legislation, social norms and so on. In this sense Europe is not an optimum currency area. The cost of adjustments to these changes in labor markets' rigidities in terms of output and unemployment would be larger under a common currency. Further research, however, should focus on the effect of EMU on future changes in labor markets rigidities in order to fully understand the benefits and costs of a common currency.

NOTES

1.   See Bayoumi and Eichengreen [2] for a survey.
2.   Decressin and Fatas [9] estimate that participation rates are the principal adjustment variable to shocks to the demand for labor, at least in the short run, while migration does not react during the first three years (Germany, though, is an exception)
3.   Similarly, regional contrasts in unemployment rates differ between countries. This might come from huge differences in country-sizes; this could also come from different level of infrastructure development and equipment. Whichever the reason of these discrepancies, Decressin and Fatas [9] find that differences in relative unemployment rates between regions are high. In addition, common as well as regional shocks are not absorbed by changes in regional employment rates, and this finding is particular to Europe.
4.   In many countries though, the wage of workers who are not explicitly in the unions is determined by the union wage negotiations.
5.   Le Monde, Thursday 08/14/97: "10 milliards de francs pour les emplois-jeunes et le maintien des anciens dispositifs d'aide", & Le Monde, Thursday 08/21/97 "Mr Chirac approuve l'inspiration du projet destiné à créer 350 000 emplois". Front pages.
6.   "La CGT demande au gouvernement de rompre plus nettement avec la politique de la droite", Le Monde August 27, 1997.
7.   The "loi Robien" had been adopted on June 11, 1996 under the right wing Juppé Government and allowed for a reduction in firms' non-wage labor costs for those enterprises which reduced the working time by 10 to 15% in order to limit lay offs or increase employment.
8.   For a comparison between the changes in the wage structure in the UK and in France, see Katz, Loveman and Blanchflower [11].
9.   Note though that this is an equilibrium relationship. That is, an exogenous increase in wage would [still] increase unemployment.
10. This equation is implied by equations (9) and (10) if each country satisfies its budget constraint. Therefore, it will not be used in the solution.

REFERENCES

[1]   Akerlof, George and Yellen Janet (1990). "The Fair-Wage Effort Hypothesis and Unemployment," *Quarterly Journal of Economics*, (May), 255-283.
[2]   Bayoumi, Tamim and Eichengreen, Barry (1996). "Operationalizing the Theory of Optimum Currency Areas," *CEPR Discussion Paper*, 1484 (October).
[3]   Bean, Charles (1994). "European Unemployment: A Survey," *Journal of Economic Perspectives*, (June), 573-619.
[4]   Blanchard, Olivier, and Fischer Stanly (1989). *Lectures on Macroeconomics*. The Massachusetts Institute of Technology Press.
[5]   Blanchard, Olivier and Summers Lawrence (1986). "Hesteresis and the European Unemployment Problem," *NBER Macroeconomic Annual*, 15-78.
[6]   Blanchflower, David and Oswald, Andrew (1994). *The wage Curve*. The Massachusetts

Institute of Technology Press.

[7]   Blau, F. and Kahn, L. (1995). "The Gender Earnings Gap: Some International Evidence", in *Differences and Changes in Wage Structures*, NBER Comparative Labor Markets Series, edited by Freeman, Richard and Katz, Lawrence, The University of Chicago Press.

[8]   Clamfors, L. and Driffill, J. (1988). " Bargaining Structure, Corporatism and Macroeconomic Performance," *Economic Policy* , vol. 3 (1), 13-47.

[9]   Decressin, Jorg and Fatas, Antonio (1995). "Regional Labor Market Dynamics in Europe," *European Economic Review*, 39, 1627-1655.

[10]   Jensen (1989). "Employment and Unemployment Policies and the Functioning of the Labor Market in a Comparative Perspective," *Acta Sociologica* , (32), 405-1989.

[11]   Katz, Lawrence, Loveman, Gary and Blanchflower, David (1995). "A Comparison of Changes in the Structure of Wages in four OECD Countries," in Freeman, Richard and Katz, Lawrence (1995) Differences and Changes in Wage Structures, National Bureau of Economic Research, comparative Labor Markets Series, The University of Chicago Press.

[12]   Layard,R. Nickell, S. and Jackman, R. (1991). Unemployment - Macro- economic Performance and the Labour Market, Oxford University Press.

[13]   Lindbeck, Assar and Snower, dennis, (1988). "Corpporation, Harassment and Involuntary Unemployment: An Insider-Outsider Approach,"*American Economic Review,* (March) 167-188.

[14]   Mundell, Robert A. (1961). " A Theory of Optimum Currency Areas, " *American Economic Review*, (51) 657-665.

[15]   Nickell, Stephen (1997), "Unemployment and Labor Market Rigidities: Europe Versus North America," *Journal of Economic Perspectives*, (Summer), 55-74.

[16]   Shapiro, Carl and Stiglitz, Joseph (1984). "Equilibrium Unemployment as a Worker Discipline Device," *American Economic Review* (June) 433-444.

[17]   Siebert, Horst (1997). "Labor Market Rigidities: At the Root of Unemployment in Europe," *Journal of Economic Perspectives*, (Summer), 37-54.

[18]   Soskice, David (1994). "Labour Markets in the EC in the 1990's." *Social Europe*, Supplement # 1. European Commission.61-73.

[19]   Tronti and Turatto (1990) "A structural Approach to the European Labor Market." *Labour*, 4(20).

[20]   Yellen, Janet (1984). "Efficiency Wage Models of Unemployment," *American Economic Review*, (May), 200-205.