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THE CAUSES OF SPANISH UNEMPLOYMENT: A STRUCTURAL VAR APPROACH

by

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Abstract

We review the causes of Spanish unemployment by estimating a simple macroeconomic model using the VAR methodology. In our model, the labour market presents full hysteresis, hypothesis which provides a sufficient number of identifying restrictions to be imposed in the estimation. Our results suggest that the combination of a plausible mixture of different types of shocks and extreme persistence mechanisms in the transmission of them explains the performance of the Spanish labour market in the last two decades.

JEL Codes: J60, E24.

1 Introduction

No country in the OECD has as great an unemployment problem as Spain. The Spanish unemployment rate is the highest and most stubborn: it rose dramatically during the second half in the 1970s and the first half in the 1980s (from 5% to 21%) and, after a brief fall in the second half of the 1980s (from 21% to 16%), resumed an upward trend at the beginning of the 1990s (from 16% to 24%). Only recently there are some signs of a pause in this unfavourable

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evolution. As shown in the top panel of Fig. 1, this evolution is not too dissimilar to that in the rest of the OECD. What really differs is the extent of the increase in unemployment and its persistence: close to 23% nowdays, and almost 20% on average for the last decade[1].

Besides the magnitude of unemployment, the Spanish labour market performance is striking as regards the evolution of both employment and the labour force over the last two decades (see the remaining panels in Figure 1). In 1973, the Spanish employment rate was 5 points lower than the EU and the OECD averages[2]. Since then, the employment rate has decreased intensively throughout, with the exception of the second half in the 1980s, and is nowdays almost 20 points lower than the EU average. This very low employment rate is the joint outcome of a low participation rate (mainly, among women) and a stagnant employment level. Net employment creation has been negative since 1973. Intense job destruction in agriculture (with a share of 30% at the beginning of the 1970s and down to less than 10% nowdays, with a loss of 2.7 million jobs), partially countervailed by the expansion of employment in the public sector (15% of employees in the mid-1970s and 25% nowdays), and a similar job creation performance in the remaining sectors to those in other EU countries, are the main facts behind net job creation in Spain over this period. Furthermore, an overall decline in the participation rate during this period has precluded an even higher increase in unemployment.

Increasing unemployment has been simultaneous with a slow disinflationary process. As shown in Figure 2, the inflation rate soared to 25% in 1977, an outcome which is related to the combination of the first oil crisis and the consequences of the end of the Francoist dictatorship which engendered a strong political drive for redistribution and increased the influence of the trade unions. Since then, the Spanish economy entered a prolonged period of disinflation, and the increase in unemployment was strikingly high. In fact there has taken almost two decades to produce an almost perfect crossing: the unemployment rate is nowdays close to what the inflation rate was in 1977 and, conversely, the inflation rate is down to roughly the unemployment rate in the mid-1970s.

The goal of this paper is to identify the causes of Spanish unemployment in light of the above mentioned stylised facts. To achieve this aim we will focus on the role of persistence in the propagation of those shocks which affected the Spanish economy. Indeed, in our view, the dismal performance of Spanish unemployment is the result of a series of adverse shocks, which were difficult to absorb in a context of disinflationary policies and a rigid system of labour

[1] An initial reaction to these figures is to take them with disbelief on the grounds of the existence of a large black economy which acts as a "shock absorber". Nonetheless, the official unemployment rate is approximately correct: taking account of the underground economy and correcting for some technical problems in the elaboration of the Spanish Labour Force Survey will reduce this rate by 3 points at most (see Toharia, 1995).

[2] The employment rate is defined as the ratio between employment and working age population.

market institutions. Accordingly, we claim that the propagation mechanisms of those shocks are consistent with a extreme form of hysteresis so that every change in unemployment becomes an equilibrium. To explain the main sources of shocks and the most relevant features of their transmission mechanism, we turn to a "Structural Vector Autoregression" (SVAR) approach[3]. We do so for two reasons. First, to overcome some of the difficulties traditionally faced when estimating small quasi-structural econometric models in line with the research summarized in Layard et al. (1991) where measurement problems in the construction of some variables and dubious identification restrictions abound (see Manning, 1993). And, secondly, because we wish to gauge how robust are some of the results obtained with the previous approach, under the comparing SVAR methodology.

The rest of the paper is structured as follows. In section 2, we provide a brief overview of the main features of the Spanish labour market and its institutions, in the light of various explanations which have been given for Spain's staggering unemployment rate and its evolution. In section 3, we present a simple model which encompasses the main ingredients behind the above explanations. This model is built upon the assumption of full hysteresis, an extreme assumption whose validity is empirically tested. In section 4, we estimate a VAR in five variables (output, employment, wage, price and unemployment) with the aim of recovering five structural shocks (aggregate demand, wage-push, price-push, productivity and labour supply shocks) by making use of some long-run identifying restrictions implied by the model. Having identified the shocks, we proceed to quantify then effects through impulse-response functions and forecast error variance decompositions and, in this way, evaluate their importance in explaining the nature of the unusually high and persistent Spanish unemployment. Finally, Section 5, briefly concludes.

2 Facts and Explanations

This section provides a brief description of the evolution of labour market structure and unemployment performance over the past two decades with a view towards pinpointing key stylized facts which underlie some of the various explanations which have been put forward to explain Spanish unemployment. For this purpose, Tables 1 and 2 summarise some relevant information on the evolution over the last two decades of employment, unemployment, labour force, labour costs and a few macroeconomic indicators.

Most pundits have a story whereby adverse starting conditions, stemming from the Francoist autarkic model of development (high protectionism, high share of agriculture, authoritarian and paternalistic labour relations, and a concentration of manufacturing production in sectors intensive in the use of energy),

[3]For empirical applications of the SVAR methodology see, *inter alia*, Blanchard and Quah (1989), Bean (1992) and Galí (1992).

together with a wage explosion at the beginning of the 1970s, in the advent of democracy and its unfortunate coincidence with the oil price hikes, led to an important shock, triggering a quick initial rise in unemployment[4]. The inheritance from the past of high employment protection, the amplification of the size and coverage of unemployment benefits, and the rise in labour taxation to finance the unemployment protection system, has led to a high degree of hysteresis and a slow process of disinflation with large sacrifice ratios in terms of unemployment. Henceforth, the permanence of a large part of these institutions, combined with a progressive catch-up of labour supply which, as in most Catholic countries, stems from very low female workers' participation rates, and further negative demand shocks at the beginning of the 1990s, have been the sources of the current staggering unemployment rate[5].

In what follows, we take these arguments separately and discuss in more detail which is their likely contribution to the whole story.

i) *Initial Conditions.* It is clear that Spain's initial conditions at the beginning of the 1970s was one of an archaic system of labour relations with a substantially higher share of agricultural employment than in other EU countries. During the Franco period, Spain had a rigidly controlled labour market. Trade union activism was prohibited and the social security benefits of the modern welfare state were largely absent. In their place there was a set of ridigly defined working conditions which provided social protection both by making firing workers difficult and by setting generous severance pay for dismissals. Marimón and Zilibotti (1994) take the initial sectoral composition of the labour force as a crucial explanation of why Spain has created less net employment than other EU countries over the last two decades. Their idea is that the shedding of labour out of agriculture into manufacturing and services has taken place in a period where the rate of technological progress was higher than in the past (see Table 1). Hence, by choosing less labour-intensive techniques, net employment growth has been lower. This argument, no doubt, has an element of truth. However, there are the contrasting cases of Italy and Portugal which also had a large share of agriculture. Particularly relevant is the case of Portugal, a neighbouring economy which shares with Spain similar initial conditions, including the end of a military dictatorship, and has, nonetheless, absorbed the labour force surplus from the rural sector (see Blanchard and Jimeno, 1995). Furthermore, employment in the Spanish public sector by having created 1.1 million jobs since 1972, ought to have had a countervailing effect on the fall of 2.1 million jobs in agriculture.

ii) *Wage Push.* This is one of the arguments which has been favoured to explain Spain's diversity. However, the evidence is not too strong at least uni-

[4]See, *inter alia*, Dolado *et al.* (1986), Bentolila and Blanchard (1989) and Andres *et al.* (1990).

[5]The fact that unemployment affects mostly second-earners within the family is clearly one of the main reasons behind the lack of a social upheaval and the low job search intensity. So, *e.g.* the unemployment rate of heads of household is 12% in 1995.

formly across the sample period. First, although real wages and the 'fiscal wage wedge' have grown substantially since the beginning of the 1970's, labour productivity growth has more than offset the growth in unit labour costs (see Table 2). It is true that unit labour costs grew above the EU rate during the 1973-85 period, with the government and the employers giving free rein to wage aspirations in the hope of easing the transition from dictatorship to democracy. Nonetheless, it not less true that they behaved much more moderately since the mid-1980s. However, a rise in wage rates has been observed at the beginning of the 1990s, despite a sharp rise in unemployment which, as will be discussed below, can be interpreted in terms of a strengthening of the bargaining power of "insider" workers in wage setting. This could be due to the segmentation of the labour market in workers with permanent and fixed-term jobs (see Bentolila and Dolado, 1994).

iii) *Labour Supply.* Starting from very low participation rates, labour force was fairly stable until the beginning of the 1980s, with a large flow of emigrants towards other European countries helping to keep unemployment rates low until the mid-1970s. Thereafter, as shown in Table 1, labour force evolution (0.8% per year) has been dominated by an increase of female participation in the central age groups (2.2% per year). It is from the early 1990s that labour force growth has decelerated as a result of early retirements, discouraged worker effects and the wider coverage of compulsory education (see Bover and Arellano, 1995). Summing up, there is evidence that its evolution somehow countervailed that of employment, putting a brake to the fall in unemployment over the expansionary years of the late 1980s. Apart from that, its role as a direct cause of unemployment seems limited.

iv) *Unemployment Protection System.* Blanchard and Jimeno (1995) argue that some characteristics of the Spanish system may lie behind the very different of evolution of unemployment in two economies subject to similar shocks: Portugal and Spain. Whereas before the mid-1980s less than 30% of non-agricultural workers were eligible for unemployment compensation, by 1995 over 60% were receiving compensation. In contrast, this coverage rate was very low in Portugal throughout the 1980s. However, in Spain, neither the replacement ratio (70%) nor duration are out of range with what is available in other EU economies. Nonetheless benefits, particularly during the first year of joblessness, are high enough to make unemployment tolerable[6]. Long-term unemployment share is 52% nowdays, having fallen after the introduction of fixed-term jobs in 1984 and is mainly concentrated on youngsters and women with no work experience who are, therefore, not entitled to unemployment benefits. Thus, reductions of the replacement ratio, as those which took place in 1992 may take a long time to become effective. Nonetheless, the difference between insurance and assistance benefits is weak. The first one should be more closely related to insurance principles, whilst the assistance benefits should be means-tested and integrated

[6]See Bover *et al.* (1996).

within general social welfare policies (see Jimeno and Toharia, 1994).

v) *Wage Bargaining.* It is often argued that wage rigidity is very high in Spain. However, in terms of the cross-country comparisons of real and nominal wage rigidities carried out by Layard *et al.* (1991), Spain does not appear to be an outlier on either count. It should be noticed that coordination is not too high, especially among employers, that synchronisation is low, as wage setting is spread throughout the year, and that the system has an inflationary bias in the relationship between tariff wage and wage-drift (see Felgueroso, 1995). Although, in theory, the industrial relations system is characterised by three-tier bargaining at the central, sectoral and firm level, de facto, collective agreements at the industry level are more frequent. They establish wage level floors for subsequent negotiations at the firm level, which then push for additional wage increases (wage drift). Thus, the Spanish collective bargaining system delivers neither the benefits of centralisation nor those of a decentralised one (see Calmfors and Driffill, 1988)[7]. These arrangements were interrupted by a series of national pacts from 1977 to 1986 which, though ensuring some wage moderation, fostered a narrowing of wage differentials, precisely at a time where labour reallocation was badly needed. This has had perverse effects on labour mobility which has been much reduced (see Antolín and Bover, 1994). Furthermore, this low factor mobility has been exacerbated by the existence of restrictive rules on work practices and geographical and functional mobility inherited from the old regime, together with a distorting housing price policy.

vi) *Employment Security Legislation.* This has been claimed as one of the main obstacles to employment creation. Until the mid-1980s, with the exception of temporary jobs in seasonal activities (like agriculture and tourism), by law, the employment relationship was assumed to be a permanent one. Workers could only be dismissed under limited conditions, entailing sizeable redundancy payments. Average severance payments grew from just over 4.5 months in 1981 to over 12 months pay by 1993. Moreover, collective dismissals needed administrative approval by the Labour Ministry and the agreement of worker representatives, and whether individual dismissals are "fair" or "unfair" is decided by labour courts. Because of this involvement, dismissals entail large "red-tape" costs, like costly bureaucratic procedures, which place an additional financial burden on employers. To avoid those costs, most dismissals cases are settled out of court at amounts above the legal levels. As mentioned above, these rigidities have been somehow compensated by the introduction in the mid-1980s of fixed-term contracts with low redundancy payments. Since their introduction, this type of contract has been extensively used, representing nowdays over one-third of total employment. So, in this sense, the unions' claim that Spain has a very flexible labour market is only partially correct, since it is also a very segmented market. The effects of such short-tenure contracts on the various dimensions

[7]Trade union density is low, around 12%, but the coverage of collective bargaining is high, around 70%. For descriptions of Spanish pay-setting institutions, see Milner and Metcalf (1994) and Jimeno and Toharia (1994).

of the labour market have been extensively analyzed, *inter alia*, by Jimeno and Toharia (1993) and Bentolila and Dolado (1994). They seem to have increased labour turnover, lowered labour and total factor productivity and, most importantly, they have enhanced the power of "insiders" (workers with permanent jobs), leading to unjustified wage rises at the beginning of the 1990s.

vii) *Mismatch.* There is general consensus that high, structural unemployment in Europe has been concentrated among unskilled workers, Spain being no exception to this overall trend. In this respect, the working of the collective bargaining system, preventing wage differentials from rising, and the fiscal wedge, which is particularly high in terms of the lower tail of the wage distribution, have contributed to bias demand away from unskilled labour. At the same time, long-term unemployment, by reducing skills and the will to search for new jobs, has been a major force behind the outward shifts in the UV curve, as reflected in Figure 3 (see Dolado and Gómez, 1996). In this respect, it is important to notice that Spain is one of the countries where "active" labour market policies have played a secondary role. Although public expenditure on labour market programmes, as a percentage of GDP, is among the highest in the OECD economies, it is not surprising that the largest share goes to unemployment compensation and so, for example, Spain is one of the European countries which dedicates least resources to public employment services[8].

viii) *Prices and Competition.* Spain has shown all the symptoms of a dual inflation economy, with a tradeable sector highly exposed to international competition and a non-tradeable sector subject to excessive regulation and insufficient competition. The difference between home good inflation and traded good inflation has been on average almost 3% since the mid-1970s. Although, in part, some of this differential may be due to the productivity hypothesis which attributes it to more rapid productivity growth in the traded good sector, it is also true that the service sector has been protected from competition by legislation, distribution networks and tradition, and by an oversized public sector which in a relatively short period has absorbed labour surplus shed by the other sectors. These rigidities have been particularly tangible in telecommunications and transport which put up the price of many intermediate inputs such as electricity. The real-state and housing rental markets are also highly regulated, inducing severe distortions on labour and capital mobility across regions[9]. Some of these rigidities have been corrected following Spain's entry in EC in 1986. However, many still persist, maybe reflecting the lack of confidence of a private sector which has a low propensity to invest in spite of having one of the highest return of capital in the OECD or the need for voting support from large segments of society which are used to the paternalistic role of the state. Naturally, the

[8]According to OECD (1991), the number of unemployed per staff member in public employment services in 1988 was 712 in Spain, while in Germany, United Kingdom and Sweden it was 86, 53 and 14, respectively

[9]See also Bentolila and Dolado (1990), Antolín and Bover (1993) and Jimeno and Bentolila (1995).

permanence of these rigidities has strong effects on the credibility of inflation targets and is one of the main forces behind the slow and painful disinflation process since the mid-1970s.

ix) *Aggregate Demand Policies.* As regards fiscal policy, it had a very limited role until the mid-1970s, in the absence of a proper tax system. Later on, after the arrival of democracy and the implementation of a comprehensive tax reform, the direct impact of public intervention on aggregate demand has expanded significantly with the shares of public expenditure and receipt rising from 25% of GDP at the beginning of the 1970s to 49% and 42% of GDP nowadays, respectively. As it can be observed in Table 2, fiscal stance (measured by changes in structural budget deficits) was fairly restrictive in the second half of the 1970s and expansive in the 1980s, with the exception of 1986-87 where a fiscal consolidation took place. Later, as a result of unsocial unrest due to wage restraints in the first half of the 1980s, trade unions pushed for an extension of the social benefit system, giving rise to increasing structural budget deficits, which reinforced the strong demand pressures at the time.

With regard to monetary policy (measured by deviations of money growth rates from target rates and ex-post real interest rates)[10], Table 2 shows that it was restrictive during the late 1970s, up to the mid-1980s, in parallel with the disinflation process which slowed down inflation from 25% in 1977 to 4.6% in 1987. As a result of the loose fiscal policy in the late 1980s and the large capital inflows after Spain's entry in the EC, monetary control became more difficult and deviations from target started to arise. The response of the Spanish authorities was to enter the EMS in 1989, while the Bank of Spain increased reserve coefficient and established credit controls in 1988 which were lifted in 1991 after demand pressures slowed down. In the absence of supply side reforms, there was a progressive lack of credibility in the government's inflation targets which were offset by higher real interest rates and a progressive overvaluation of the peseta exchange rate aimed at attracting foreign capital inflows (see Revenga, 1993). These flows helped to restore production capacity and gave rise to the "golden years" of the Spanish economy. Nonetheless, those flows were not as permanent as initially thought and when a demand-led recession was propagated across the EU, following the EMS crisis, investment and employment plummeted and the peseta was devalued four times since September 1992.

[10]The money target (m^*) has been computed as $\Delta m^* = 1.6\Delta\bar{y} + \pi^*$ where $\bar{y}$ is (log. of) potential output and π^* is the inflation target. The value 1.6 corresponds to the long-run income elasticity of demand for M4 as estimated by Vega (1994); $\Delta\bar{y}$ is taken as 2.5% per year, and π^* is constructed as a 1% percentage point per year reduction in inflation from 1977 to 1994.

3 Empirical Evidence: A Structural VAR Approach

According to the descriptive evidence presented above, Spain has been buffeted by similar shocks as the remainder of Europe since the 1970s. The specifity comes from the permanence of rigidities inherited from the Franco legacy which have given rise to strong persistence mechanisms. Thus, although the analysis of the nature of the shocks is interesting in itself, these shocks alone cannot provide a satisfactory causal explanation of the rise in unemployment in 20 percentage points over two decades, unless there are propagation mechanisms that translate temporary shocks into permanent changes in unemployment. Indeed, in our view, Spanish unemployment is just the result of a series of adverse demand and supply shocks amplified by specific labour market institutions (a combination of the structure of collective bargaining, high firing costs, barriers to competition in the goods market). Thus, in what follows we will place a strong emphasis on hysteresis to characterise and quantify the importance of various shocks which somehow reflect the various explanations above mentioned.

3.1 A Simple Model of Hysteresis

Our starting point is the simple framework set out in Blanchard and Quah (1989), augmented by specific behavioural relationships which help us in identifying a wide variety of shocks, in a context of hysteresis. In particular we will be able to identify five types of shocks which, in light of the previous discussion, seem important to us in explaining Spanish unemployment: *aggregate demand, wage push, price push, productivity* and *labour supply* shocks, respectively.

The model is fairly standard and basically consists of five equations. The first three equations are as follows:

$$y = \phi(d - p) \tag{1}$$

$$y = n + \theta \tag{2}$$

$$p = w - \theta + \mu \tag{3}$$

where y, p, n, w and $(d-p)$ denote the logs of output, price level, employment, nominal wages and real aggregate demand (reflecting fiscal and monetary policies); in turn, θ and μ represent shift factors in productivity and price-setting respectively, and d is a index of nominal expenditure.

Equation (1) is a simplified version of an aggregate demand function where $\phi > 0$, Equation (2) is the (long-run) production function under a CRS technology. Finally, equation (3) describes the corresponding price setting rule as a mark-up on unit labour cost.

To further characterise the supply side of the labour market, the following three equations are added to the model,

$$l = c(w - p) - bu + \tau \tag{4}$$

$$w = w^* + \varepsilon_w + \gamma_1 \varepsilon_d + \gamma_2 \varepsilon_p \tag{5}$$

$$w^* = \arg \{n^e = (1 - \lambda) n_{-1} + \lambda l_{-1}\} \tag{5'}$$

where l is the log. of the labour force, n^e is the expected value of (log.) employment, $u(= l - n)$ is the unemployment rate, τ is a labour supply shift factor and ε_w, ε_d and ε_p are *i.i.d.* shocks to wages, demand and prices, respectively, to be defined below.

Equation (4) is a labour supply function which depends upon real wages $(w - p)$, the unemployment rate (u) -capturing a "discouragement' effect- and other supply shift factors (changes in participation rates, etc.). We expect $c > 0$ and $b > 0$, the latter reflecting the demoralisation of the long-term unemployed. Equation (5), in turn, characterises the wage-setting behaviour. Wages have both a backward looking component and a forward-looking one. As in Blanchard in Summers (1986), targeted nominal wages are chosen one period in advance, and are set so as to equate expected employment to a weighted average of lagged labour supply and employment. In (5') we allow effectively bargained wages to be partially indexed to price and demand surprises through the indexation coefficients $\gamma_i (i = 1, 2)$, so that if $\gamma_i = 0 (\gamma_i = 1)$ there is no (complete) indexation. Furthermore, there in an *i.i.d.* wage shock reflecting changes in union's bargaining power, etc[11]. As is well known, the microfoundations of (5) follow typically from an insider-outsider framework (see, *e.g.* Blanchard and Summers, 1986) which fits well with the characteristic of Spanish wage-setting as discussed in Section 2. This parameterisation leads to partial-hysteresis when $0 < \lambda < 1$ and to full-hysteresis when $\lambda = 0$.

To close the model, as customary, we need to specify the stochastic processes governing the evolution of the exogenous shift factors defined earlier. For illustrative purposes, we consider that d, θ, μ and τ evolve as simple random walks

$$\Delta d = \varepsilon_d \tag{6}$$

$$\Delta \theta = \varepsilon_s \tag{7}$$

$$\Delta \mu = \varepsilon_p \tag{8}$$

$$\Delta \tau = \varepsilon_l \tag{9}$$

where ε_d, ε_s, ε_p and ε_l are *i.i.d.* uncorrelated aggregate demand, productivity, price and labour supply shocks.

[11] We used just ε_p and ε_d as subject of indexation, rather than the whole array of shocks, because under alternative identification restriction which allowed for that possibility, we could not reject that the long-run effects of ε_s and ε_l on w were zero.

Solving equations (1)-(9) for unemployment yields

$$(1-\rho L)u = (1+b)^{-1}\left\{\begin{array}{c} -\phi(1-\gamma_1)\varepsilon_d + [\phi(1-\gamma_2)-c]\,\varepsilon_p + \\ +(1+c-\phi)\varepsilon_s + \varepsilon_l + \phi\varepsilon_w \end{array}\right\} \tag{10}$$

where L is the lag operator and $\rho = \frac{1+b-\lambda}{1+b}$. Thus, in this partial hysteresis framework, the persistence of unemployment is an increasing function of both the discouragement effect (b) and the influence of lagged employment on wage determination (λ). Note that, for finite $b, \rho = 1$ is equivalent to $\lambda = 0$, so that a full-hysteresis framework is equivalent to unemployment rate being I(1). A formal unit root test does not reject the unit root restriction: for example, an augmented Dickey-Fuller test based on an AR(6) with constant and trend for the sample 1972:1-1994:1, yields a p-value on the unit root hypothesis of 0.12 and a 95% confidence interval for the largest autoregressive root of (0.97, 1.03)[12]. Even a test of a second unit root, *i.e.*, u is I(2) can only be rejected at the 5% level. Therefore, we believe that the assumption that u is I(1), or $\lambda = 0$, is reasonable, at least as a local approximation for the period and the economy at hand, and we will use it in what follows[13].

Under full hysteresis, solving out (1)-(10), for employment, output, wages, prices and the unemployment yields

$$\Delta n = \phi(1-\gamma_1)\varepsilon_d + (\phi-1)\varepsilon_s - \phi(1+\gamma_2)\varepsilon_p - \phi\varepsilon_w \tag{11}$$

$$\Delta y = \phi(1-\gamma_1)\varepsilon_d + \phi\varepsilon_s - \phi(1+\gamma_2)\varepsilon_p - \phi\varepsilon_w \tag{12}$$

$$\Delta w = \gamma_1\varepsilon_d + \gamma_2\varepsilon_p + \varepsilon_w \tag{13}$$

$$\Delta p = \gamma_1\varepsilon_d - \varepsilon_s + (1+\gamma_2)\varepsilon_p + \varepsilon_w \tag{14}$$

$$\Delta u = (1+b)^{-1}\left\{\begin{array}{c} -\phi(1-\gamma_1)\varepsilon_d + [\phi(1-\gamma_2)-c]\,\varepsilon_p + \\ +(1+c-\phi)\varepsilon_s + \varepsilon_l + \phi\varepsilon_w \end{array}\right\} \tag{15}$$

Thus, aggregate demand shocks (ε_d) increase (decrease) employment/output (unemployment) if indexation is not complete. Equally, they increase wages/prices unless there is complete rigidity. Price shocks (ε_p) decrease employment/output, increase wages/prices and increase unemployment if the labour supply schedule is relatively inelastic, *i.e.*, c is small. Wage shocks (ε_w) decrease employment/output and increase wages/price and unemployment. Productivity shocks (ε_s) increase output and employment (the latter if $\phi > 1$), reduce prices and rise unemployment if $\phi < 1$. Note that, by allowing for full hysteresis, all shocks have permanent effects on unemployment.

[12] See Stock (1991).

[13] See Dolado and López-Salido (1996) for a detailed discussion of the sources of full hysteresis in Spain over a similar sample period.

3.2 A Structural VAR Approach

In order to identify the five shocks defined above, we consider the following VAR model

$$A(L)\Delta X_t = \nu_t + \eta_t \tag{16}$$

where X_t is a 5x1 vector of variables including (y, n, w, p, u); $A(L)$ is $k-th$ order matrix of polynomials in the lag operator L with all its roots outside the unit circle; ν_t is a vector of deterministic term -including, say, a constant and seasonal dummies- and η_t is a vector of zero-mean *i.i.d.* innovations with covariance matrix Σ. The Wold moving average representation of (16) is given by

$$\Delta X_t = D(L)\eta_t \tag{17}$$

where $D(L) = A(L)^{-1}$, $D_o = I$, and the deterministic terms have been omitted for simplicity. The innovations are expressed as linear combination of the shocks, *i.e.*, $\eta_t = S\varepsilon_t$, where S is a (5x5) mapping matrix. Assuming without loss of generality that the $\varepsilon_t's$ are uncorrelated *i.i.d.* shocks with unit variances, we get the structural moving-average representation

$$\Delta X_t = C(L)\varepsilon_t \tag{18}$$

where $C(L) = D(L)S$, $C_o = S$. To identify the 25 elements in S we need 10 restrictions ($n(n-1)/2$), given that the orthonormality of ε_t imposes already fifteen restrictions ($n(n+1)/2$). Those required restrictions can be easily obtained from the structure of S in (11)-(15), by exploiting the absence of permanent effects of some shocks on some variables. In particular we chose the following set of nine long-run restrictions: ε_d has no permanent effect on productivity ($y-n$) and real wages ($w-p$); ε_s has no permanent effect on the wage share ($w+n-p-y$); ε_w has no permanent effect on productivity and real wages; and ε_t does not affect y, n, w and p in the long-run. To these nine long-run restrictions a further short-run restriction was added, namely, that ε_d does not affect the wage share within the initial quarter, which allows to distinguish ε_d from ε_w.[14]

4 Results

4.1 Data

All the data are drawn from the Quarterly National Account and the Statistical Bulletin of the Banco de España and correspond to non-seasonally adjusted

[14]The model is clearly overidentified. We tried different identifying restrictions and chose to report the results for the restrictions in the text on the basis of the shapes of the impulse-response functions. Nonetheless, the results in section 4.3 are fairly robust to alternative identifying restrictions choices.

form. The variables used to estimate the VAR in (16) are GDP in 1986 prices (y), total employment (n), average monthly labour costs (w), GDP deflator (p) and the total unemployment rate (u). The VAR was estimated using quarterly data from 1972:1 to 1993:4 with a constant and three seasonal dummies. The optimal lag length was derived using the AIC and BIC criteria, leading to a choice of four lags for each series. All the variables appeared to be I(1), with the exception of the wage and price levels which were borderline $I(1)/I(2)$.[15] Given this evidence, and the fact that the Johansen (1988) procedure did not indicate signs of cointegration among the variables, the VAR was specified in first differenced form, in agreement with the model in the previous section. The estimated VAR coefficients are not reported here for the sake of brevity, but there were no signs of misspecification in any of the equations. Instead, the next section considers the impulse response (IR) functions and the forecast error variance (FV) decompositions embedded within the VAR.

4.2 Impulse-Response Functions and Variance Decompositions

Figure 4 plots the IR function of output, employment, real wages and unemployment with respect to an innovation in each of the shocks equivalent to 1% point rise. In the top panel we get the dynamic pattern to an ε_d shock: employment and output rise with no effect on productivity after 10 years; real wages are only marginally affected in the short run and unemployment fall by less that the increase in output/employment, as predicted by equation (15), which implies a positive value of the discouragement coefficient effect (b) of about 0.5. In the second panel, the dynamic effects of an ε_w shock are depicted: they decrease unemployment and only increase real wages in the short-run. In the third panel, we get the effects of an ε_p shock: they decrease employment and output while they reduce real wages and increase unemployment which, in turn, implies that $\phi(1+\gamma_2) > c$, *i.e.*, labour supply is not too elastic. In the fourth panel, appear the effects of an ε_s shock which leaves the wage share unaffected and tends to increase unemployment in the short and medium-term while it is neutral in the long-term, indicating that $\phi \approx 1 + c$. Finally, in the bottom panel, by assumption in the identifying procedure, ε_l has only permanent effects on unemployment while real wages, after an initial decline, show a slowly mean-reverting process.

As regards the FV decompositions, shown in Table 3, we find evidence that aggregate demand shocks dominate the variability of output at all horizons and, to a lesser extent the same feature is shared by employment, where price and productivity shocks also play a role. The variability of wages is basically

[15]Some preliminary tests suggested that there was evidence of a shift in the mean growth of wages and prices in 1978:1. Thus it was removed prior to the analysis. Using Perron's (1989) testing procedure we could reject the null hypothesis that w and p were I(2) against the alternative hypothesis that they were I(1) with a mean shift.

explained by its own shocks whilst that of prices seems to be dominated by wage, price and productivity shocks. Lastly, and most importantly, the short-run variability of the unemployment rate is mainly explained by productivity and labour supply shocks, whereas in the long-run the contributions of the different shocks do not differ by much. The latter result seems to provide some favourable evidence for our conjecture that no shock alone plays an influential role in explaining Spanish unemployment. Rather, it results from a series of adverse supply shocks, compounded by disinflationary policies and a system of labour market institutions which have exacerbated the hysteretic mechanism in the propagation of those shocks.

4.3 Interpreting the results

To extend the interpretation of the rise in unemployment, Figure 5 shows the accumulated effects of each of the above identified shocks, in terms of percentage points of unemployment, for five significant sub-samples with the sample period. Bars above the zero line plot unemployment increases whilst those below the zero line depict reductions[16].

The results match satisfactorily most of the discussion in section 2. Over the second half of the 1970s there is a large price shock following the delayed effects of the first oil crisis in the Spanish economy which was partly accommodated by monetary policy, paving the way for price rises. At the same time, the social pacts which were signed from 1977 reduced the negative effects of the wage shocks in that period. During the first half of the 1980s, monetary policy was tighter while fiscal policy became more expansive, setting the basis of the welfare state, implying a joint neutral effect of aggregate demand shocks on unemployment. Price shocks became negative as a reflection of the progressive opening of the Spanish economy, while wage shocks became the most important source of unemployment. Over the second half of the 1980s, the so called "golden years", fiscal policy continued being expansionary overcoming the tightness of monetary policy. Equally, price margins, adjusting to the increase in foreign competition following Spain's entry in EC, behaved very favourably giving rise to largest negative shock over the sample period. Finally, during the first half of the 1990s, both a very negative demand shock and a wage shock took place. The former was mainly due to monetary policy, reflecting the turbulence in the ERM after Germany's reunification. The latter, in turn, probably reflected the strengthening of the insider effects following the wide use of fixed-term contracts and some redistributive effects by unions to restore the wage share. As regards productivity and labour supply shocks, the former seem to have been more important, particularly in the second halves of the 1970s and 1980s where labour productivity slowdowns decreased unemployment in the short run,

[16]Given that all shocks have potentially permanent effects on unemployment, the unemployment rate in each sub-period is the outcome of the shocks during the period and the projection from the past. Figure 5 only depicts the shocks.

via a fairly elastic labour supply. The latter, in term, seem to have played a more minor role and yet they could have been downplayed by the inclusion of deterministic components in the VAR.

In sum, we have shown that the permanence of rigidities in both good and labour markets have implied an extreme degree of persistence in the propagation on shocks which have played different roles in different significant sub-periods during the sample period. Furthermore, the existence of strong hysteresis has had serious consequences on the slowness of the disinflation process. This is so since in such an economy, compared to one without hysteretic features, the presence of hysteresis makes it easier to raise unemployment and harder to reduce it, particularly if those rigidities lower the credibility of ambitious inflation targets (see Appendix).

5 Conclusions

In this paper we have estimated a small vector autoregressive model of the Spanish economy in order to quantify the contribution of several potential factors which might have explained the staggering rise in unemployment over the last two decades. We have identified five types of structural shocks and associated them to various arguments which have been put forward to explain Spanish unemployment. Our results suggest that Spanish unemployment results from a series of adverse shocks, compounded by disinflationary policies and a system of labour market institutions and product market rigidities which convert transitory shocks into permanent ones. In particular, we find that price and wage shocks dominated the second of the 1970s and the first half of the 1980s, periods in which unemployment rose by 3 and 9 points, respectively. In turn, the recession of the early 1990s is the outcome of negative demand shocks and, to a lesser extent, of wage and productivity shocks. On the other hand, the boom in the second half of the 1980s is dominated by favourable demand and price shocks. Nonetheless, the permanence of many hysteretic features prevented unemployment from falling below the 16% mark.

Our shock accounting exercise is somehow consistent with the following political economy interpretation of the course of events. Many inefficiencies inherited from the old autocratic system were bound to be reformed, but unfortunately the political reform coincided with the two oil price shocks. To offset the initial rise in unemployment, a neo-corporatist arrangement (social pacts) was tried. These arrangements generally operated in favour of capital and the otherwise unemployed, and against the interests of the employed (particularly skilled workers). In order to ensure the unions' participation in the agreement, the government provided much more generous welfare benefits and maintained employment protection from the past. This led to an increasing divergence between the employed and the unemployed, with the state inheriting an irreversible increase in social security outlays. In these circumstances,

adverse shocks to the economy triggered undesirable adjustments. Employment destruction took place in big chunks. In addition, more inactive people meant less tax revenue, more benefits to be paid and, consequently, higher tax rates and non-wage costs. This caused further inactivity and an increase in the fiscal wedge, thereby lessening the incentive to create jobs. At the same time disinflation has been very slow, in spite of several aggressive attempts to reduce inflation. This is so because, unless the mechanisms leading to persistence are corrected, a small rise in unemployment today has large adverse effects on unemployment in subsequent periods.

What are the normative conclusions for the future? The fact that Spain has the highest and most stubborn unemployment rate in the OECD means that the "Spanish disease" is unique and therefore needs specific remedies. In this respect, the recent CEPR report on Spanish unemployment by Blanchard, Jimeno et al. (1995) argues that this is the right moment to call for a social pact, without the constraints of the past. Redistributive policies in favour of capital are no longer needed, as reflected by the fall of the wage share from 78% in 1975 to 66% nowdays, and a "two-handed" approach seems feasible (see, also, Bean, 1994) which would entail lowering firing costs, eliminating quasi-monopoly rents in many product markets and implementing a more expansionary demand. Likewise, an intensification of efficient active labour market policies targeted on long-term unemployment is badly needed. Otherwise, history will repeat itself.

Appendix

To analyse the effects of hysteresis on inflation, we use a slightly different version of the model in the main text. The model consists of four equations: a *Phillips curve*, an *aggregate demand*, an *aggregate supply* and *a policy rule* equation. The Phillips curve is an expectations augmented one such that,

$$\pi = \pi^e - \beta[u - (1-\lambda)u_{-1}] + x \tag{A1}$$

where π =inflation, π^e =expected inflation, u =unemployment rate, x =shift factors. As in the model in section 3, λ denotes the degree of hysteresis, so that $\lambda = 0$ implies full hysteris. The aggregate demand equation is simply written as

$$y = m - p \tag{A2}$$

where y = (log. of) output, m = (log. of) money stock and p = (log. of) price level. Note that $\pi = p - p_{-1} = \Delta p$. Lettingy $\bar{y}(t)$ represent the log of potential output which, for simplicity, is assumed to be a linear trend, the underlying production function (assuming CRS) implies

$$y - \bar{y} = u \tag{A3}$$

Lastly the policy rule is stated as

$$\Delta m - \pi = -\gamma(\pi - \pi^*) \tag{A4}$$

where π^* =government's inflation target. The parameter γ represents the degree of accommodation of monetary policy, *i.e.*, $\gamma = 0$ implies fully accommodating policy whilst $\gamma = 1$ implies no accommodation, namely $\Delta m = \pi^*$.

Solving the three equations in terms of u and π yields

$$u = c_1 u_{-1} + c_2(x + \pi^e - \pi^*) \tag{A5}$$

$$\pi - \pi^* = -d_1 u_{-1} + d_2(x + \pi^e - \pi^*) \tag{A6}$$

where $c_1 = 1 - \frac{\lambda\beta\gamma}{1+\beta\gamma}$, $d_1 = \frac{\beta\lambda}{1+\beta\gamma}$, $c_2 = \frac{\gamma}{1+\beta\gamma}$,and $d_2 = \frac{c_2}{\gamma}$.

The variable $(\pi^e - \pi^*)$ represents the deviation of expected inflation from target inflation and can be interpreted as an index of *lack of credibility*, namely, the more credible are inflation targets, the closer will be the market's expectations to them. From (A.5)-(A.6), it follows that the lower is λ (increasing hysteresis) the lower is the effect of lagged unemployment on inflation, for a given inflation target, and the higher the persistence of unemployment. Finally, the lower is credibility the larger will be inflation and unemployment for given past unemployment and inflation target.

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Table 1
Labour Force Employment and Unemployment
(Average Percentage Changes)

Period	1973-85		1986-95		1973-95	
Labour Force						
Total	0.34	(100)	1.27	(100)	0.76	(100)
Male	-0.14	(73)	0.21	(68)	0.02	(62)
Female	1.50	(27)	3.24	(32)	2.23	(38)
Employment						
Total	-1.25	(100)	1.10	(100)	-0.18	(100)
Male	-1.50	(73)	0.31	(71)	-0.68	(65)
Female	-0.60	(27)	1.27	(29)	0.94	(35)
Unemployment Rate (%)						
Total	16.5	(100)	1.3	(100)	17.8	(100)
Male	14.4	(65)	-0.9	(60)	13.5	(49)
Female	20.9	(35)	3.2	(40)	24.2	(51)
Sectoral Employment						
Agriculture	-3.8	(25)	-5.8	(18)	-4.7	(10)
Non-Agriculture	-1.4	(67)	2.2	(66)	0.2	(73)
Public Sector	4.5	(8)	1.8	(16)	3.4	(47)

Note: The bold figures represent average annual % changes over the relevant period. The figures in parenthesis represent the proportions of male and female labour force, employment and unemployment in 1973 (column 1), 1985 (column 2) and 1995 (column 3). The sectoral employment breakdown is with respect to total employment. Source: Spanish Labour Force Survey.

Table 2
Spanish Unemployment: Main Features

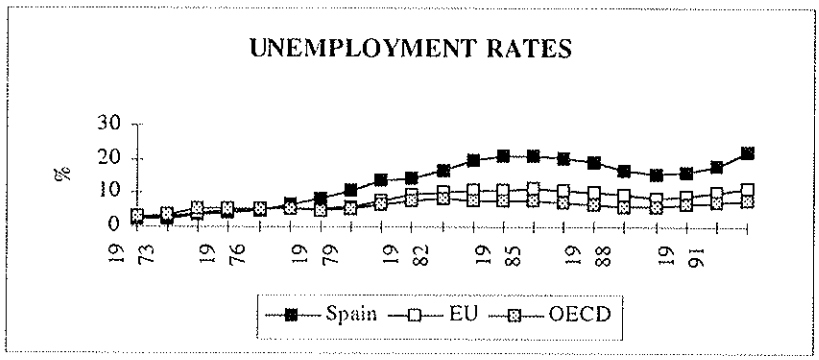
Unemployment Rate (%)	Total	Long-term	Unskilled	Youth
Spain	24.3	52.7	70.5	45.1
Europe	11.4	46.1	49.2	22.0
1. Labour Costs	**1973-85**	**1986-95**	**1973-95**	
Spain	2.6	0.9	1.9	
Europe	1.7	1.1	1.4	
2. Productivity				
Spain	2.8	2.3	2.6	
Europe	2.2	1.9	2.1	
3. Real Unit Labour Costs				
Spain	-0.2	-1.4	-0.7	
Europe	-0.5	-0.8	-0.7	
Monetary Policy				
1. Monetary Stance	-1.4	0.3	-0.7	
2. Real Interest Rate	1.2	5.2	2.9	
Fiscal Policy				
1. Fiscal Stance	1.4	0.1	0.8	

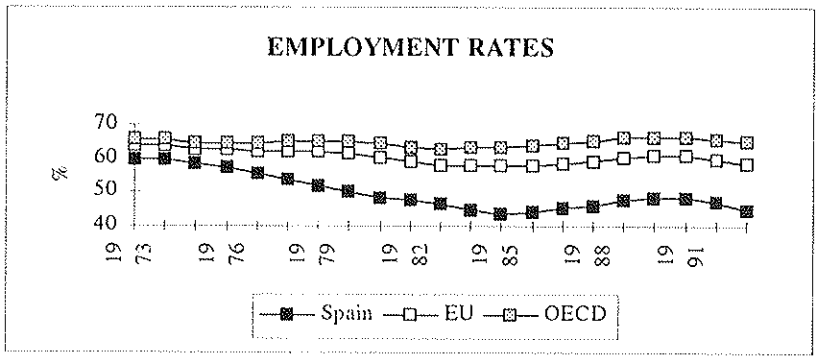
Note: For unskilled, the table gives the proportion of unemployed with low levels of qualification. The monetary stance indicator is defined as the difference between annual money growth (M4) and the money growth target (see footnote 10). A positive sign indicates expansionary monetary policy; the fiscal stance indicator is defined as the change in structural budget deficit. Source: European Economy, 1996.

Table 3
Forecast Error Variance Decomposition

Period/shock	Demand	Wage	Price	Productivity	Labour Supply
			Output		
1	83.6	6.3	6.3	3.1	0.7
4	78.0	14.1	3.3	4.1	0.4
∞	52.0	23.2	7.9	16.4	0.4
			Employment		
1	40.3	0.7	25.9	28.4	4.7
4	42.7	3.4	19.1	24.2	6.4
∞	31.5	13.1	29.5	19.6	6.3
			Wages		
1	0.1	91.6	6.7	1.2	0.4
4	0.3	81.8	11.7	3.7	2.6
∞	3.1	74.9	13.6	5.7	2.6
			Prices		
1	8.8	17.4	27.1	40.8	6.0
4	4.9	20.5	20.1	50.2	4.3
∞	6.9	21.8	20.2	46.6	4.5
			Unemployment Rate		
1	19.6	3.9	14.7	36.7	25.1
4	25.4	3.4	11.1	36.6	25.4
∞	22.5	13.0	23.0	25.5	16.0

Figure 1
Unemployment Employment and Participation Rates





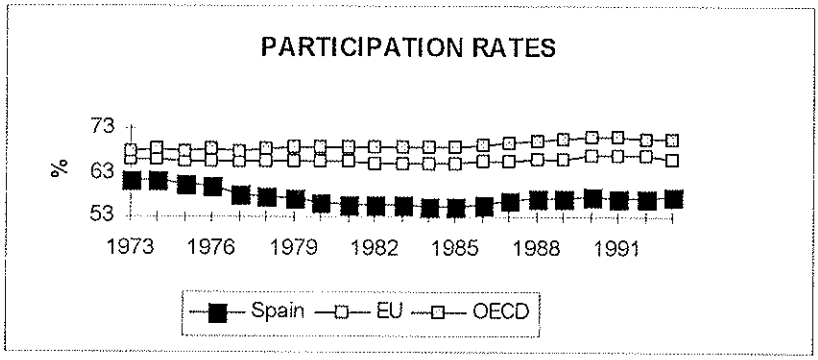


Figure 2
The Phillips Curve

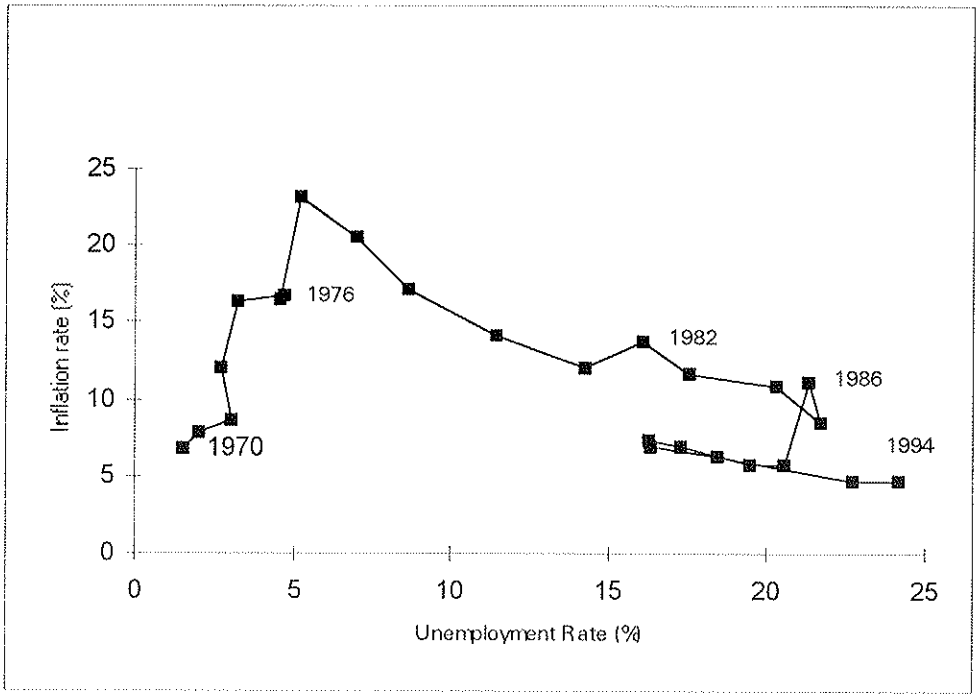


Figure 3
The Unemployment-Vacancy Curve

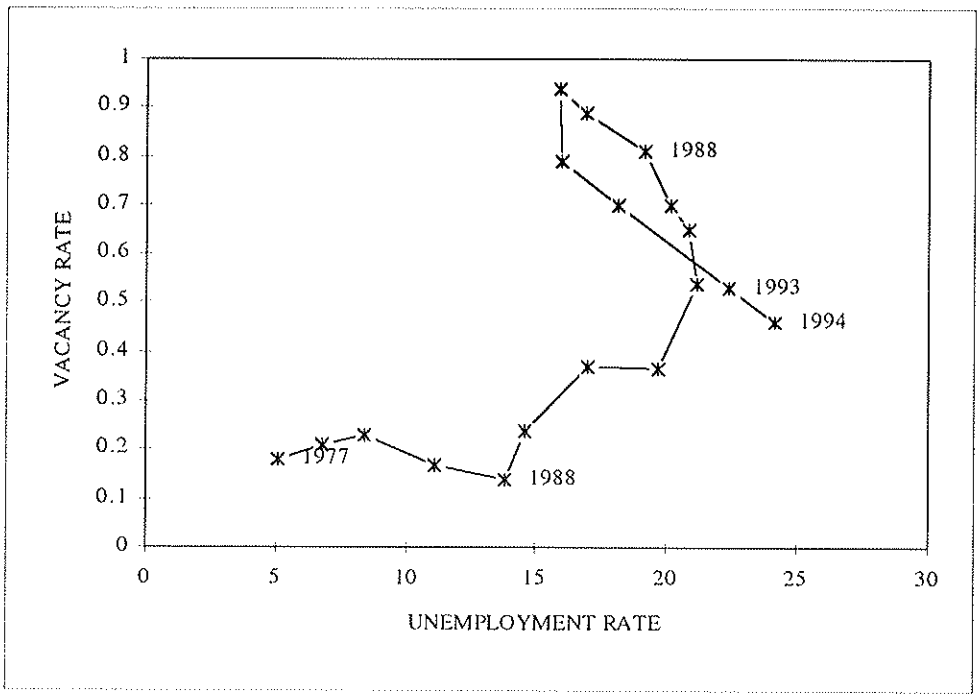
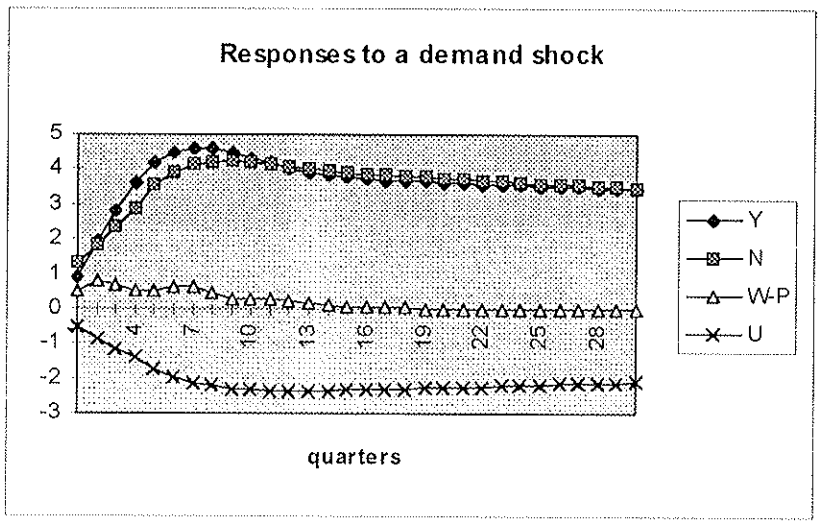


Figure 4
Impulse-Response Functions



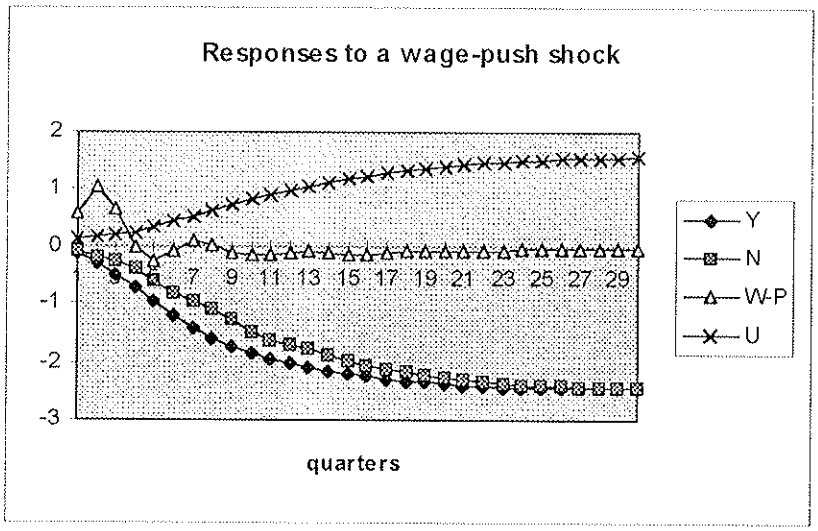
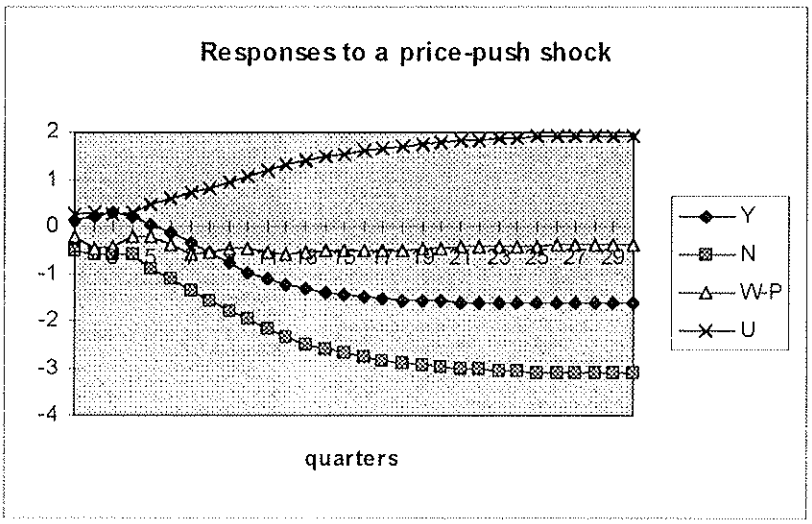
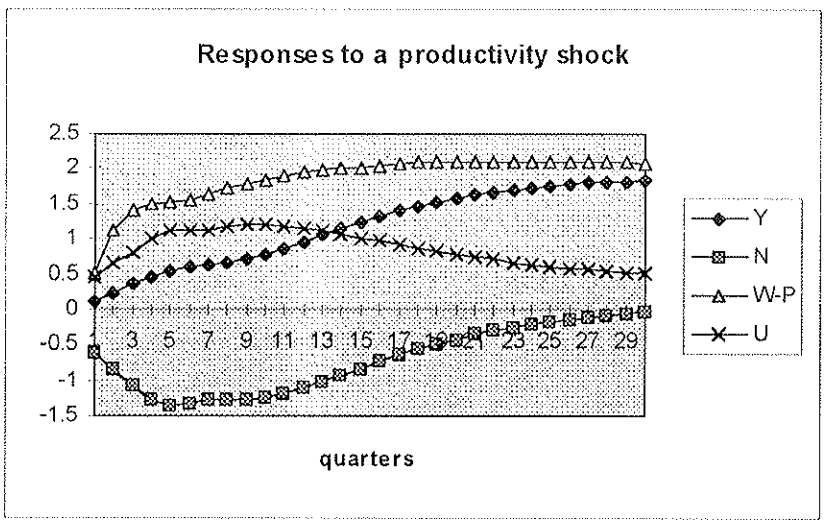


Figure 4 (continued)





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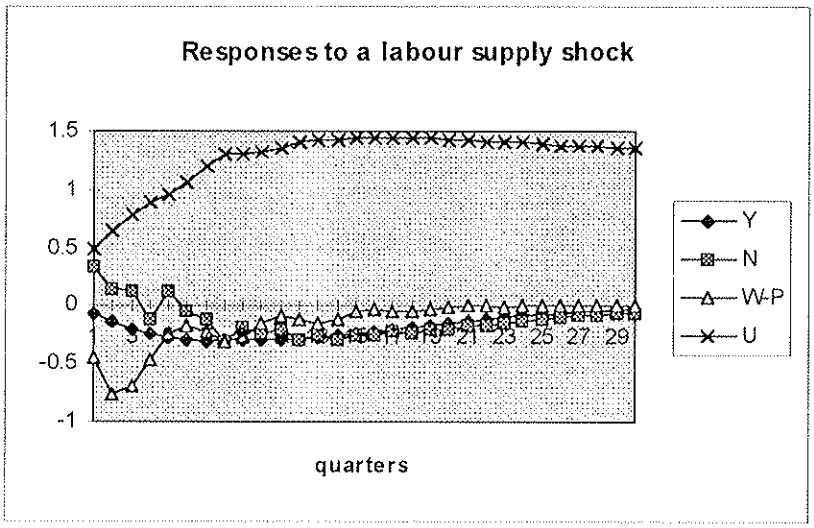

Figure 5
Accumulated Structural Shocks