A Tale of Two Neighbour Economies: Does Wage Flexibility Make the Difference Between Portuguese and Spanish Unemployment?*

Sonsoles Castillo[†] **Juan J. Dolado**[‡]
Juan F. Jimeno[§]

Abstract

Portugal and Spain are two neighbour economies which share many characteristics. However, Spanish unemployment more than doubles Portuguese unemployment. In this paper we provide an explanation for this difference in two steps. First, we estimate the degree of nominal and real wage rigidity in both countries and the dynamic response of various labour market variables to different types of shocks using structural VAR techniques. Our results show that real wage flexibility is higher in Portugal, and that, although shocks hitting both economies since the beginning of the eighties were not too dissimilar, their effects on unemployment were much more long-lasting in Spain than in Portugal. And secondly, we use individual data from the Spanish and Portuguese Household Budget Surveys to measure the loss in consumption suffered by unemployment workers relative to employed workers. We find that this loss is much more sizeable in Portugal, which could explain the higher degree of wage flexibility shown by the Portuguese labour market.

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[†]FEDEA.

[‡]Universidad Carlos III and CEPR.

[§]Universidad de Alcalá, FEDEA, and CEPR.

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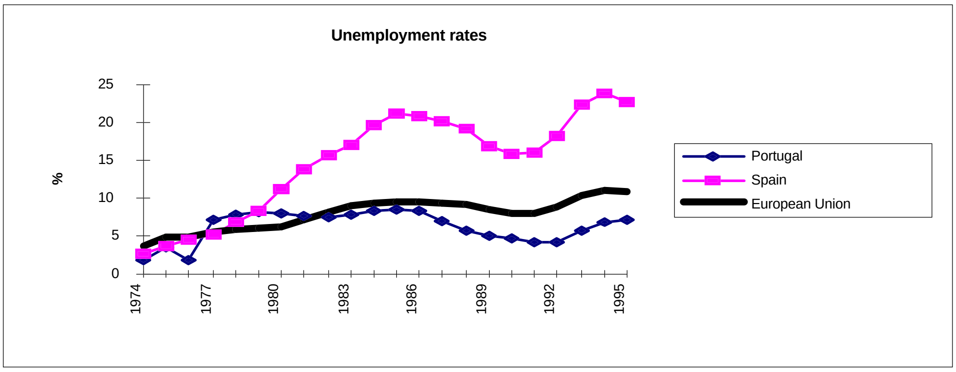
1 Introduction

Portuguese unemployment has remained at low levels since the mid-seventies, in contrast with the evolution of unemployment in the rest of EU countries (see Figure 1). This has led several authors to highlight the "Portuguese puzzle" (Layard, 1990, Blanchard and Jimeno, 1995) and propose some explanations of the good Portuguese labour market performance. Amongst these explanations, the following stand out as the most popular:

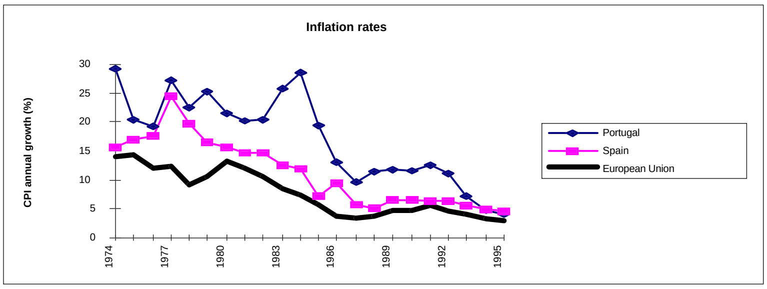
Figure 1



- Portuguese unemployment is low because real wage flexibility is much higher in Portugal than in the rest of EU countries (Luz and Pinheiro, 1994, Marimón and Zilibotti, 1997). This flexibility has allowed to absorb shocks without increasing unemployment. There is the presumption that the shocks which hit Portugal during the last two decades have been somewhat similar to those that hit other EU countries, but this remains to be fully documented.

- Besides unemployment, there is, though, another difference between the macroeconomic performance of Portugal and that of the rest of EU countries: while most EU countries embarked in disinflationary policies during the late seventies and early eighties, Portuguese inflation remained high until 1985, and then diminished by 10 percentage points in two years without any noticeable impact on unemployment (in fact, unemployment was falling at the time). A new wave of disinflation took place in 1992-94, this time with a slight adverse effect on unemployment. The "timing of disinflation" has been stressed by Blanchard and Jimeno (1995) as another possible candidate to explain why Portuguese unemployment has remained low.

Figure 2



- Finally, there is the issue of the effects of unemployment benefits on unemployment and its persistence. The coverage of unemployment benefits in Portugal throughout the eighties and the requirements to be entitled to get them are rather strict, by European standards (see OECD, 1994). In their comparison of Portuguese and Spanish labour market institutions, Blanchard and Jimeno (1995) identify the coverage of unemployment benefits as the only apparent difference.[1] Ball (1995), after finding that there is a sizeable trade-off between the rise in unemployment and the amount of disinflation across European countries during the eighties, points out that mainly countries with low unemployment benefits (like Portugal) are those which have avoided this trade-off.

In this paper, we shed new evidence on the functioning of the Portuguese labour market relative to the Spanish one. We first provide new estimates

[1] For a more detailed comparisons of the institutional aspects of the Portuguese and the Spanish labour markets, see Bover, García-Perea and Portugal (1997).

of the degrees of nominal and real wage rigidities in both labour markets in section 2, and offer a structural VAR interpretation of the rise of unemployment in section 3. As a benchmark for comparison, we use two versions of the model proposed in Dolado and Jimeno (1997), which allows us to decompose variations in unemployment into different kind of shocks and their propagation mechanism. Finally, in order to test whether unemployment hardship lies behind the different degree of wage rigidity in both countries, in section 4 we use data from the Portuguese and the Spanish Household Budget Surveys to measure the consumption losses derived from unemployment. Our motivation is based on the presumption that the larger these losses are, the higher is the downward pressure than unemployed exert on wage determination, and, therefore, the lower is real wage rigidity. Finally, section 5 draws some brief conclusions.

2 Measuring nominal and real wage rigidity

2.1 Nominal rigidity

In this section, we use a rather simplistic VAR approach to analyse the dynamics of output and prices in Portugal and Spain. Our approach consists of identifying two different types of shock: a shock to output that is associated with a contemporaneous movement in the price level and another shock associated with no contemporaneous price response. (We shall use quarterly data in the estimation, thus, "contemporaneous" means "within a quarter"). The variance decomposition (at various frequencies) will be used to assess the role of sticky prices in the transmission of both type of shocks: the larger the proportion of variance of output explained by shocks which have no contemporaneous effects on prices is, the higher the degree of price stickiness is and, hence, the higher the degree of nominal inertia.

Formally, let the vector moving-average representation of prices and output be the following

$$\begin{aligned} p_t &= \theta_{11}(L)\varepsilon_t + \theta_{12}(L)\xi_t \\ y_t &= \theta_{21}(L)\varepsilon_t + \theta_{22}(L)\xi_t \end{aligned} \tag{1}$$

where p is (log) prices, y is (log) output, $\theta' s$ are polynomials in the lag operator, L, and ε and ξ are shocks. The latter shock, ξ, has not contemporaneous effect on prices, that is, $\theta_{12}(0) = 0$. Thus, ε_t is the one-step forecast error for

p, and we can identify this shock by means of a Cholesky decomposition of the variance-covariance matrix. We interpret the proportion of the variance of output explained by ξ as a measure of the importance of sticky price adjustment for output fluctuations. Notice that this recursive statistical model assumes that prices do not react to output contemporaneously but allows output to react to prices contemporaneously. Thus, an economic interpretation of the shocks could be as follows. Suppose that the economy has a flat short-run aggregate supply curve and a standard aggregate demand curve. Thus, an innovation to the price level could only be interpreted as a result of a shock to this flat supply curve (i.e., ε must be a supply shock), whereas the component of output associated with no contemporaneous price movement, ξ, would be attributable to an aggregate demand shock.

Finally, note that if there were unit roots in both prices and output (say they are I(1) and not cointegrated) we could impose them directly in the estimation by choosing the variables in (1) in first-difference form, as Δp and Δy, rather than estimating the unit roots in a VAR in levels as in (1). Thus, in what follows we report the results from two bivariate VARs: one in (log) levels and another in (log) first-differences. The VAR contains 4 lags, a constant and centered seasonal dummies, and a linear trend (only in the specification in levels). The data are quarterly and cover the period 1984:2-95:4. Output is measured by GDP (y) and the price level is the GDP deflator (p). Tables 1a and 1b report the variance decompositions of output and prices at one and three years horizons. By construction, ξ has no contemporaneous effect on prices and ε explain most of the variance in the price level. However, this pattern persists after three years. As regards the variance of output, ξ explains almost 100% after one year in Portugal and 80% in Spain. These relative patterns persist after three years, albeit to a lesser extent in the first-differenced specification.

Table 1a. Variance Decompositions

Model: (p, y)		p		y	
Horizon		ϵ	ξ	ϵ	ξ
1 year	Portugal	87.0	13.0	0.9	99.1
	Spain	91.2	8.8	19.9	80.1
3 years	Portugal	72.5	27.5	6.9	93.1
	Spain	85.1	14.9	16.5	83.5

Table 1b. Variance Decompositions					
Model: $(\Delta p, \Delta y)$		Δp		Δy	
Horizon		ϵ	ξ	ϵ	ξ
1 year	Portugal	81.2	18.8	1.5	98.5
	Spain	84.6	15.4	17.8	82.2
3 years	Portugal	80.1	19.9	9.6	90.4
	Spain	80.7	19.3	11.3	82.7

Therefore, the main conclusions we draw from this simple exercise is that nominal sticky price adjustment seems to be more relevant for output fluctuations in Portugal than in Spain, and that supply shocks (ε) explain a higher proportion of output fluctuations in Spain than in Portugal. We will however be more explicit about the sources of the shocks hitting both economies in section 3.

2.2 Real wage rigidity

Nominal rigidity can explain the different dynamics of output and employment in the short-run but cannot explain while real wages do not adjust to high levels of unemployment. Thus, any attempt of explaining unemployment differences across countries must account for the different response of real wages to unemployment. In this section, we provide a simple measure of real wage rigidity in Spain and Portugal which has also been applied by Viñals and Jimeno (1996) to some OECD countries.

This measure of real rigidity is based on a very simple labour market model. Assuming constant mark-up pricing, prices (in logs) are given by: $p - w = m + z$ where w is (nominal) wages, m is the mark-up and z are shocks assumed to follow a I(1) process, and, therefore, innovations in z have permanent effects on real wages. Wage determination negatively relates real wages to unemployment, as in: $w - p = -c(u - hu_{-1}) + z^w$ where u is the unemployment rate, c and h ($h \leq 1$) are positive parameters, and z^w are shocks to the wage equation. As is standard in the literature, u_{-1} appears in the wage-setting equation to allow for some persistence. When $h < 1$, a measure of real wage rigidity is the inverse of $c(1-h)$. The higher c is, the less rigid real wages are; the higher h is, the more rigid real wages are. Combining these two equations yields an unemployment equation given by $u = \frac{m}{c} + hu_{-1} + \frac{z^w + z}{c}$.

Now suppose that shocks to the price-setting equation are mostly of a "technological" nature with permanent effects on real wages ($z = -\nu^s$). Shocks to the wage equation include both technological shocks and (stationary) wage push/labour supply shocks, so that $z^w = \nu^s + \nu^w$. Then, unemployment can be expressed in terms of shocks as

$$u = \frac{m}{c} + h\, u_{-1} + \frac{\nu^w}{c} = \frac{m}{c(1-h)} + \sum_{j=0}^{\infty} \frac{h^j}{c} \nu^w_{-j}$$

Thus, unemployment is stationary, and its initial response to wage-push and labour supply shocks is greater the more rigid real wages are. The mean lag of the response in unemployment ($h/(1-h)$) is increasing in h. If $h = 1$, unemployment follows a random walk with drift, and both its short-run and long-run responses to wage push/labour supply shocks are decreasing in c. This simple model suggests that the degree of real wage rigidity (RWR) is related to some characteristics of the impulse-response of unemployment to wage push/labour supply shocks, which are easily identified. In both cases considered ($h < 1$ and $h = 1$) real wages are I(1) and wage push/labour supply shocks have no long run effects on the level of real wages. Thus, the empirical exercise to assess the degree of real wage rigidities across countries is very simple. When $h < 1$, we estimate a VAR composed by the growth rate of real wages and the (level of the) unemployment rate, and recover the impulse-response of unemployment to shocks which have no log-run effects on real wages.[2] When $h = 1$, we estimate a VAR composed by the growth rate of real wages and the first difference of the unemployment rate, and recover the impulse-response of unemployment to the same kind of shocks. Note that the model above suggests that the other type of shocks recovered from the VAR innovations are technological shocks which increase real wages in the long run but do not affect equilibrium unemployment.

The results are shown in Table 2. On the one hand, under the assumption of $h < 1$, the estimate of the degree of hysteresis is close to 0.9 in both Portugal and Spain, although is higher in Spain. There are, however, noticeable differences in the degree of real wage rigidity and in the mean lag between both countries. As shown in Viñals and Jimeno (1996), when this estimation strategy is applied to several OECD countries with annual data, the estimates for Spain of RWR, h, and the mean lag are slightly above the

[2] Notice that this VAR is over-identified: Technology shocks, ν^s, are supposed to have no long-run effects on unemployment.

EU average. Thus, as the first panel of Table 2 shows that the degree of real wage rigidity in Portugal can be considered extremely low, according to European standards. On the other hand, when pure hysteresis is assumed ($h = 1$), the results show the same pattern: the corresponding index of real wage rigidity is higher in Spain than in Portugal. In the next section, we estimate a more structured model of the labour market which combine nominal and wage rigidities to identify the sources of Portuguese and Spanish unemployment, using the same model as in Dolado and Jimeno (1997).

Table 2. Measures of Real Wage Rigidity

	$h < 1$			$h = 1$
	Model: $(\Delta(w-p), u)$, 4 lags*			Model: $(\Delta(w-p), \Delta u)$, 4 lags
	RWR	h	Mean lag (quarters)	RWR
Portugal	2.56	0.90	9.18	1.03
Spain	13.62	0.94	16.58	1.32

Sample periods:1984:2-1995:4 for Portugal, 1970:2-1994:3 for Spain.
**For Spain 2 lags.*

3 A structural VAR interpretation of Portuguese unemployment

So far we have documented the peculiarities of the Portuguese economy as regards nominal and real wage rigidities. These rigidities are an important element of the transmission of shocks to macroeconomic variables. We now turn to identify the shocks hitting the Portuguese economy during the last decade. To identifying the shocks, we draw from Dolado and Jimeno (1997), who use a structural VAR approach to measure the relative contribution of different types of shock to the Spanish economy in the 1970-94 period. By applying the same approach to both countries, we will be able to test the presumption that both economies have been hit by similar shocks, but that the propagation mechanisms have been somehow different.

3.1 The structural model

Our structural model is composed of five relationships and five types of shocks: *aggregate demand, wage push, price push, productivity* and *labour* *supply* shocks. It contains a minimum of dynamics to simplify the analysis. Yet, its long-run behaviour is consistent with more general dynamic patterns which we consider in the empirical analysis. The first three equations are as follows:

$$y = d - p \tag{2}$$

$$y = n + \theta \tag{3}$$

$$p = w - \theta + \mu \tag{4}$$

where n, and $(d - p)$ denote the logs of employment 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 (2) is a simplified version of an aggregate demand function, Equation (3) is a (long-run) production function under a CRS technology. Finally, equation (4) describes the corresponding price setting rule as a mark-up on unit labour cost.

Labour supply and wage determination, in turn, are represented by the following three equations:

$$l = c(w - p) - bu + \tau \tag{5}$$

$$w = w^* + \varepsilon_w + \gamma_1\varepsilon_d + \gamma_2\varepsilon_p \tag{6}$$

$$w^* = \arg\{n^e = (1 - \lambda)n_{-1} + \lambda l_{-1}\} \tag{6'}$$

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 (5) 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 (6), in turn, characterises wage-setting behaviour. Wages have both a backward looking component and a forward-looking one. As in Blanchard and 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 equation (6') 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 is an *i.i.d.* wage shock reflecting changes in union's bargaining power, etc.[3] As is well known, the microfoundations of (6') follow typically from an insider-outsider framework (see, *e.g.* Blanchard and Summers, 1986) which fits well with the characteristic of the Spanish wage-setting process as discussed in Section 2. This parameterisation leads to a partial hysteresis hypothesis when $0 < \lambda < 1$ and to a full hysteresis one 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 assume that d, θ, μ and τ evolve as simple random walks

$$\Delta d = \varepsilon_d \tag{7}$$

$$\Delta \theta = \varepsilon_s \tag{8}$$

$$\Delta \mu = \varepsilon_p \tag{9}$$

$$\Delta \tau = \varepsilon_l \tag{10}$$

where ε_d, ε_s, ε_p and ε_l are *i.i.d.* uncorrelated aggregate demand, productivity, price and labour supply shocks. However, in the empirical implementation of the model we will allow for richer dynamics and the presence of deterministic trends while maintaining the assumptions in (7) to (10).

Solving equations (2)-(10) for unemployment yields

$$(1 - \rho L)u = (1+b)^{-1} \left\{ \begin{array}{c} -(1-\gamma_1)\varepsilon_d + (1+\gamma_2 - c)\varepsilon_p + \\ +(1+c)\varepsilon_s + \varepsilon_l + \varepsilon_w \end{array} \right\} \tag{11}$$

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).

However, for a finite b,this model yields two different specifications of unemployment dynamics, depending on the value of λ. For $\lambda > 0$ ($\rho < 1$), the unemployment rate follows a stationary process and transitory shocks, the $\varepsilon' s$, have no long-run effects on unemployment. For $\lambda = 0$ ($\rho = 1$), the unemployment rate follows an I(1) process and transitory shocks have long-run effects on unemployment (full-hysteresis).

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

There is some debate on which of these two specifications is more appropriate. Dolado and Jimeno (1997) show that the case of full hysteresis for Spanish unemployment is not at odds with the data, as reflected by the fact that standard unit root tests do not reject the existence of a unit root in unemployment (and even a second unit root is barely rejected). As for Portugal, an augmented Dickey-Fuller test does not reject the existence of a unit root in the unemployment rate, even at the 10% significance levels (t-statistics are -1.08, -1.18, -1.52 , and -2.07, with 1,2,3 and 4 lags of the difference of unemployment, respectively). Thus, results from unit root testing do not contradict the view that $h = 1$ (there is full hysteresis), both in Portugal and Spain.

Nevertheless, given the well-known low power of unit root testing, these results should not be taken for granted. On theoretical arguments, full-hysteresis may look as a too stringent assumption, even for Spain. It should be noticed however that if the unemployment rate is a stationary variable in Portugal and we over-difference it, this will give rise to unit roots in its moving-average representation, uncovering therefore whether the above-mentioned shocks have permanent or transitory effects on unemployment.

Here, we choose to remain neutral in this debate and report the results from both specifications. Our main purpose is to compare unemployment dynamics and the sources of shocks in Portugal and in Spain. Thus, we can perform this comparison for each of the two specifications of the model. It will turn out that the main qualititative conclusions about the differences between Spain and Portugal are invariant to the chosen specification.

3.2 Identifying assumptions

We estimate the two versions of the previous model by means of a structural VAR. Under the full-hysteresis version ($\rho = 1$) we rely on a set of nine (hopefully, non-controversial) long-run restrictions and a short-run restriction. Under the stationary version of the model ($\rho < 1$), we use four long-run restrictions and six short-run restrictions.

3.2.1 Full-hysteresis

Imposing $\rho = 1$ and solving out equations (2) to (10), for employment, output, wages, prices and unemployment yields the following representation of variables in terms of shocks:

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

$$\Delta y = (1-\gamma_1)\varepsilon_d + \varepsilon_s - (1+\gamma_2)\varepsilon_p - \varepsilon_w \tag{13}$$

$$\Delta w = \gamma_1\varepsilon_d + \gamma_2\varepsilon_p + \varepsilon_w \tag{14}$$

$$\Delta p = \gamma_1\varepsilon_d - \varepsilon_s + (1+\gamma_2)\varepsilon_p + \varepsilon_w \tag{15}$$

$$\Delta u = (1+b)^{-1}\left\{ \begin{array}{c} -(1-\gamma_1)\varepsilon_d + (1+\gamma_2 - c)\varepsilon_p + \\ +(1+c)\varepsilon_s + \varepsilon_l + \varepsilon_w \end{array} \right\} \tag{16}$$

In words, aggregate demand shocks (ε_d) increase (decrease) employment and output (unemployment) if indexation is not complete. Equally, they increase wages and prices unless there is complete rigidity. Price shocks (ε_p) decrease employment and output, increase wages and 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, prices and unemployment. Productivity shocks (ε_s) increase output and leave employment unaffected, reduce prices and rise unemployment. In this case, all shocks have permanent effects on unemployment.

From equations (12) to (16), we choose are the following long-run restrictions: ε_d has no permanent effect on productivity $(y-n)$ and real wages $(w-p)$, since, by CRS, only productivity shocks increase productivity in the long-run, while the permanent component of real wages is only driven by productivity and price push shocks; ε_s has no permanent effect on employment; ε_w has no permanent effect on productivity and real wages, for the same reasons explained with regard to ε_d; and ε_l does not affect y, n, w and p in the long-run, since *outsiders* do not affect the wage determination process. The short-run restriction is the conventional one that ε_d does not affect nominal wages within the initial quarter, which allows us to distinguish ε_d from ε_w.

3.2.2 Partial hysteresis

When $\rho < 1$, solving out equations (2) to (10), for employment, output, wages, prices and unemployment yields the following representation of variables in terms of shocks and past unemployment:

$$\Delta n = (1-\gamma_1)\varepsilon_d - (1+\gamma_2)\varepsilon_p - \varepsilon_w + \lambda u_{-1} \tag{17}$$

$$\Delta y = (1-\gamma_1)\varepsilon_d + \varepsilon_s - (1+\gamma_2)\varepsilon_p - \varepsilon_w + \lambda u_{-1} \tag{18}$$

$$\Delta w = \gamma_1 \varepsilon_d + \gamma_2 \varepsilon_p + \varepsilon_w - \lambda u_{-1} \tag{19}$$

$$\Delta p = \gamma_1 \varepsilon_d - \varepsilon_s + (1+\gamma_2)\varepsilon_p + \varepsilon_w - \lambda\lambda u_{-1} \tag{20}$$

$$\Delta u = (1+b)^{-1} \left\{ \begin{array}{c} -(1-\gamma_1)\varepsilon_d + (1+\gamma_2 - c)\varepsilon_p + \\ +(1+c)\varepsilon_s + \varepsilon_l + \varepsilon_w \end{array} \right\} - \frac{\lambda}{1+b} u_{-1} \tag{21}$$

From equations (17) to (21), we choose the following four long-run restrictions: ε_d has no permanent effect on productivity $(y-n)$ and real wages $(w-p)$, and ε_w has no permanent effect on productivity and real wages, as before. The six short-run restrictions are the same restriction use in the full-hysteresis version (ε_d does not affect nominal wages within the initial quarter, which allows us to distinguish ε_d from ε_w) and five new restrictions: productivity shocks, ε^s, has no contemporaneous (within the quarter) effects on employment, and labour supply shocks, ε^l, have no contemporaneous (within the quarter) effects on production, employment, wages, and prices

3.3 Results

The results of the structural VAR estimation of the model presented above, are given in various ways: i) variance decompositions (Tables 3a and 3b for the full hysteresis version, and tables 4a and 4b for the stationary version), ii) impulse-response functions (Appendix 2), and the contribution of each shock to unemployment (Figure 3 for the full-hysteresis version and Figure 4 for the stationary version). We first comment on the results from the full hysteresis version. The main conclusions that we draw from this set of results are the following:

- As shown by the impulse-response functions in Appendix 2, and in clear contrast to Spain where all five shocks have non-negligible long run effects on unemployment, demand shocks, productivity shocks and labour supply shocks have no long-run effects on unemployment in Portugal (even after estimating the model under the assumption of pure hysteresis). In the case of demand shocks, their effects on unemployment vanish after one and a half years, approximately, although their initial impact is larger than in Spain (the latter being consistent with the finding in section 2.1 of higher nominal inertia in Portugal). As regard productivity and labour supply shocks, their effects on unemployment are small at all horizons, in the first case, and vanish also quite rapidly, in the second. As for wage-push shocks, they have large and persistent effects on unemployment, while price-push shocks have smaller effects on unemployment. Overall, the comparison of the impulse-response functions suggest that in the Portuguese labour market, persistence mechanisms play a much less important role in the transmission of shocks.

- As regards, the sources of unemployment fluctuation, Tables 3a and 3b show that while in Spain all five shocks have play a more or less similar role (with predominance of productivity shocks), in Portugal they have been driven mostly by demand shocks and, to a lesser extent, wage and labour supply shocks. Almost 70% of the forecast error variance of unemployment in the long-run is explained by shocks (demand and labour supply shocks) which, as above-mentioned, have short-lived effects on unemployment.

- The contributions of each shock to unemployment in the last decade have been rather similar. In Portugal, during the second half of the eighties, the largest contribution to the unemployment reduction came from negative wage-push shocks, whereas in Spain negative price shocks, following liberalisation of the goods markets and trade opening played the main role. Yet, in Portugal, price-push shocks, productivity shock, and even demand shocks, despite the disinflation that took place during 1985-87, helped to reduce unemployment. By contrast, during the first half of the nineties, all shocks have caused a raise of unemployment: demand shocks have increased unemployment by one and half percentage points, productivity shocks by more than one point, and wage-push shocks, price-push shocks, and productivity shocks by about half point each. It is surprising that demand shocks have played such a different role in the two subperiods. After all, disinflation took place both at mid-eighties and early nineties with rather different effects on unemployment, a fall in unemployment in the late 80s and a rise in the early nineties.[4] The painless disinflation of the eighties should be the topic of further research.

[4] We have also estimated this specification of the model conditioning for GDP of OECD countries as an exogenous variable. Although the coefficient of this variable turns out to be negative and statistically significant in the unemployment equation, the historical decomposition of the unemployment rate into contribution of shocks is not qualitatively different to that commented in the text.

As for the set of results from the stationary version, we find that:

- The comparison between the impulse-response functions show that all the five shocks have long-lasting effects on unemployment in Spain, while in the case of Portugal, their effects die out much more quickly (see Appendix 2).

- As for the sources of unemployment fluctuations, Tables 4a and 4b show that, while in Spain all five shocks have play a more or less similar role (with predominance of productivity shocks), in Portugal they have been driven mostly by demand shocks and, to a lesser extent, labour supply shocks. In this version, more than 80% of the forecast error variance of unemployment in the both the short-run and the long-run is explained by shocks (demand and labour supply shocks) which, as above-mentioned, have short-lived effects on unemployment. In Spain, as it happens in the full hysteresis version, the contribution of all five shocks in the long-run is roughly of similar order of magnitude.

- In contrast to what happens under the full hysteresis specification, the contributions of each shock to unemployment in the last decade is estimated to be somewhat different in Spain and in Portugal. During the second half of the eighties, in Portugal, despite the disinflation, demand shocks, together with productivity and labour supply shocks, are identified as the main source of unemployment reductions. However, in Spain, labour supply shocks were the main source of shocks raising unemployment both in the second half of the eighties and first half of the nineties.[5] As happens under the full hysteresis specification, during the first half of the nineties, both in Portugal and Spain, demand shocks are one of the main source of unemployment increases.

Although these two exercises lead to slightly different interpretations on the origin of the shocks moving unemployment, particularly in the Spanish case where labour supply shocks seem to have played a more relevant role in the stationary version of the model, it is tempting to say that overall, both set of results point out that probably the main difference between the relative evolution of Portuguese and Spanish unemployment arises from the

[5] In this period the female participation rate increased signifcantly in Spain (see Bover and Arellano, 1995).

different propagation mechanisms of the shocks hitting the two economies, which have not been too dissimilar over the last decade (particularly in the full hysteresis version). Persistence mechanisms are much more relevant in Spain than in Portugal. The next question to address is therefore what causes such a high difference between the degree of persistence in Spain and Portugal. As mentioned in the introduction, the institutional aspects of the Portuguese labour market are similar to those in Spain in all respects but unemployment insurance. We now turn to measure the consequences of this difference for consumption and, hence, for the incentives that unemployed have to leave unemployment.

Table 3a. Forecast Error Variance Decomposition (%).
Full hysteresis. Portugal. Sample Period: 1984:2/95:4

Period/shock	Demand	Wage	Price	Productivity	Labour Supply
			Output		
1 year	46.5	9.3	23.5	3.0	17.7
4 years	46.6	10.4	22.2	3.9	16.9
10 years	46.7	10.4	22.2	3.9	16.9
			Employment		
1 year	54.7	20.3	7.7	15.1	2.2
4 years	56.2	17.3	9.7	13.4	3.4
10 years	56.2	17.3	9.7	13.4	3.4
			Wages		
1 year	0.9	32.9	12.6	37.2	16.54
4 years	1.5	31.0	12.5	35.2	19.8
10 years	1.5	31.0	12.5	35.2	19.8
			Prices		
1 year	46.2	27.0	14.9	4.5	7.4
4 years	45.8	26.7	14.8	4.6	8.2
10 years	45.8	26.7	14.8	4.6	8.2
			Unemployment Rate		
1 year	49.6	18.6	7.8	6.4	17.6
4 years	54.1	15.4	9.8	6.5	14.2
10 years	54.1	15.4	9.8	6.5	14.2

Table 3b. Forecast Error Variance Decomposition (%).
Full hysteresis. Spain. Sample period: 1971:4/94:3

Period/shock	Demand	Wage	Price	Productivity	Labour Supply
			Output		
1 year	78.0	14.1	3.3	4.1	0.4
4 years	52.9	23.3	18.1	5.4	0.4
10 years	52.0	23.2	17.9	6.4	0.5
			Employment		
1 year	42.7	3.4	19.1	24.2	6.4
4 years	32.3	12.9	29.7	18.8	6.3
10 years	31.5	13.2	29.5	19.6	6.2
			Wages		
1 year	0.3	81.8	11.7	3.7	2.6
4 years	3.1	75.0	13.6	5.7	2.5
10 years	3.1	74.9	13.6	5.8	2.6
			Prices		
1 year	4.9	20.5	20.1	50.2	4.3
4 years	6.8	21.8	20.2	46.7	4.5
10 years	6.9	21.8	20.3	46.6	4.5
			Unemployment Rate		
1 year	25.4	3.4	11.1	36.6	25.4
4 years	20.1	12.4	23.6	28.3	15.5
10 years	19.5	13.0	23.9	28.6	15.0

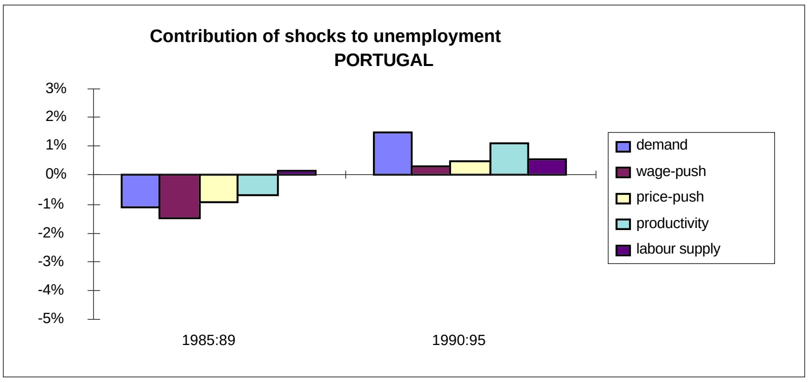
Table 4a. Forecast Error Variance Decomposition (%).
Stationary version. Portugal. Sample Period: 1984:2/95:4

Period/shock	Demand	Wage	Price	Productivity	Labour Supply
			Output		
1 year	86.7	4,3	5.9	2.2	0.8
4 years	84.1	4.0	6.2	2.9	2.7
10 years	84.2	3.9	6.2	3.0	2.8
			Employment		
1 year	61.6	6.8	28.1	3.2	0.2
4 years	65.3	6.0	24.7	3.1	0.9
10 years	65.6	5.9	24.4	3.1	1.0
			Wages		
1 year	6.9	22.5	3.4	66.8	0.3
4 years	8.4	21.5	4.5	65.0	0.6
10 years	8.4	21.5	4.5	65.0	0.6
			Prices		
1 year	25.7	53.7	10.3	8.9	1.4
4 years	26.4	52.8	10.4	8.8	1.5
10 years	26.5	52.8	10.4	8.9	1.5
			Unemployment Rate		
1 year	41.9	1.7	9.2	4.3	42.9
4 years	72.1	0.5	6.7	4.2	16.5
10 years	72.4	0.5	6.6	4.2	16.2

Table 4b. Forecast Error Variance Decomposition (%).
Stationary version. Spain. Sample period: 1971:4/94:3

Period/shock	Demand	Wage	Price	Productivity	Labour Supply
			Output		
1 year	64.1	11.2	3.5	21.1	0.0
4 years	53.3	13.7	3.1	29.8	0.1
10 years	53.2	13.7	3.2	29.7	0.3
			Employment		
1 year	38.6	12.8	45.9	1.9	0.9
4 years	40.0	13.2	35.0	10.5	1.3
10 years	39.6	13.3	33.6	10.7	2.8
			Wages		
1 year	0.8	75.9	2.9	19.1	1.3
4 years	2.9	71.2	5.7	18.2	2.0
10 years	3.6	69.9	5.9	18.2	2.4
			Prices		
1 year	0.8	13.7	3.0	82.5	0.0
4 years	2.3	13.5	4.3	79.4	0.5
10 years	3.0	13.6	4.5	77.9	1.0
			Unemployment Rate		
1 year	15.0	8.8	19.4	0.7	56.1
4 years	30.6	14.1	16.1	8.9	30.2
10 years	31.6	15.9	14.2	13.1	25.3

Figure 3.
Full hysteresis



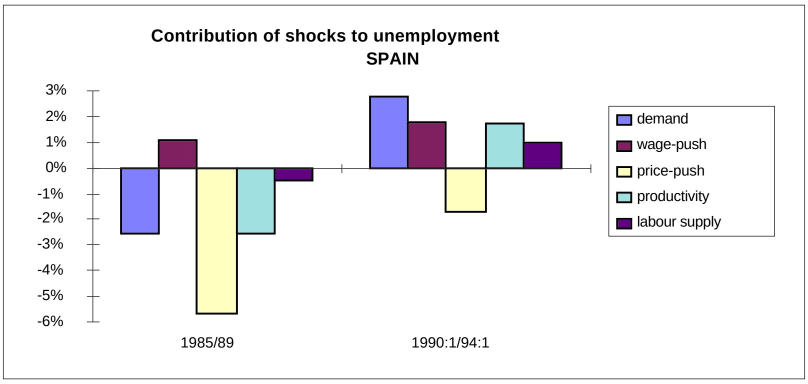
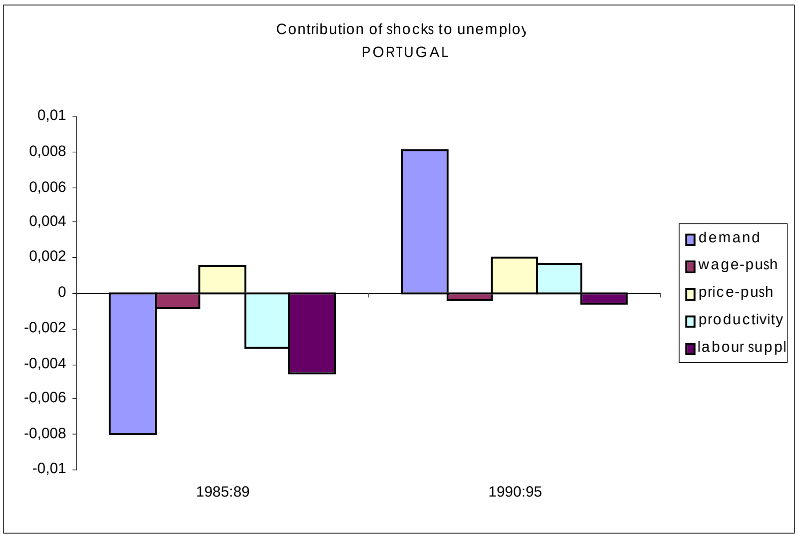
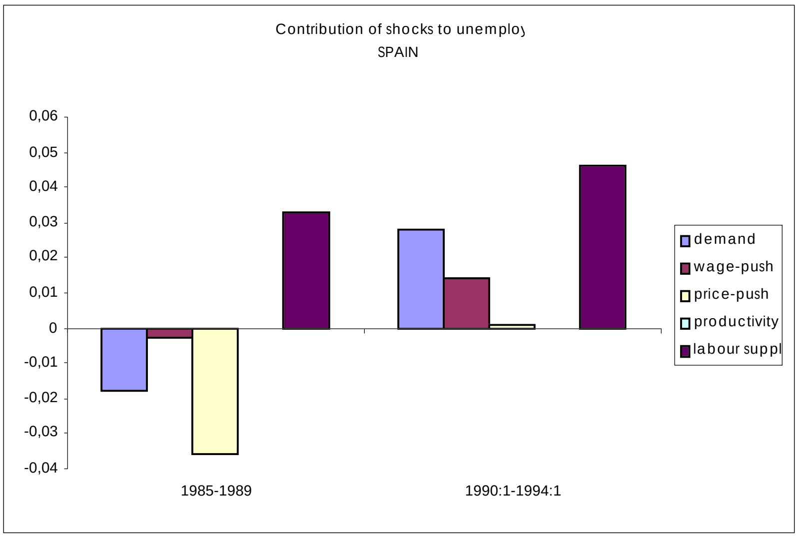


Figure 4
Stationary version





4 The consumption losses from unemployment

We have shown that the Portuguese labour market shows a low degree of real wage rigidity. The question that arises is how is real wage flexibility achieved: How is it that a labour market which is regulated in a "European style" yields a high degree of real wage flexibility? When comparing labour market institutions across EU countries, one fact stands out as a peculiarity of the Portuguese labour market: the coverage of unemployment benefits. In fact, Blanchard and Jimeno (1995) point out to this fact as the most likely explanation for the different performance of the Portuguese labour market.

The reason why unemployment benefits are thought to affect real wage rigidity are well-known: in insider-outsider models real wages are determined by the insider power in wage setting and by the competitiveness of outsiders (long-term unemployed), which is related to their skills and job search effectiveness. The lower the unemployment benefits are, the less intense job search is, and the longer unemployment duration is. As unemployment duration increases, unemployed skills depreciates and their competitiveness in the labour markets decreases. Thus, it is not surprising to see some measures of unemployment benefits entitlements (replacement rates, duration, etc.) in cross-section regressions designed to identify the sources of unemployment differentials across countries, or in the estimation of unemployment duration models with individual data.[6]

In some countries, however, unemployment benefits are not the only buffer against unemployment. For instance, in Spain, family structure has adapted to high unemployment, and, despite unemployment rates above 20% in the eighties and nineties, the proportion of families which do not receive any regular source of income is below 5% (see CEPR, 1995, annex 1). Thus, income redistribution within families is playing some role at slowing down search behaviour, at least, among second income earners (other than breadwinners).

Here, we adopt a complementary approach at establishing the effects of unemployment on search and, hence, wage determination. It has been often argued that consumption is a more accurate measure of welfare than income at a given moment in time. In fact, this is obvious from the permanent income hypothesis. Thus we propose to proxy the unemployed pressure on wage determination by the extent to which unemployment reduces consump-

[6] See, for example, Layard, Nickell and Jackman (1996), for cross-section regressions, and Bover, Arellano and Bentolila (1996), for an estimation of the effects of unemployment benefits on the unemployment hazard rate from Spanish individual data.

tion. The higher unemployment benefits and the family transfers are, the smaller are the consumption losses from unemployment are. Also, the higher the turnover rate and the higher the discount rate are, the smaller are the consumption losses from unemployment are (see Appendix 3).[7]

Our data comes from the Spanish and Portuguese Household Budget Surveys (1990-91). These surveys provide information on consumption of both durables and non-durables goods, on individual characteristics (including employment status), and household composition. With these data, we run OLS cross-section regressions of the form

$$c_i = \gamma_1 X_i + \gamma_2 \lambda_i + \epsilon_i$$

where c is (log) consumption per capita (household consumption divided by household size) of either durables or non-durables goods, X is a vector of individual characteristics, and λ is a vector of dummies for employment status (employed, unemployed with past job experience, unemployed without job experience, and out of the labour force).[8] We are interested in the difference between the value of γ_2 in Spain and Portugal. We expect to find that the consumption losses from unemployment are much larger in Portugal (where unemployment benefits are low and eligibility rules are more restrictive, family structure seems to have remained stable, despite unemployment fluctuations, and the turnover rate is low) than in Spain (where, unemployment benefits are higher, the family plays a role as buffer against unemployment, and turnover rate is very high due to a high proportion of fixed-term contracts -over 30%).

We have run regressions with two different samples (including and excluding the population out of the labour force). As regressors and besides employment status, we include age, sex, educational attainment levels a set of regional dummies, and a dummy if the household owns the house. For Spain, the data include the individual's household status (breadwinner, spouse, living with parents, and others). Thus, we also run regressions splitting the samples according to household status.[9] For Portugal, there is no informa-

[7] Gruber (1997) estimates the effects of unemployment insurance entitlement on food consumption in the US. He finds that, in the absence of unemployment insurance, the consumption of the unemployed would fall by 22%.

[8] The distinction between unemployed with and without past job experience is relevant, since in both Spain and Portugal, it is required to have had some employment spells to be entitled to receive unemployment benefits.

[9] The results from these regressions will not be reported but are available from the

tion on household status but there is information on the employment status of the household's breadwinner.

The results, which are reported in Table 5a (for Portugal) and Table 5b (for Spain), confirm that consumption under unemployment falls down by much more in Portugal than in Spain: relative to consumption under employment, in Portugal the decrease is .8 for durables and .25 for non-durables, while in Spain is a lower .5 for durables and .25 for non-durables. This fall in consumption is more pronounced in Spain when the sample is restricted to breadwinners (about .8 for durables and .15 for non-durables) and much smaller for spouses and individuals living with their parents (about .2 for durables and .15 for non-durables, in the case of spouses, and .45 and .25, respectively, in the case of individuals living with their parents).[10] In Portugal, when the employment status of the household's breadwinner is included as a regressor, the consumption losses from unemployment are .65 for durables and .20 from non-durables (being the coefficients of the employment status of the household's breadwinner 0.68 if employed, and non-significant if unemployed, for durables, and .13 if employed, and -.12 if unemployed with past job experience, for non-durables.

Thus, in sum, from the previous results it seems that the hardships of becoming unemployed in Portugal is significantly larger than in Spain and therefore more generous unemployment benefits constitutes a likely candidate to explain higher unemployment persistence in the later country.

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authors upon request.

[10] Not reported in Table 5b.

Table 5a. Portugal				
	Sample: Population (aged 16-64). N=21,807		**Sample: Labour Force (aged 16-64). N= 13,631**	
	Consumption of Durable Goods	**Consumption of Non-Durable Goods**	**Consumption of Durable Goods**	**Consumption of Non-Durable Goods**
Constant	11.69	15.31	11.94	15.47
	(0.16)	(0.04)	(0.02)	(0.05)
Owns a house	0.11	0.04	0.08	0.01
	(0.04)	(0.01)	(0.05)	(0.01)
Unemployed	-0.45	-0.06	-0.84	-0.24
(with job experience)	(0.15)	(0.03)	(0.14)	(0.03)
Unemployed	-0.39	-0.09	-0.78	-0.29
(without job experience)	(0.15)	(0.03)	(0.14)	(0.03
Employed	0.38	0.18	–	—-
	(0.05)	(0.01)		
Age	0.07	0.01	0.08	0.01
	(0.1)	(0.002)	(0.01)	(0.002)
Age-Squared (x100)	-0.09	–	-0.15	–
	(0.01)		(0.05)	
Female	-0.10	-0.05	0.85	-0.08
	(0.04)	(0.01)	(0.05)	(0.01)
Secondary Studies	0.95	0.50	0.85	0.49
	(0.05)	(0.01)	(0.06)	(0.01)
University Studies	1.48	0.83	1.48	0.84
	(0.10)	(0.02)	(0.10)	(0.02)
Regional Dummies (7)	YES	YES	YES	YES
$\bar{R}^2$	0.12	0.23	0.12	0.26

(Heteroskedasticity-robust standard errors in parenthesis)

Table 5b. Spain				
	Sample: Population (aged 16-64). N=46,343		**Sample: Labour Force (aged 16-64). N= 26,051**	
	Consumption of Durable Goods	**Consumption of Non-Durable Goods**	**Consumption of Durable Goods**	**Consumption of Non-Durable Goods**
Constant	11.56	13.31	11.66	13.40
	(0.06)	(0.02)	(0.09)	(0.03)
Owns a house	-0.06	-0.15	-0.02	-0.14
	(0.02)	(0.01)	(0.02)	(0.01)
Unemployed	-0.34	-0.14	-0.53	-0.25
(with job experience)	(0.04)	(0.02)	(0.04)	(0.02)
Unemployed	-0.17	-0.03	-0.37	-0.14
(without job experience)	(0.03)	(0.01)	(0.02)	(0.01)
Employed	0.20	0.11	–	–
	(0.02)	(0.01)		
Age				
	(non-significant)		(non-significant)	
Age-Squared (x100)				
Male	-0.14	-0.06	-0.14	-0.07
	(0.02)	(0.01)	(0.02)	(0.01)
Secondary Studies	0.64	0.26	0.37	0.26
	(0.02)	(0.01)	(0.02)	(0.01)
University Studies	0.64	0.45	0.69	0.46
	(0.02)	(0.01)	(0.03)	(0.01)
Living in Urban areas	0.21	0.15	0.18	0.13
	(0.01)	(0.01)	(0.02)	(0.01)
Regional Dummies (7)	YES	YES	YES	YES
$\bar{R}^2$	0.06	0.19	0.08	0.21

(Heteroskedasticity-robust standard errors in parenthesis)

5 Concluding remarks

In this paper we have presented further evidence on explanations of the "Portuguese-Spanish puzzle", namely, the large difference between unemployment rates in both countries. We have shown two main facts. First, we have shown that the main cause of high unemployment in Spain is a combination of demand, wage-push, price-push, productivity and labour supply shocks, that have had permanent effects on unemployment. By contrast, although the Portuguese economy has been hit by not too dissimilar shocks over the last decade, their effects have been short-lasting. Nominal price stickiness and real wage flexibility are higher in the Portuguese labour market than in the Spanish one. As a result, persistence mechanisms are very relevant to explain high Spanish unemployment, and the lack of them is relevant to explain Portuguese low unemployment.

Secondly, in order to test whether unemployment hardship could be the main factor behind the different wage adjustment, we have measured the fall in consumption due to unemployment, relative to being employed and/or inactive, in both countries. We find that this fall is largest in Portugal, a finding which is consistent with stricter unemployment insurance programs and the lesser role that the extended family plays as a "buffer" against unemployment in that country as compared to Spain.

6 Appendix 1: Recovering structural shocks

In order to identify the five shocks defined in section 3.1, we consider the following VAR model, where deterministic trends have been omitted for simplicity

$$A(L)\Delta X_t = \eta_t \qquad \text{(A.1.1)}$$

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; 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

$$\Delta X_t = D(L)\eta_t \qquad \text{(A.1.2)}$$

where $D(L) = A(L)^{-1}$, $D_o = I$. 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

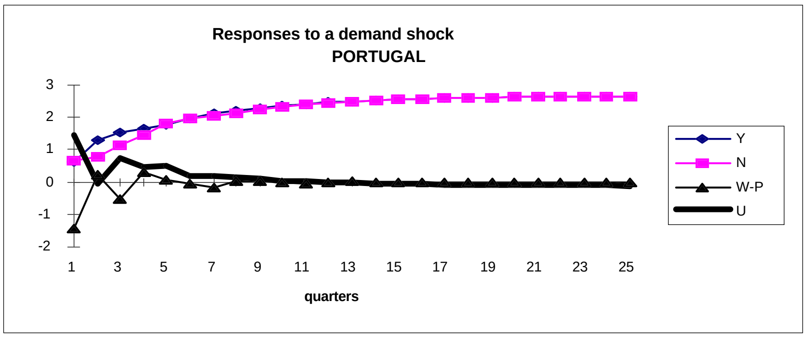
$$\Delta X_t = C(L)\varepsilon_t \tag{A.1.3}$$

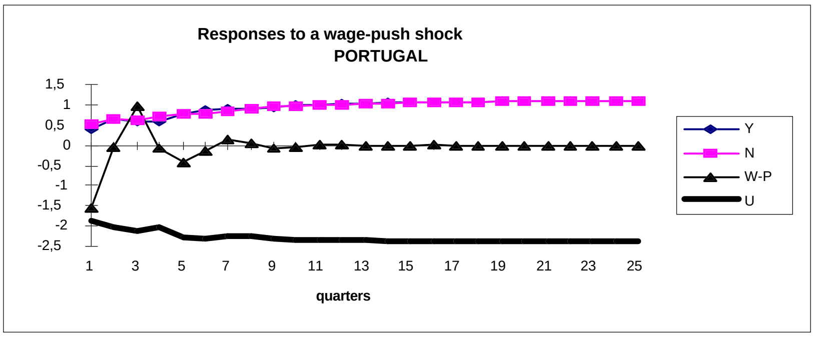
where $C(L) = D(L)S$, $C_o = S$. To identify the 25 elements in S we need 10 restrictions, given that the orthonormality of ε_t imposes 15 restrictions already. These required restrictions can be easily obtained from the structure of S in (12)-(16), by exploiting the absence of permanent effects of some shocks on some variables. In fact, the model is overidentified and there are several sets of just-identifying assumptions stemming from the underlying assumptions of the model (CRS in the production function, partial indexation of wages to shocks, etc.) To select our set of just-identifying assumptions we follow a pragmatic approach: we estimate the model under a given set of identifying assumptions and obtain the impulse-response functions; if the impulse-response functions are not reasonable or fail the overidentifying restrictions we try a different set of identifying assumptions. For the full hysteresis specification, this procedure leads us to choose a set of identifying restrictions consisting of nine long-run restrictions, all of which can be easily derived from the structure of the model in equations (12)-(16), and one contemporaneous restriction. As for the stationary version, we choose four long-run restrictions and six contemporaneous restrictions.

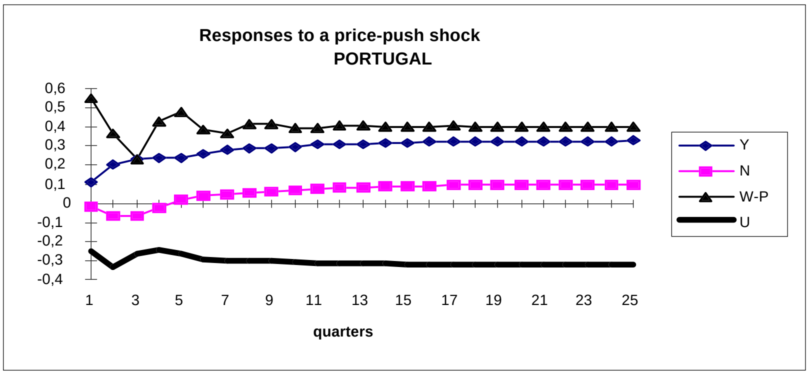
7 Appendix 2: Structural VAR Impulse-Response Functions

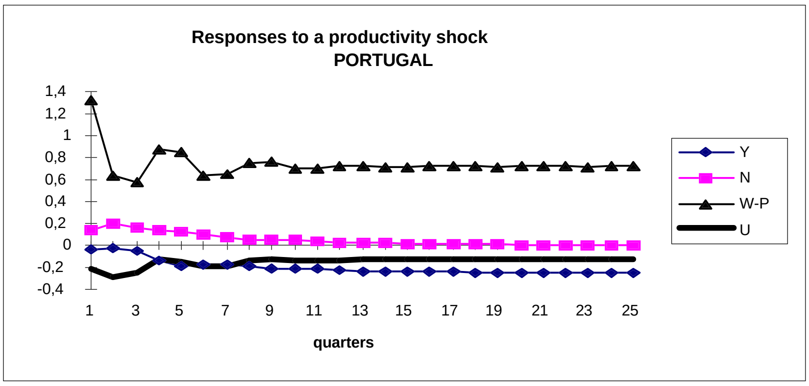
7.1 Full hysteresis

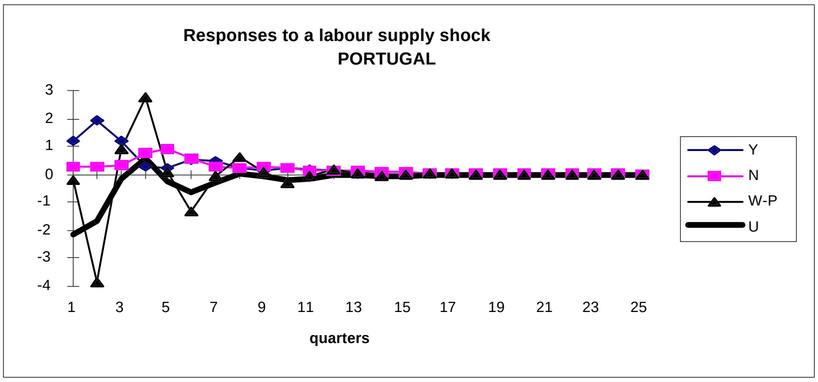
7.1.1 Portugal



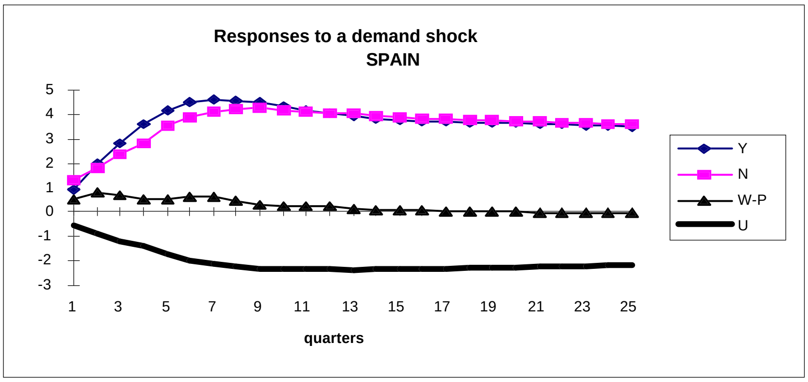


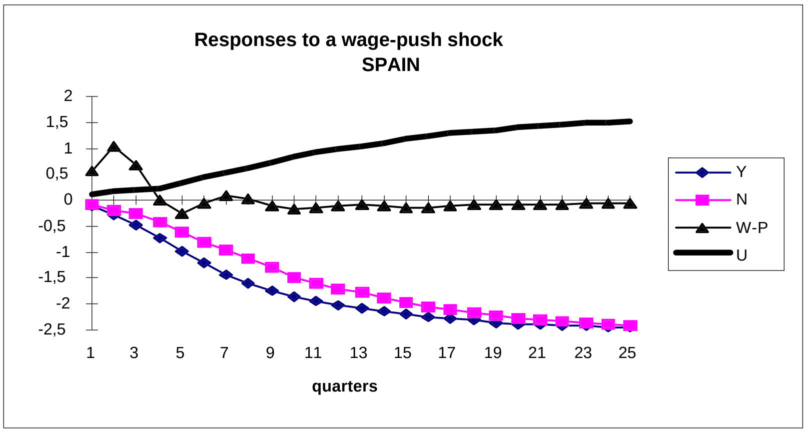

Responses to a price-push shock
PORTUGAL
0,6
0,5
0,4
0,3
0,2
0,1
0
-0,1
-0,2
-0,3
-0,4
1
3
5
7
9
11
13
15
17
19
21
23
25
quarters
Y
N
W-P
U

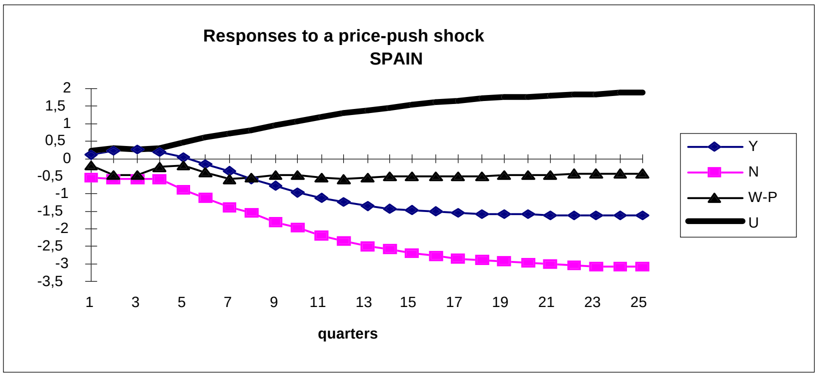

Responses to a productivity shock
PORTUGAL
1,4
1,2
1
0,8
0,6
0,4
0,2
0
-0,2
-0,4
1
3
5
7
9
11
13
15
17
19
21
23
25
quarters
Y
N
W-P
U

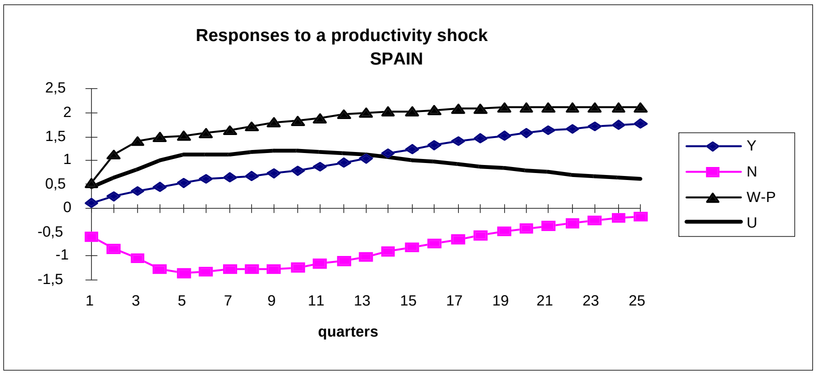

Responses to a labour supply shock
PORTUGAL
3
2
1
0
-1
-2
-3
-4
1
3
5
7
9
11
13
15
17
19
21
23
25
quarters
Y
N
W-P
U

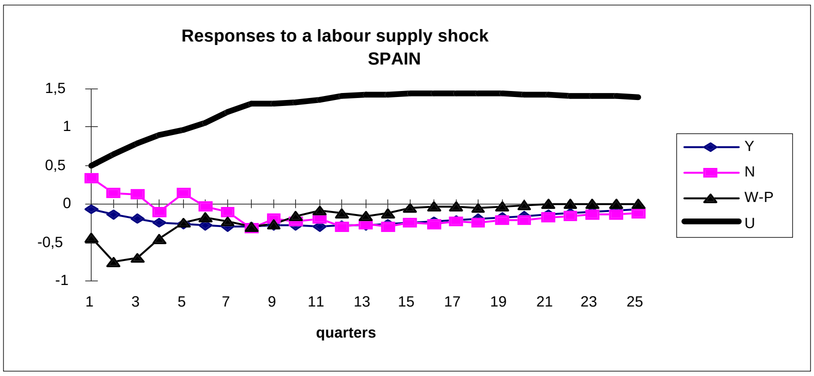
7.1.2 Spain


Responses to a demand shock
SPAIN
5
4
3
2
1
0
-1
-2
-3
1
3
5
7
9
11
13
15
17
19
21
23
25
quarters
Y
N
W-P
U


Responses to a wage-push shock
SPAIN
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
1
3
5
7
9
11
13
15
17
19
21
23
25
quarters
Y
N
W-P
U

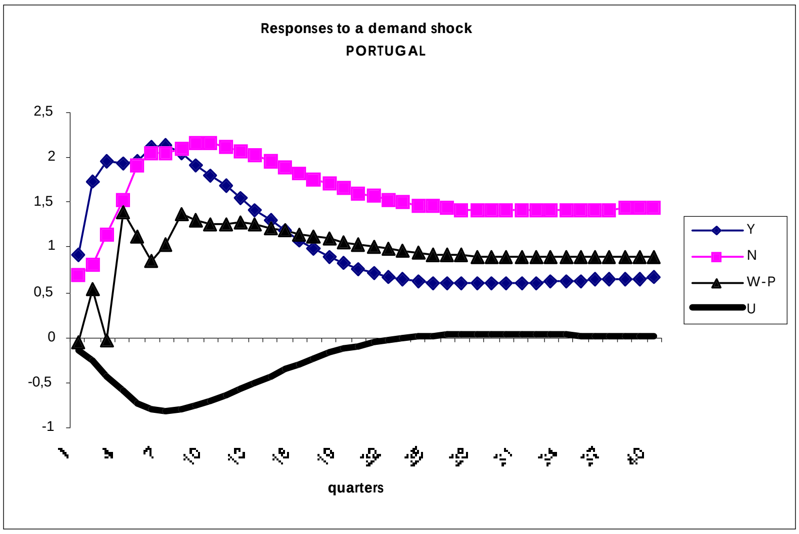

Responses to a price-push shock
SPAIN
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
-3
-3,5
1
3
5
7
9
11
13
15
17
19
21
23
25
quarters
Y
N
W-P
U

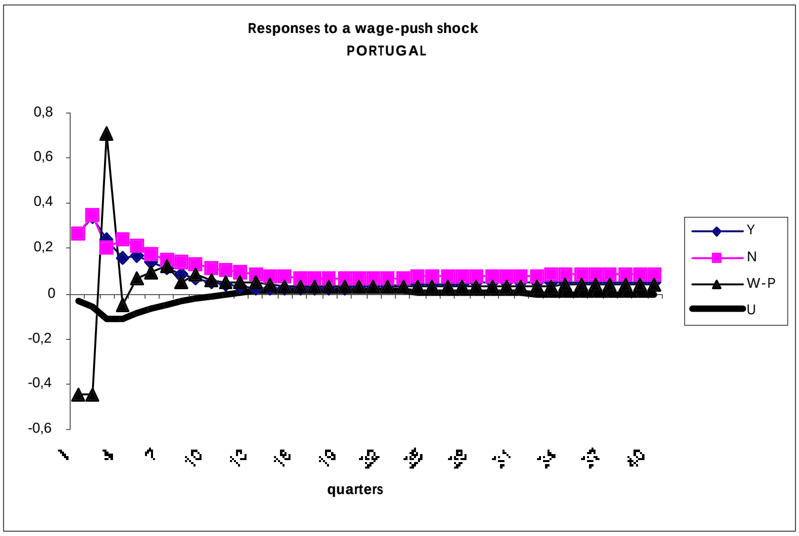

Responses to a productivity shock
SPAIN
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
1
3
5
7
9
11
13
15
17
19
21
23
25
quarters
Y
N
W-P
U

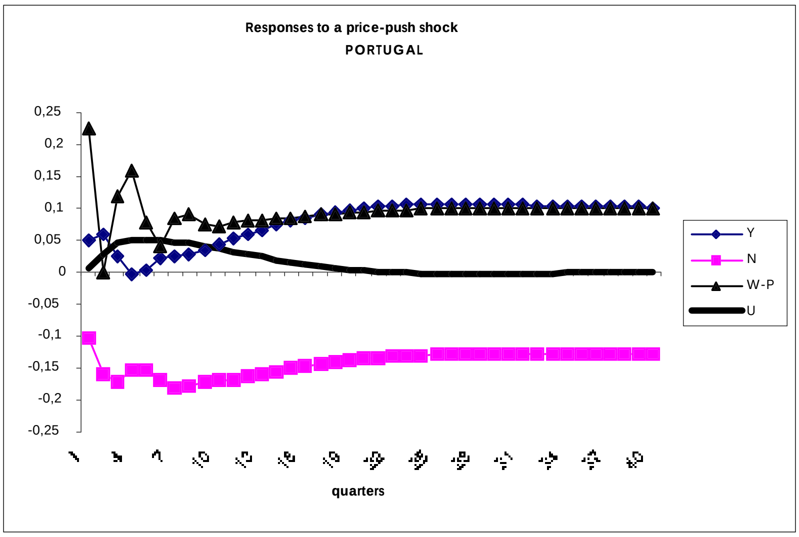

Responses to a labour supply shock
SPAIN
1,5
1
0,5
0
-0,5
-1
1
3
5
7
9
11
13
15
17
19
21
23
25
quarters
Y
N
W-P
U

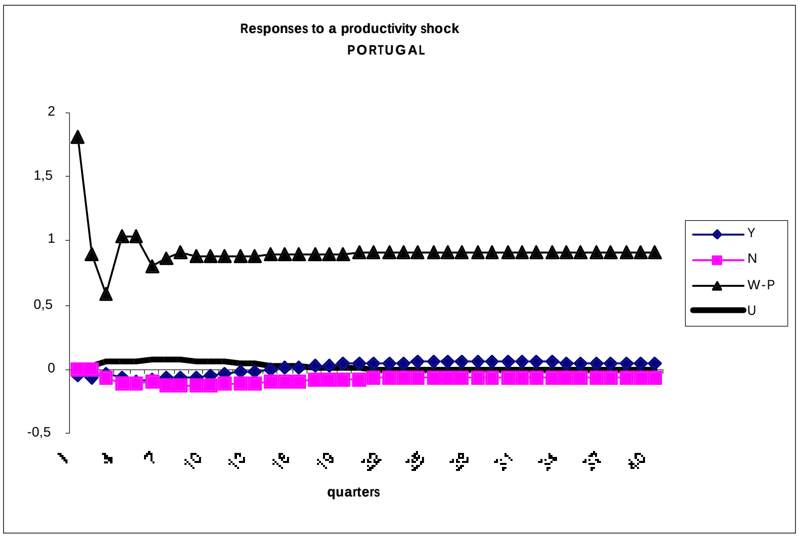
7.2 Stationary version

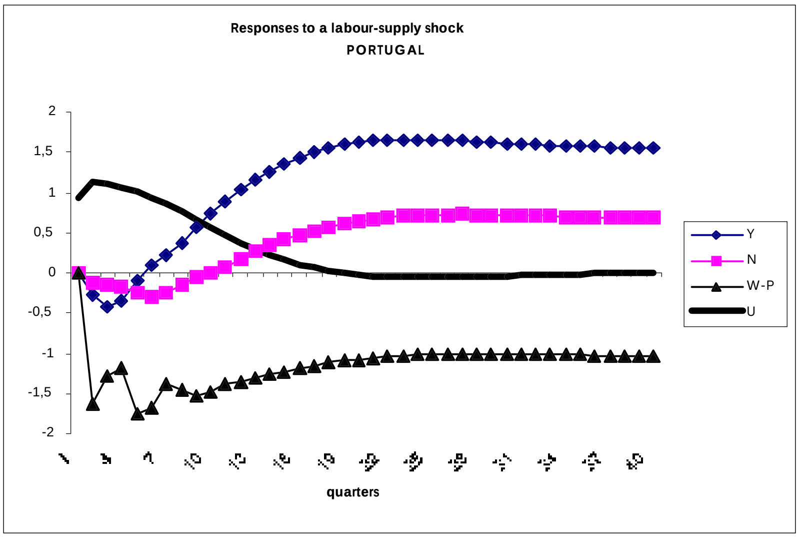
7.2.1 Portugal



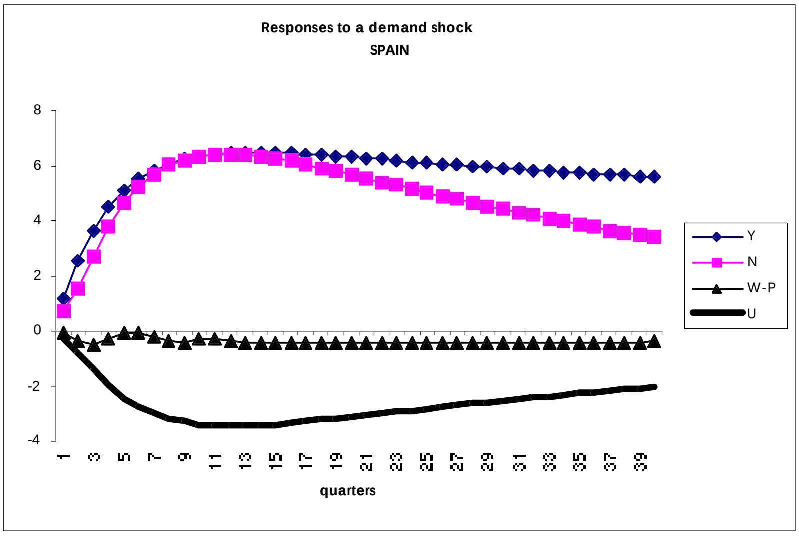


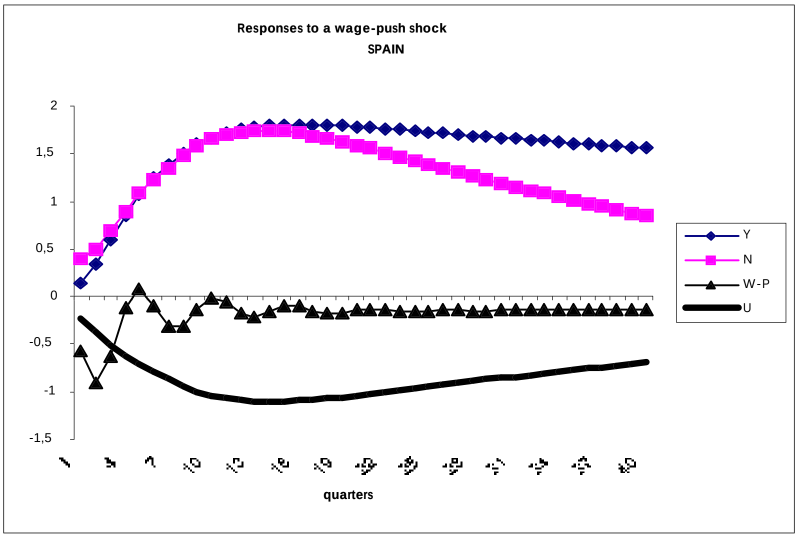

Responses to a price-push shock
PORTUGAL
0,25
0,2
0,15
0,1
0,05
0
-0,05
-0,1
-0,15
-0,2
-0,25
Y
N
W-P
U
quarters

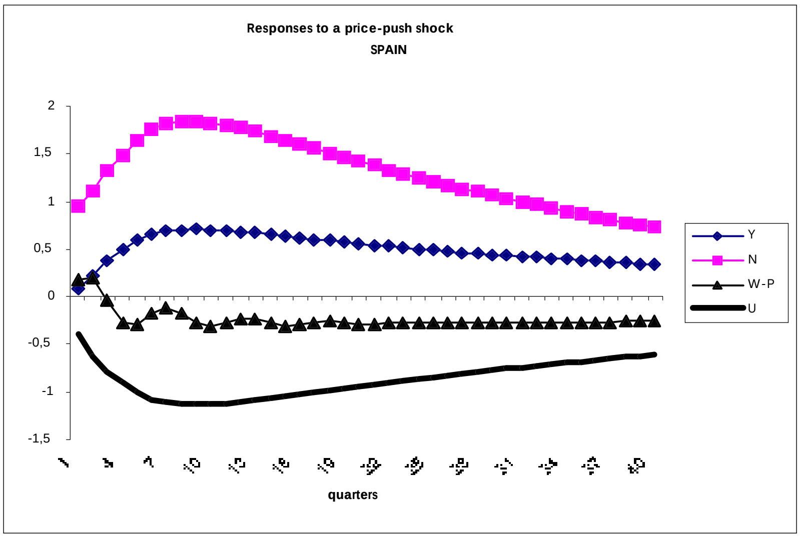

Responses to a productivity shock
PORTUGAL
2
1,5
1
0,5
0
-0,5
Y
N
W-P
U
quarters

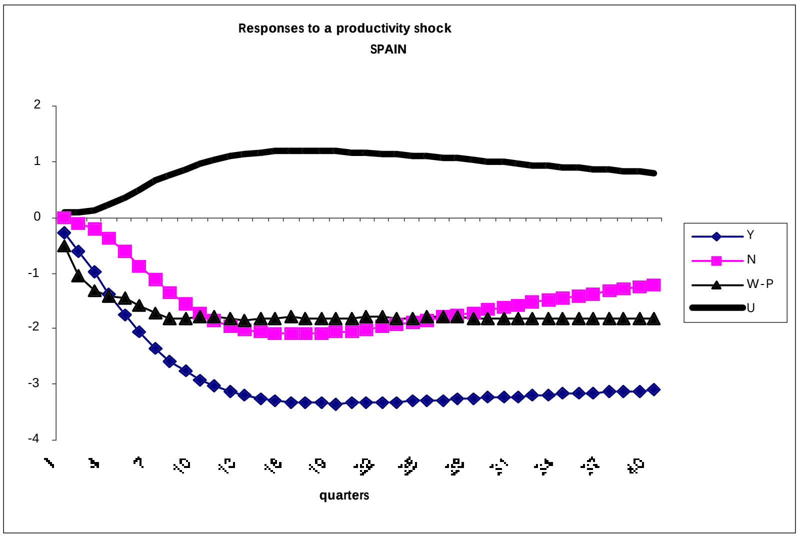

Responses to a labour-supply shock
PORTUGAL
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
Y
N
W-P
U
quarters

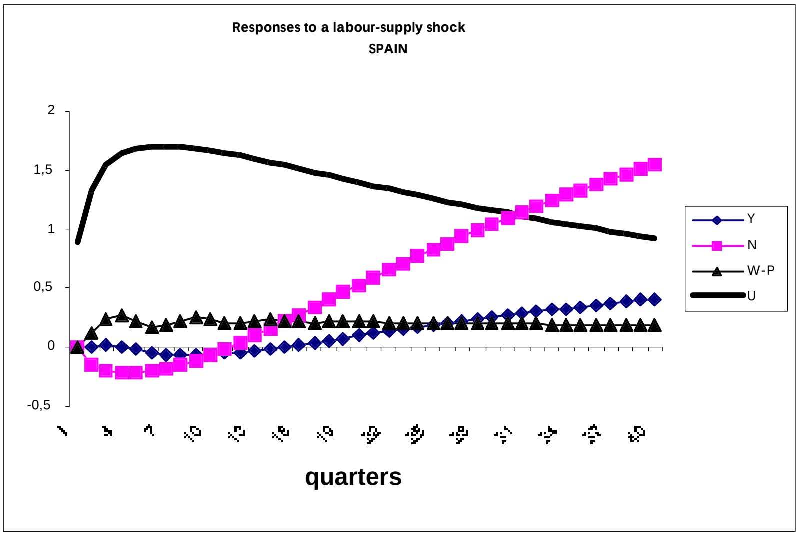
7.2.2 Spain


Responses to a demand shock
SPAIN
8
6
4
2
0
-2
-4
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
Y
N
W-P
U
quarters


Responses to a wage-push shock
SPAIN
2
1,5
1
0,5
0
-0,5
-1
-1,5
quarters
Y
N
W-P
U


Responses to a price-push shock
SPAIN
2
1,5
1
0,5
0
-0,5
-1
-1,5
quarters
Y
N
W-P
U


Responses to a productivity shock
SPAIN
quarters
Y
N
W-P
U


Responses to a labour-supply shock
SPAIN
quarters
Y
N
W-P
U

8 Appendix 3: Unemployment, permanent income and consumption

This is a simple example on the determinants of the consumption losses from unemployment. As a starting point, suppose a concave utility function and perfect capital markets, so that consumption, c, is equal to permanent income, y^p. Individuals are either employed, E, or unemployed, U. When employed, they receive wages, w, and are fired with probability f. When unemployed, they receive unemployment benefits, b, and transfers from other members of the family, τ ($b+\tau<w$), and are hired with probability h. The discount factor is β. Then, assuming an infinite horizon, permanent income when employed (the value of being employed) is given by

$$V(E) \;=\; w+\beta\left[fV(U)+(1-f)V(E)\right]=\frac{w}{1-\beta(1-f)}+\frac{\beta fV(U)}{1-\beta(1-f)} \tag{A.3.1}$$

and permanent income when unemployed (the value of being unemployed) is given by

$$V(U) \;=\; b+\tau+\beta\left[hV(E)+(1-h)V(U)\right]=\frac{b+\tau}{1-\beta(1-h)}+\frac{\beta hV(E)}{1-\beta(1-h)} \tag{A.3.2}$$

To avoid tedious algebra, suppose $h=f$ (the higher h, the higher the turnover rate). Then the difference between permanent income (and consumption) when employed and unemployed is given by

$$V(E)-V(U)=\frac{w-(b+\tau)}{1-\beta(1-2h)}$$

which is increasing in the effective replacement ratio ($w-(b+\tau)$), in the discount factor, β, and decreasing in the turnover rate, h. This is a lower bound of the difference between consumption in both states, since under imperfect capital markets and binding liquidity constraints, this difference is bound to be larger.

9 References

References

[1] Ball, L. (1995): "Disinflation and the NAIRU ", NBER, working paper 5520.

[2] Blanchard, O. and Juan F. Jimeno (1995): "Structural unemployment. Spain versus Portugal", *American Economic Review*, 85.

[3] Bover, O. and M. Arellano (1995): "Female labour force participation in the 1980s: The case of Spain", *Investigaciones Económicas*, XIX(2), 171-194.

[4] Bover, O., P. García-Perea and P. Portugal (1997): "A comparative study of the Portuguese and Spanish labour markets", mimeo.

[5] Bover, O., M. Arellano, and S. Bentolila (1996): "Unemployment duration, benefits duration, and the business cycle", Bank of Spain, mimeo.

[6] Cantó, O. (1996): "Poverty Dynamics in Spain: A study of transitions in the 1990's", London School of Economics, Distributional Analysis Discussion Paper, 15.

[7] CEPR (1995), *Spanish unemployment: Is there a solution?*, Centre for Economic Policy Research, London.

[8] Dolado, J. J. and Juan F. Jimeno (1997): "The causes of Spanish unemployment: A structural VAR approach", *European Economic Review*, 1129.

[9] Gruber J. (1997): "The consumption smoothing benefits of unemployment insurance", *American Economic Review*, 87,1.

[10] Layard, R. (1990): "Spanish unemployment: Comments" *Economic Policy*, 10.

[11] Layard, R., S. Nickell and R. Jackman (1996): "Combatting unemployment: Is flexibility enough?", Centre for Economic Performance, Discussion Paper no. 293, London.

[12] Luz, S. and M. Pinheiro (1994): "Wage rigidity and job mismatch in Europe: Some evidence", Banco de Portugal, working paper 2-94.

[13] Marimón R. and Zilibotti (1997): " 'Actual' versus 'virtual ' employment in Spain" *European Economic Review* (forthcoming).

[14] OECD (1994), *The OECD Jobs Study*, OECD: Paris.

[15] Viñals, J. and J.F. Jimeno (1996): "Monetary Union and European Unemployment", CEPR working paper 1485.