DIFFERENTIALS AND PERSISTENCE IN UNEMPLOYMENT: AN ANALYSIS OF THE SPANISH REGIONS WITH THE HIGHEST UNEMPLOYMENT RATES[a]

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Abstract: The objective of the present paper is to contribute to the study of the labor markets of two Spanish regions that have mantained over the last few decades a persistent unemployment differential with respect to the remainder of the country: Andalusia and Extremadura. To this end, a brief descriptive analysis is given of the most important variables of these regional labor makets, together with the corresponding shift-share and virtual economy analysis. To study the degree of persistence of the unemployment rate in these two regions, the behaviour of their labor markets in response to specific shocks in employment is examined by means of a VAR analysis, following the method proposed by Blanchard y Katz (1992).

JEL clasification: J0, J1.

Key words: unemployment differentials, shift-share analysis, virtual economies, VAR analysis.

1. Introduction

The search for solutions to unemployment has always attracted the interest and efforts of economists. While in itself it is not a new problem, its relevance has grown with the persistent unemployment of the last thirty years or so, especially in Europe. The analysis of the labour market has been approached from various perspectives, with different theories and explanatory factors being put forward: euro-sclerosis, hysteresis, insiders-outsiders, long-term unemployment, union power, mismatching skills, etc. [1].

The social importance of the topic more than justifies the interest in studying the labour market, and unemployment in particular. The magnitude of the problem is evident in light of the

data of the Spanish economy, and even more so if one descends to the regional level (Andalusia and Extremadura). Indeed, the motivation behind the present work is the fact that for the last three decades these two regions have borne notably higher unemployment rates than the rest of Spain. The study was undertaken from a macroeconomic perspective, with the fundamental objective of presenting a general diagnostic picture of the behaviour of the Andalusia and Extremadura labour markets. This could then serve as a basis for subsequent, more specific, studies aimed at explaining why certain Spanish regions have maintained a persistent unemployment differential relative to the rest of the country during the last few decades.

The rest of the article is arranged as follows. Section 2 presents a brief descriptive analysis of the labor markets of Andalusia and Extremadura relative to the rest of Spain [2]. The objective is to give a picture in terms of the most important variables of the similarities and differences between the behaviour of the labour markets of these two regions, and between them and the rest of Spain's regions. Section 3, following the basic lines set out in the preceding section, presents a shift-share analysis and a virtual economy analysis to aid in comparing in greater depth the Andalusia and Extremadura labour markets with the rest of Spain. In Sec. 4, the degree of persistence of unemployment in these two regions is studied, examining the behaviour of their labour markets in response to specific shocks in employment. The method used is that proposed by Blanchard & Katz (1992). Finally, Sec. 5 summarizes the principal conclusions drawn from the study.

2. Descriptive analysis of the Andalusia and Extremadura labour markets relative to the rest of Spain

In this section, we shall give a brief descriptive analysis of the principal elements of the Andalusia and Extremadura labour markets in comparison with the rest of Spain, paying particular regard to the unemployment differential of these two regions [3]. As is noted by Jimeno (1997a), there are two possible palliative mechanisms for the reduction of a region's adverse unemployment differential: on the one hand, geographical mobility of the workers towards regions with lower unemployment or higher wages, and on the other, wage moderation. If neither mechanism works adequately —as seems to be the general conclusion for the case of the Spanish economy in the last few decades [4]— the explanation of the regional unemployment differential needs to be sought in terms of three elements: the labor supply, the labor demand and the wage negotiation mechanism. This general perspective was the one taken in the present study.

The reference time period was 1980-2000, and the variables that were analyzed were: unemployment, labor force, employment, unions and collective bargaining, wages, and

unemployment benefits. Most of the data used in this section were taken from the Survey of the Active Population (Encuesta de Población Activa, EPA) published by the National Institute of Statistics (Instituto Nacional de Estadística, INE). The data predate the latest modifications made to the EPA Survey.

2.1. Unemployment

In this subsection, we shall consider the analysis of the variable *unemployment* from different points of view. It will be seen that, practically independently of the viewpoint taken, the unemployment figures of the Andalusia and Extremadura economies were always higher than of the rest of Spain, and that there were certain cyclic oscillations in the series that were common to all three economic environments.

One observes in Fig. 1 that the unemployment differential between Andalusia and the rest of Spain increased slightly in the first years of the reference period, to stabilize at around 12 percentage points [5]. The behaviour in the case of Extremadura was even more negative. This region's unemployment differential with respect to the rest of Spain rose throughout the period, reaching levels similar to those of Andalusia despite starting from a relatively more favourable position.

[Figure 1. Evolution of unemployment.]

A statistical question of especial importance in this terrain is the weight of the "black economy" in each of the three economic environments. This could alter the unemployment figures that are given in this section (and hence the deductions that will be made) [6]. It must also be borne in mind that, as was noted above, the present analysis uses the unemployment data given in the EPA. Although for the rest of Spain the EPA unemployment rates differ hardly at all from the rates of the registered unemployed published by the National Institute of Employment (Instituto Nacional de Empleo, INEM), this is not the case for Andalusia and Extremadura. In these two regions, the EPA unemployment rates are considerably higher than the INEM figures of registered unemployment. This is especially noticeable from the 1990s onwards because of the high number of workers receiving agrarian subsidies who are excluded from the INEM's unemployment figures [7].

In a more detailed analysis of the unemployment rates of Andalusia and Extremadura relative to the rest of Spain, it is of especial interest to study the differences between the unemployment rates by gender, age, and educational attainment. The following comments are apposite in this regard. Firstly, with respect to the unemployment rates by gender, one observes in Fig. 2 that the unemployment of women was greater than that of men in all three economic

environments, especially after the mid-1980s. Of the three environments, Extremadura presented the greatest differential, which approached 20 percentage points in some years.

Secondly, with respect to the unemployment rates by age group (Table 1), unemployment in all three economies declined with increasing age. Especially notable were the high figures corresponding to the 16-19 and 20-24 year age groups in Andalusia and Extremadura. In view of these results, it is not surprising the stress that is laid, from different standpoints, on the problem of youth unemployment and its determining factors [8].

Thirdly and lastly, the relationship between unemployment and educational attainment (Table 2) is theoretically more complex than the previous two relationships, and it is difficult to draw immediate conclusions in this regard. Nevertheless, one of the aspects that most clearly stands out in the table is that a university degree constitutes —at least apparently— insurance against unemployment, especially in the cases of Andalusia and Extremadura. In general, controlling for age groups (Table 3), one observes that unemployment diminished notably with increasing educational attainment. Also, again with especial emphasis in the case of these two regions, one observes a relative worsening of the unemployment rates of individuals with no completed formal education over the course of the reference period.

[Figure 2. Evolution of unemployment by gender.]

[Table 1. Evolution of unemployment by age (%).]

[Table 2. Evolution of unemployment by educational attainment (%).]

[Table 3. Unemployment by educational attainment and age group (%).]

With respect to unemployment by sector (Table 4), Andalusia and Extremadura presented a behaviour that was clearly differentiated from the rest of the country. While there was a relative homogeneity in unemployment by sector in the rest of Spain, in these two regions there were some particularly noteworthy differences: the high unemployment in agriculture [9] (especially in Andalusia) and construction (especially in Extremadura [10]).

[Table 4. Evolution of unemployment by sector (%).]

One factor which has often been referred to in attempting to explain the behaviour of the European and Spanish unemployment rates of the last few decades is long-term unemployment [11]. In this sense, it is perhaps surprising that Andalusia and Extremadura's long-term unemployment figures were lower than the rest of Spain (Table 5). A possible explanation is the greater weight of recurrent unemployment in these regions [12], as is shown by their higher percentages of unemployed with less than 6 months seeking work. This is doubtless a consequence

of the higher proportion of seasonal employment (greater relative weight of agriculture, and of the tourist sector in the case of Andalusia), and of the differential characteristics of the system of unemployment protection in these regions (agrarian subsidy [13]).

[Table 5. Percentages of unemployed by time seeking employment.]

2.2. Labor force

To illustrate the analysis of the evolution of the labor force in Andalusia and Extremadura relative to the rest of Spain, Table 6 gives (by five-year periods) the mean annual growth of the working-age population, of the labor force and of employment. One observes that there were considerable fluctuations in all three variables, especially in employment [14]. Employment, for instance, grew in all three economic environments in 1985-1990 and 1995-2000, but declined in 1990-1995 and 1980-1985. With respect to the entire reference period (bottom rows of the table), the labor force of Andalusia grew more than did that of Extremadura or of the rest of Spain [15], and employment in Extremadura had a markedly weaker growth than in the rest of Spain or, even more so, than in Andalusia [16].

In sum, both in Andalusia and in Extremadura there has been a major gap between the mean annual growth of the labor force and that of employment. The result has been the growing problem of unemployment. In the case of the Andalusia economy, this point has been the reason why many studies on the region's unemployment have focused on the supply side of the job market [17].

[Table 6. Mean annual growth rates (%) of: the working age population, the labour force, and employment.]

Comparison of the activity rates (i.e., the labor force-total population ratio) of Andalusia and Extremadura with respect to the rest of Spain (Fig. 3) shows that there had been convergence in this aspect, with these two regions having started behind the rest of the country. This convergence was above all due to the greater increase in the activity rates of women in Andalusia and Extremadura during the reference period. Nonetheless, there was still a differential of greater than 20 percentage points in activity rates between men and women in all three economic environments. There was also convergence in the active population percentages by gender between Andalusia, Extremadura, and Spain.

[Figure 3. Evolution of the activity rates.]

Lastly, the analysis of the labor force percentages by educational attainment (Table 7) showed that, despite the considerable educational effort made by Andalusia and Extremadura in the last few decades, these two regions have remained somewhat behind the rest of Spain in this aspect.

In particular, the active population of Andalusia and Extremadura was still more concentrated in the lower educational attainment groups than the rest of the country [18], and these are the groups that in general presented higher unemployment rates. This may be an especially serious issue in a context of bias towards formal qualifications [19] in which there are not many very hopeful alternatives offered workers with few qualifications [20]. Also, the economic growth literature points to several tendencies that underline the importance of the availability of a workforce with a good level of skills in any regional development strategy [21].

[Table 7. Active population percentages by educational attainment.]

2.3. Employment

With respect to the analysis of the variable *employment*, the most important aspects concern its sectoral composition and the characteristics of salaried employment. One first has to note that not only were the occupation rates -calculated relative to the working age population- of the Andalusia and Extremadura economies markedly below those of the rest of Spain (by approximately 8 percentage points), but that also they showed hardly any convergence in the reference period.

[Figure 4. Evolution of the occupation rates.]

Comparing the sectoral composition of employment of Andalusia and Extremadura with that of the rest of Spain (Table 8), one observes that the most noteworthy aspects are, on the one hand, the greater weight of agriculture and, on the other, the lower weight of industry in these two regions. As was noted above, the agricultural sector presented high unemployment rates in these regions. The greater concentration of workers in the agrarian sector is therefore a cause for concern from the perspective of unemployment. Agrarian subsidies have frequently been blamed —at least in part— for this situation [22]. One would also have to bear in mind, however, that the low level of educational and professional training of the workers in this sector has aggravated the situation, by weakening their possibilities of finding alternative jobs [23].

[Table 8. Employment percentages by sector.]

Table 9 presents a summary of the principal characteristics of salaried employment. Firstly, one observes that the percentage of temporary contracts in Andalusia and Extremadura was higher than in the rest of Spain. This could be due —at least in part— to the major weight of seasonal activities (agriculture and tourism) in these regions. The importance of this aspect can not be overstated since much emphasis has been given to the influence of high rates of temporary employment in the analysis of unemployment in Spain [24] (in the framework of the problem of

insiders-outsiders, for instance) [25]. In this regard, it could be interesting to take into account the possible effects on temporary job contracts of the latest labour reforms in Spain [26]. Secondly, there were hardly any differences between the three economic environments with respect to part-time *vs* full-time jobs, with a clear prevalence of the latter. And thirdly, there was another element differentiating the Andalusia and Extremadura labour markets from the rest of Spain in their greater weight of public sector employment relative to the total of salaried workers. This difference was especially notable in Extremadura.

[Table 9. Characteristics of salaried employment (%).]

2.4. Unions, collective bargaining, and wages

The type of collective bargaining (centralized, decentralized, etc.) is a very important factor in studying the operation of a labour market [27]. For the case of the Spanish economy, the predominant model is of sectoral collective agreements with province-wide coverage. This therefore corresponds to an intermediate degree of centralization. Single company agreements are uncommon. It is also noteworthy that, although union membership is very low (around 10-15% of the labor force), the coverage of collective bargaining is high because of the general automatic effectiveness of these agreements.

One observes in Fig. 5 that, considering the total of labour agreements, the collective bargaining coverage —calculated from the EPA data— was lower in Andalusia and Extremadura than in the rest of Spain. Also, the coverage of single company agreements, already very low for the rest of the country, was even lower in Andalusia and especially in Extremadura. In sum, workers in Andalusia and Extremadura are covered less by collective bargaining than those of the rest of Spain. This factor could be interpreted as an indicator of a lower level of union power. Figure 6 shows, however, that this lower coverage of collective bargaining in Andalusia and Extremadura has not been translated into a moderation of the wage pacts relative to the rest of Spain, either for the total of agreements or for the single company agreements. This result is consistent with the findings of Jimeno (1992) who concludes that in the Spanish economy there is a very narrow dispersion in negotiated wage rises whether considered by sector or by province.

[Figure 5. Evolution of the coverage of collective bargaining.]

[Figure 6. Evolution of negotiated wage rises in collective bargaining.]

It is interesting to complement the foregoing information with the mean earnings per worker per month data (Fig. 7). One observes that, in relative terms, there was a very slight moderation in wages in Andalusia with respect to the rest of Spain (the figure always being close to 90%). In the

case of Extremadura, however, there was a greater tendency to wage moderation: in approximately one decade, Extremadura passed from figures close to 90% of the rest of Spain to around 80%. There was therefore a major difference in the behaviour of the two regions in this factor. From a comparison of Figs. 6 and 7, one also deduces that the main causes of this wage moderation were the workers or wage agreements that remained outside the coverage of collective bargaining.

[Figure 7. Evolution of the mean earnings per worker per month.]

Lastly, an important aspect related to wage flexibility is the dispersion of the distribution of wages. We approach this from the standpoint of wage differences by educational attainment. A straightforward way of estimating wage rate dispersion by educational attainment is to calculate the ratio between the mean earnings of workers with higher or lower educational levels. This was the procedure used to calculate the data presented in Fig. 8. One observes that individuals with tertiary education had higher earnings than the average, while the contrary was the case for individuals with primary or no completed formal education. This result is consistent with the theory of human capital that increases in workers' educational attainment lead to greater productivity and hence higher wages[28]. Lastly, it is also worth noting that wage dispersion in Andalusia was very similar to that of the rest of Spain, while that of Extremadura was somewhat greater.

[Figure 8. Wage dispersion by educational attainment.]

2.5. Family insurance, agrarian subsidy, and unemployment benefits

The various forms of unemployment benefits represent of course an important complement to the income of unemployed workers. We shall next consider the relevance of these payments —in particular, of agrarian subsidies— as an explanatory factor in the unemployment differential of Andalusia and Extremadura.

The agrarian labour markets of Andalusia and Extremadura present some extremely complex characteristics (labor supply, labor demand, institutional and social factors, etc. [29]) that, in the opinion of many authors, call for a series of specific political measures. In this sense, an institutional factor that is different from the rest of the Spanish regions is the subsidy to temporary farm workers, supplemented by the Rural Employment Plan (Plan de Empleo Rural, PER), later known as the Agreement for Agrarian Employment and Social Protection (Acuerdo para el Empleo y la Protección Social Agraria, AEPSA).

One observes in Fig. 9 that the number of persons receiving agrarian subsidies in Andalusia, while fluctuating, never fell below that of the year in which the system was instituted (some 150 000). The proportion of women steadily increased, to more than half in the 1990s. In

Extremadura, the number of agrarian subsidies followed a slightly declining trajectory from some 40 000 in the first years of the system. The proportion of women beneficiaries also rose, but without becoming the majority.

[Figure 9. Evolution of the number of agrarian subsidies.]

Independently of the polemical nature of the entire topic of agrarian subsidies, one observes in Fig. 10 an example of the important role they play in Andalusia and Extremadura. Excluding these subsidies from the total of compensatory payments for unemployment, the coverage represented by such payments (as percentages of the EPA unemployment figures) was clearly below that of the rest of Spain. Including them, however, exactly the opposite was the case, especially in the 1980s. I.e., when agrarian subsidies are included, Andalusia and Extremadura had a greater percentage of their unemployed receiving compensatory benefits. According to some authors, this factor might reduce the willingness for geographical mobility of unemployed workers in Andalusia [30] and Extremadura [31], although it should be borne in mind that the actual amount of income represented by these agrarian subsidies is very small.

[Figure 10. Evolution of the coverage represented by compensatory unemployment payments.]

To finish this section, it should be noted that several studies have shown that in Spain the weight of the black economy in employment (informal jobs) is not very large [32]. Furthermore, Spain's system of unemployment benefits is no more generous than that of other countries of its economic zone [33]. In this sense, "family insurance" has usually been pointed to as the key element in explaining the social sustainability of the high and persistent unemployment in the Spanish economy [34]. This topic, which lies outside the scope of the present analysis, has been only very sparsely documented for the case of Andalusia and Extremadura, although some authors hold that it may have more relevance in these two regions than in the rest of the country.

3. Shift-share and virtual economy analyses

To conclude the descriptive study of the Andalusia and Extremadura labour markets relative to the rest of Spain, we shall use two analytical techniques which, while straightforward, can be particularly illustrative: shift-share analysis and virtual economy analysis. These are basically descriptive methods, allied to "growth accounting". They will allow us to look in more depth at some of the factors mentioned in Sec. 2 as possible explanatory factors of the differential of Andalusia and Extremadura unemployment with respect to the rest of Spain.

3.1. Shift-share analysis

Shift-share analysis provides a decomposition of the changes that a variable undergoes. A necessary condition is therefore that the said variable can be subdivided into groups and expressed as a weighted mean of its values in those groups. Under these circumstances, the change in the variable between two situations may be explained in terms of either a variation in the weights of the different constituting groups or a modification of its values. Hence, one can distinguish two components responsible for the change: the structural component which is associated with variations in the weights, and the internal component which is associated with modifications of the values.

In the present work, this technique is used to analyze separately the unemployment differential with the rest of Spain of Andalusia on the one hand, and of Extremadura on the other [35]. To this end, the unemployment of each economic environment is expressed as a weighted mean of the unemployment rates of the different groups making up the labor force, classified by age, gender, and educational attainment. The method allows one to determine the contributions of each group of the labor force to the said differential, in both its structural and its internal components. The structural component explains the part of the unemployment differential that is due to the differences of weights of the labor force within each group between the two economic environments being analyzed (Andalusia and the rest of Spain, or Extremadura and the rest of Spain). The internal component explains the part of the differential that is due to the differences of the values of the unemployment within each group.

Tables 10 and 11 list, respectively, the decomposition of the Andalusia and Extremadura unemployment differential relative to Spain for 1990 and 2000. One observes in the two tables the clear predominance of the internal over the structural component. This means that these unemployment differentials are not due to any unfavourable weights of the groups in the labor force in Andalusia and Extremadura, but, in general, to the greater unemployment rates of the groups in these regions than in the rest of Spain. For example, in both tables (Andalusia and Extremadura) there stands out the major contribution of the internal component of men and women with a primary education to the unemployment differential (i.e., the high rates of unemployment of these groups in Andalusia and Extremadura explain a good part of the nemployment differentials being studied).

[Table 10. Shift-share analysis: decomposition of the unemployment differential in Andalusia with respect to the rest of Spain (%).]

[Table 11. Shift-share analysis: decomposition of the unemployment differential in Extremadura with respect to the rest of Spain (%).]

3.2. Virtual economies

A method of analysis related to shift-share is that of virtual economies. In essence, the idea is to combine elements taken from different economies. Labour markets constitute one of the fields where this method can be most illustrative. A representative study for the case of Spain is that of Marimón & Zilibotti (1996) [36]. In this section, we shall reconstruct the Andalusia and Extremadura unemployment rates by combining certain elements of these regional economies with other elements taken from the Spanish economy (virtual unemployment rates of Andalusia and Extremadura, respectively). In particular, we shall focus on the following aspects: the sectoral structure of employment, growth of the labor force, and employment growth.

As was indicated in Sec. 2.3, the sectoral structure of employment in Andalusia and Extremadura is fundamentally characterized by presenting high percentages of the working population in sectors that are subject to high unemployment,i.e. agriculture and construction (see Table 8). In the first virtual economy, one poses the question: "What would the evolution of the Andalusia and Extremadura unemployment rates be if the real unemployment rates of the sectors of these regional economies were combined with the employment structure of the rest of Spain?" One observes in Fig. 11, as was to be expected, that the virtual unemployment rates are notably less than the real rates, especially in Extremadura.

[Figure 11. Virtual economies (with the sectoral employment structure of the rest of Spain).]

Comparing in Table 6 the figures corresponding to the growth of the working age population, of the labor force and of employment in Andalusia, Extremadura and the rest of Spain, one observes that the active population grew more strongly in Andalusia than in the other two economic environments. In the second virtual economy, therefore, the question posed is: "What would happen if, *ceteris paribus* [37],the labor force of Andalusia and Extremadura grew at the rates shown by the labor force of the rest of Spain?" One observes in Fig. 12 that while this change would leave the Extremadura unemployment practically unaffected, it would notably reduce the Andalusia unemployment, putting it at a level similar to that of the Spanish economy. This analysis shows therefore that, as was suggested by the analysis of Sec. 2, the Andalusia unemployment differential has an important demographic or labor supply component.

[Figure 12. Virtual economies (with the active population growth of the rest of Spain).]

One also observes in Table 6 that while employment grew more strongly in Andalusia than in the rest of Spain, the opposite was the case for Extremadura. With the third virtual economy we therefore ask: "What would happen if, *ceteris paribus* [38], employment in these two regions grew at the rates shown by the rest of the country?" As was to be expected, one clearly sees in Fig. 13

that this change affects the Andalusia unemployment negatively, and the Extremadura unemployment very positively.

[Figure 13. Virtual economies (with the employment growth of the rest of Spain).]

In sum, the results of these virtual economies emphasize the following: firstly, the problem in the Andalusia and Extremadura economies of the relative concentration of jobs in sectors with high unemployment, and, secondly, the differences in the behaviour of the labor and of employment between Andalusia and Extremadura on the one hand, and between these regions and the rest of Spain on the other.

4. Persistence of unemployment at a regional level: the cases of Andalusia and Extremadura

After the above descriptive analysis of the labour markets of Andalusia and Extremadura relative to the rest of Spain, in this section we shall consider the persistence of unemployment in these two regions, using the methodological framework proposed by Blanchard & Katz (1992).

Given the major rises in unemployment of some states of the US with respect to the national average throughout the 1980s and into the 1990s, Blanchard & Katz (1992) studied the response of the local labor markets in these states to an adverse shock in employment. They introduced a model of regional labor markets that allows one to interpret the conjoint evolution of relative prices, wages, employment, and unemployment in the different states [39]. Their model assumes that each state produces various goods according to a production function with constant returns to scale, and that in the long term there is perfect mobility of workers and companies, so that, although there are differences in the rate of growth of employment, this mobility leads to a stable structure of unemployment and wage differentials between the states. On this basis, they interpret the adjustment of local labor markets to specific demand shocks. Such perturbations will first affect wages and relative unemployment, and then, through them, the mobility of workers and companies, so that finally the wage and unemployment differentials will return to their initial values while employment will have been affected permanently.

Following the publication of this seminal work of Blanchard & Katz (1992), there have been several studies of the persistence of unemployment at a regional level [40]. For the case of Spain, particularly worthy of note are the works of Jimeno & Bentolila (1998) and Mauro & Spilimbergo (1998). These authors examine the degree of persistence of unemployment in an average Spanish region and compare the results with those corresponding to regional labour markets in Europe and the United States. They conclude that the main differences between the local labor markets of these three economic environments lie in the long term effects of a demand shock. In particular, the

geographical mobility of workers in Europe and, above all, in the United States is much greater than in Spain. Unlike the cases of Europe and the United States, therefore, neither the participation rate nor unemployment manage to bounce back in the long term to the values prior to the shock.

We shall here also take this line in analyzing the response of the Andalusia and Extremadura labor markets to specific demand shocks in these regions. To this end, we estimated a vector autoregressive (VAR) model using data for the period 1964-2001 relative to the over-16 population, the labor force and employment. The source of these data was the Valencia Institute of Economic Research (Instituto Valenciano de Investigaciones Económicas, IVIE). They are disaggregated by educational attainment [41], so that one has relatively long homogeneous series for each variable to use in the analysis. In particular, there are 185 observations (37 temporal observations for each of five educational levels) for each variable.

4.1. Persistence of regional unemployment in Andalusia and Extremadura

As was noted above, Andalusia and Extremadura have for 30 years been at the head of Spanish regions with the highest unemployment. Figure 14 gives a first approximation to the persistence of unemployment at a regional level in Spain, showing the unemployment rates of Spain's regions for 1977 and 2001. One deduces from the figure that the unemployment rates of the different Spanish regions at the beginning and the end of the period analyzed were positively correlated [42]. In this sense, one can state that there was a certain persistence in the ranking of the regions by unemployment. Indeed, the regions with the highest rates of unemployment at the beginning of the period —Andalusia and Extremadura— were also those with the highest rates at the end of the period.

[Figure 14. Regional unemployment in Spain.]

To analyze the degree of persistence of unemployment in these two regions more formally, we shall next describe the application of the method of Blanchard & Katz (1992). We estimate a VAR model for each region that will allow us to examine how their labor markets react to a variation in the rate of employment growth. The variables used in the analysis are employment growth ("e"), the unemployment ("d"), and the labour force participation rate ("p"). The equation that is estimated is (Jimeno & Bentolila, 1998):

$$X_t = \alpha + \beta(L)X_{t-1} + \varepsilon_t \qquad (1)$$

where $X_t = (e, d, p)$, L is the lag operator, and ε_t is the error term.

The variables of Eq. (1) are expressed in logarithms and defined in terms relative to their national values [43] so that they reflect the behaviour at a regional level that is not due to changes in

the national values. The error term represents transitory variations in employment which, following Blanchard & Katz (1992), are interpreted as specific demand shocks which allow one to identify the dynamic response of employment, unemployment, and the participation rate to variations in labor demand at a local level [44]. This behaviour will be analyzed on the basis of the impulse-response functions calculated by the generalized impulse method (Pesaran & Shin, 1998) [45].

Figure 15 shows the impulse-response functions of the analyzed variables for one standard deviation in employment growth. The variables are expressed on a scale of 0 to 1, with the horizontal axis being the number of years considered. The standard errors associated with each variable are included in the plots, so that one can examine the degree of significance of the trajectories over time.

Interpreting the results for a decrease in the rate of employment growth at a regional level, one observes that the short-term response is a rise in unemployment and a fall in the participation rate in both regions. Particularly notable is the magnitude of the variation in the Extremadura participation rate. Indeed, in general the unemployment and participation rates of Extremadura show a greater initial impact to a demand shock than those of Andalusia.

In the case of the variable unemployment, the initial increase is progressively absorbed in the long term, although without disappearing completely, especially in the Extremadura case. This result is consistent with the unfavourable structure of employment in Extremadura (concentrated in sectors with the greatest unemployment) that was shown by the virtual economy analysis. It has to be noted that the behaviour of this variable is only significant during the first two years following the demand shock.

There is also recuperation in the long term from the drop in the participation rate, again, as was the case with the variable unemployment, without a complete recovery. The behaviour of this variable is significant during the first 10 years after the demand shock for the case of Extremadura, and during the first 3 years for the case of Andalusia.

The behaviour shown by the participation rate of Andalusia is especially interesting. Although the drop that this variable undergoes in the short term is not as great as in the case of Extremadura, there is hardly any long term recovery. One can thus state that a variation in the rate of growth of employment in Andalusia has a permanent effect of considerable magnitude on the participation rate. This result is consistent with the findings of Pérez *et al*. (2003) that the disincentive effect is stronger in Andalusia than in Spain [46]. It is also coherent with the results of the virtual economy analysis which showed that there was a major demographic component in the high unemployment of Andalusia (see Fig. 12).

[Figure 15. Response to one standard deviation in employment growth.]

In sum, one can affirm that a variation in the rate of employment growth in these regions has permanent effects on unemployment (especially in the case of Extremadura) and on the participation rate (especially in the case of Andalusia). One hence deduces that worker mobility in these two regions plays a very limited role as a mechanism of adjustment to the demand shock that was analyzed above. These results are in agreement with those of Jimeno & Bentolila (1998) and Mauro & Spilimbergo (1998), who find that the labor markets of Spain's regions present a lower degree of adjustment to a demand shock than local labor markets in other economic environments (Europe and the United States). The result is that Spain's regional unemployment and participation rates have an important degree of persistence.

5. Conclusions

The aim of the present work has been to contribute to the study of the labor markets of Andalusia and Extremadura, regions that have shown a persistent unemployment differential with respect to the rest of Spain over the last few decades. A number of factors were found that may in part explain that differential. To evaluate what actually is the explanatory capacity of each of these factors would require more specific analyses in accord with the theories and methods appropriate to each case.

One of the most important results of the descriptive analysis that was carried out was that, although Andalusia and Extremadura's labour markets shared many characteristics —indeed most of those which were analyzed— they also presented differentiated patterns of behaviour in some important variables. In the Andalusia economy, for instance, there was particular strength in the growth of the active population. This contrasts with the weakness of the growth of employment in the Extremadura economy. It also stood out that wage flexibility was greater in Extremadura than in Andalusia.

The VAR analyses applied to each of these two regions showed that a specific demand shock can have permanent effects on the participation rate (especially in the case of Andalusia) and on unemployment rate (especially in the case of Extremadura). Migratory movements in these regions are insufficient to allow these variables to rebound to their levels prior to the demand shock.

Finally, it should be emphasized that, since the unemployment differential of Andalusia and Extremadura depends on the supply of jobs, on the demand for jobs, and on the wage bargaining mechanism (understood in a broad sense), reduction of this differential would require policies in general aimed at improving these three elements (active policies on job creation, fostering entrepreneurial effort, etc.). In particular, a set of economic, educational, and social policy measures

common to both environments would be needed, while bearing in mind the specific explanatory factors of unemployment in each region.

Footnotes

1. The literature on the high unemployment rates in Europe and Spain is very extensive. See, for example, from the European and Spanish perspectives respectively, Bean (1994) and Blanchard & Jimeno (1994). Also germane is Usabiaga (2003), chapter 2.

2. A complete and more detailed descriptive analysis of the behaviour of the Andalusia and Extremadura labor markets with respect to the rest of Spain is given in Murillo *et al*. (2003). As in the present work, all the variables used in the analysis of Murillo *et al*. (2003) are defined relative to the rest of the Spanish regions (and not relative to the overall national values which would include the two regions being studied).

3. For a review of the international literature on regional differentials in unemployment, see Elhorst (2000). Elhorst's approach to the spatial distribution of regional unemployment is applied to the case of the Spanish economy by López-Bazo *et al*. (2002).

4. See Bentolila (1997) and Jimeno & Bentolila (1998). With respect to the geographical mobility of Spain's workers, see Ródenas (1994) and Ródenas & Martí (2002).

5. Avilés *et al*. (1997) show that there has been a process of divergence between the unemployment of Andalusia and of the rest of Spain in the last few decades. Torres & Villalba (1997b) find that this divergence not only affects the observed unemployment, but also its structural component as measured through the mean utilization rate of unemployment (MURU). Sánchez (1994), using the analytical framework of the Phillips curve, concludes that unemployment in Andalusia presents a high degree of persistence.

6. Thus, for example, Ferraro (2002) concludes that the black economy and informal employment have greater weight in Andalusia than in Spain.

7. See Murillo *et al*. (2003).

8. See, for example, Congregado & García-Pérez (2002).

9. See, for example, Baigorri *et al*. (1991) and Langreo *et al*. (1998).

10. For an analysis of the construction sector in Extremadura, see García & Jurado (1998).

11. See, for example, Bentolila & Blanchard (1990).

12. See Cebrián *et al*. (1995).

13. The subject of the agrarian subsidy will be returned to below in this same section.

14. For a study of the main cyclical characteristics of the Andalusia economy relative to that of Spain, see Leal *et al.* (2002) and Pérez *et al.* (2003).

15. The same could be said of the over-16 population.

16. Maesso *et al.* (1998) find that in Extremadura, relative to the rest of Spain, employment grows less in expansions and declines more in recessions.

17. For this topic at the level of the Spanish economy, see Castillo & Jimeno (1996).

18. For the case of Andalusia, Jimeno (1997b) remarks that an analysis of the labor force by age group and educational attainment gives no cause for optimism: the percentage of the labor force with secondary and tertiary education in this region is smaller than the rest of Spain.

19. Castillo *et al.* (1994) detect a possible mismatch of the labor force in Andalusia to newly created jobs. They also note that the demand for education of the labor force between 16 and 45 years old in Andalusia is less than is observed in the rest of Spain.

20. For the case of Andalusia, see Castillo *et al.* (1994).

21. See, for example, Raymond (2002).

22. See, for example, Cansino *et al.* (2002).

23. See, for example, Becerra *et al.* (1998).

24. See, for example, Bentolila *et al.* (1991) and Segura *et al.* (1991).

25. The most commonly used theoretical framework in this type of analysis is that proposed by Blanchard & Summers (1986).

26. For a review of the latest labour reforms that have been applied in Spain, see Segura (2001).

27. See, for example, Bentolila & Jimeno (2002) and Jimeno (1992).

28. See, as one of the pioneering works in this field, Becker (1964).

29. See Langreo *et al.* (1998).

30. Castillo *et al.* (1994) conclude that the willingness for geographical mobility of the unemployed in Andalusia is less than that in other Spanish regions.

31. See Baigorri & Fernández (1998).

32. See, for example, Toharia (1998).

33. See, for example, the various opinions reported in Usabiaga (2002).

34. See, for example, Usabiaga (2003).

35. On this type of approach, see for the case of Andalusia Jimeno (1997a), Herce *et al*. (2001), and Usabiaga (2003), and for the Extremadura case Murillo (2000).

36. For the case of the Andalusia economy, see Torres & Villalba (1997a), Becerra *et al*. (1998), and Usabiaga (2003).

37. Employment in these regions is assumed to follow its real trajectory.

38. The labor force in these regions is assumed to follow its real trajectory.

39. The term "relative" refers to the behaviour of these variables in each state with respect to the national mean.

40. Decressin & Fatás (1995), for example, analyze the dynamics of the labour markets at the regional level in Europe.

41. The only objective of using values disaggregated by educational attainment is to obtain a greater number of observations. The disaggregation categories were: illiterate or with no formal completed education, primary education, secondary education, pre-tertiary education, and tertiary education (see Mas *et al*. 1995).

42. Jimeno & Bentolila (1998) and Mauro & Spilimbergo (1998) report similar results with respect to the ranking of regions by unemployment, for different time periods.

43. Thus, the variable "e" for example is the first difference of the logarithm of employment in Andalusia or Extremadura minus the first difference of the logarithm of employment in Spain.

44. The assumption behind this idea is that most of the variation in short term employment reflects changes in labor demand and not in labor supply (Blanchard & Katz, 1992; Jimeno & Bentolila, 1998; Mauro & Spilimbergo, 1998).

45. The main advantage of this method over other alternatives is that the results are independent of the order of the variables. Following Jimeno & Bentolila (1998), we also calculated the impulse-response functions by Cholesky's method (see Favero, 2001) for the following order of variables: "e", "d", and "p". This order implies that variations in the growth rate of employment are contemporaneously transmitted to the unemployment and the participation rates, but not *vice versa*. The results of the two methods were the same.

46. The incentive and disincentive effects refer to flows of workers into and out of the labor market in response to the economic cycle (see, for example, Nickell, 1987 and Blanchard, 1991).

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Figure 1. Evolution of unemployment rates

Andalusia — Extremadura — Rest of Spain

Source: Labor Force Survey (INE)

Figure 2. Evolution of unemployment rates by gender

Andalusia men — Andalusia women
Extremadura men — Extremadura women
Rest of Spain men — Rest of Spain women

Source: Labor Force Survey (INE)
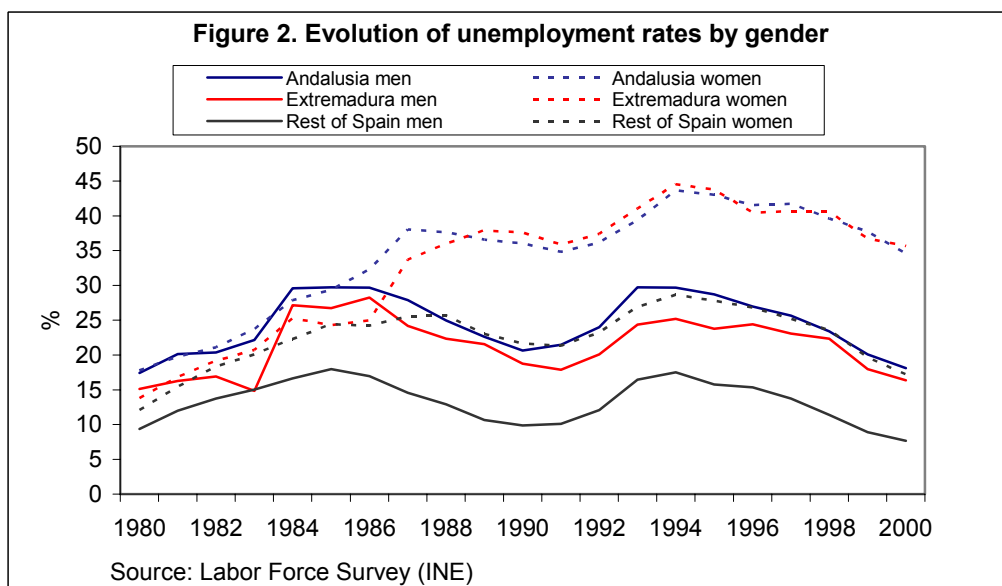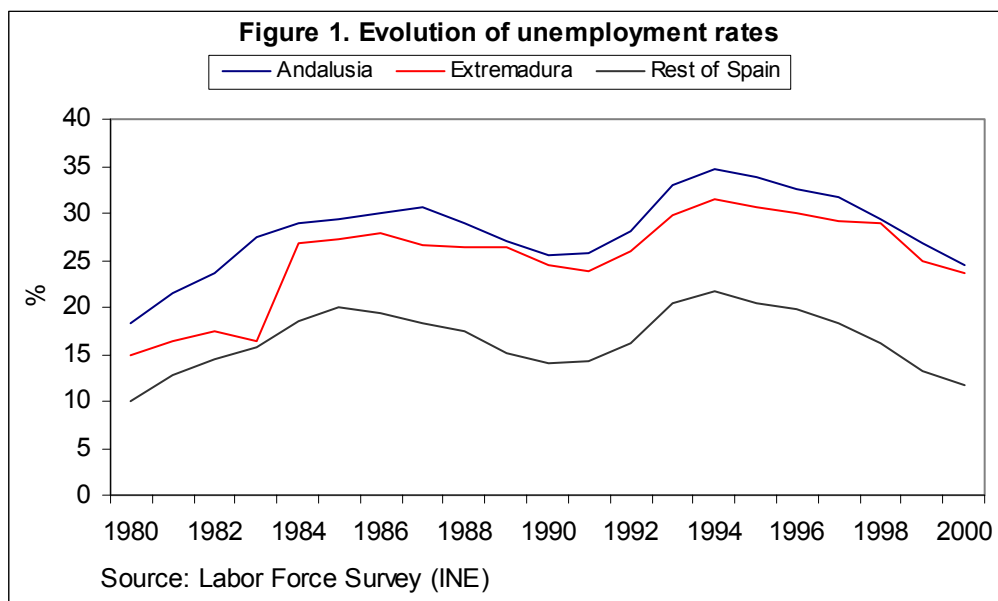
Table 1. Evolution of unemployment by age (%)

		Andalusia	Extremadura	Rest of Spain
1980	16–19 years	41.68	31.35	32.87
	20–24 years	32.56	28.54	22.09
	25–54 years	12.11	11.15	6.28
	55 and more years	8.65	6.87	3.67
1990	16–19 years	48.63	45.78	32.71
	20–24 years	41.23	42.88	27.52
	25–54 years	20.49	20.48	11.46
	55 and more years	15.93	11.42	6.11
2000	16–19 years	44.15	45.82	30.64
	20–24 years	35.03	30.95	20.75
	25–54 years	22.03	22.05	10.04
	55 and more years	18.95	16.88	7.19

Source: Labor Force Survey (INE).

Table 2. Evolution of unemployment rate by educational attainment (%)

		Andalusia	Extremadura	Rest of Spain
1980	No completed formal education	17.17	18.05	7.79
	Primary	19.79	14.55	7.56
	Secondary	29.79	14.86	17.23
	Technical professions	30.60	31.25	17.09
	University degrees	14.18	13.06	9.27
1990	No completed formal education	26.81	23.52	10.42
	Primary	23.51	25.36	10.98
	Secondary	29.70	31.25	18.66
	Technical professions	30.53	33.33	17.85
	University degrees	14.46	19.51	11.35
2000	No completed formal education	31.32	37.16	11.53
	Primary	25.13	25.37	9.67
	Secondary	25.64	17.33	12.77
	Technical professions	24.51	26.14	12.40
	University degrees	15.89	12.77	10.11

Source: Labor Force Survey (INE).

Table 3. Unemployment rates by educational attainment and age group (%)

1990		Andalusia	Extremadura	Rest of Spain
16-24 years	No formal education	62.05	47.38	38.59
	Primary	59.05	43.11	31.49
	Secondary	63.55	46.05	31.50
	Pre-tertiary	44.06	35.98	35.05
	Tertiary	51.42	73.55	39.72
24-45 years	No formal education	30.21	26.56	20.13
	Primary	22.72	22.97	14.76
	Secondary	21.88	22.30	14.41
	Pre-tertiary	10.45	24.43	10.27
	Tertiary	14.88	17.76	12.95
45+ years	No formal education	24.67	21.95	12.77
	Primary	11.25	9.19	7.90
	Secondary	7.84	7.63	6.44
	Pre-tertiary	3.24	1.03	3.53
	Tertiary	0	0	4.29
2000		Andalusia	Extremadura	Rest of Spain
16-24 years	No formal education	57.39	35.08	35.72
	Primary	50.24	31.38	24.19
	Secondary	51.74	34.92	26.04
	Pre-tertiary	40.48	26.42	24.90
	Tertiary	50.05	20.16	37.12
24-45 years	No formal education	32.62	46.37	25.89
	Primary	27.62	27.91	15.20
	Secondary	19.93	20.61	12.25
	Pre-tertiary	18.67	15.29	10.97
	Tertiary	15.45	14.04	10.58
45+ years	No formal education	30.29	32.23	17.77
	Primary	16.25	15.33	9.32
	Secondary	12.06	4.92	7.73
	Pre-tertiary	3.15	3.06	3.66
	Tertiary	5.27	1.29	5.47

Source: Labor Force Survey (INE).

Table 4. Evolution of unemployment rates by sector (%)

		Andalusia	Extremadura	Rest of Spain
1980	Agriculture & fisheries	13.82	7.44	1.44
	Industry	10.31	12.04	7.06
	Construction	32.67	29.78	20.41
	Services	7.39	8.92	4.68
1990	Agriculture & fisheries	33.20	18.33	3.49
	Industry	12.69	16.55	8.25
	Construction	23.25	29.58	11.87
	Services	12.05	12.05	7.97
2000	Agriculture & fisheries	38.62	28.91	5.02
	Industry	12.16	14.13	6.08
	Construction	18.19	25.10	7.87
	Services	13.47	13.61	7.46

Source: Labor Force Survey (INE).

Table 5. Percentages of unemployed by time seeking employment

		Andalusia	Extremadura	Rest of Spain
1980	< 6 months	47.78	56.43	38.94
	6 months – 1 year	23.37	18.06	26.67
	1 – 2 years	18.21	13.52	24.00
	> 2 years	10.63	11.97	10.37
1990	< 6 months	34.29	37.30	27.67
	6 months – 1 year	16.20	15.04	16.27
	1 – 2 years	17.26	17.20	18.96
	> 2 years	32.24	30.44	30.09
2000	< 6 months	36.79	45.41	33.77
	6 months – 1 year	18.32	19.04	16.63
	1 – 2 years	15.29	14.35	17.32
	> 2 years	29.58	21.19	32.26

Source: Labor Force Survey (INE).

Table 6. Mean annual growth rates of working age population, labor force and employment (%)

		Andalusia	Extremadura	Rest of Spain
1980-1985	Working age population	1.78	1.28	1.24
	Labor force	1.67	0.92	0.69
	Employment	-1.54	-2.12	-1.54
1985-1990	Working age population	1.68	1.17	1.17
	Labor force	3.22	2.07	1.73
	Employment	4.37	2.66	3.09
1990-1995	Working age population	1.24	-0.27	0.88
	Labor force	1.39	-0.13	0.91
	Employment	-1.00	-1.79	-0.61
1995-2000	Working age population	1.10	0.24	0.89
	Labor force	2.11	2.04	1.87
	Employment	4.82	3.98	3.99
1980-2000	Working age population	1.45	0.60	1.04
	Labor force	2.10	1.23	1.30
	Employment	1.66	0.68	1.23

Source: Labor Force Survey (INE).
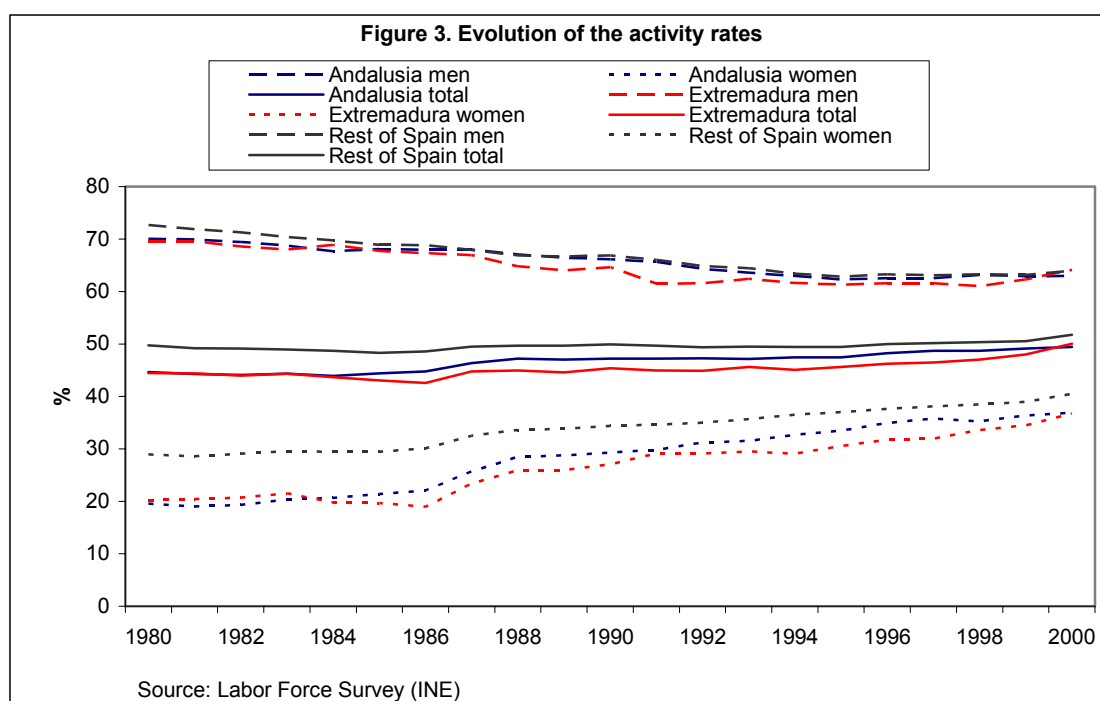
Figure 3. Evolution of the activity rates

Source: Labor Force Survey (INE)

Table 7. Active population percentages by educational attainment

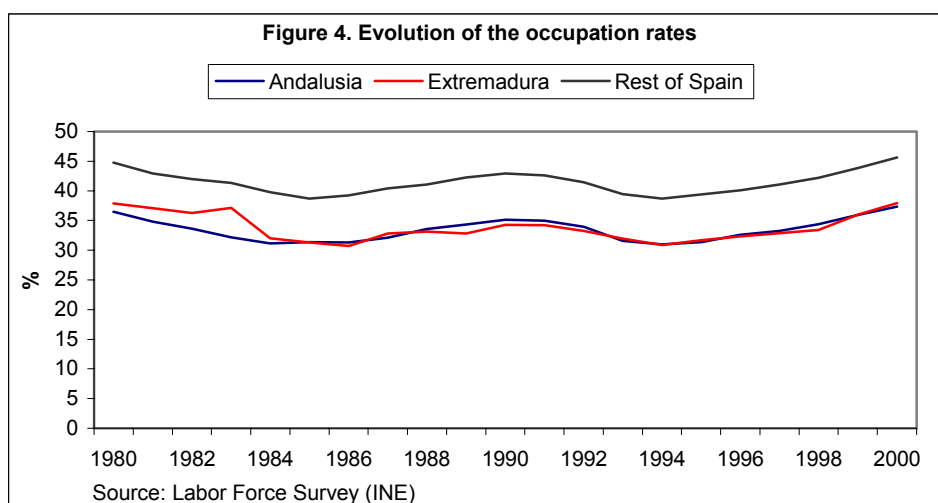|		Andalusia	Extremadura	Rest of Spain
1980	No completed formal education	25.12	26.69	12.40
	Primary	50.94	64.41	60.63
	Secondary	15.57	2.16	17.43
	Technical professions	1.84	0.93	2.11
	University degrees	6.53	5.81	7.43
1990	No completed formal education	17.85	17.83	9.58
	Primary	36.99	63.85	36.94
	Secondary	29.49	4.82	32.64
	Technical professions	6.59	5.27	8.75
	University degrees	9.08	8.23	12.09
2000	No completed formal education	11.64	10.28	4.34
	Primary	22.20	55.82	19.95
	Secondary	36.35	9.05	40.49
	Technical professions	13.87	10.44	16.28
	University degrees	15.93	14.41	18.94

Source: Labor Force Survey (INE).

Figure 4. Evolution of the occupation rates

Source: Labor Force Survey (INE)

Table 8. Employment percentages by sector

		Andalusia	Extremadura	Rest of Spain
1980	Agriculture & fisheries	24.95	36.48	17.83
	Industry	16.72	10.59	29.14
	Construction	9.88	9.66	8.82
	Services	48.44	43.26	44.20
1990	Agriculture & fisheries	15.72	25.72	10.72
	Industry	15.47	11.14	25.46
	Construction	12.09	13.40	9.18
	Services	56.70	49.73	54.62
2000	Agriculture & fisheries	11.10	14.47	5.86
	Industry	12.66	10.70	21.38
	Construction	12.21	15.07	10.69
	Services	64.01	59.75	62.06

Source: Labor Force Survey (INE).

Table 9. Characteristics of salaried employment (%)

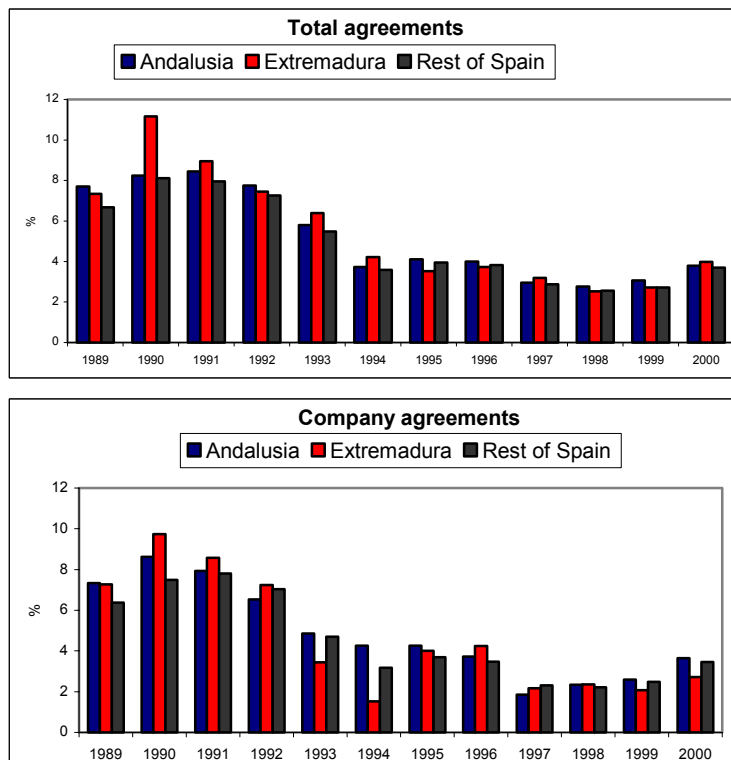|	Andalusia		Extremadura		Rest of Spain	
Contract	Temporary	Indefinite	Temporary	Indefinite	Temporary	Indefinite
1987	24.90	75.09	27.58	72.41	16.70	83.29
1993	39.00	60.99	35.78	64.21	31.09	68.90
2000	45.41	54.59	38.58	61.41	29.37	70.62
Time	Full	Part	Full	Part	Full	Part
1987	96.08	3.91	93.70	6.29	95.50	4.49
1993	94.05	5.94	93.74	6.26	94.28	5.71
2000	91.70	8.29	91.26	8.73	91.90	8.09
Sector	Public	Private	Public	Private	Public	Private
1987	25.36	74.63	33.85	66.14	21.92	78.08
1993	28.65	71.34	32.81	67.18	23.39	76.61
2000	25.03	74.96	29.73	70.27	19.24	80.75

Source: Labor Force Survey (INE).

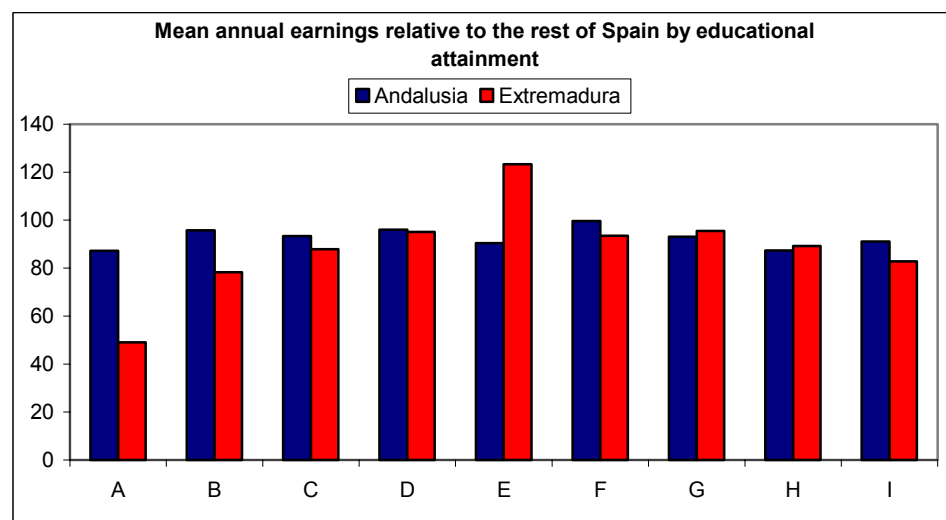**Figure 5. Evolution of the coverage og collective bargain**
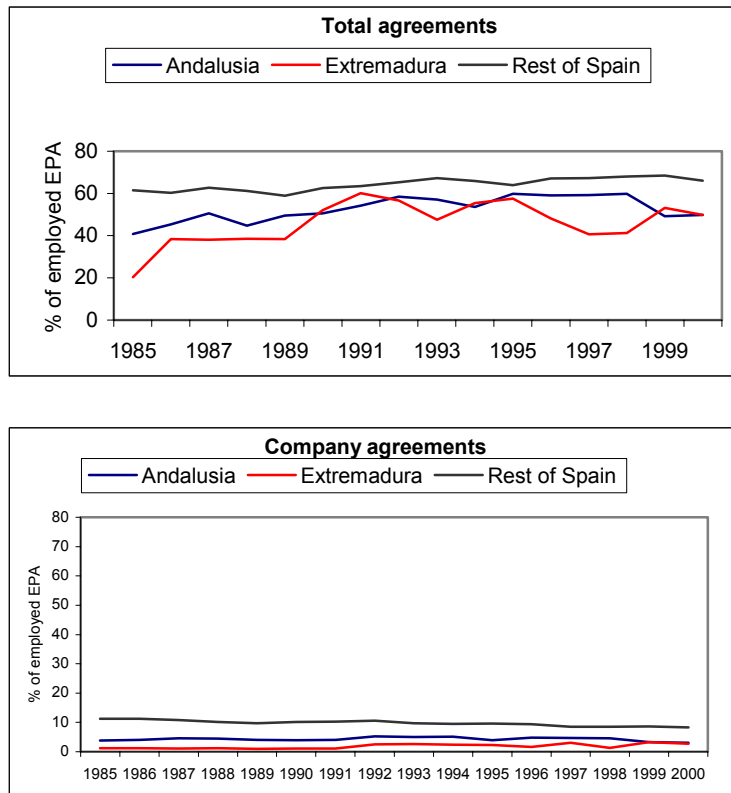
Source: Collective Labor Agreements (Bulletin of Statistics, MTAS) and Labor Force Survey (INE).

Figure 6. Evolution of negociated wage rises in collective bargain

Figure 7. Evolution of the mean earnings per worker per month

Source: Survey of Wages in Industry and Services (INE)

Figure 8. Wage dispersion by educational attainment

Mean annual earnings by worker per educational attainment

Mean annual earnings relative to the rest of Spain by educational attainment

A: no completed formal education/B: primary/C: secondary/D: pre-university/E:vocational training (intermediate)/F: vocational training (high level)/G: diploma/H:BA, Engineer, PhD/I: all educational levels
Source: Wage Structure Survey (INE). 1995

Figure 9. Evolution of the number of agrarian subsidies

Source:Unemployment payments (Bulletin of Labor Statistics, MTAS)
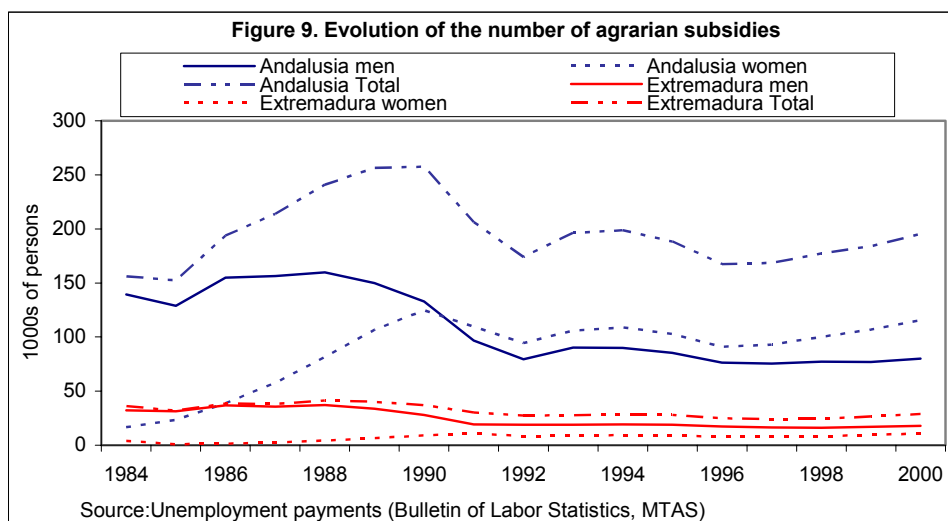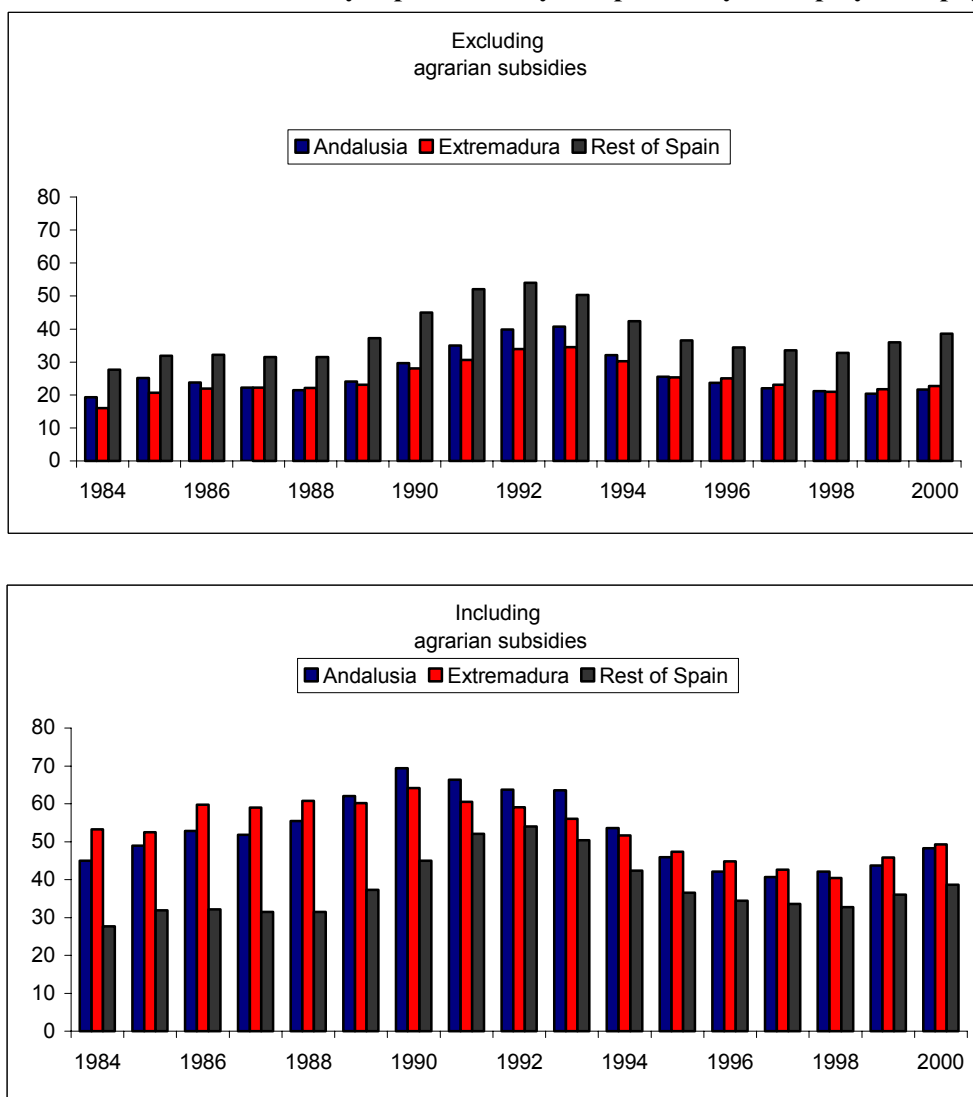
Figure 10. Evolution of the covery represented by compensatory unemployment payments

Source: Unemployment payments (Bulletin of Labor Statistics, MTAS) and Labor Force Survey (INE).

Table 10. Shift-share análisis: decomposition of the unemployment differential in Andalusia with respect to the rest of Spain (%)

	1990					2000			
	Structural component		Internal component			Structural component		Internal component	
	Men	Women	Men	Women		Men	Women	Men	Women
16-24 years									
No formal education	0,08	0,95	0,91	0,09		0,06	0,58	0,59	0,06
Primary	-2,94	8,24	21,06	10,71		-1,94	3,60	10,08	5,10
Secondary	-2,60	-2,00	5,94	2,75		-1,25	0,68	3,52	2,39
Pre-tertiary	-0,13	-0,18	-0,08	0,46		-0,24	-0,04	0,66	2,31
Tertiary	0,02	0,08	0,23	0,10		-0,01	-0,17	0,14	0,28
25-45 years									
No formal education	2,96	1,91	4,92	4,01		2,00	1,74	1,89	2,61
Primary	2,12	-1,55	16,41	8,76		1,35	1,95	15,24	16,64
Secondary	-1,01	-2,17	2,84	2,12		-0,36	-1,46	3,17	3,62
Pre-tertiary	0,03	-0,24	0,23	0,02		-0,15	-0,65	2,55	4,02
Tertiary	-0,42	-1,02	-0,05	0,66		-0,22	-0,78	0,94	1,60
45 and more years									
No formal education	2,61	0,23	9,09	3,40		2,28	1,03	5,03	5,28
Primary	-1,18	-1,57	3,24	0,58		-0,97	-2,02	4,85	2,35
Secondary	-0,17	-0,24	0,06	0,12		-0,15	-0,23	0,36	0,48
Pre-tertiary	-0,03	-0,03	-0,11	0,07		-0,11	-0,08	0,11	-0,22
Tertiary	-0,02	-0,04	-0,10	-0,09		0,03	-0,04	-0,10	0,04
Total	-0,70	2,35	64,59	33,77		0,31	4,10	49,04	46,55
Source: Labor Force Survey (INE)									

Table 11. Shift-share analysis: decomposition of the unemployment differential in Extremadura with respect to the resto f Spain(%)

	1990					2000			
	Structural component		Internal component			Structural component		Internal component	
	Men	Women	Men	Women		Men	Women	Men	Women
16-24 years									
No formal education	0,27	-0,25	1,06	-0,17		0,00	-0,19	0,19	0,00
Primary	4,05	6,87	19,95	7,77		2,14	4,38	3,42	7,93
Secondary	-2,93	-2,82	4,13	1,38		-1,09	-0,77	1,84	0,95
Pre-tertiary	0,36	-0,34	0,11	0,07		-1,07	-1,24	-0,18	0,42
Tertiary	-0,02	-0,14	0,37	0,38		-0,38	-0,68	-0,08	-0,06
25-45 years									
No formal education	2,87	0,52	3,91	2,82		1,99	1,88	4,46	4,46
Primary	2,78	-3,58	18,30	13,91		2,16	3,05	18,39	21,91
Secondary	-2,37	-3,35	-0,97	5,37		-0,44	-1,84	2,34	6,14
Pre-tertiary	-0,04	-0,72	0,71	3,90		-0,67	-0,69	1,19	2,88
Tertiary	-1,09	-1,24	0,54	0,42		-0,74	-1,80	1,38	0,27
45 and more years									
No formal education	4,12	0,19	10,28	3,60		2,18	0,49	7,23	3,70
Primary	-0,76	-1,75	2,71	-0,02		-0,34	-2,17	5,08	3,84
Secondary	-0,33	-0,36	0,29	-0,15		-0,22	-0,61	-0,08	-0,15
Pre-tertiary	0,07	-0,03	-0,38	0,03		-0,11	-0,12	0,18	-0,32
Tertiary	0,03	-0,14	-0,17	-0,01		0,10	-0,07	-0,51	0,03
Total	7,00	-7,13	60,84	39,28		3,51	-0,37	44,87	52,00
Source: Labor Force Survey (INE)									

Figure 11. Virtual economies(with the sectoral employment structure of the rest of Spain)

- Real unemployment rate Andalusia
- Virtual unemployment rate Andalusia
- Real unemployment rate Extremadura
- Virtual unemployment rate Extremadura
- Real unemployment rate rest of Spain

Source: Labor Force Survey (INE)
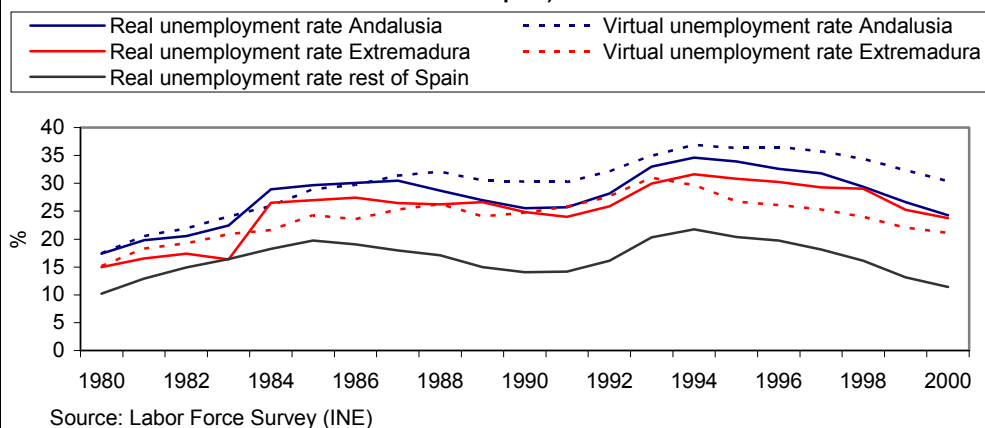
Figure 12. Virtual economies (with the labor force growth of the rest of Spain)

- Real unemployment rate Extremadura
- Virtual unemployment rate Extremadura
- Real unemployment rate Andalusia
- Virtual unemployment rate Andalusia
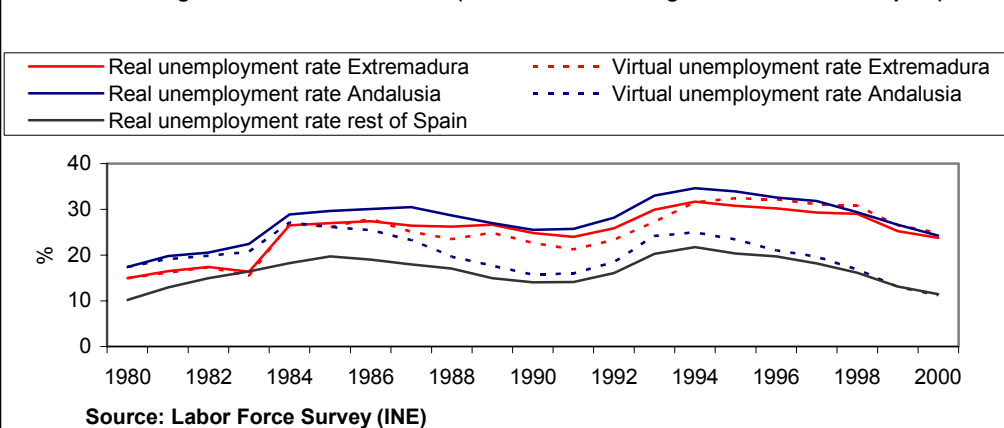- Real unemployment rate rest of Spain

Source: Labor Force Survey (INE)

Figure 13. Virtual economies (with the active population growth of the rest of Spain)

- Real unemployment rate Extremadura
- Virtual unemployment rate Extremadura
- Real unemployment rate Andalusia
- Virtual unemployment rate Andalusia
- Real unemployment rate rest of Spain
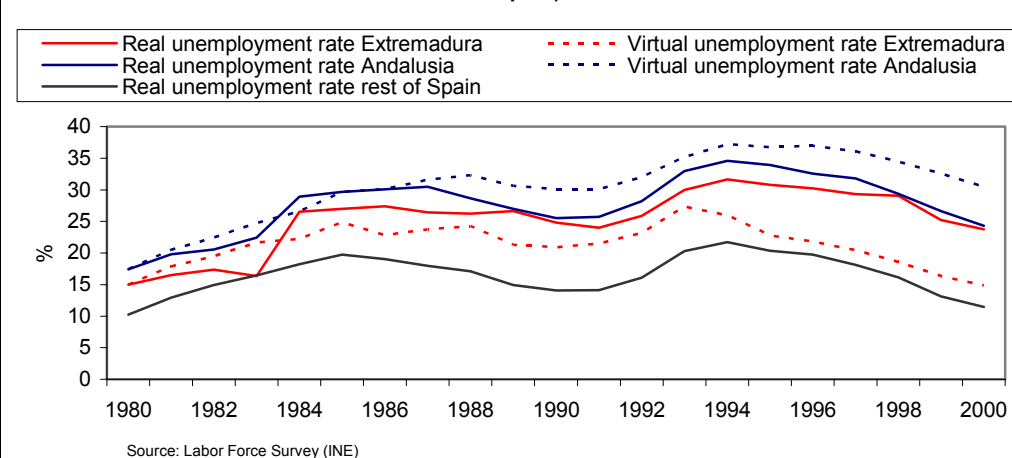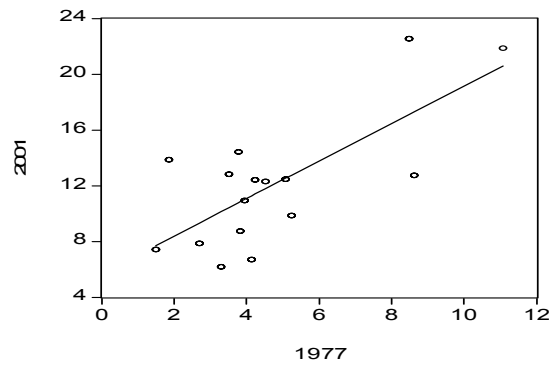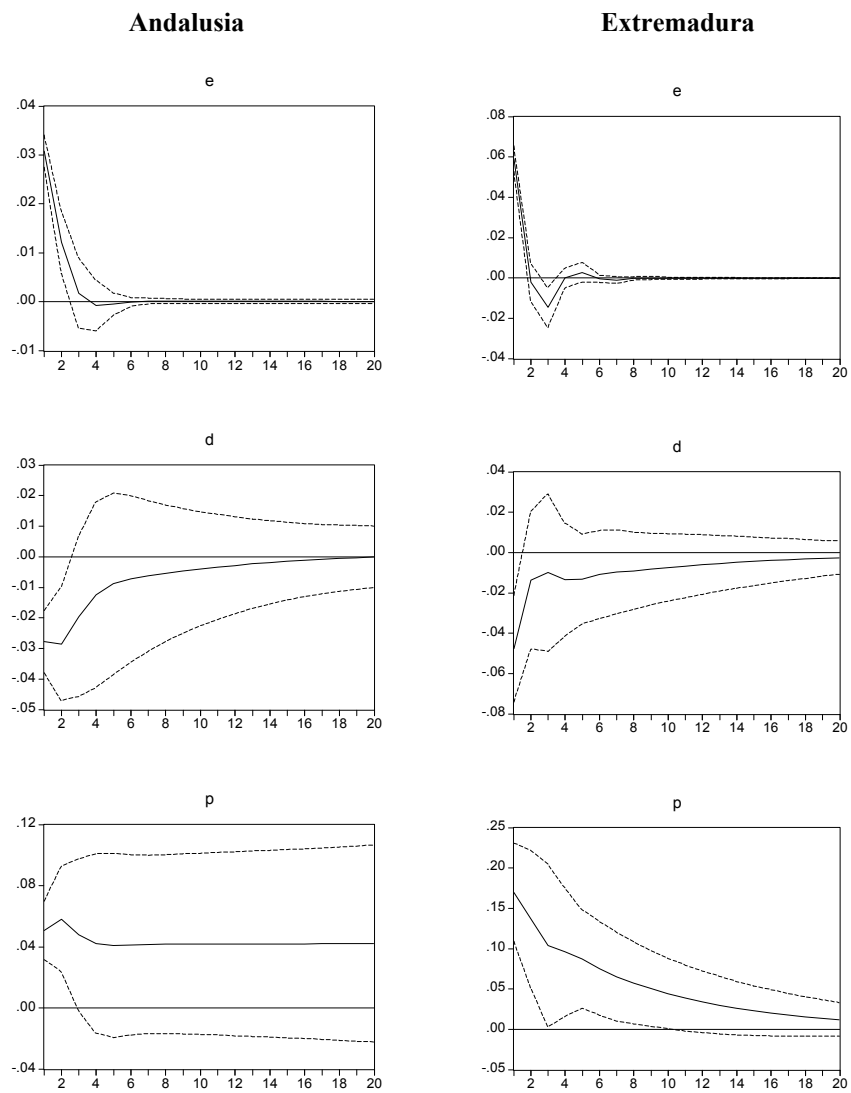

Source: Labor Force Survey (INE)

Figure 14. Regional unemployment rates in Spain (%)

Source: Fundation Bancaja

Figure 15. Response to one standar deviation in employment growth

Andalusia   **Extremadura**

Source: Fundation Bancaja