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ESTIMATION OF TIME SPENT IN UNEMPLOYMENT FOR MARRIED WOMEN: AN APPLICATION AT REGIONAL LEVEL[1]

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Abstract: It is very well known that long unemployment duration is a factor which contributes to explain the high unemployment rates in Spain, unemployment spells for married women being particularly long. Unemployment duration analysis *via* stock sampling typically suffers from two sampling problems: right-censoring and length-bias. In this work we investigate unemployment duration for married women by using new estimation methods which jointly take account for both sampling issues. We report results separately for several Spanish autonomous regions.

Key words: censoring, duration analysis, Kaplan-Meier, length-bias, unemployment

JEL classification: J64

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1 Introduction

Over the last few decades, unemployment in Europe has been and continues to be one of the most important economic problems, both in terms of the social damage it causes and for the under-use of human resources that this involves. This problem is particularly serious in the southern European countries, among which the Spanish case stands out.

Within the general conceptual framework of matching models the unemployment rate in the stationary state can be expressed as the product of the rate of entry into unemployment and the mean duration of unemployment. A high unemployment rate could be caused by, therefore, a high frequency of unemployment and/or a long duration of it. The differences between countries has been continuously shown regarding the relative importance of each of these components when explaining the unemployment figures. Thus, for example, the North American labor market is characterized by relatively short lengths of unemployment and high flows of entry and exit, whereas in the countries of the European Union it is just the opposite that occurs. Once again amongst these latter cases Spain stands out as an example of a country in which the length of unemployment component is relatively important when justifying the high unemployment figures.

Among the structural causes that have been pointed out as possible reasons behind long-term unemployment feature the legislation regarding the inter-professional minimum salary, the level of coverage of collective bargain-

ing agreements, the unemployment welfare payment system, the contributions of the employers to the Social Security system and the costs for firing staff (in Alba *et al.* (1999) there are brief comments regarding each of these factors with numerous bibliographical references made to them).

Given the importance of the length of unemployment in terms of explaining it in a number of European countries, this work is focused on the analysis of the length of time spent in unemployment using data from Spain, the country in which the level of long-term unemployment is greater[2] . In particular, we investigate the unemployment duration in Spain from a regional viewpoint.

It should be pointed out that there are many studies that also focus on unemployment in Spain. On these lines, with the data from the Spanish Labour Force Survey (LFS) connected, Bover *et al.* (1997) analyze the effects that unemployment pay and the economic cycle have on the length of male unemployment; Ahn and García - Pérez (1999) study the effects on the length of unemployment made by the fact of an individual accepting jobs with a salary lower than that corresponding to their professional training; Alba (1999) studies the exit from unemployment of males aged between 20 and 59, using models of duration. With a similar methodology, and using the list of paid up members of the Social Security system, García - Fontes and Hopenhayn (1996) provide results about the flexibility and volatility of employment for the period 1978-1992; furthermore, García - Pérez (1997) examine the determining factors of the exit rates in employment and un-

[2]For incidence of long-term unemployment we understand the percentage of unemployed who have been 12 months or more in unemployment.

employment. With the Survey of Living and Working Conditions in 1985, Andrés et al. (1989) analyze the incidence and duration of male unemployment in Spain; Blanco and Tena (1997) study the transition of unemployed women into employment and inactivity.

On the other hand, the problem of unemployment is not the same for all Spanish society, but rather affects women to a much larger extent. According to the data of the LFS corresponding to the second quarter of 2003, the male unemployment rate was about 8% whereas female unemployment was as much as 16%.

Amongst the group of women workers, the labor behavior of married women may differ from that of the others due to the possible influence of the family structure in which they find themselves. The decision of work offers of a woman will depend on the value of her time dedicated to producing in the labor market compared to the value of her time dedicated to production at home[3]. Therefore, the productivity of the woman outside the labor market will determine, to a great extent, her reserve salary.

There are different reasons that could explain greater productivity of married women in the home. Among them, for example, would be found the greater family responsibilities, which married women have to face. One important aspect of these responsibilities is clearly the presence of children, which, in the Spanish case, are still born mainly within the institution of marriage. Greater relative productivity of married women in the home will affect in a positive way their reserve salary, which may contribute towards explaining the lower unemployment figures amongst married women compared

[3]See, for example, Becker (1965).

to the others[4] .

On the other hand, the decision to enter the labor market by the married woman may also be affected by her husband's labor activity. On being able to count on the husband's salary, the pressure on the married woman to look for work may decrease. In terms of the models for looking for work, this can be translated into a reduction in the intensity of searching as well as a reduction in the probability of accepting any given job offer[5] . Arguments of this sort help in understanding why amongst unemployed women the length of time is longer among married woman than those that are not[6] .

Finally, we can consider that married women tend, to a lesser extent than the others, to enter into an unemployment situation, since for them the cost of the opportunity of finding work may be relatively higher, but that once they do it, they tend to stay more time in this situation.

In this study we present results, at a regional level, of the length of time in unemployment of married women in Spain based on the data contained in the LFS. As can be seen from table 1, the problem of unemployment in our interest group differs from region to region. Undertaking the analysis for each region we can test whether there are significant differences in the behavior of married women in each region compared to the Spanish mean. This regional perspective of our duration analysis constitutes a novelty in

[4]The unemployment rate for women in the second quarter of 2003 for married women was 14.45% whereas for unmarried women the figurs was 17.44%.

[5]Less need for married women to find a job may make them more demanding as regards the nature of the jobs they would be disposed to accept.

[6]The incidence of long-term unemployment in the second quarter of 2001 is situated at 44.27% for unmarried women and 53.64% for married women.

literature devoted to the Spanish labour market.[7] In figure 1, the relative location of each region within Spain can be seen.

Due to the existence of a limit in the following up of individuals, some periods of unemployment are right censored. The problem of right censoring is well known in the economic analysis of duration, as for example in Kiefer (1988). On the other hand, the same nature of the cross section that the LFS has causes a bias[8] in the sample of lengths of unemployment, in such a way that it will be more probable to see a period of unemployment the greater the length (or duration) of it (this is the problem of stock sampling, as described in Lancaster (1990), Sec. 5.3.1). In this situation, a correction of the estimators in use is required: otherwise the time spent in unemployment will be overestimated. In the field of the labor economy, Kaitz (1970) is one of the first references in which this problem of bias by length is present. In our case, we will use the non-parametric methodology introduced recently by de Uña-Álvarez (2004), which is specially designed to simultaneously correct the two problems mentioned: censoring and length-bias.

The organization of the study is the following: section 2 features the nature of the data, section 3 the methodology used in the length of unemployment data analysis, taking into account right censoring and longitudinal bias. Section 4 shows and comments on the results obtained in the application and, finally, section 5 summarizes the main conclusions of the study.

[7]There exist indicators for the incidence of long-term unemployment which are often computed by regions, such as that shown in table 1. However, due to the sampling biasing, none of the existing indicators can be legitimally regarded as a measure of the unemployment duration.

[8]This is the sampling bias referred above.

2 Nature of the data

In accordance with the definition of an unemployed person (an individual looking for work who is not doing paid work), the variable of interest in this study is the time that passes from when a married woman who is not in paid work starts to look for a job until she finds work (transit to employment) or stops looking for it (transit to inactivity).

In relation to this variable, denoted by T, there is a sample available built from the Spanish Labour Force Survey (LFS). The LFS is undertaken on a quarterly basis in some 60,000 homes. From one quarter to another, 1/6 of the homes are updated, while the rest are maintained. In this way, each home remains under observation for a maximum period of 6 quarterly periods. The study has been undertaken using a pool of 38 panels in which the individuals are monitored throughout a period of one and a half years. The sample period extends from the second quarter of 1987 until the fourth quarter of 1997.

The sample used in the empirical analysis is made up of the periods of unemployment (12,179 in total) corresponding to married women who, at the time of the first survey, were in a situation of unemployment. As one of the questions in the LFS concerns the time that the individuals have been looking for work, it is possible to discover the initial moment of the unemployment period for the cases considered. The same does not occur for the final moment, since some women may continue (and, in fact, will continue) in their situation of unemployment after the 6 quarters of monitoring. These cases provide T values with right censoring (4,746 of the 12,179 cases, or 39%

of censoring). Table 2 presents the number of data items and the percentage of censoring by autonomous region.

As has already been pointed out, a second problem that arises from the data used is that of longitudinal bias. If one imagines the (first) quarter in which an individual is monitored by the LFS as a random instant in the history of the subject (which will be spread during periods of unemployment of a greater or lesser period), then it is clearly understood that the periods of long-term unemployment are over-represented in the sample: in other words, by means of the sampling mechanism it will more probable to monitor a given length of unemployment however long it may be. The stock sampling that is produced on merely seeing the periods corresponding to unemployed individuals is the last cause of this situation.

Although the problems of longitudinal bias and censoring are well known in the field of labor economics, the models used in literature are restricted to the parametric world: that is, a hypothesis is needed of a distributional kind about the lengths of unemployment in order to proceed with the inferences. The study of non-parametric methods to deal with biased and censored data has been started very recently in the ambit of statistical methodology, and we do not know what has been applied to economic data as yet.

The following section presents a statistical methodology of a non-parametric type (and, therefore, free of distribution estimates) in order to analyze the data of available duration. This methodology considers two phenomena that define the nature of the sample information: the right censoring and the length-bias.

3 Statistical methodology

In this section we introduce a nonparametric methodology in order to analyze the data without assuming any given parametric family of distributions. For $t \geq 0$ we set $F(t) = P(T \leq t)$ (the cumulative distribution function of T) and

$$S(t) = 1 - F(t) = P(T > t).$$

This curve $S(t)$ is the survival function of T, and it represents in our case the probability of staying more than t time units on unemployment for a married woman.

Under right-censoring, the nonparametric maximum likelihood estimator of $S(t)$ equals the well-known Kaplan-Meier estimator, given by

$$\widehat{S}(t) = 1 - \widehat{F}(t) = \prod_{t_{(i)} \leq t} (1 - \frac{d_i}{n_i}).$$

Here, $t_{(1)} < ... < t_{(k)}$ denote the k distinct times at which the n individuals leave unemployment or are censored, and (for $i = 1, ..., k$) d_i is the number of subjects leaving unemployment exactly at time $t_{(i)}$, and n_i is the number of individuals staying unemployed $t_{(i)}$ time units or more (this n_i is typically referred as size of the risk group at $t_{(i)}$). If no data are right-censored, then $\widehat{F}$ becomes the ordinary empirical distribution function.

When individuals being censored at time c are representative of those subjects staying unemployed more than c time units, then $\widehat{S}(t)$ consistently estimates the survival function $S(t)$. However, when the data are length-biased (as in our study), Kaplan-Meier estimation overestimates unemployment duration. This problem is well-known in econometric literature, being a consequence of a particular sampling scheme otherwise (stock-sampling).

In order to correct this overestimation issue, de Uña-Álvarez (2004) suggests estimating the distribution of interest F through

$$\widetilde{F}(t) = \sum_{t_{(i)} \leq t} \frac{d_i w_i}{nw}$$

where

$$w_i = \begin{cases} 1/t_{(i)} \text{ if } t_{(i)} \leq \tau \\ 1/\tau \text{ if } t_{(i)} > \tau \end{cases},$$

τ denotes the following-up period duration ($\tau = 18$ months in our case), and $w = \frac{1}{n}(d_1 w_1 + ... + d_k w_k)$. When there is no limitation in following-up ($\tau = \infty$), the weights w_i become proportional to the size of $1/t_{(i)}$, and the proposed estimator becomes the standard nonparametric tool for length-biased data (Vardi, 1982). Inclusion of the constant τ in the indicated form results in an adaptation of Vardi's estimator under censoring provoked for ending of following-up.

The estimator $\widetilde{F}$ was deeply investigated in de Uña-Álvarez (2004). In particular, consistency of $\widetilde{F}$ was established, and the corresponding limit gaussian distribution was obtained. As a result, computation of the standard errors of $\widetilde{F}(t)$ is possible through proper estimation of the limit variance, say $\sigma^2(t)$; for example, a confidence interval for the survival function $S(t) = 1 - F(t)$ with 95% nominal confidence level is given by

$$I(95) = \left(1 - \widetilde{F}(t) \pm 1.96 \frac{\widetilde{\sigma}(t)}{\sqrt{n}}\right),$$

where

$$\widetilde{\sigma}^2(t) = \left[1 - 2\widetilde{F}(t)\right] \sum_{t_{(i)} \leq t} \frac{d_i w_i^2}{nw^2} + \widetilde{F}^2(t) \sum_{i=1}^{k} \frac{d_i w_i^2}{nw^2}$$

(see de Uña-Álvarez, 2004)[9].

In the following section, this new methodology is applied to the unemployment duration data for Spanish married women. The application is performed from a regional viewpoint.

4 Application

Tables 3-8 show the values of the survival function for distinct periods of unemployment of married women in Spain and the different autonomous regions. In terms of Spain we can see how the probability or staying unemployed decreases very quickly during the first months, only 53% of the cases continuing in unemployment after the first year. From then on, leaving unemployment is a much slower process, 34% of the women remaining unemployed after the second year, and 22% in the third. This pattern of abandoning unemployment is repeated in all the autonomous regions, even though the rates are going to differ in each specific case (tables 3-8).

As measurements of summary of the duration of female unemployment, table 9 provides the mean and median duration times of unemployment. In the case of Spain, the mean unemployment duration time for married women is estimated at 20 months, while the median (preferable to the mean in markedly asymmetric situations, like this one) drops to 14 months. In other

[9] Other statistical tools for analyzing this kind of data are possible. Indeed, in de Uña-Álvarez *et al.* (2003) a different correction of the Kaplan-Meier estimator was proposed. However, unlike for the referred statistic, the simplicity of the methods applied in this paper allows for the construction of confidence intervals and the consequent analysis of significance.

words, one in two married Spanish women do not leave their situation of unemployment until after the first year and two months of looking for work have passed.

Generally speaking, the obtained results agree with the figures reported in table 1 in all the cases but for Asturias. The longest unemployment durations are found for the Cantabric regions (North of Spain), as Euskadi or Cantabria. On the other hand, women living in the Mediterranean shore of Spain show particularly short unemployment spells (Balearic, Murcia).

More in detail, the regions with the longer duration of unemployment for the married women are, in this order, the Euskadi, Madrid, Galicia and Cantabria. This is what stands out in the medians of estimated duration (table 9), which reads as 24, 19, 18 and 18 months, respectively. The analysis of the mean periods of unemployment provides us with a similar conclusion, with the exception of La Rioja (table 9). In this region the estimated mean does not adequately represent the duration of unemployment, due to the presence of exaggeratedly high levels of duration. In the Euskadi, the married woman stays in unemployment 31 months in mean terms (approximately two and a half years), whereas this parameter decreases to 30, 29 and 28 months in the cases of Galicia, Madrid and Cantabria.

At the other end, the autonomous regions that show least duration of unemployment (focusing on their median) are the Balearics (7 months), Murcia and Asturias (10 months), see table 9. As has been shown, the use of the mean as a parameter of localization can present problems when it does not represent the group well.

As regards the successive rates of abandonment by autonomous region (tables 3-8), some statistically significant differences can be seen compared to Spain as a whole. The following comments, relating to this question, are based on the comparison of the 95% confidence intervals built for the different functions of survival, and collected in tables 3-8.

The Balearic region stands out for its low rates of periods of unemployment. For this region survival estimated at 3, 6, 9, 12, 24 and 36 months is significantly lower than the Spanish mean. As illustrative examples we can state that, after the first six months, permanence in unemployment was 50% (Compared to 78% for Spain), whereas, after the first year, this percentage dropped to 18% (52% in Spain). Other regions that also showed permanence in unemployment rates significantly lower than the rest of Spain were Murcia (at 6, 9 and 12 months) and Andalucía (at 12 months).

Regarding the autonomous regions that stand out for their high levels of permanence in unemployment, we should first mention the Euskadi, which showed a survival significantly higher than the rest of Spain at 6, 9, 12, 24 and 36 months (tables 3-8). Moreover, the regions of Galicia and Castilla y León show permanence rates significantly above the Spanish means as from the first nine months (twelve months in the case of Castilla y León). Evidence illustrating the difference in figures shows that, after the first year of looking for work, 72% of Basque women (Euskadi) remained unemployed (63% and 60% in Galicia and Castilla y León, respectively) compared to the 52% previously recorded for Spain.

The results provided in this work show that the spatial dependence factor

plays an important role when trying to explain the differences among unemployment durations computed region by region. This is in accordance with previous research on this topic, as that reported in Bentolila and Dolado (1990) or López-Bazo *et al.* (2002).

As shown in section 3, the methods of estimation used in this study take into account a twofold problem in the data: right censoring and longitudinal bias. In some applications the phenomenon of longitudinal (or length) bias is ignored, which in turn leads to an overestimation of survival. To illustrate this fact, in figure 2 the Kaplan-Meier survival estimator is presented in the case of Spain, alongside the estimator presented in section 3 for this same curve. The figure shows how the Kaplan-Meier method, which does not take the problem of longitudinal bias into account, clearly overestimates the unemployment period. In terms of mean duration of unemployment, the Kaplan-Meier method would estimate this parameter at 66 months, compared to the 20 months provided by the estimation with bias corrected. Of course, the same problem is present in the study of the data at a regional level.

5 Conclusions

The objective pursued in this work is to study the time spent in unemployment in Spain from a regional perspective. We focus on the group of married women because the problem of unemployment in Spain affects women more than men and, within the female group, married women are those that experience longer periods in their situations of unemployment.

The data used in the empirical analysis, obtained from the Spanish Labour Force Survey, show two characteristics that are also common in many other sources that have been used to study the duration of unemployment. These two characteristics are right censoring and longitudinal bias. Ignoring them in the analysis could, potentially, alter the results obtained. On these lines, we propose the use of a new non-parametric statistical tool that enables both problems to be corrected simultaneously.

As regards the results found, they show that the pattern of duration, both in Spain as a whole and at a regional level, experiences a fall in the permanence in unemployment, pronounced at the beginning and at a slower rate as the months of duration advance.

Moreover, the time of permanence in unemployment is not uniform in the autonomous communities, but there are significant differences. On these lines, the Galician woman and Basque woman (Euskadi) are notable for their long periods of unemployment, whereas women from the Balearics are notable for the short duration of their periods of unemployment. Looking further into the possible explanations (structural differences or spatial location, for example) that underlie these divergences observed could be the object of future studies.

It is important to point out that our study shows evidence of the relevance of taking into account the possible longitudinal bias of the data on analyzing the duration of times in unemployment. Regarding this question, the analysis undertaken shows that ignoring this bias, leads to a serious problem of overestimating the survival of the unemployed individuals in their labor situation.

Finally, we mention that any available result on unemployment duration should be taken into account by the regional goverments, in order to get a better understanding of the labour market and to prevent future issues. Several authors have pointed out that there is a negative relationship between earnings and short-run unemployment, while long-term unemployment has no effect in wage determination (Layard, 1987; Manning, 1994). The evidence provided in this paper is useful for distinguishing among long-term and short-run unemployed, since we have estimated the probability of suffering an unemployment spell of a given duration. As we have mentioned before, the incidence of long-term unemployment changes from region to region. There is some hope that the provided results can help to develope appropriated labour policies for the unemployed within each region.

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	Incidence of long-term unemployment	Unemployment rate
Andalucía	46.40%	29.93%
Aragón	56.99%	12.10%
Asturias	69.60%	16.75%
Balearic	19.51%	7.36%
Canarias	37.69%	13.82%
Cantabria	74.30%	17.20%
Castilla y León	61.71%	14.74%
Castilla la Mancha	52.31%	18.94%
Cataluña	58.21%	9.21%
Valencia	48.91%	13.65%
Extremadura	44.41%	32.01%
Galicia	62.42%	16.44%
Madrid	66.70%	11.38%
Murcia	32.32%	14.99%
Navarra	59.56%	8.11%
Euskadi	71.79%	13.92%
La Rioja	60.26%	9.84%

Table1: Incidence of long-term unemployment and unemployment rate for married women in the second quarter of 2001 by autonomous region

	number of data items	percentage of censoring
Spain	12,179	39
Andalucía	2.698	31
Aragón	483	42
Asturias	243	40
Balearic	160	25
Canarias	674	30
Cantabria	224	52
Castilla y León	1,160	41
Castilla la Mancha	672	31
Cataluña	1,228	45
Valencia	1,209	37
Extremadura	650	29
Galicia	1,009	56
Madrid	343	54
Murcia	362	24
Navarra	197	18
Euskadi	686	53
La Rioja	129	60

Table 2: Number of data items and the percentage of censoring by autonomous region

	Level	d_l	d_u
Spain	0.9550	0.9456	0.9645
Andalucía	0.9453	0.9232	0.9638
Aragón	0.9392	0.8827	0.9957
Asturias	0.9490	0.8814	1.0167
Balearic	0.8080	0.6956	0.9204
Canarias	0.9833	0.9604	1.0061
Cantabria	1.0000	0.7859	1.2141
Castilla y León	0.9617	0.9321	0.9913
Castilla la Mancha	0.9816	0.9565	1.0067
Cataluña	0.9581	0.9281	0.9880
Valencia	0.9731	0.9500	0.9961
Extremadura	0.9304	0.8850	0.9758
Galicia	0.9202	0.7713	0.8945
Madrid	0.9720	0.9184	1.0256
Murcia	0.9333	0.8781	0.9886
Navarra	1.0000	0.8205	1.1795
Euskadi	0.9850	0.9560	1.0140
La Rioja	1.0000	0.7002	1.2998

Table 3: Survival function for 3 months.

Note: d_l and d_u are the 95% confidence interval limits

	Level	d_l	d_u
Spain	0.7766	0.7547	0.7845
Andalucía	0.7378	0.7076	0.7680
Aragón	0.8106	0.7345	0.8868
Asturias	0.7032	0.5969	0.8096
Balearic	0.5008	0.3926	0.6089
Canarias	0.7324	0.6732	0.7916
Cantabria	0.8228	0.7094	0.9361
Castilla y León	0.8125	0.7646	0.8608
Castilla la Mancha	0.8030	0.7471	0.8590
Cataluña	0.7411	0.6915	0.7908
Valencia	0.7734	0.7279	0.8166
Extremadura	0.7425	0.6809	0.8041
Galicia	0.8329	0.7713	0.8945
Madrid	0.7982	0.6968	0.8997
Murcia	0.6467	0.5675	0.7259
Navarra	0.7375	0.6385	0.8365
Euskadi	0.8739	0.8113	0.9365
La Rioja	0.8991	0.7680	1.0301

Table 4: Survival function for 6 months.

Note: d_l and d_u are the 95% confidence interval limits

	Level	d_l	d_u
Spain	0.6315	0.6168	0.6463
Andalucía	0.5915	0.5625	0.6205
Aragón	0.6910	0.6139	0.7681
Asturias	0.5461	0.4467	0.6455
Balearic	0.3572	0.2683	0.4461
Canarias	0.5976	0.5404	0.6548
Cantabria	0.7096	0.5903	0.8290
Castilla y León	0.6889	0.6401	0.7378
Castilla la Mancha	0.6526	0.5953	0.7099
Cataluña	0.6081	0.5599	0.6563
Valencia	0.6219	0.5769	0.6669
Extremadura	0.5998	0.5407	0.6589
Galicia	0.7295	0.6668	0.7923
Madrid	0.6763	0.5733	0.7793
Murcia	0.5009	0.4294	0.5724
Navarra	0.5538	0.4598	0.6478
Euskadi	0.7950	0.7276	0.8625
La Rioja	0.6549	0.4938	0.8159

Table 5: Survival function for 9 months.

Note: d_l and d_u are the 95% confidence interval limits

	Level	d_l	d_u
Spain	0.5303	0.5166	0.5441
Andalucía	0.4597	0.4339	0.4854
Aragón	0.5643	0.4921	0.6365
Asturias	0.4527	0.3622	0.5431
Balearic	0.2505	0.1801	0.3208
Canarias	0.4998	0.4469	0.5526
Cantabria	0.6152	0.4991	0.7313
Castilla y León	0.5981	0.5513	0.6450
Castilla la Mancha	0.5513	0.4970	0.6056
Cataluña	0.5208	0.4757	0.5659
Valencia	0.5238	0.4817	0.5658
Extremadura	0.4995	0.4451	0.5539
Galicia	0.6340	0.5736	0.6945
Madrid	0.6225	0.5222	0.7229
Murcia	0.4424	0.3757	0.5091
Navarra	0.4920	0.4030	0.5811
Euskadi	0.7168	0.6488	0.7848
La Rioja	0.5095	0.3585	0.6605

Table 6: Survival function for 12 months.

Note: d_l and d_u are the 95% confidence interval limits

	Level	d_l	d_u
Spain	0.3391	0.3281	0.3501
Andalucía	0.2937	0.2734	0.3140
Aragón	0.3473	0.3900	0.4046
Asturias	0.2293	0.1666	0.2920
Balearic	0.1160	0.0713	0.1607
Canarias	0.2676	0.2293	0.3059
Cantabria	0.3572	0.2648	0.4497
Castilla y León	0.4060	0.3665	0.4454
Castilla la Mancha	0.3421	0.2985	0.3858
Cataluña	0.3116	0.2768	0.3464
Valencia	0.3257	0.2924	0.3590
Extremadura	0.3088	0.2666	0.3551
Galicia	0.4240	0.3736	0.4745
Madrid	0.4344	0.3490	0.5197
Murcia	0.2933	0.2405	0.3461
Navarra	0.3148	0.2440	0.3857
Euskadi	0.4878	0.4271	0.5485
La Rioja	0.3365	0.2105	0.4624

Table 7: Survival function for 24 months.

Note: d_l and d_u are the 95% confidence interval limits

	Level	d_l	d_u
Spain	0.2160	0.2072	0.2247
Andalucía	0.1950	0.1786	0.2114
Aragón	0.2003	0.1565	0.2441
Asturias	0.1486	0.0985	0.1987
Balearic	0.0640	0.0316	0.0964
Canarias	0.1380	0.1106	0.1653
Cantabria	0.3092	0.2226	0.3957
Castilla y León	0.2604	0.2284	0.2923
Castilla la Mancha	0.2025	0.1685	0.2365
Cataluña	0.1887	0.1617	0.2158
Valencia	0.1902	0.1647	0.2157
Extremadura	0.2233	0.1875	0.2590
Galicia	0.2860	0.2442	0.3279
Madrid	0.3176	0.2439	0.3913
Murcia	0.1866	0.1453	0.2280
Navarra	0.2371	0.1758	0.2985
Euskadi	0.3320	0.2781	0.3823
La Rioja	0.2423	0.1340	0.3506

Table 8: Survival function for 36 months.

Note: d_l and d_u are the 95% confidence interval limits

	Mean	Median
Spain	20	14
Andalucía	17	11
Aragón	22	15
Asturias	19	10
Balearic	12	7
Canarias	17	13
Cantabria	28	18
Castilla y León	22	17
Castilla la Mancha	19	15
Cataluña	22	13
Valencia	20	14
Extremadura	17	12
Galicia	30	18
Madrid	29	19
Murcia	14	10
Navarra	14	12
Euskadi	31	24
La Rioja	31	13

Table 9: Mean and Median duration times of unemployment in months

Figure 1. Spanish regions.

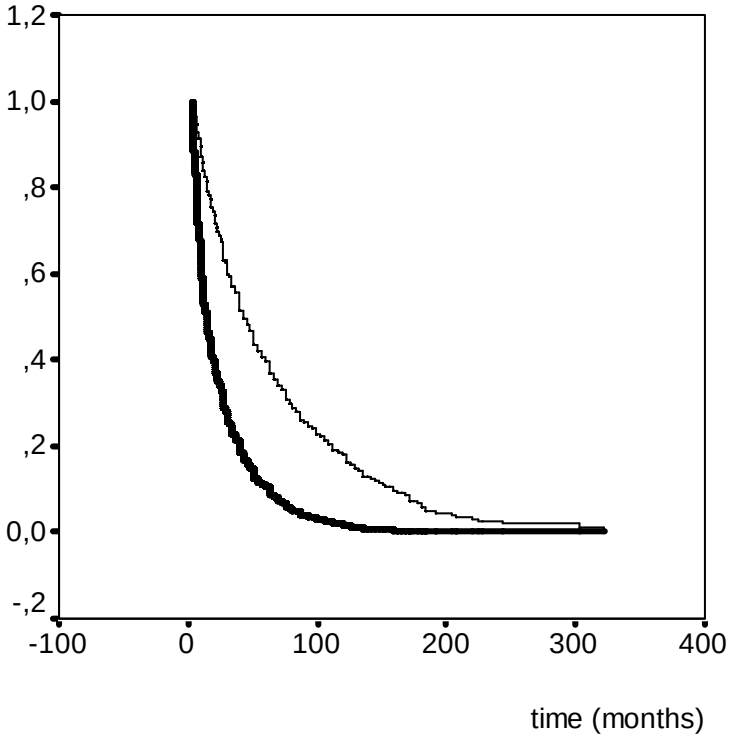

Figure 2. Ordinary Kaplan-Meier survival function (thin line) and correction for length-bias (thick line).

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