



UNIVERSIDAD CARLOS III DE MADRID

working
papers

Working Paper 05-12
Economics Series 05
February 2005

Departamento de Economía
Universidad Carlos III de Madrid
Calle Madrid, 126
28903 Getafe (Spain)
Fax (34) 91 624 98 75

***EVALUATING THE EFFECTS OF LABOUR MARKET REFORMS “AT THE MARGIN”
ON UNEMPLOYMENT AND EMPLOYMENT STABILITY: THE SPANISH CASE****

F. Alfonso Arellano¹

Abstract

This study analyses the effects on unemployment and the quality of employment of the Spanish labour market reform in 2001 for the most important age groups. The content of the reform was based on the implementation of two policies: (i) a new permanent contract with lower firing costs than the ordinary one, and (ii) the reduction of the payroll taxes paid by firms to foster creation/ conversion of/ into permanent contracts. This reform extended to further groups of workers similar measures adopted in a previous reform in 1997. Using a data base of unemployed workers in the region of Madrid from January 1997 up to September 2003, and methods for non-experimental data, the results suggest that, regardless of gender, workers below 30 years are negatively affected by the reform, and workers above 55 years show positive but small effects. The influence of the reform for workers between 45 and 50 years is negligible. As regards education, graduates are more sensitive to the reform than workers with a lower level of education (primary and secondary education).

JEL Codes: J64, J68

Keywords active labour market policy, DID estimation, panel data, permanent employment.

* ***Acknowledgements.*** I would like to thank to César Alonso-Borrego and Juan José Dolado for supervising this work, and Raquel Carrasco and participants of the 7th. IZA Summer School in Labour Economics, of seminar at FEDEA and the 2004 EEA-ESEM meeting in Leganés for very useful comments. Also thanks to Almudena Durán and Antonio Hernando (INEM) for giving to me the data bases used in this work. Financial support from the Predoctoral Fellowship AP2000-0853 of the Spanish Ministry of Education is gratefully acknowledged. The usual disclaimer applies.

¹ **Address for correspondence:** F. Alfonso Arellano. Department of Economics. Universidad Carlos III de Madrid, C/ Madrid, 126, 28093 Getafe, Madrid, Spain. E-mail: farellan@eco.uc3m.es.

1. INTRODUCTION:

Governments spend great amounts of resources, basically from taxes, to develop social programmes and other public activities. The study of these profits and losses plays an important role on the public decision taking. For analytical and policy purposes, the OECD breaks down this spending into so-called *active* and *passive* programmes. The earlier set of measures comprises a wide range of policies aimed at improving the access of unemployed workers to the labour market and jobs, job-related skills and the functioning of the labour market, while the latter consist of income transfers.

Considering the economic situation of each country and the commitments of the European Union Summit Meeting of Luxembourg in December 1997, European governments have introduced several labour market reforms in order to promote employment. The importance of these measures can be shown in Table 1. It presents the expenditures on the main categories of active labour market programmes for several EU countries in 2001. Although Spain dedicates a small amount of resources to these policies (compared to other EU countries), the category with the highest weight with respect to the GDP is the subsidised employment, which represents around 55% of the total active measures and a fifth of the labour market policies. This fact justifies the interest of an analysis of these measures.

In this study, I assess the impact of the Spanish labour reform in 2001 on one of the most representative regions of Spain, Madrid, for the most significant age groups. The last reforms implemented in Spain have been done “at the margin”, that is, several distortions have been included and affect to specific groups of unemployed workers for last six years. These reforms are associated with the active labour market measures and are based on two main policies: a new permanent contract with lower dismissal costs than the ordinary one, and the promotion by reduction of payroll taxes paid by firms to foster creation / conversion of / into permanent contracts.

This work constitutes a complement of previous papers about Spanish labour reforms in 1984, 1994 and 1997, like Jimeno, Kugler and Hernanz (2002), Dolado et al. (2001), Ferreiro and Serrano (2001), and Segura (2001), and new studies of other active labour market policies, for example, Arellano (2003).

The remainder of the paper is organized as follows. Section 2 provides evidence about the institutional framework and evolution of contracts and unemployment in the region of Madrid and Spain and the institutional framework. The theoretical structure and methodology are observed in Section 3. Section 4 describes the sample used in this study and Section 5 presents the results. Finally, Section 6 concludes.

Table 1: Spending on labour market programmes in EU countries, 2001

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Netherlands	Portugal	Spain	Sweden	U.K.
1. Public employment services and administration	0,14	0,17	0,12	0,12	0,18	0,23	0,06	0,26	0,11	0,09	0,23	0,13
2. Labour market training	0,20	0,24	0,85	0,29	0,25	0,34	0,21	0,31	0,15	0,14	0,30	0,05
3. Youth measures	0,03	-	0,10	0,16	0,42	0,09	0,10	0,04	0,22	0,06	0,02	0,15
4. Subsidised employment	0,11	0,77	0,17	0,29	0,37	0,25	0,08	0,38	0,09	0,40	0,24	0,01
-Hiring subsidies	0,06	0,27	0,02	0,15	0,18	0,03	0,05	0,05	0,01	0,25	0,19	0,01
5. Measures for the disabled	0,06	0,12	0,33	0,09	0,09	0,29	0,01	0,58	0,04	0,03	0,31	0,02
Active measures (from 1 to 5)	0,53	1,30	1,56	0,95	1,31	1,20	0,46	1,58	0,61	0,73	1,09	0,36
Passive measures (*)	1,07	2,18	3,00	2,02	1,65	1,92	0,47	1,86	0,90	1,33	1,19	0,56
Labour market policies	1,60	3,48	4,56	2,96	2,96	3,13	0,93	3,44	1,52	2,06	2,28	0,92
Labour market policies for one point of unemployment rate	0,44	0,53	1,06	0,33	0,34	0,40	0,12	1,43	0,37	0,16	0,45	0,18
Active policies for one point of unemployment rate	0,15	0,22	0,36	0,10	0,15	0,15	0,06	0,66	0,15	0,06	0,21	0,07

(*) It includes unemployment benefits and early retirement pensions for labour market reasons.

Source: OECD, Employment perspectives, June 2002

2. EVOLUTION OF THE LABOUR MARKET IN MADRID AND SPAIN:

In order to know the reality of the economies and the labour markets of Spain and the region of Madrid in the last years, I have incorporated information about the Spanish labour legislation since 1997 and the relevant variables since 1998².

The 1997 Spanish labour market reform introduced two important measures to promote the permanent employment, a new permanent contract with lower dismissal costs and the reduction of payroll taxes paid by firms to promote the creation of new permanent contracts from unemployment or the conversion of temporary contracts into permanent ones. Consequently, the duality of the Spanish contract structure between permanent and temporary contracts incorporates a new element. Old permanent contracts are characterized by a severance payment of 20 days' wages per year of job tenure (up to 12 months) in the case of fair dismissals, and 45 days' wages per year of job tenure (up to 42 months) in the case of unfair dismissals. New permanent contracts present the same figures as old ones for fair dismissals, but they allow a reduction of 33 days' wages per year of job tenure (up to 24 months) in the case of unfair dismissals.

With respect to the set of temporary contracts, their main types have been derived from an adaptation and improvement of the so-called Workers' Statute (*Ley del Estatuto de los Trabajadores*) and the subsequent legislation:

Table 2: Main types of temporary contracts

Type of Contract	Purpose	Duration	Applicable groups
Fixed-term project work	Realize certain works or services	Completion of such works or services	All
Seasonal and Casual	Increase firms' production because of market incidental facts	Maximum of 6 months in a year	
Internship	Cover an absent post	Worker's absence period	
Temporary substitute worker	Completing the working day of workers partially retired	Worker's absence period	
Apprentice	Promote young new workers	Between 6 and 24 months	Until 4 years after completion of University degree or medium / high technical college, or workers between 16 and 21 years
Promotion of employment	Help to introduce disabled workers to the labour market	Between 12 and 36 months	Disabled workers

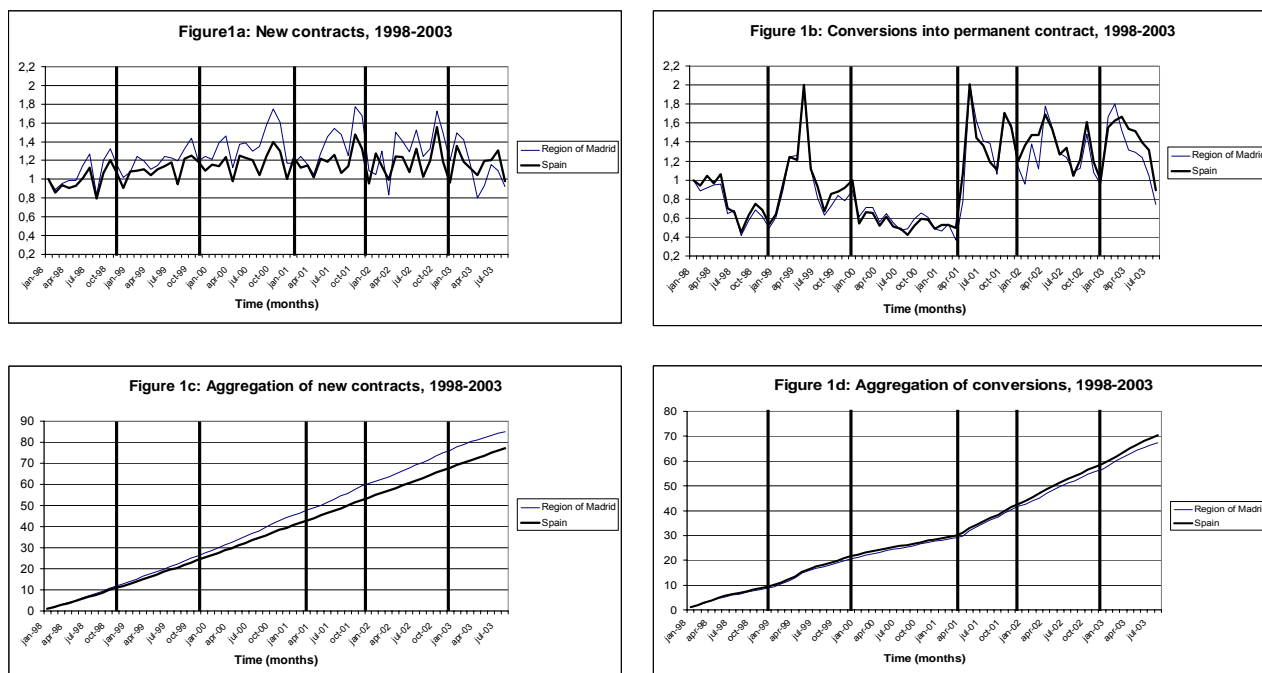
However, these instruments were applied to several groups of disadvantaged unemployed workers and the reductions varied among them. From this reform, the changes of legislation have consisted of movements of the reduction of the payroll taxes and the groups of unemployed workers, and the 2001 labour market reform constituted the most important

² All this information about the labour market since this year is available in the web page of the Spanish Department of Employment (INEM): <http://www.inem.es>.

change of these measures since 1997. The differences for the most representative groups as well as more comments about the legislation are included in Appendix B.

All these changes of legislation tried to improve the quality of employment, among other problems of the Spanish labour market. Figure 1 presents the evolution of new contracts and the conversions of temporary contracts into permanent ones, jointly with their respective aggregations in the region of Madrid and Spain between 1998 and 2003. It is necessary to note that this concept includes all temporary and permanent contracts. Figure 2 introduces the major types of contracts.

Figure 1: Evolution of new contracts and conversions into permanent contracts



Note: All these series are normalized by data of January 1998. The vertical lines indicate the date when the new labour market legislations were introduced between 1998 and 2003: December 1998, December 1999, March and December 2001, and December 2002, respectively

Source: INEM

Apart from seasonal effects with reductions of new contracts in August and increases in October, there does not appear a clear pattern in the evolution of the new contracts after the reforms.

Figure 1 can be divided in two periods. In the first time interval, between January 1998 and December 2001, the evolution of new contracts in Madrid is slightly better than in Spain. Therefore, the difference between both lines widens as it is illustrated in Figure 1c. The second period (January 2002-August 2003) is characterized by the similar behaviour between Madrid and Spain. With respect to the conversions of temporary contracts into permanent ones, the evolution is very similar in the first period, but there exists a slightly better performance in Spain during the second period. It is worth to consider the huge increases of the conversions since January 1999 and March 2001 that change the slope of the line of aggregated conversions clearly in Figure 1d. These two dates incorporate changes in labour market legislation. Moreover, there are seasonal effects both in the evolution of conversions into permanent contracts and new contracts.

The changes of legislation affect the behaviour of the most important types of permanent and temporary contracts (Figure 2). The division between these two periods in Figure 2 is not only justified by the change in the evolution of contracts, but also because a change in the contract typologies took place at the end of 2001 by INEM.

The evolution of new permanent contracts does not show a different pattern until 2001 in Spain. However, differences in the behaviour of permanent contracts arise with respect to the remaining contracts one year earlier in Madrid.

Other important characteristic is the old permanent contracts' behaviour, which is better than the other contracts, especially as the GDP growth decreases since 2001. This fact is compatible with employers' prudence if the worker does not belong to the groups affected by the reforms.

Comparing Figures 1 and 2, a substitution effect can be inferred at least in the second labour market reform, because the increase of the conversions is compensated in part by the decrease of the initial new permanent contracts. A possible explanation is employers' prudence, because they use temporary contracts as a screening device.

In the second period (Figures 2c and 2d), there are not important distinctions among them, and the fluctuations are explained by the seasonal evolution of the Spanish economy³, although there exists also an exhaustion of new permanent contracts at the end of the period.

However, this aggregation may prevent from observing other significant facts, especially when the legislation distinguished among different groups of workers (Appendix B). Therefore, gender and several age groups are also introduced to study the effects of the reforms more profusely⁴.

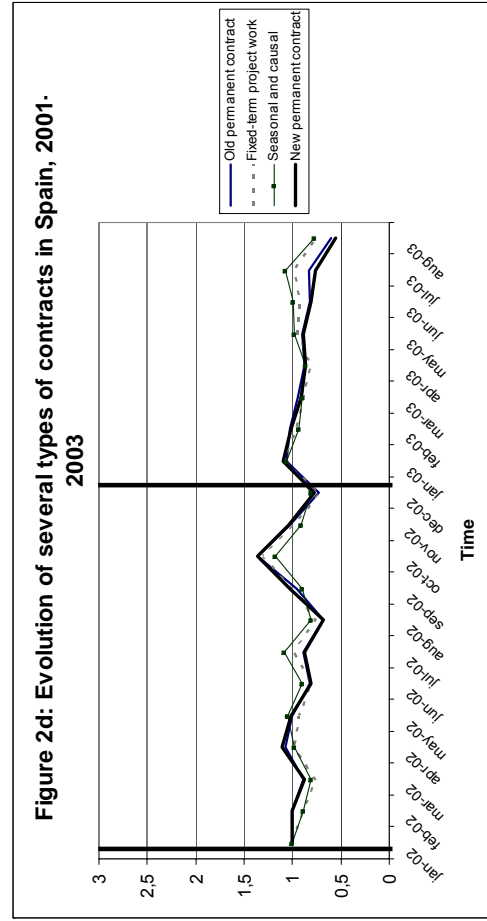
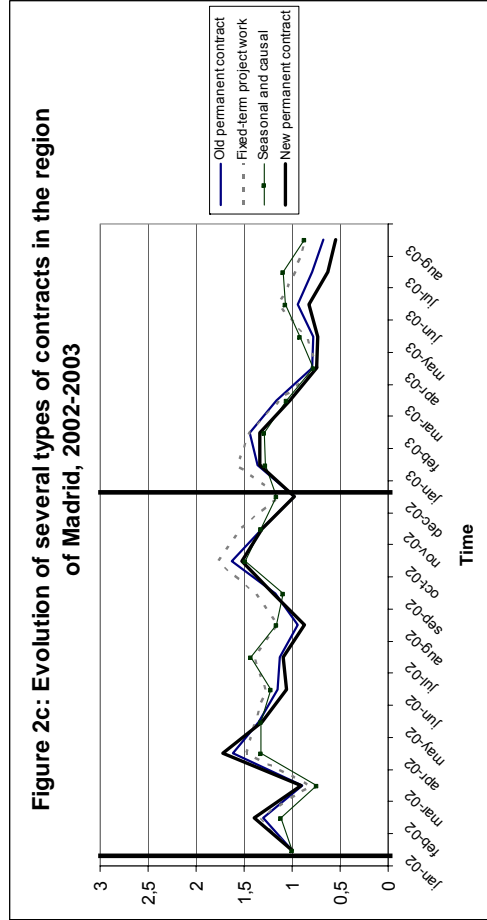
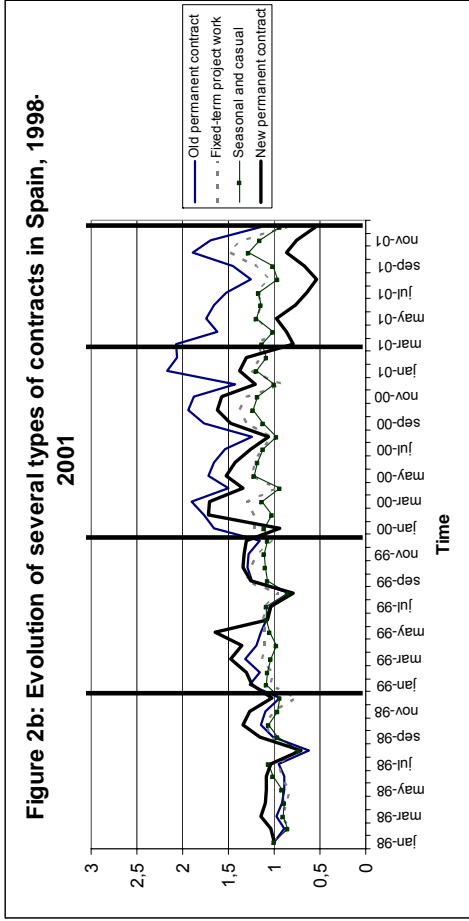
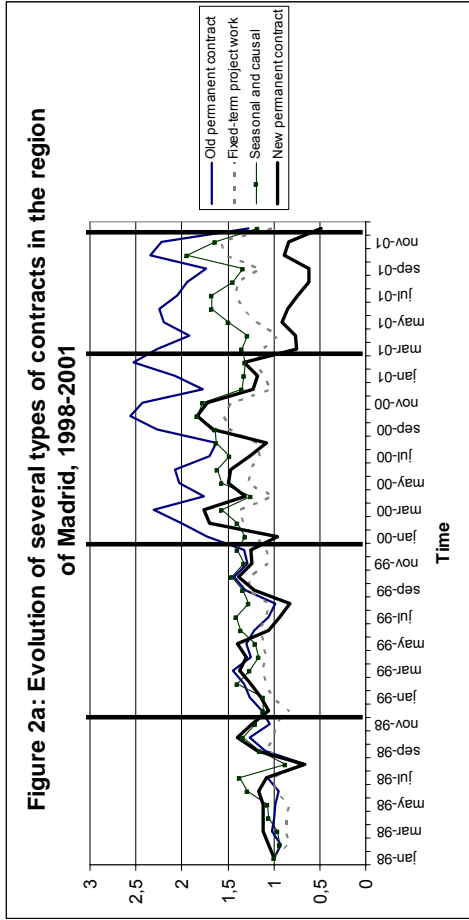
With respect to the composition of the conversions, the two highest peaks of Figure 3a are associated to a different age group. The focus of the change of legislation on some specific group can be also derived. Unlike to the first important value in May 1999 with small differences among the age groups for men, the second maximum in May 2001 indicates the emphasis on the youngest workers. Moreover, the higher the age of the workers is, the less the fluctuations and the amount of the conversions are. Comparing for each age group, men seem to present a better behaviour than women, especially for men below 45 years.

The most important difference between men and women corresponds to the group between 30 and 44 years. This subset is not affected by the reforms in general. For the remaining groups, the differences are smaller because of a favourable behaviour of women compared to men.

³ I insist on the change of definitions as an important explanation of the behaviour among groups in these two periods.

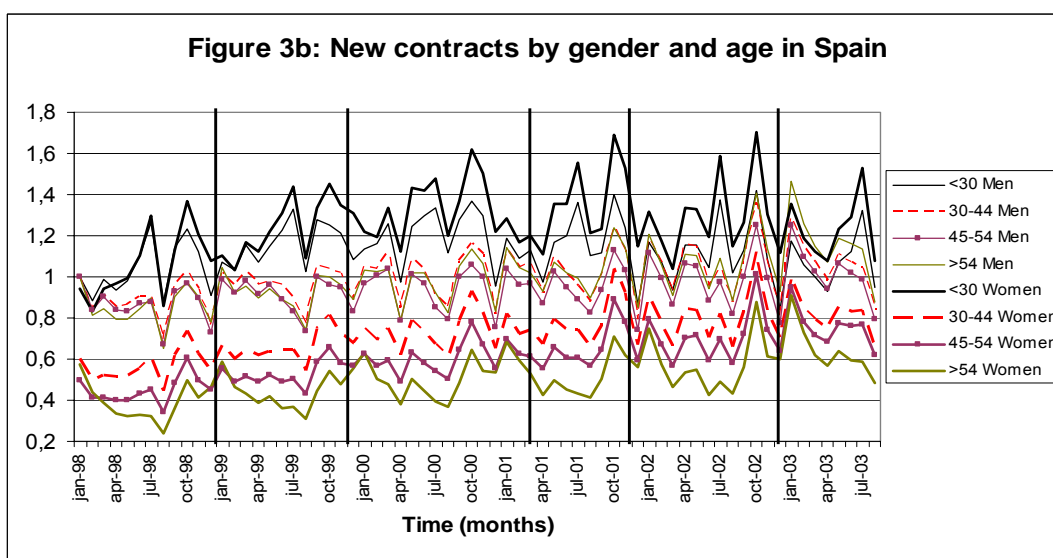
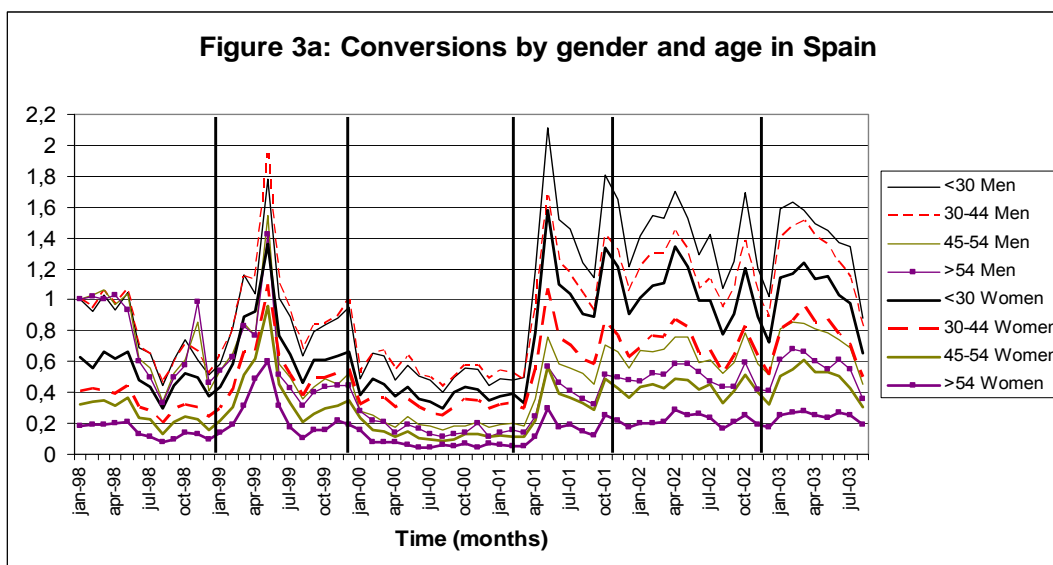
⁴ I only incorporate information of the composition of conversions in Spain because there are not important differences between the region of Madrid and Spain.

Figure 2: Main types of new contracts in the region of Madrid and Spain



Note: Between 1998 and 2001, the normalization is done with respect to January 1998, for the figures between 2002 and 2003 the reference date is January 2002. These figures do not include transformations of temporary contracts into permanent ones or extensions of temporary contracts. The vertical lines indicate the date when the new labour market legislations were introduced between 1998 and 2003: December 1999, March and December 2001, and December 2002, respectively
Source: INEM

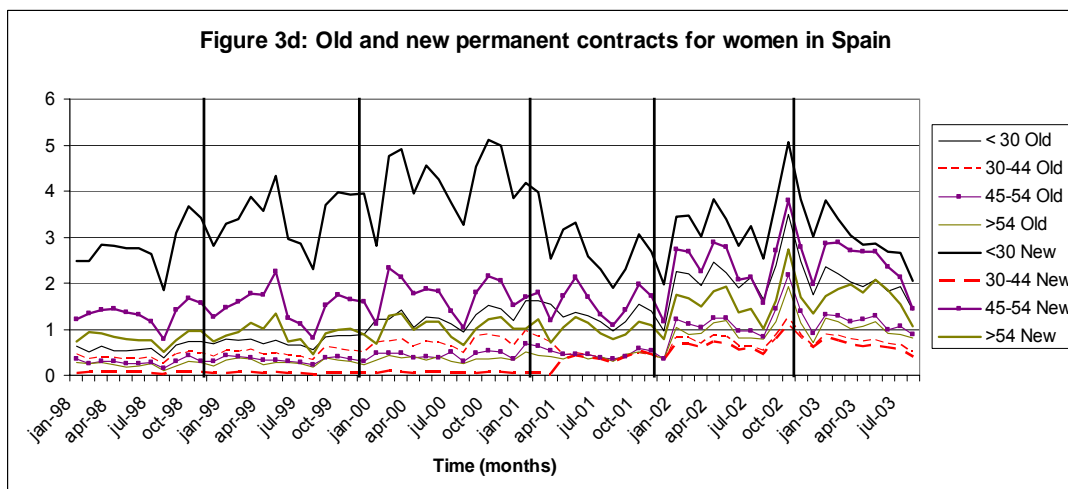
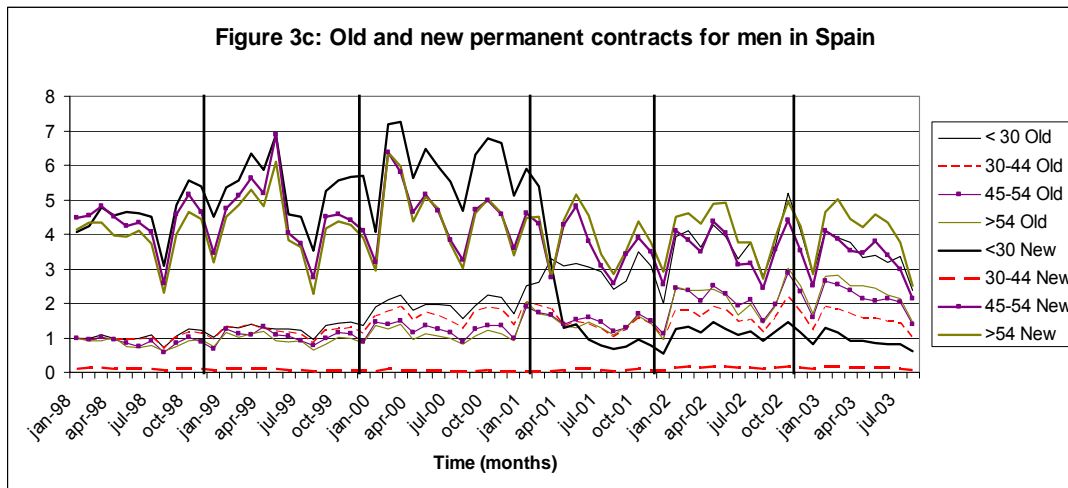
Figure 3: Evolution of conversions and permanent contracts by gender and age in Spain



Note: The reference for these series is the number of conversions and new contracts obtained by men for each age group in January 1998. The vertical lines indicate the date when the new labour market legislations were introduced between 1998 and 2003: December 1998, December 1999, March and December 2001, and December 2002, respectively
Source: INEM

However, from Figure 3b, women below 30 years get more new contracts than men who belong to the same age group, although both sets show small dissimilarities. Comparing among age intervals, the differences among groups for women are higher than for men, but they reduce as time passes. While men's behaviour is approximately constant, women improve during this period. A possible explanation of this fact would be the application of all these labour market measures.

Only new and old permanent contracts (Figures 3c and 3d) are distinguished when age and gender are incorporated to the new contracts. Considering these two figures, the possible existence of effects derived from the reforms may be also observed, especially since March 2001.



Note: These series take as point of reference the number of old permanent contracts for men with each age group in January 1998. The vertical lines indicate the date when the new labour market legislations were introduced between 1998 and 2003: December 1998, December 1999, March and December 2001, and December 2002, respectively
Source: INEM

As can be inferred from Figure 3c, the number of new permanent contracts is higher than old ones at least up to March 2001, except for men between 30 and 44 years, because this group is not included in the labour market reforms. There are small amounts of contracts because some individuals of this group belong to other very specific groups affected by these reforms⁵.

March 2001 legislation introduces a novelty for men below 30 years, because this set of workers was not included in the labour market measures after this month. This restriction implies a substitution effect from new to old permanent contracts. Only for this age group, a revealing increase of old permanent contracts is produced since 2001, and its evolution is similar to the amount of new permanent contracts for workers between 45 and 54 years. For the rest of groups there is a slight increase in all the period, but it is not comparable.

With respect to women (Figure 3d), the decrease of new permanent contracts for those below 30 years is smaller than for men because the former group is still included in the

⁵ There are further details about these groups and how they are affected by the changes of legislation in Appendix B.

labour market measures. An increase of new permanent contracts for women between 30 and 44 years is produced since March 2001 because they were added to the labour market reform. In relative terms, the effect was important; the number of contracts was multiplied by six in the next month (April 2001), and by 18 in October 2002.

Although the main goal of the reforms was the improvement of the employment quality, the unemployment can be positively affected by these reforms. In order to study this possibility, Figure 4 points out this behaviour distinguishing among age, gender and education. The evolution of workers above 54 years is worse than the rest of groups, and it is the unique group whose situation in 1998 is better than in 2003. The evolution was constant up to 2001; an increase of the number of individuals belonging to this group has been produced since this year. Female unemployment explains this fact, because the evolution of unemployed men is stable for all the period; in both cases this age group plays an increasing role in the male and female unemployment. This fact generates that the percentage of workers above 54 years grows from 10% to 17% of the total unemployed workers.

On the contrary, the youngest workers present the best results, because it reduces up to 2001 and afterwards the number of young people maintains constant for women or it grows slightly for men. Hence, the percentage was reduced from 37% to 27%.

The other two groups are intermediate cases of these previous ones. The workers between 45 and 54 years behave more similar to the oldest group (with a percentage increasing from 15% to 18%). The set of individuals between 30 and 44 years decreases up to 2001 but it increases slightly in the second period, so the percentage is quite constant around 37% (the percentage for men is near 32%, and for women around 41%).

The behaviour of percentages is more cyclical in the case of men than women, and their evolutions are clearly associated with the growing importance of women in the labour market. Except for women between 30 and 44 years, there is a convergence of percentages for the rest of groups. A possible explanation to this fact is the existence of a long-run effect of the labour market reforms, because it seems that there are not clear and direct consequences from them whether seasonal and cyclical effects are eliminated.

These percentages and figures are comparable in Madrid and Spain, but the higher the age of the group is, the worse the evolution of the groups from Madrid in comparison with Spain. Hence, Figures 4a and 4b do not indicate an important influence of the reforms on the reduction of unemployment, although the indirect effects can appear in the changes of the unemployment structure.

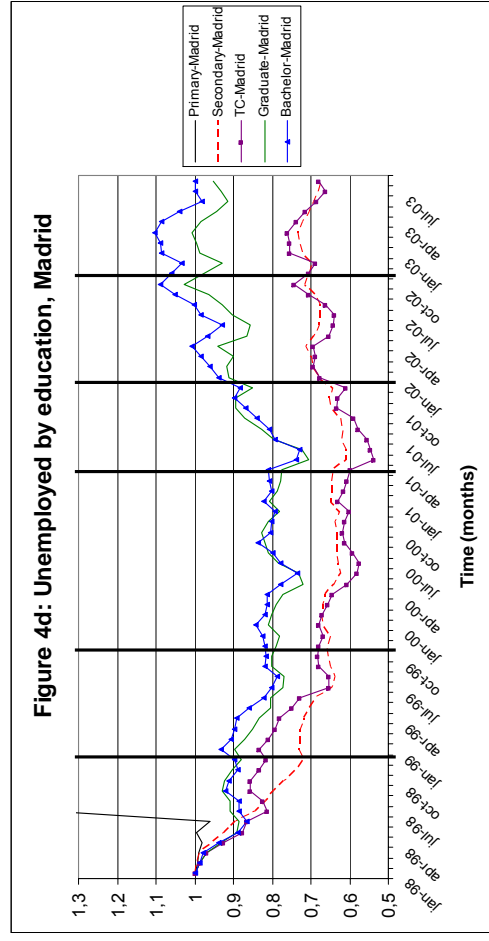
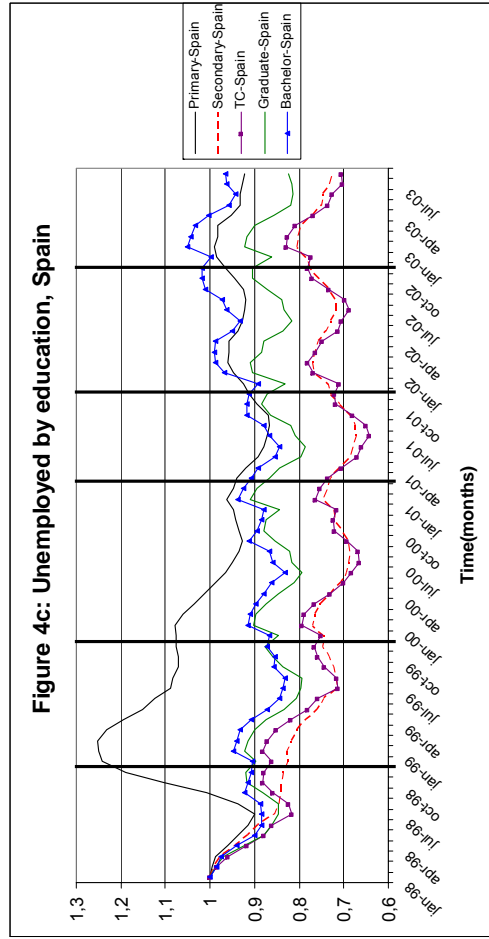
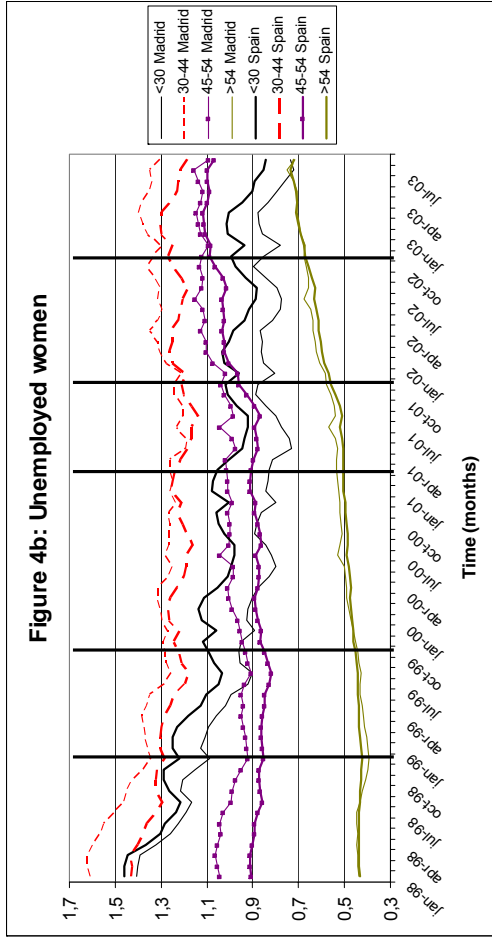
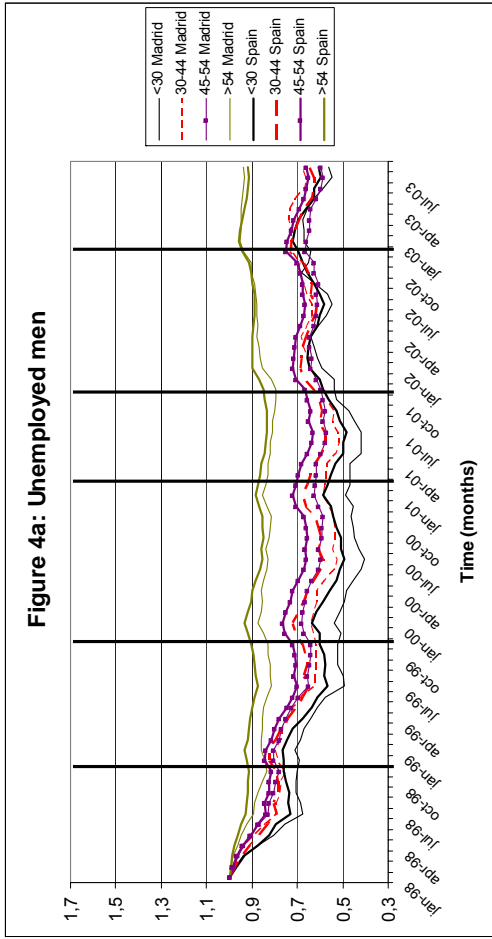
Finally, the education is introduced to study whether the effect of the reforms on unemployment is different among several levels. The workers with primary education present a high value at the end of 1998. The numbers are extremely unusual in Madrid (from one to seven in December 1998, and then it goes down to 2.75 in September 2003), and high between July 1998 and October 2000 in Spain. This is motivated by the initial small number of people belonging to this level.

With respect to the other groups, two subsets can be distinguished: University Education and medium level education (Secondary Education and Technical College –TC–). The differences between these two groups increase since July 1999 in favour of medium level education. The behaviour of workers with university degree is clearly negative since July 2001 in Madrid, due to the reduced growth of its economy. However, in the case of Spain

there is a dichotomy between graduates (with a similar evolution to the case of Madrid) and the rest who behaves better and introduces a significant difference in 2003.

The justifications to these movements are based on the educational structure of the new workers. The percentage of university degree unemployed workers is higher in Madrid than in Spain, but there is an unbalance between the requirements demanded by the firms and the education degree of workers. As in the case of age and gender, the combination of education and unemployment would not seem to show a significant influence of the reforms. Apart from seasonal characteristics of the Spanish economy, the relationship between unemployment and GDP is clear in the period of analysis, because unemployment finishes its downward slide in 2001, when the GDP begins to grow at a rate around 2-3%.

Figure 4: Unemployment by gender, age and education in Madrid and Spain



Note: For Figures 4a and 4b, each group has as reference the number of contracts for the corresponding male age group in January 1998. For Figures 4c and 4d, each education level has as date reference January 1998. The vertical lines indicate the date when new labour market legislations were introduced between 1998 and 2003: December 1998, December 1999, March and December 2001, and December 2002, respectively
Source: INEM

3. IDENTIFICATION STRATEGY AND ESTIMATION METHOD:

The goal of this study is to identify the impact of the 2001 labour market reform on unemployment and the employment quality⁶. Given the great number of observations of the non-experimental data base and the different quantitative and qualitative measures, two different studies can be carried out: a general comparison between workers affected by the reform and the other set of workers, and partial comparisons among the most important groups⁷.

The analysis of the effects of the labour market reform has a limited shelf life, because of the relatively high number of partial changes produced in the period of study. It is obvious that the conclusions from estimates will be derived from short-run results, due to the time limits given rise to the legislation.

As a first approximation in the analysis of the data base, any person is able to occupy one of two mutually exclusive states at the same time, “1” denotes the treated state and “0” denotes the non-treated state. The potential outcome is defined by Y , so Y_{it}^1 is the outcome of individual i in period t whether this worker is affected by the labour market reform (treatment), and Y_{it}^0 in the case of non-treatment. The impact for individual i in period t of the policy is $Y_{it}^1 - Y_{it}^0$. However, this difference is unknown because it is not possible to observe these two terms for the same worker at the same time. This difficulty is called by the fundamental evaluation problem. In this section, this problem will be solved using an alternative and several assumptions that will allow to estimate the effect of the policy measures.

In this case, the treatment group is defined as the set of those workers included in any of the groups affected by the labour reforms. The rest of workers are incorporated into the control group.

The difference-in-difference (DID) estimation is one of the most appropriate methods for this sample, because one pre-programme set and one post-programme set of observations are available. The first assumption to use this process is the condition of equal behaviour of the outcome between the treatment and the control group if the policy is not produced. Therefore, it is necessary to control for some factors, e.g. unobserved individual effects and common macro effects⁸, which constitute a major obstacle to obtain fair estimates.

The treatment effect on the treated is identifiable, but not the population impact, because the unobserved component of the treatment impact enters in the model as a temporary individual-specific effect that determines participation. Other problems which should be controlled in the DID estimation are related with the cyclical effects and the age-specific cyclical effects, as the figures of Section 2 illustrate.

⁶ For further references about the effect of the 1997 labour market reform, see Jimeno, Kugler and Hernanz (2002).

⁷ If the results are similar having multiple control groups or at least there exists a consistency of them, there are good reasons to consider that the effect of the reform is estimated appropriately (Eissa and Leibman, 1996).

⁸ According to Blundell and Costas-Dias (2000), the unobservable effect $U_{it} = \phi_i + \theta_t + \mu_{it}$, where the first term of the sum is the individual-specific effect constant over time, the second is a common macroeconomic effect and the last term is the temporary individual-specific effect.

The possible existence of self-selection could be justified because these measures are not compulsory. Nevertheless, it does not mean an important difficulty in this case. The unemployed workers cannot change, at least easily, decisions in order to belong to the treatment or control group. This decision depends on the Spanish Government's labour market policies and firms' labour needs. Hence, there will be workers who satisfy the conditions established by the legislation but they do not belong to the treatment group, because the firms which hire them are not interested in these incentives.

Associated with these problems, there is a possible substitution effect between workers of the treatment group and those who do not satisfy the conditions of the legislation to belong to a target group, although they have similar characteristics. With respect to the measures of the reforms, if they cover the differential of productivity between treated and non-treated workers, the substitution is not important. Firms might be also affected by this effect because they could have incentives to replace a worker finishing the economic advantages with a new "subsidized" worker. In spite of this fact, there are two reasons to abandon this possibility. First, the application period of the measures is large (at least two years) and usually exceeds the period of analysis. Second, the economic advantages are conditional on the use of permanent contracts. Therefore, the substitution costs are considerable compared to the profits of that decision.

Finally, given that all these measures were introduced in the labour market immediately and the agents could not anticipate to the changes of legislation, the Ashenfelter's dip does not constitute a severe problem.

One possible source of identification is age. Unfortunately, there is an evident risk of having different cohorts in the treatment and control groups. This fact could generate different responsiveness to macroeconomic cycles, affecting the DID estimation. The assumption of independence between the selection into treatment and the temporary individual-specific effect would not be satisfied (both groups would not be subject to the same aggregate labour market trends). For this reason, the study of more specific groups is considered to eliminate this possibility. In conclusion, the fact that the programme is partly age-specific allows to use slightly older people of similar unemployment duration as a natural comparison group⁹. This question should be studied taking into account the possible different idiosyncratic gains from treatment for each age group that distorts the treatment effect (Blundell and Costas-Dias, 2002).

Other source of homogeneity comes from unemployed workers' labour history. The evolution of the contracts registered in INEM between January 1997 and September 2003 is known. There does not exist any indicator to confirm the beginning of the worker's labour history. A good option to overcome this problem of truncation is the use of contract's renewals. When a contract finishes, it is possible to infer if the next contract is a renewal¹⁰. The conversion of a temporary contract into a permanent one is only a subset of all possible renewals. As Ham and Lalonde (1996) point out, the individual labour history from the second new contract will be analyzed in order to avoid distortions in the estimates. However

⁹ For further information about the evaluation problem, see Heckman et al. (1999) and Rubin (1974).

¹⁰ The characterization of a renewal for temporary contracts depends on the economic activity of the new contract and firm's localization. The value of the economic activity is associated to the National Classification of Occupations which is made up of eight digits. The localization depends on the municipality. Therefore, both variables are excellent indicators of the firm's identification. A permanent contract can be perfectly classified as a renewal, because the variable which defines the type of contract incorporates a distinction between new permanent contract and conversion into permanent contract.

this measure implies an important restriction and elimination of observations (around 450,000). A less restrictive alternative is the discrimination of the types of contracts depending on the maximum legal duration. In some cases, the unique possibility is the elimination (Fixed-term project worker, Internship and Temporary substitute worker). For the rest of contracts, a time restriction will be enough to know if the first contract can be accepted or not.

With respect to the outcome variable, this study will pay special attention to the outflows into permanent employment. The absence of wages is not considered in this study as a major problem, because this variable is not included in the goal of these labour market reforms. Nevertheless, the type of contract is available. This variable is the most important reference to determine whether the reforms succeeded or not. The contracts will be divided into two great sets, permanent contracts and temporary contracts. The former group is also divided in two depending on they are renewals or not. The rigidity of the Spanish labour market reflected in the wages implies that the most of adjustments takes place through quantities rather than through prices. Therefore, the outcome variable is a dichotomous variable indicating if the worker gets a permanent or a temporary contract.

The model used to implement the estimation strategy in this case is a probit model:

$$\Pr[e_{it} = 1 | X_{it}, d_i] = \Phi[\alpha_t + \beta' d_i + \gamma' X_{it} + \delta_R(d_i \times R_t) + \delta_E(d_i \times E_t) + \delta_{ER}(d_i \times E_t \times R_t)] \quad (1)$$

where $e_{it} = 1$ if the individual i at time t is employed with a permanent contract and zero otherwise, d_i is a vector of dummies for treated groups representing the treatment variable, α_t is a year effect, X_{it} includes covariates affecting individual i at time t , including quarter dummies and sector and seasonal variables. Specifications that control for age-specific cyclical effects include age group interactions with an expansion dummy E_t introducing the general economic effect; it is equal to 1 if the quarterly economic growth is higher than 3% and 0 otherwise¹¹. R_t is a dummy for reform dates, so that δ , the vector of reform/treatment group interactions, captures the effects of interest. The age-specific cyclical effect is captured by δ_E , δ_R quantifies the influence of the reform on the treatment groups, while δ_{ER} measures the reform impact relative to the expansion.

A worker is assumed to occupy one of three mutually exclusive labour situations: a permanent job, a temporary job and unemployment. The transitions from unemployment / temporary employment to permanent employment will be also analyzed separately. Given the importance of conversions of temporary contracts into permanent ones, two subsets will be created when transitions come from temporary contracts. The selection rule will be the condition of the permanent contract as a renewal of the previous temporary contract or not¹².

In order to estimate the reform's effects correctly, it is necessary to identify a suitable comparison group. Considering the data base, women between 30 and 44 years will be used as a natural control group to compare with women below 30 years and above 45 years. It would not be correct to use men between 30 and 44 years, because middle-aged men have different labour conditions to women of the same age group. Using a similar argument, men

¹¹ A continuous economic growth was produced between 1997 and 2003. The possibility to distinguish among terms from the general economic point of view is the separation between high and low economic growths, establishing the limit in 3%.

¹² It is possible to make this distinction thanks to the elimination of observations done because of truncation.

between 30 and 44 years constitute a control group for men below 30 years and above 45 years. This selection is one of the reasons to explain the application of these reforms to specific groups (Table 3).

Given the large number of observations, these age groups will be reduced in order to balance the difference between groups with similar behaviour and characteristics¹³. Workers between 25 and 30 years will be compared with those between 31 and 35 years, and workers between 40 and 44 years with other people between 45 and 50 years.

Finally, no treatment group may be comparable with other one, because the measure for each group is quantitatively different. A possible alternative involves conditioning on the observable characteristics, assuming that the differences among groups are only limited to the measure (lack of unobserved heterogeneity).

Table 3: The measures for the treatment and control groups

		Before the 2001 reform		The 2001 reform	
		Reduction payroll taxes (%)	New permanent contract	Reduction payroll taxes (%)	New permanent contract
MEN	Workers < 30 years	20	YES	0	YES
	Workers \in [30, 45) years	0	NO	0	NO
	Workers \in [45, 55) years	50 (1st year) 45 (thereafter)	YES	50 (1st year) 45 (2nd year)	YES
	Workers \geq 55 years	51 (1st year) 45 (thereafter)	YES	55 (1st year) 50 (2nd year)	YES
WOMEN	Workers < 30 years	20	YES	25	YES
	Workers \in [30, 45) years	0	NO	25	NO
	Workers \in [45, 55) years	50 (1st year) 45 (thereafter)	YES	50 (1st year) 45 (2nd year)	YES
	Workers \geq 55 years	51 (1st year) 45 (thereafter)	YES	55 (1st year) 50 (2nd year)	YES

¹³ These limitations manage to satisfy the assumption of common aggregate labour market trends for treatment and control groups.

4. DESCRIPTION OF THE SAMPLE:

The data bases used in this study were provided by INEM. On one hand, the first data set includes all the workers with active labour demand at the end of several months in the region of Madrid. Any individual who appears in these files presents multiple personal characteristics, resumed in Appendix A. On the other hand, those contracts generated in the region of Madrid between January 2000 and December 2001 are also available¹⁴. All the information about how the workers are affected by the laws is also presented in this data base.

Several reasons can justify the use of all the population of contracts generated in Madrid versus a random sample of Spain. Madrid is a centripetal region in terms of (net) jobs, because it is one of the most dynamical and richest regions of Spain, so there are not high external effects from other regions that affect contracts. Moreover, this region is representative of the Spanish economy, and it is one of the regions which generate an important part of the total employment and GDP (around 17% in 2001). In terms of new contracts, the participation of Madrid in the total number varies around 9% and 16%. This percentage increases in the case of conversions into permanent contracts to the range 13% - 22%.

Finally, all the groups included in the labour market reforms may be studied. This option is not possible if a random sample for Spain is considered, unless the sample is very large. However, as was commented in the previous section, it is necessary to introduce a major degree of homogeneity in the sample. Some groups are not included in the final sample:

- Migrants.
- Disabled people.
- Workers in very difficult economic and social situation.
- Any worker who is not unemployed. The purpose of getting a job is known, so any individual with active labour demand who desires a second employment or prefers to change his job is eliminated from the sample¹⁵.
- Workers above 65 years.

The final sample used in this study includes 1,797,555 contracts for 430,981 Spanish workers (not only people from Madrid, but also from other regions). With respect to the variables, the tables of Appendix C present descriptive statistics when the workers appear the first time in the sample. As may be deduced from the comments of Section 2, the tables divide men from women. Four age groups are also considered due to the arguments of Section 3.

Considering the entire sample (Table C1), there are some important differences among the age groups. Education level is negatively related to age. The percentage of workers with Primary and Secondary Education is smaller for the older group than for the younger group.

¹⁴ These time intervals were imposed by the author because of legislation (see Figure B1 in Appendix B), because the data base has information about contracts from January 1997 to September 2003.

¹⁵ Any worker who belongs to the treatment group must be unemployed, but the rest of workers could be non-unemployed (workers with more than one job or workers seeking a better job). In order to homogenize the sample, all these workers are eliminated.

The small weight of the older workers is compensated by the increase of their percentage in the lowest education levels. The previous conclusion can also be extended to any kind of knowledge, because there is an inverse relationship between the percentage of workers who know English and age.

Data show the correlation between the civil status and the age groups. The predominance of single status over marriage diminishes when the youngest workers are compared to the oldest ones.

The effect of age on the probability to get any kind of benefit is perfectly justified, given the relationship between the right to get benefits and the number of years the individual works. Partially related to benefits, there exists a positive influence of age on the number of months with active labour demand.

The differences among the age groups about the economic activity of the last job are studied are influenced by previous variables. Older workers' last job is usually related to Construction and Hotel/Catering business. The weight of younger people without previous job is higher, and they prefer to get jobs associated with the Service Sector.

These comments confirm the need for estimating several models to each age group in order to obtain appropriate results. The choice of the control group depends basically on the similarities to the corresponding treatment group, so the age differences between each group will be as small as possible.

Regarding to the distinction between men and women (Tables C2 and C3), the education level of younger men is usually low compared to younger women. This relationship is the opposite for older groups. Something similar occurs when idioms are considered. The weight of younger men who do not know other idiom is higher than the corresponding female case. But these latter differences become insignificant when age increases.

With respect to civil status, the most important differences appear in the interval between 30 and 44 years, indicating that men marry later in life than women. However, the percentage of men who do not marry is smaller than in the case of women for older workers.

There are not important differences in terms of benefits for the youngest workers, the percentage of women who do not receive any benefit decreases slower and it is maintained around 50% as age raises, while the percentage for men is around 30%. This result can be justified by the higher participation of older men in the labour market. This explanation and the difficulty in getting a job, as can be observed in the number of months of active labour demand, can argue the focus of the labour market reforms on women.

The economic activity selected as first option to get a job presents also important peculiarities. The most popular options for women are jobs related to Non-skilled Workers¹⁶, Restaurant Workers, Protection and Sellers, and White-collar Workers. Men prefer jobs related to Construction and Industry. The previous difference is connected to the labour history of each group. Finally, the percentage of women getting a permanent contract as first job is slightly higher than men only for the younger groups. This fact can constitute a consequence of the labour market measures.

¹⁶ The exception is the group of youngest workers. This result can be associated to the low education level of men, which increases the possibility to choose this option.

5. RESULTS OF THE IMPACT OF THE 2001 LABOUR MARKET REFORM:

Using equation (1), a model is estimated for men and women because of the differences between them. Probit marginal effects of the most important variables appear in tables of Appendix D. The conclusions have to be considered taking into account that the legislation previous to the 2001 labour market reform was not the 1997 reform but a modification incorporated in the 1999 State Budget Law (Appendix B).

The definition of each group depends on the use of the full sample or a restrictive version. In the first case, the treatment group is constituted by unemployed workers below 30 years, between 45 and 54, and between 55 and 65 years. The control group are those unemployed workers between 30 and 45 years. Because these groups show significant variety in some characteristics (Section 4), restricted age groups are applied. Three different set of workers can be analyzed: workers between 25 and 35 years where the age limit is 30 years, and workers between 40 and 44 years will be compared to two other groups, between 45 and 50 years and between 55 and 60 years.

Other piece of advice from the previous sections is the complexity to obtain general common results. Apart from the dissimilarities among age groups, the results depend crucially on the differences of measures between each treatment and control group, before and after the reform (Table 3). For each gender, the estimates can be compared among transitions for the same treatment and control groups, and between the two oldest groups, because they share the same control group. With respect to women, the conclusions are more complicated. The control groups also suffer changes, so the comments have to focus on the net effects of the measures.

The control variables used to estimate the marginal effects in the models are defined in Appendix A. An additional distinction among education levels is introduced to analyze the possible dissimilarities in the labour measures' effects. In order to avoid a great amount of estimates for each level, the three most representative education levels were selected. Comparing them, there are not important differences in estimates' signs and their corresponding tests. The estimates are usually similar between Primary and Secondary Education and lower in absolute value than University Education's estimates.

When the origin of the transition to a permanent contract is not distinguished, the marginal effect captures the change in the permanent employment probability of the treatment group with respect to the control group. The estimates show statistically significant effects, and higher for men between 45 and 54 years than for the other treatment groups. The permanent employment probability increases at least by 0.0616 for the former group, by more than 0.0403 for the youngest group and 0.386 for the oldest one. In the case of women, the estimates present greater values between the target groups and the comparison group.

As Table D1 shows, any of the estimates derived from the product of the treatment, the reform and the expansion dummy variables is negative and highly significant for men above 45 years. The reform can be understood as an instrument to reduce the fluctuations of the permanent employment supply for older men. The number of new permanent contracts is positively correlated with a high economic growth, as the estimates of the target groups and the expansion dummy variable present. In these economic situations, the decision to generate a permanent contract to these workers depends on sector and firm's conditions. When the

economic growth is small, there is a high uncertainty about the economic future. New factors play an increasing role to create new permanent employment, e.g. marginal changes in labour market legislation.

The effect is usually positive and significant whether the workers below 30 years are studied for the entire sample. But the effect is small and loses its importance if the sample is limited to the restricted age groups. In this case, the reform could stimulate the creation of permanent contracts for younger workers to avoid the abuse of temporary contracts. Firms would try to increase the labour supply partly with temporary contracts in expansions as a precaution against future depressions. This non-linear effect is not very important for women. Those estimates which are slightly significant confirm the countercyclical effect of the reform for the treatment groups.

Although the youngest men can get a permanent contract earlier than the medium-aged workers, the reform does not help this age group. Fortunately, this effect is compensated by the economic expansion's influence on this group. This result is consistent with the new measures affecting to this group. This reform eliminates the reduction of the payroll taxes paid by firms, although they still belong to those workers who can be hired using the new permanent contract (Table 3). Given that the control group does not suffer any change of legislation, the expected effect of these measures on the treatment group coincides with the estimates.

This previous conclusion is very similar to young women, because the reform also presents negative estimates for this age group. Nevertheless, these groups are affected in a different way by the reform. The measures are common in terms of percentages for the treatment and control groups, although only women below 30 years can get the new permanent contract (Table 3). The expected effect is also negative and the reform generates a similar influence for the two groups below 30 years, but the measures are different.

The belonging to the older age groups generates slightly better results. The influence of the reform is not very significant and the expansion achieves further beneficial effects. This latter estimate is compensated by the value obtained from the combination of expansion, reform and treatment dummy variables. Hence, the older groups suffer negligible changes of their conditions in this reform.

The change of the measures for older women is identical to men for the treatment groups; but the control group is included in the reform. Firms can get a reduction of payroll taxes similar to the youngest women if they are hired using a permanent contract. In spite of this fact, the net effects of older women are similar to men. The combination of the reform, expansion and treatment generates negative and not very significant estimates. The positive influence of the expansion is smaller and the effect of the reform is slightly negative.

Focusing on the results from the restricted age groups, the qualitative conclusions are alike to the final sample, although the effects are usually smaller. However, workers above 55 years show higher estimates than those between 45 and 50 years, which is expected given the measures of those groups (Table 3).

All these results may infer the small effectiveness of the reform and the usefulness of distinguishing among different sub-samples. A complementary explanation to these estimates is the low differences of productivity between these treatment and control groups

which are not compensated by incentives to firms. The reform would not constitute a good instrument to select unemployed workers belonging to the treatment groups.

Transitions to permanent employment:

After estimating the transition from any labour situation to permanent employment, it is convenient to distinguish between two initial situations, unemployment and temporary employment. The transition from temporary to permanent employment includes an especial case, when the permanent contract constitutes a renewal of the previous temporary contract. This situation will be also analysed dividing this latter transition into conversions and non-conversions.

Table D2 reports probit marginal effects for transitions from unemployment to permanent employment. In this case, the dependent variable only takes value 1 if the transition comes from unemployment to permanent employment. The variables used in the models are the same as in the previous subsection. Although the signs of the significant estimates are identical to Table D1, these values are lower in absolute value. This result indicates the small influence of the reform and the economic expansion on this transition in comparison with the general case. The net effect of the significant variables is better for men, regardless of the sample used. Only the product of treatment, expansion and reform generates worse estimates for men than for women.

When the restricted age groups are introduced in the model, the effects for men above 55 years are more important than men between 45 and 50 years, which confirm the expected results from the measures. This conclusion is also common to the older women. The estimates are higher in absolute value for the former group, although the influence of the reform is insignificant. Regarding to younger workers, this group is more probable to get a permanent contract earlier than their control group. The economic expansion also helps their incorporation to the labour market, but the effect of the reform is negative.

With respect to the conversions of temporary contracts into permanent ones (Table D3), the results for the final sample are worse to previous ones, especially for women. The effects of the variables are not significant at most for any of the age groups. Only the dummy variables for age intervals are significant and positive except for men between 45 and 54 years. Only men between 45 and 54 years obtain good results, but this estimate is compensated by the negative figure of the interaction of the expansion with the reform dummy variable.

For the restricted age groups, the effect of the reform for men above 45 years is negative in economic expansions. This influence intensifies as age increases. Nevertheless, it is compensated by the positive and significant effect of the expansion dummy. When the youngest workers are compared, the effect of the reform is negligible, but the economic expansion does not generate good effects on them.

In the case of women, estimates confirm the negative outcome of the reform and the expansion on the youngest group, and the small efficacy on the older groups, more important for women above 55 years.

Finally, the effect of the 2001 labour market reform on the transitions from temporary employment to permanent employment excluding conversions is presented in Table D4. Unlike the previous transition, there are more significant effects of the variables for men and women. In general, the estimates show similar qualitative results when the final sample is used, although the estimates are smaller. In the case of women, they are slightly worse.

With the restricted age groups, the qualitative conclusions are common to men and women, although the latter group shows positive and significant estimates for the age groups' dummy variables. Workers below 30 years obtain negative estimates from the reform. They are compensated by the expansion dummy variable and the combination of this latter variable with the reform dummy variable. Older groups suffer a bad influence from the expansion, and the reform is ineffective for them. Distinguishing between them, workers above 55 years show higher results in absolute value than workers between 45 and 50 years, as occurred in other transitions.

6. CONCLUSIONS:

This study analyses the effect of the Spanish labour market reform in 2001 using a sample of unemployed workers in the region of Madrid. Apart from the theoretical importance of permanent employment in firms' productivity and innovation, these labour market reforms try to generate positive effects on workers who have important difficulties to get a permanent contract. The reform's measures are concentrated on the reduction of payroll taxes paid by firms and a permanent contract with lower firing costs. This reform, which can be classified as "carrot" of job assistant, is called "at the margin" because their measures are available only for some specific groups.

The initial figures suggest that the effects of the labour market reform are concentrated on the composition of employment, not on the reduction of unemployment. The results from the DID estimator confirm partly this idea when the transition from temporary to permanent employment excluding conversions are studied. Firms may prefer to generate new permanent contracts instead of transforming temporary contracts into permanent ones if there is a clear economic expansion. The estimates suggest nevertheless that the reform does not constitute a powerful instrument to change temporary contracts into permanent contracts.

In terms of policy implications and considering the goal of the reform to reduce the disadvantages of women with respect to men, it is very difficult to derive an evident conclusion about this topic. The results indicate that there are not dissimilarities in the effects between men and women.

The 2001 reform does not imply important changes compared to the previous situation as the last labour market reform meant in 1997. The estimates of workers above 55 years are consistent, because they are usually positive and small.

With respect to men, workers between 45 and 54 years belong to the treatment groups but they do not suffer any change in their measures in comparison to the 1999 State Budget Law. Their corresponding control group is not included in the reform. Therefore, the expected effect is negligible¹⁷. The results confirm this idea and the assumptions made on the comparability on these groups are valid.

Workers below 30 years are more sensitive to the reforms due to the more important and significant estimates. The effect of the reform on these groups is negative, regardless of the gender and in spite of the dissimilar measures between men and women for treatment and control groups.

In general, these estimates are not in conflict with the figures of Section 2, because the measures between specific treatment and control groups are analyzed in these models. The figures show general age groups, without any other distinction.

With respect to education, graduate workers show a higher sensibility to the reform than those less educated workers. In consequence, it would be interesting to introduce differences among education levels depending on the policy objectives.

¹⁷ There exists a difference in terms of duration, which is common to this treatment group and the oldest one, as can be observed when Table B4 is compared to Table B5. However, the time interval between the beginning of the reform and the next change in legislation is smaller than two years, as occurred in previous reforms, so the influence of this topic on the estimates is supposed to be inappreciable.

REFERENCES:

- All the Laws and Royal Decrees (only Spanish version) can be obtained from www.boe.es or www.noticias.juridicas.com.
- Arellano, A. (2003), Do training programmes get the unemployed back to work? : A look at the Spanish experience, mimeo.
- Blundell, R. and M. Costas-Dias (2000), Evaluation methods for non-experimental data, *Fiscal Studies*, Vol. 21, N° 4: 427-468.
- Blundell, R. and M. Costas-Dias (2002), Alternative approaches to evaluation in empirical microeconomics, *Portuguese Economic Journal*, Vol. 1, N° 2: 91-116.
- Blundell, R., M. Costas-Dias, C. Meghir and J. Van Reenen (2001), Evaluating the employment impact of a mandatory job search program. IFS working paper W01/20.
- Dolado, J. J., G. García-Serrano and J. F. Jimeno (2002), Drawing lessons from the boom of temporary jobs in Spain, *The Economic Journal*, Vol. 112, N° 480: 270-295.
- Eissa, N. and J. B. Leibman (1996), Labour supply response to the earned income tax credit, *The Quarterly Journal of Economics*, Vol. 111, N° 2: 605-637.
- Ham, J. C. and R. J. Lalonde (1996), The Effect of Sample Selection and Initial Conditions in Duration Models: Evidence from Experimental Data on Training, *Econometrica*, Vol. 64: 175-205.
- Heckman, J. J., R. J. Lalonde and J. A. Smith (1999), The Economics and Econometrics of Active Labor Market Programs, in Ashenfelter A. and D. Card (eds.) *Handbook of Labor Economics*, Volume 3, Elsevier, Amsterdam.
- Ferreiro, J. and F. Serrano (2001), The Spanish labour market: reforms and consequences, *International Review of Applied Economics*, Vol.15, N° 1.
- Kugler, A., J. F. Jimeno and V. Hernanz (2002), Employment consequences of restrictive permanent contracts: evidence from Spanish labor market reforms, *IZA Discussion Paper*, N° 657.
- Rubin, D.B. (1974), Estimating causal effects of treatments in randomized and nonrandomized studies, *Journal of Educational Psychology*, 66: 688-701.
- Segura, J. (2001), La reforma del mercado de trabajo español: un panorama, *Revista de Economía Aplicada*, Vol. 9.

Appendix A: Variable descriptions.

In order to distinguish between original variables and transformed ones, we used the letter *X*. For example, *levestu* is an original variable that takes values between 0 and 9, and *levestuX* is a transformed dummy variable that takes value one if *levestu* = *X* and zero otherwise.

1. *woman* is a dummy variable equals 1 if the worker is female.
2. *age* is a variable which takes values from 18 to 65 years old.
3. *levestuX* is a group of dummy variables that adopts value one if the level of studies of the individual is *X*, where *X* may be:

- 0 → No education
- 1 → Pre-Primary education without certificate
- 2 → Pre-Primary education with certificate
- 3 → Basic Technical College
- 4 → Primary education
- 5 → Medium Technical College
- 6 → Secondary education
- 7 → Superior Technical College
- 8 → Graduate (3 years)
- 9 → Graduate (more than 3 years)

4. *benefitX* is a set of dummy variables indicating if an individual has some benefit. *X* indicates which kind of benefit may be:

- 0 → the individual does not receive any help
- 1 → the individual receives benefits
- 2 → the individual receives any subsidy except for worker above 52 years or related to Agriculture
- 3 → the individual receives a subsidy for worker above 52 years
- 4 → the help has been disappeared by any reason

5. *madrid* is a dummy variable indicating if the worker's residence belongs to this region.

6. *groupX* is a set of dummy variables considering different economic activities in which people desire to work as their first preference. These variables follow the ten Big Groups of the National Classification of Occupations (CNO-94):

- 0 → Armed Forces
- 1 → Management and Public Administrations
- 2 → Technicians, professionals, scientists and intellectuals
- 3 → Support technicians and professionals
- 4 → White-collar workers
- 5 → Restaurant workers, protection and sellers

- 6 → Skilled workers in farming and fishing
- 7 → Workers in factory industry, construction and mining
- 8 → Operators of installations and machinery, and assemblers
- 9 → Non-skilled workers

7. *dmonth* defines the number of months that a worker has maintained the active labour demand continuously.
8. Some dummy variables related to civil status are introduced: *single*, *married*, *widowed*, *divorced*.
9. There are dummy variables indicating whether the worker knows other languages: *English*, *French*, *German*, *Catalan*, *Galician*, *Basque*, *Valencian* and other European (*European*) and non-European (*othlan*) languages.
10. There are several dummy variables which denote the economic activity of the previous job if it existed:

- Agrfish → Agriculture and Fishing
- Indust → Industry and Energy
- Constr → Construction
- Commer → Commerce
- Cater → Hotel and Catering Business
- Transp → Transports
- Finan → Finance Services
- Estate → Estate Activities
- Pubadm → Public Administration
- Educat → Education
- Health → Health
- Othser → Other Activities

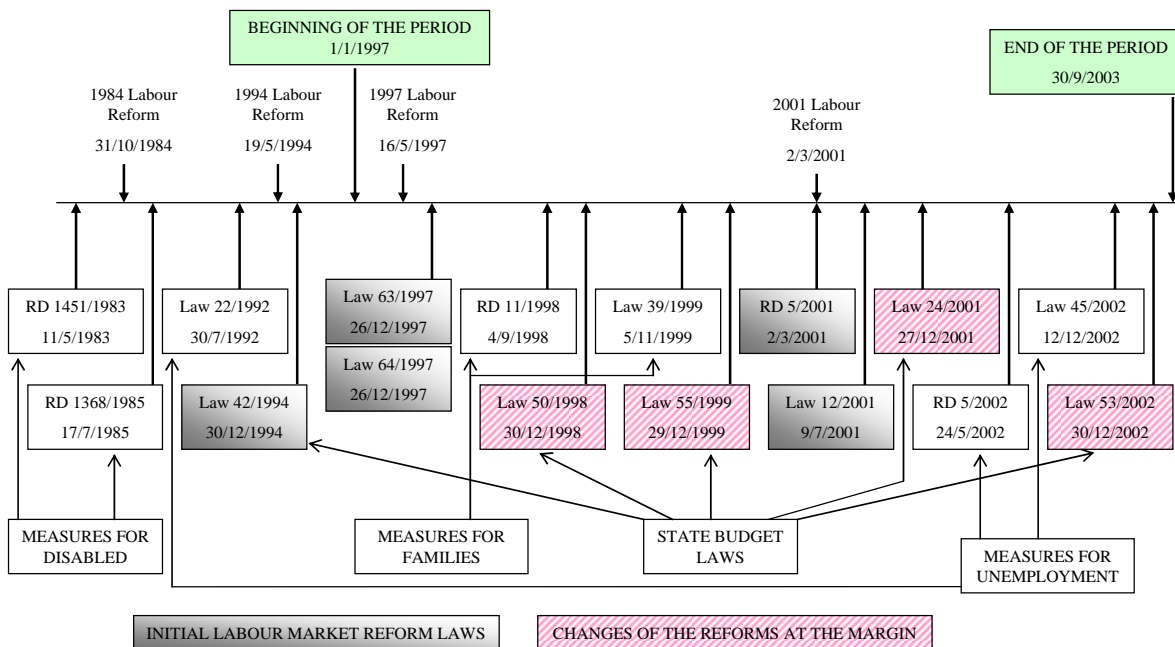
11. Finally, there are dummy variables for each year, month, day of the week and the first day of the month, due to the evolution of contracts.

Appendix B: Spanish Legislation affecting the sample

The labour legislation presents two basic structures: Royal Decrees and Laws. The Royal Decree (RD) is incorporated to the Legislation by the Government immediately. It is necessary to be approved by the Parliament and transformed into a Law in any case. This process was thought to introduce important and urgent measures, to avoid behaviour distortions while the Parliament approved the corresponding Law. Unfortunately, it is frequently used when a party constitutes absolute majority in the Parliament. The reference of these instruments is divided into two numbers. The second one indicates the year of creation, and the first one indicates the order of generation among the other RDs and Laws in the corresponding year.

Figure B1 shows the recent evolution of the legislation, distinguishing among measures which constitute a labour reform, partial changes of the initial reforms and other initiatives.

Figure B1: Evolution of the Spanish Legislation between 1997 and 2003



The first important measure adopted was RD 1451/1983, which establishes labour measures for disabled workers. The firms which hire a disabled worker with a permanent contract received 3906.58 € and a reduction of payroll taxes paid by firms of 70 % if the worker was below 45 years, otherwise the percentage was 90 %. The upper limit of amount of money received was the 60 % of annual salary cost.

Complementary to this measure, RD 1368/1985 introduced the legislation for disabled people who worked at Special Employment Centres (“Centros Especiales de Empleo”). Only people with a disability degree above 33% could work at these centres, and the economic help was the same as in the previous RD.

After the implementation of the 1994 labour market reform (Law 10/1994), Law 42/1994 included modifications of the legislation for permanent and temporary disability, and maternity. It also allowed part-time contracts as well as temporary contracts for some

unfavourable groups: long-run unemployed workers¹⁸, people above 45 years and disabled workers. The reduction of the payroll taxes paid by firms for a maximum period of three years depends on the number of workers of the firm, as Table B1 shows.

SEE TABLE B1

If these temporary contracts were transformed into permanent ones, then the firm would receive incentives (money and reduction of the payroll taxes for all the duration of the contract), according to Law 22/1992:

SEE TABLE B2

Law 63/1997 and Law 64/1997 contain the Spanish labour reform in 1997 in order to improve the labour market and incentive permanent contracts for specific groups of unemployed workers. The first Law introduced changes in Workers' Statute, like a new work-experience contract dedicated to workers with university degree or a high Technical College degree and a new regulation for other temporary contracts. But the two most important actuations were:

1. Incentives to hire some groups of unemployed workers using permanent contracts.
2. Introduction of a new permanent contract with smaller dismissal costs for several groups of unemployed workers.

Table B3 presents a resume of these two laws.

SEE TABLE B3

RD 11/1998 eliminated payroll taxes of firms if they hired unemployed workers to substitute those in periods of maternity or adoption. Law 39/1999 promoted the conciliation between family and job for workers.

Other legislation in the State Budget Laws up to 2001 was created to complement and modify this labour market reform. Law 50/1998 and Law 55/1999 incorporated changes in the percentages. Table B4 describes the differences:

SEE TABLE B4

Afterwards, RD 5/2001 incorporated other labour reform in March 2001. It was approved by the Spanish Parliament 9th July 2001 (Law 12/2001). This law introduced higher payroll taxes for firms using temporary contracts with duration below 7 days, in order to avoid the abuse of this type of contracts. All the most important information about these laws as well as comparison between last two reforms appear in Tables B5 and B6.

SEE TABLE B5 AND TABLE B6

Finally, this last labour market reform was maintained in 2002 by Law 24/2001 and suffered changes in 2003 by Law 53/2002. This last law incorporated a new measure for firms with

¹⁸ Long-run unemployed workers are understood as people who were not hired at least in the last 12 months. In the case of medium-run unemployed workers, the minimum period is 6 months, and 3 months for short-run unemployed workers.

workers above 60 years who have more than 5 years of seniority in the firm. The payroll taxes of firms were reduced by 50% if 2003 is the first year satisfying this condition. The percentage increased by ten percentage points for each previous year satisfying the condition up to a maximum of 100%.

Table B1: Percentages of reduction of costs for firms

Reduction (%)	Number of workers of the firm		
	0	≤ 25	> 25
- Unemployed > 45 years	100	75	75
- Disabled people	100	75	75
- Long-run unemployed < 45 years	75	50	-

Table B2: Groups and incentives of Law 22/1992

Groups	Money (€)	Reduction (%)
- Long-run unemployed workers > 45 years	3005,06	50
- Long-run unemployed workers < 25 years	2404,05	-
- Short-run unemployed workers ≥ 25 & ≤ 29 years	2404,05	-
- Long-run women in jobs with small weight of female employment	3005,06	-
- Women > 25 years reincorporated to labour market after 5 years of inactivity	3005,06	-
- Transformation of work-experience contracts into permanent ones	3305,57	-

Table B3: Incentives and groups affected by the 1997 labour market reform

Groups	Reduction (%) ^{19,20}	New permanent contract
- Unemployed workers < 30 years	40	yes
- Long-run unemployed workers	40	yes
- Long-run unemployed women in jobs with a small weight of female employment	60	no
- Unemployed workers > 45 years	60 (2 first years) 50 (thereafter)	yes
- Transformation into permanent contracts	50	yes
- Transformation into permanent contracts for unemployed women in jobs with a small weight of female employment	60	yes
- Transformation into permanent contracts for unemployed workers > 45 years	60 (2 first years) 50 (thereafter)	yes
- Disabled workers ²¹	-	yes

¹⁹ The maximum period that these measures can be applied for is 24 months, except for unemployed workers above 45 years (the period depends on the duration of the contract for this age group).

²⁰ These percentages were increased five points if a self-employed worker hired a worker who belongs to any of these groups.

²¹ This group was affected by first two laws commented previously.

Table B4: Comparison of laws and groups before the 2001 labour market reform

Application period	16/5/1997 - 16/5/1999	17/5/1999 - 31/12/1999	1/1/2000 - 3/3/2001
Groups	Law 64/1997 ²²	Law 50/1998 ²³	Law 55/1999 ²⁴
- Unemployed workers < 30 years	40	35 (first year) 25 (second year)	20
- Long-run unemployed workers	40	40 (first year) 30 (second year)	50 (first year) 45 (second year)
- Long-run unemployed women in jobs with a small weight of female employment	60	45 (first year) 40 (second year)	60 (first year) 55 (thereafter)
- Unemployed workers > 45 years	60 (2 first years) 50 (thereafter)	45 (first year) 40 (thereafter)	50 (first year) 45 (thereafter)
- Transformation into permanent contracts	50	25	20
- Transformation into permanent contracts for unemployed women in jobs with a small weight of female employment	60	25	20
- Transformation into permanent contracts for unemployed > 45 years	60 (2 first years) 50 (thereafter)	25 (2 first years) 25 (thereafter)	20
- Disabled workers	-	-	-
- Unemployed women in jobs with a small weight of female employment > 45 years	-	-	60 (first year) 55 (thereafter)
- Unemployed women in jobs with a small weight of female employment	-	-	35 (first year) 30 (thereafter)
- Unemployed workers in a very difficult economic and social situation ²⁵	-	-	65

²² All notes of Table B3 are valid for this column, and the limit of 24 months is also valid for every column.

²³ RD 5/1999 introduced modifications to this law, but it did not affect to this table. The permanent contracts done to women included in the group of unemployed workers below 30 years, above 45 years, and long-run unemployed workers received an increase of the corresponding percentage by five points. Permanent contracts and transformations of temporary contracts into permanent ones generated between 17th May 1997 and 17th May 1999 could obtain a reduction of 20% for an additional period of 12 months after the first period of 24 months.

²⁴ There was not any difference about self-employed workers between Law 64/1997 and Law 50/1998. However, Law 55/1999 incorporates new percentages depending on the membership of several groups:

1. If an unemployed worker above 45 years or a long-run unemployed worker was hired, the percentages were 60% for the first year, and 55% for the second year.
2. For an unemployed worker below 30 years or an unemployed woman in jobs with a small weight of female employment not included in the previous point, the percentages were 35% for the first year and 30% for the second year.

²⁵ This reduction could be received using also temporary contracts, with a maximum period of 24 months.

Table B5: Comparison of laws and groups from the 2001 labour market reform

Application period	4/3/2001 - 31/12/2002	1/1/2003 – 31/12/2003
Groups	Law 12/2001 ²⁶	Law 53/2002
- Unemployed women ≤ 45 years	25	25
- Medium-run unemployed workers	20	20
- Unemployed women in jobs with a small weight of female employment	35	35
- Unemployed women in jobs with a small weight of female employment > 45 years	70 (first year) 60 (second year)	70 (first year) 60 (second year)
- Medium-run unemployed women in jobs with a small weight of female employment	70 (first year) 60 (second year)	70 (first year) 60 (second year)
- Unemployed workers who can receive benefits at least for the next year	50 (first year) 45 (second year)	50 (first year) 45 (second year)
- Unemployed workers > 45 & < 55 years	50 (first year) 45 (second year)	50 (first year) 45 (second year)
- Unemployed workers ≥ 55 & < 65 years	55 (first year) 50 (second year)	55 (first year) 50 (second year)
- Unemployed workers in a very difficult economic and social situation ²⁷	65	65
- Unemployed workers receiving insertion active income > 45 & < 55 years	65	65 (first 2 years) 45 (thereafter)
- Unemployed workers receiving insertion active income ≥ 55 & < 65 years	65	65 (first 2 years) 50 (thereafter)
- Long-run unemployed women who are hired before 2 years after the childbirth	100 (only 1 year)	100 (only 1 year)
- Unemployed workers included in the Agricultural regimen of the Social Security	90 (first year) 85 (second year)	90 (first year) 85 (second year)
- Transformation into permanent contracts	25	25
- Disabled workers	-	-
- Unemployed substituting workers with a period of maternity or similar situation	100	100

²⁶ For both laws, these percentages were increased five points if a self-employed worker hires any of these groups, except for long-run unemployed women who were hired before 2 years after the childbirth. The maximum period that these measures could be used is 24 months, unless there was an explicit comment indicating other limit. The permanent contracts done to women included in the group of unemployed workers above 45 years, long-run unemployed workers, those who could receive benefits at least for the next year, and those in a very difficult social and economic situation received an increase of the corresponding percentage by ten points.

²⁷ This reduction could be received using also temporary contracts, with a maximum period of 24 months.

Table B6: Comparison of labour market reforms for the new permanent contract

Application period	16/5/1997 - 4/3/2001	4/3/2001 -
Groups	Law 63/1997	Law 12/2001
- Unemployed women >16 & < 30 years	Yes	Yes
- Unemployed men >16 & < 30 years	Yes	Yes
- Unemployed women ≥ 30 & ≤ 45 years	No	No
- Unemployed men ≥ 30 & ≤ 45 years	No	No
- Unemployed workers > 45 & < 55 years	Yes	Yes
- Unemployed workers ≥ 55 & < 65 years	Yes	Yes
- Medium-run unemployed workers	No	Yes
- Long-run unemployed workers	Yes	Yes
- Unemployed women in jobs with a small weight of female employment	No	Yes
- Unemployed workers who can receive benefits at least for the next year	No	No
- Unemployed workers in a very difficult economic and social situation	No	No
- Unemployed workers receiving insertion active income > 45 & < 55 years	Yes	Yes
- Unemployed workers receiving insertion active income ≥ 55 & < 65 years	Yes	Yes
- Long-run unemployed women who are hired in the 2 years after the childbirth	No	No
- Unemployed workers included in the Agricultural regimen of the Social Security	No	No
- Disabled workers	Yes	Yes

Appendix C: Descriptive Statistics.

Table C1: Descriptive statistics for the entire sample

	Total			
	<30	30-44	45-54	55-65
Age	23.77	35.90	48.83	57.78
	(3.03)	(4.30)	(2.83)	(2.48)
Primary Education	42.19	43.06	36.11	26.00
Secondary Education	26.30	18.99	12.32	9.52
No idioms	64.51	70.94	85.64	85.73
English	32.55	20.52	8.02	8.32
Single	98.01	58.66	18.28	16.91
Married	1.87	37.37	73.30	74.85
Do not receive benefits	74.26	45.36	42.65	30.21
Madrid as residence	99.97	99.97	99.98	99.98
Active labour demand (months)	2.83	5.25	6.71	7.12
	(6.62)	(12.79)	(15.86)	(15.42)
Restaurant workers, protection and sellers*	24.95	21.42	24.11	26.42
White-collar workers*	18.30	18.93	14.66	8.31
Non-skilled workers*	20.23	19.74	23.93	17.26
Other business activities ²⁸	32.69	33.85	33.29	31.86
Construction	5.57	8.69	11.95	18.39
Hotel and Catering business	8.10	11.27	14.22	12.84
No last job	14.59	3.52	3.29	2.60
Permanent	14.23	13.76	18.02	20.75
Sample	1,069,027	527,517	155,547	45,464

Table C2: Descriptive statistics for men

	Men			
	<30	30-44	45-54	55-65
Age	23.43	35.75	49.16	57.89
	(3.28)	(4.26)	(2.87)	(2.44)
Primary Education	45.63	42.16	28.78	22.11
Secondary Education	23.06	18.29	15.42	11.73
No idioms	69.72	73.21	85.09	86.70
English	28.02	20.02	8.64	7.46
Single	98.55	63.81	17.36	10.39
Married	1.27	33.60	76.94	84.78
Do not receive benefits	71.68	38.93	34.54	28.06
Madrid as residence	99.88	99.86	99.90	99.93
Active labour demand (months)	2.74	4.71	6.83	10.67
	(5.93)	(9.90)	(13.79)	(19.35)
Restaurant workers, protection and sellers*	12.26	13.15	11.39	8.83
White-collar workers*	10.84	10.22	8.95	5.87
Non-skilled workers*	25.38	14.67	11.51	12.22
Other business activities	26.26	25.28	23.22	22.55
Construction	11.08	18.63	23.76	27.44
Hotel and Catering business	6.79	7.96	7.30	5.19
No last job	15.62	3.31	2.63	3.16

²⁸ Other business activities include multiple and different aspects related to Accounting, Law, Consultancy, Advertising, recruitment agencies, research and security services among others.

Permanent	20.16	22.94	39.65	42.97
Sample	108,997	53,290	20,524	9,526

Table C3: Descriptive statistics for women

	Women			
	<30	30-44	45-54	55-65
Age	23.67 (3.14)	35.93 (4.26)	48.60 (2.79)	57.48 (2.39)
Primary Education	34.25	38.31	38.54	31.79
Secondary Education	27.74	20.15	13.83	10.80
No idioms	55.45	65.68	83.47	84.84
English	40.33	24.09	8.73	7.51
Single	96.54	48.84	17.19	15.42
Married	3.19	45.95	71.43	69.94
Do not receive benefits	76.14	53.77	58.82	55.27
Madrid as residence	99.92	99.93	99.98	99.98
Active labour demand (months)	4.09 (8.57)	9.11 (17.38)	12.12 (23.00)	13.40 (24.17)
Restaurant workers, protection and sellers*	32.17	21.66	21.96	25.63
White-collar workers*	25.88	27.78	22.28	15.83
Non-skilled workers*	10.65	20.23	33.23	36.56
Other business activities	28.51	34.20	34.73	34.12
Construction	1.42	2.03	2.03	2.30
Hotel and Catering business	7.54	8.83	10.21	10.50
No last job	20.42	6.25	7.47	8.05
Permanent	21.90	22.08	31.30	40.65
Sample	138,572	75,437	20,414	4,221

* Economic activity selected as first option to get a job. The later three economic activities refer to that associated to the last job. The table reports means and percentages for the indicated group. Standard deviations are in parenthesis where appropriate.

Appendix D: Results derived from estimation of the models.

Table D1: Permanent Employment Probabilities

Education	MEN											
	Full Sample			Restricted Age Groups								
	Primary	Secondary	Graduate	25-35			40-50			40-44 / 55-60		
Age < 30	0.0403*** (0.0023)	0.0413*** (0.0023)	0.0499*** (0.0027)	0.0135*** (0.0023)	0.0141*** (0.0024)	0.0167*** (0.0029)	-	-	-	-	-	-
Age ∈ [45,55]	0.0616*** (0.0042)	0.0634*** (0.0043)	0.0772*** (0.0049)	-	-	-	0.0079 (0.0050)	0.0085 (0.0054)	0.0111 (0.0071)	-	-	-
Age ≥ 55	0.0386*** (0.0047)	0.0396*** (0.0048)	0.0478*** (0.0057)	-	-	-	-	-	-	0.1011*** (0.0097)	0.1194*** (0.0118)	0.1789*** (0.0179)
(Age < 30)×Reform	-0.0238*** (0.0035)	-0.0243*** (0.0036)	-0.0285*** (0.0042)	-0.0112*** (0.0037)	-0.0116*** (0.0039)	-0.0136*** (0.0045)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform	0.0066 (0.0056)	0.0068 (0.0057)	0.0080 (0.0068)	-	-	-	0.0125* (0.0071)	0.0134* (0.0076)	0.0176* (0.0100)	-	-	-
(Age ≥ 55)×Reform	-0.0035 (0.0088)	-0.0036 (0.0090)	-0.0043 (0.0106)	-	-	-	-	-	-	-0.0020 (0.0093)	-0.0023 (0.0106)	-0.0030 (0.0140)
(Age < 30)×Expansion	0.0210*** (0.0027)	0.0215*** (0.0027)	0.0253*** (0.0032)	0.0348*** (0.0032)	0.0360*** (0.0033)	0.0419*** (0.0038)	-	-	-	-	-	-
(Age ∈ [45,55])×Expansion	0.0479*** (0.0047)	0.0489*** (0.0048)	0.0569*** (0.0054)	-	-	-	0.0216*** (0.0057)	0.0231*** (0.0061)	0.0296*** (0.0077)	-	-	-
(Age ≥ 55)×Expansion	0.0017 (0.0061)	0.0017 (0.0062)	0.0020 (0.0073)	-	-	-	-	-	-	0.0341*** (0.0076)	0.0385*** (0.0085)	0.0497*** (0.0106)
(Age < 30)×Reform×Expansion	0.0161*** (0.0056)	0.0165*** (0.0057)	0.0194*** (0.0067)	-0.0003 (0.0059)	-0.0003 (0.0061)	-0.0004 (0.0072)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform×Expansion	-0.0319*** (0.0098)	-0.0327*** (0.0101)	-0.0393*** (0.0123)	-	-	-	-0.0260** (0.0123)	-0.0280** (0.0133)	-0.0371** (0.0179)	-	-	-
(Age ≥ 55)×Reform×Expansion	0.0018 (0.0187)	0.0018 (0.0192)	0.0021 (0.0227)	-	-	-	-	-	-	-0.0280* (0.0158)	-0.0322* (0.0183)	-0.0440* (0.0254)
N	837,489	837,489	837,489	327,533	327,533	327,533	100,498	100,498	100,498	78,064	78,064	78,064

Education	WOMEN											
	Full Sample			Restricted Age Groups								
	Primary	Secondary	Graduate	25-35			40-50			40-44 / 55-60		
Age < 30	0.0518*** (0.0033)	0.0511*** (0.0032)	0.0562*** (0.0033)	0.0107*** (0.0016)	0.0112*** (0.0017)	0.0138*** (0.0021)	-	-	-	-	-	-
Age ∈ [45,55]	0.1159*** (0.0075)	0.1139*** (0.0075)	0.1279*** (0.0073)	-	-	-	0.0174*** (0.0031)	0.0200*** (0.0036)	0.0240*** (0.0044)	-	-	-
Age ≥ 55	0.1911*** (0.0134)	0.1872*** (0.0134)	0.2160*** (0.0135)	-	-	-	-	-	-	0.1027*** (0.0133)	0.1138*** (0.0148)	0.1387*** (0.0181)
(Age < 30)×Reform	-0.0474*** (0.0047)	-0.0469*** (0.0047)	-0.0502*** (0.0050)	-0.0190*** (0.0029)	-0.0197*** (0.0030)	-0.0239*** (0.0037)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform	-0.0219** (0.0085)	-0.0217** (0.0084)	-0.0233** (0.0091)	-	-	-	-0.0022 (0.0050)	-0.0026 (0.0057)	-0.0030 (0.0067)	-	-	-
(Age ≥ 55)×Reform	0.0152 (0.0163)	0.0150 (0.0161)	0.0163 (0.0174)	-	-	-	-	-	-	0.0056 (0.0125)	0.0061 (0.0136)	0.0071 (0.0158)
(Age < 30)×Expansion	0.0479*** (0.0037)	0.0474*** (0.0037)	0.0507*** (0.0037)	0.0218*** (0.0022)	0.0226*** (0.0023)	0.0274*** (0.0028)	-	-	-	-	-	-
(Age ∈ [45,55])×Expansion	0.0170*** (0.0063)	0.0168*** (0.0062)	0.0181*** (0.0066)	-	-	-	0.0166*** (0.0041)	0.0189*** (0.0047)	0.0223*** (0.0055)	-	-	-
(Age ≥ 55)×Expansion	0.0203* (0.0121)	0.0201* (0.0119)	0.0216* (0.0128)	-	-	-	-	-	-	0.0363*** (0.0105)	0.0391*** (0.0112)	0.0449*** (0.0127)
(Age < 30)×Reform×Expansion	-0.0135* (0.0074)	-0.0133* (0.0073)	-0.0145* (0.0080)	-0.0015 (0.0042)	-0.0016 (0.0044)	-0.0019 (0.0054)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform×Expansion	0.0100 (0.0174)	0.0099 (0.0172)	0.0107 (0.0186)	-	-	-	-0.0079 (0.0090)	-0.0091 (0.0103)	-0.0109 (0.0124)	-	-	-
(Age ≥ 55)×Reform×Expansion	-0.0457 (0.0336)	-0.0451 (0.0331)	-0.0495 (0.0367)	-	-	-	-	-	-	-0.0435** (0.0220)	-0.0475** (0.0242)	-0.0562* (0.0289)
N	867851	867851	867851	348,970	348,970	348,970	122,851	122,851	122,851	79,381	79,381	79,381

Note: The table presents the probit marginal effects at the mean or the most representative values of the variables where is possible and consistent with the rest of variables. The robust standard errors reported in parenthesis. * Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

Table D2: Transition Probabilities from non-employment to permanent employment

Education	MEN											
	Full Sample			Restricted Age Groups								
	Primary	Secondary	Graduate	25-35			40-50			40-44 / 55-60		
Primary				Secondary	Graduate	Primary	Secondary	Graduate	Primary	Secondary	Graduate	
Age < 30	0.0121*** (0.0018)	0.0135*** (0.0020)	0.0184*** (0.0027)	0.0085*** (0.0016)	0.0094*** (0.0018)	0.0117*** (0.0022)	-	-	-	-	-	-
Age ∈ [45,55]	0.0360*** (0.0036)	0.0405*** (0.0039)	0.0565*** (0.0050)	-	-	-	0.0192*** (0.0041)	0.0239*** (0.0050)	0.0366*** (0.0077)	-	-	-
Age ≥ 55	0.0086*** (0.0032)	0.0096*** (0.0036)	0.0129*** (0.0048)	-	-	-	-	-	-	0.0778*** (0.0083)	0.1125*** (0.0119)	0.2082*** (0.0208)
(Age < 30)×Reform	-0.0180*** (0.0029)	-0.0200*** (0.0033)	-0.0265*** (0.0043)	-0.0075*** (0.0027)	-0.0083*** (0.0030)	-0.0102*** (0.0037)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform	0.0006 (0.0038)	0.0006 (0.0043)	0.0008 (0.0058)	-	-	-	0.0014 (0.0060)	0.0017 (0.0074)	0.0025 (0.0111)	-	-	-
(Age ≥ 55)×Reform	-0.0013 (0.0056)	-0.0014 (0.0062)	-0.0019 (0.0083)	-	-	-	-	-	-	-0.0065 (0.0087)	-0.0086 (0.0116)	-0.0131 (0.0176)
(Age < 30)×Expansion	0.0090*** (0.0021)	0.0100*** (0.0024)	0.0133*** (0.0031)	0.0169*** (0.0024)	0.0187*** (0.0026)	0.0228*** (0.0032)	-	-	-	-	-	-
(Age ∈ [45,55])×Expansion	0.0209*** (0.0034)	0.0231*** (0.0038)	0.0306*** (0.0048)	-	-	-	0.0092* (0.0047)	0.0113** (0.0057)	0.0166** (0.0083)	-	-	-
(Age ≥ 55)×Expansion	0.0013 (0.0039)	0.0014 (0.0043)	0.0019 (0.0058)	-	-	-	-	-	-	0.0212*** (0.0072)	0.0279*** (0.0093)	0.0416*** (0.0134)
(Age < 30)×Reform×Expansion	0.0140*** (0.0047)	0.0155*** (0.0053)	0.0207*** (0.0069)	0.0040 (0.0044)	0.0044 (0.0049)	0.0054 (0.0060)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform×Expansion	-0.0192*** (0.0060)	-0.0215*** (0.0067)	-0.0294*** (0.0093)	-	-	-	-0.0203** (0.0093)	-0.0252** (0.0116)	-0.0387** (0.0181)	-	-	-
(Age ≥ 55)×Reform×Expansion	-0.0066 (0.0113)	-0.0074 (0.0126)	-0.0100 (0.0172)	-	-	-	-	-	-	-0.0356*** (0.0119)	-0.0489*** (0.0166)	-0.0803*** (0.0284)
N	763884	763884	763884	295,201	295,201	295,201	91,671	91,671	91,671	72,056	72,056	72,056

Education	WOMEN											
	Full Sample			Restricted Age Groups								
	Primary	Secondary	Graduate	25-35			40-50			40-44 / 55-60		
Primary				Secondary	Graduate	Primary	Secondary	Graduate	Primary	Secondary	Graduate	
Age < 30	0.0171*** (0.0032)	0.0173*** (0.0033)	0.0211*** (0.0039)	0.0060*** (0.0011)	0.0067*** (0.0012)	0.0085*** (0.0015)	-	-	-	-	-	-
Age ∈ [45,55]	0.0688*** (0.0085)	0.0697*** (0.0085)	0.0872*** (0.0095)	-	-	-	0.0126*** (0.0023)	0.0161*** (0.0029)	0.0222*** (0.0042)	-	-	-
Age ≥ 55	0.0987*** (0.0129)	0.1001*** (0.0130)	0.1276*** (0.0150)	-	-	-	-	-	-	0.0700*** (0.0104)	0.0813*** (0.0123)	0.1232*** (0.0184)
(Age < 30)×Reform	-0.0348*** (0.0051)	-0.0352*** (0.0052)	-0.0419*** (0.0060)	-0.0093*** (0.0021)	-0.0102*** (0.0023)	-0.0129*** (0.0029)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform	-0.0009 (0.0072)	-0.0009 (0.0073)	-0.0010 (0.0088)	-	-	-	0.0018 (0.0036)	0.0023 (0.0045)	0.0031 (0.0061)	-	-	-
(Age ≥ 55)×Reform	0.0069 (0.0125)	0.0069 (0.0126)	0.0084 (0.0152)	-	-	-	-	-	-	0.0028 (0.0109)	0.0031 (0.0124)	0.0044 (0.0172)
(Age < 30)×Expansion	0.0193*** (0.0037)	0.0195*** (0.0038)	0.0234*** (0.0043)	0.0091*** (0.0015)	0.0100*** (0.0017)	0.0127*** (0.0021)	-	-	-	-	-	-
(Age ∈ [45,55])×Expansion	0.0116** (0.0054)	0.0118** (0.0054)	0.0141** (0.0065)	-	-	-	0.0024 (0.0027)	0.0030 (0.0033)	0.0041 (0.0045)	-	-	-
(Age ≥ 55)×Expansion	0.0008 (0.0089)	0.0008 (0.0089)	0.0009 (0.0108)	-	-	-	-	-	-	0.0068 (0.0080)	0.0076 (0.0091)	0.0106 (0.0124)
(Age < 30)×Reform×Expansion	0.0111 (0.0076)	0.0112 (0.0077)	0.0135 (0.0092)	0.0020 (0.0030)	0.0022 (0.0033)	0.0028 (0.0041)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform×Expansion	-0.0173 (0.0135)	-0.0175 (0.0136)	-0.0213 (0.0166)	-	-	-	-0.0024 (0.0065)	-0.0030 (0.0082)	-0.0041 (0.0112)	-	-	-
(Age ≥ 55)×Reform×Expansion	-0.0168 (0.0247)	-0.0170 (0.0250)	-0.0207 (0.0305)	-	-	-	-	-	-	-0.0186 (0.0186)	-0.0211 (0.0212)	-0.0298 (0.0304)
N	802587	802587	802587	318,834	318,834	318,834	115,144	115,144	115,144	75,137	75,137	75,137

Note: The table presents the probit marginal effects at the mean or the most representative values of the variables where is possible and consistent with the rest of variables. The robust standard errors reported in parenthesis. * Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

Table D3: Transition Probabilities from temporary to permanent employment (conversions)

Education	MEN											
	Full Sample			Restricted Age Groups								
	Primary	Secondary	Graduate	25-35			40-50			40-44 / 55-60		
			Primary	Secondary	Graduate	Primary	Secondary	Graduate	Primary	Secondary	Graduate	
Age < 30	0.0020** (0.0010)	0.0019** (0.0010)	0.0028** (0.0014)	0.0006 (0.0013)	0.0006 (0.0013)	0.0008 (0.0018)	-	-	-	-	-	-
Age ∈ [45,55)	-0.0046** (0.0021)	-0.0044** (0.0021)	-0.0063** (0.0029)	-	-	-	-0.0047** (0.0020)	-0.0047** (0.0020)	-0.0075** (0.0032)	-	-	-
Age ≥ 55	0.0194*** (0.0035)	0.0186*** (0.0034)	0.0275*** (0.0048)	-	-	-	-	-	-	-0.0010 (0.0040)	-0.0010 (0.0042)	-0.0019 (0.0076)
(Age < 30)×Reform	0.0008 (0.0015)	0.0008 (0.0014)	0.0012 (0.0021)	0.0018 (0.0018)	0.0019 (0.0018)	0.0026 (0.0024)	-	-	-	-	-	-
(Age ∈ [45,55))×Reform	0.0006 (0.0035)	0.0006 (0.0034)	0.0008 (0.0048)	-	-	-	0.0008 (0.0023)	0.0008 (0.0023)	0.0013 (0.0037)	-	-	-
(Age ≥ 55)×Reform	-0.0044 (0.0064)	-0.0043 (0.0062)	-0.0061 (0.0089)	-	-	-	-	-	-	-0.0028 (0.0025)	-0.0029 (0.0026)	-0.0053 (0.0047)
(Age < 30)×Expansion	-0.0076*** (0.0016)	-0.0073*** (0.0016)	-0.0106*** (0.0022)	-0.0036** (0.0017)	-0.0036** (0.0017)	-0.0050** (0.0024)	-	-	-	-	-	-
(Age ∈ [45,55))×Expansion	0.0153*** (0.0047)	0.0148*** (0.0046)	0.0208*** (0.0062)	-	-	-	0.0039 (0.0027)	0.0039 (0.0028)	0.0062 (0.0043)	-	-	-
(Age ≥ 55)×Expansion	0.0065 (0.0066)	0.0063 (0.0063)	0.0089 (0.0089)	-	-	-	-	-	-	0.0072** (0.0034)	0.0076** (0.0036)	0.0135** (0.0063)
(Age < 30)×Reform×Expansion	0.0012 (0.0028)	0.0012 (0.0027)	0.0017 (0.0038)	-0.0003 (0.0034)	-0.0003 (0.0035)	-0.0003 (0.0047)	-	-	-	-	-	-
(Age ∈ [45,55))×Reform×Expansion	-0.0243*** (0.0054)	-0.0233*** (0.0052)	-0.0347*** (0.0077)	-	-	-	-0.0090*** (0.0034)	-0.0091*** (0.0035)	-0.0151** (0.0060)	-	-	-
(Age ≥ 55)×Reform×Expansion	-0.0006 (0.0171)	-0.0006 (0.0164)	-0.0008 (0.0236)	-	-	-	-	-	-	-0.0078** (0.0033)	-0.0082** (0.0035)	-0.0158** (0.0070)
N	763,045	763,045	763,045	298,419	298,419	298,419	88,805	88,805	88,805	69,958	69,958	69,958

Education	WOMEN											
	Full Sample			Restricted Age Groups								
	Primary	Secondary	Graduate	25-35			40-50			40-44 / 55-60		
			Primary	Secondary	Graduate	Primary	Secondary	Graduate	Primary	Secondary	Graduate	
Age < 30	0.0160*** (0.0027)	0.0151*** (0.0026)	0.0194*** (0.0031)	0.0024* (0.0012)	0.0023* (0.0012)	0.0032* (0.0016)	-	-	-	-	-	-
Age ∈ [45,55)	0.0167*** (0.0053)	0.0158*** (0.0051)	0.0202*** (0.0063)	-	-	-	0.0008 (0.0016)	0.0009 (0.0018)	0.0011 (0.0021)	-	-	-
Age ≥ 55	0.0708*** (0.0127)	0.0666*** (0.0122)	0.0886*** (0.0148)	-	-	-	-	-	-	0.0000 (0.0072)	0.0000 (0.0083)	0.0000 (0.0084)
(Age < 30)×Reform	-0.0062* (0.0033)	-0.0059* (0.0031)	-0.0074* (0.0039)	-0.0030* (0.0018)	-0.0029* (0.0018)	-0.0040* (0.0024)	-	-	-	-	-	-
(Age ∈ [45,55))×Reform	-0.0018 (0.0077)	-0.0017 (0.0073)	-0.0022 (0.0093)	-	-	-	-0.0003 (0.0022)	-0.0003 (0.0025)	-0.0004 (0.0029)	-	-	-
(Age ≥ 55)×Reform	0.0271* (0.0156)	0.0256* (0.0148)	0.0330* (0.0189)	-	-	-	-	-	-	0.0024 (0.0040)	0.0028 (0.0046)	0.0029 (0.0047)
(Age < 30)×Expansion	-0.0123*** (0.0034)	-0.0116*** (0.0033)	-0.0149*** (0.0041)	-0.0071*** (0.0014)	-0.0071*** (0.0014)	-0.0098*** (0.0020)	-	-	-	-	-	-
(Age ∈ [45,55))×Expansion	0.0050 (0.0089)	0.0047 (0.0084)	0.0060 (0.0107)	-	-	-	0.0035 (0.0028)	0.0040 (0.0032)	0.0046 (0.0037)	-	-	-
(Age ≥ 55)×Expansion	0.0035 (0.0209)	0.0033 (0.0198)	0.0042 (0.0251)	-	-	-	-	-	-	-0.0020 (0.0048)	-0.0023 (0.0056)	-0.0023 (0.0057)
(Age < 30)×Reform×Expansion	-0.0236*** (0.0060)	-0.0223*** (0.0057)	-0.0287*** (0.0071)	-0.0015 (0.0032)	-0.0015 (0.0032)	-0.0021 (0.0043)	-	-	-	-	-	-
(Age ∈ [45,55))×Reform×Expansion	-0.0471*** (0.0161)	-0.0444*** (0.0152)	-0.0582*** (0.0198)	-	-	-	-0.0091*** (0.0035)	-0.0107** (0.0042)	-0.0125** (0.0050)	-	-	-
(Age ≥ 55)×Reform×Expansion	-0.1054*** (0.0235)	-0.0983*** (0.0220)	-0.1355*** (0.0304)	-	-	-	-	-	-	-0.0166*** (0.0050)	-0.0196*** (0.0059)	-0.0199*** (0.0065)
N	810,811	810,811	810,811	324,818	324,818	324,818	114,157	114,157	114,157	75,211	75,211	75,211

Note: The table presents the probit marginal effects at the mean or the most representative values of the variables where is possible and consistent with the rest of variables. The robust standard errors reported in parenthesis. * Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

Table D4: Transition Probabilities from temporary to permanent employment (not conversions)

Education	MEN											
	Full Sample			Restricted Age Groups								
	Primary	Secondary	Graduate	25-35			40-50			40-44 / 55-60		
			Primary	Secondary	Graduate	Primary	Secondary	Graduate	Primary	Secondary	Graduate	
Age < 30	0.0289*** (0.0023)	0.0292*** (0.0023)	0.0357*** (0.0027)	0.0086*** (0.0017)	0.0090*** (0.0017)	0.0107*** (0.0021)	-	-	-	-	-	-
Age ∈ [45,55)	0.0461*** (0.0044)	0.0468*** (0.0045)	0.0577*** (0.0053)	-	-	-	0.0061 (0.0040)	0.0063 (0.0042)	0.0082 (0.0055)	-	-	-
Age ≥ 55	0.0139*** (0.0041)	0.0141*** (0.0041)	0.0171*** (0.0050)	-	-	-	-	-	-	0.0620*** (0.0075)	0.0710*** (0.0090)	0.1087*** (0.0143)
(Age < 30)×Reform	-0.0202*** (0.0033)	-0.0204*** (0.0033)	-0.0244*** (0.0040)	-0.0085*** (0.0029)	-0.0088*** (0.0031)	-0.0104*** (0.0036)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform	-0.0054 (0.0050)	-0.0055 (0.0051)	-0.0066 (0.0061)	-	-	-	0.0022 (0.0058)	0.0023 (0.0060)	0.0030 (0.0078)	-	-	-
(Age ≥ 55)×Reform	-0.0014 (0.0075)	-0.0014 (0.0076)	-0.0017 (0.0092)	-	-	-	-	-	-	-0.0088 (0.0080)	-0.0099 (0.0090)	-0.0138 (0.0125)
(Age < 30)×Expansion	0.0239*** (0.0028)	0.0242*** (0.0028)	0.0288*** (0.0032)	0.0228*** (0.0025)	0.0236*** (0.0026)	0.0278*** (0.0031)	-	-	-	-	-	-
(Age ∈ [45,55])×Expansion	-0.0066** (0.0032)	-0.0067** (0.0032)	-0.0080** (0.0039)	-	-	-	-0.0084** (0.0037)	-0.0087** (0.0039)	-0.0114** (0.0051)	-	-	-
(Age ≥ 55)×Expansion	-0.0044 (0.0051)	-0.0044 (0.0051)	-0.0053 (0.0062)	-	-	-	-	-	-	-0.0183*** (0.0047)	-0.0206*** (0.0053)	-0.0297*** (0.0078)
(Age < 30)×Reform×Expansion	0.0239*** (0.0052)	0.0242*** (0.0052)	0.0288*** (0.0062)	0.0137*** (0.0049)	0.0142*** (0.0051)	0.0168*** (0.0060)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform×Expansion	0.0263** (0.0109)	0.0266** (0.0110)	0.0317** (0.0129)	-	-	-	0.0039 (0.0112)	0.0041 (0.0115)	0.0053 (0.0150)	-	-	-
(Age ≥ 55)×Reform×Expansion	0.0078 (0.0163)	0.0079 (0.0165)	0.0095 (0.0198)	-	-	-	-	-	-	0.0228 (0.0165)	0.0254 (0.0183)	0.0351 (0.0249)
N	773,344	773,344	773,344	299,759	299,759	299,759	91,672	91,672	91,672	71,236	71,236	71,236

Education	WOMEN											
	Full Sample			Restricted Age Groups								
	Primary	Secondary	Graduate	25-35			40-50			40-44 / 55-60		
			Primary	Secondary	Graduate	Primary	Secondary	Graduate	Primary	Secondary	Graduate	
Age < 30	0.0287*** (0.0035)	0.0277*** (0.0034)	0.0326*** (0.0037)	0.0028*** (0.0008)	0.0029*** (0.0009)	0.0035*** (0.0011)	-	-	-	-	-	-
Age ∈ [45,55)	0.0687*** (0.0092)	0.0661*** (0.0090)	0.0792*** (0.0099)	-	-	-	0.0098*** (0.0024)	0.0113*** (0.0028)	0.0130*** (0.0033)	-	-	-
Age ≥ 55	0.0786*** (0.0119)	0.0755*** (0.0116)	0.0910*** (0.0131)	-	-	-	-	-	-	0.0534*** (0.0085)	0.0634*** (0.0103)	0.0747*** (0.0131)
(Age < 30)×Reform	-0.0382*** (0.0051)	-0.0370*** (0.0050)	-0.0427*** (0.0056)	-0.0095*** (0.0018)	-0.0099*** (0.0019)	-0.0118*** (0.0023)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform	-0.0173** (0.0069)	-0.0167** (0.0067)	-0.0194** (0.0077)	-	-	-	-0.0002 (0.0040)	-0.0003 (0.0045)	-0.0003 (0.0052)	-	-	-
(Age ≥ 55)×Reform	0.0094 (0.0129)	0.0091 (0.0125)	0.0106 (0.0146)	-	-	-	-	-	-	0.0068 (0.0087)	0.0079 (0.0101)	0.0090 (0.0115)
(Age < 30)×Expansion	0.0521*** (0.0055)	0.0506*** (0.0055)	0.0581*** (0.0057)	0.0109*** (0.0013)	0.0113*** (0.0014)	0.0135*** (0.0017)	-	-	-	-	-	-
(Age ∈ [45,55])×Expansion	-0.0424*** (0.0058)	-0.0408*** (0.0056)	-0.0484*** (0.0063)	-	-	-	-0.0053** (0.0025)	-0.0060** (0.0028)	-0.0069** (0.0033)	-	-	-
(Age ≥ 55)×Expansion	-0.0492*** (0.0087)	-0.0474*** (0.0085)	-0.0563*** (0.0098)	-	-	-	-	-	-	-0.0172*** (0.0055)	-0.0200*** (0.0065)	-0.0231*** (0.0076)
(Age < 30)×Reform×Expansion	0.0198*** (0.0070)	0.0191*** (0.0068)	0.0222*** (0.0077)	0.0086*** (0.0028)	0.0089*** (0.0029)	0.0107*** (0.0035)	-	-	-	-	-	-
(Age ∈ [45,55])×Reform×Expansion	0.1053*** (0.0196)	0.1025*** (0.0193)	0.1160*** (0.0209)	-	-	-	0.0076 (0.0083)	0.0086 (0.0094)	0.0098 (0.0107)	-	-	-
(Age ≥ 55)×Reform×Expansion	0.0670* (0.0364)	0.0651* (0.0355)	0.0744* (0.0399)	-	-	-	-	-	-	0.0112 (0.0210)	0.0129 (0.0240)	0.0147 (0.0273)
N	810,157	810,157	810,157	322,096	322,096	322,096	115,594	115,594	115,594	74,923	74,923	74,923

Note: The table presents the probit marginal effects at the mean or the most representative values of the variables where is possible and consistent with the rest of variables. The robust standard errors reported in parenthesis. * Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.