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LABOUR MARKET PROGRAMME FOR DISMISSED WORKERS**

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# THE EFFECT OF EXTENDING THE DURATION OF ELIGIBILITY IN AN ITALIAN LABOUR MARKET PROGRAMME FOR DISMISSED WORKERS

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**Abstract:** *Liste di mobilità* (LM) is an Italian labour market programme targeted to workers permanently separated from their employers. The programme includes both a “passive” and an “active” component: (i) it grants monetary benefits to (part of the) dismissed employees, and (ii) provides firms who hire these workers with a hiring subsidy. Eligibility duration and benefits vary with the size of the dismissing firm and the worker’s age at dismissal. Using a new linked administrative panel data set for an Italian region, we exploit the variability of these provisions to evaluate the impact of extending the duration of eligibility on re-employment probabilities over each of the 36 months subsequent to enrolment in the programme. The average treatment effect is identified *via* a Regression Discontinuity Design. We validate the design by a set of overidentification tests. The impact on re-employment rates is not significantly different from zero for most of the sub-groups we analyse, with two exceptions: (i) workers 50 years old and entitled to monetary benefits, who can use the LM as a bridge to retirement, have much lower re-employment rates than workers just under 50, who may stay in the LM for two years; (ii) women just over 40 and entitled to monetary benefits, who may double their stay in the LM as compared to their younger colleagues, delay their re-employment; this is especially true for women with lower wages.

*Keywords:* Active labour market policies, Regression discontinuity design, Linked data.

JEL code: J38, J65, J68

## 1. Introduction

*Liste di mobilità* (LM)<sup>1</sup> is an Italian labour market programme introduced in the early ’90s to handle redundancies in the labour market. The design of this programme is quite complex because of two reasons: first, it includes both a “passive” and an “active” component; second, it differentiates eligibility duration and benefits according to the age of the worker at dismissal and the size of the dismissing firm.

The passive component grants monetary benefits, with a high replacement rate, but only to workers who have been dismissed by a firm employing more than 15 employees. The active

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<sup>1</sup> Literally “Mobility Lists”, where eligible workers are registered.

component provides firms that hire any dismissed worker – either with a permanent or a temporary contract – with a hiring subsidy, consisting of a substantial reduction in social security contributions (SSCs) for that worker, for up to two years. In addition, firms that hire – with a permanent contract in this case – workers eligible for monetary benefits are entitled to receive up to 50% of the residual benefits they would have received had they remained unemployed. The latter feature is close to the benefit transfer scheme proposed by Snower (1994).

The worker stays in the LM programme until s/he is hired with a permanent contract or until the end of the eligibility period, whichever comes first. Crucial to our analysis, the length of the eligibility period for both the passive and active components depends on the age of the worker at the time of dismissal: it is one year for workers younger than 40; it doubles to two years for those 40 to 49 years old; for workers older than 49 the eligibility status extends to three years, and even longer for workers entitled to monetary benefits when they are getting close to being eligible for retirement benefits – the latter is the so-called *mobilità lunga* (“long mobility”), designed to bridge unemployment and early retirement. Besides, during the time they are enrolled in the ML, workers are allowed to engage in temporary employment while maintaining their LM status (for details, see Section 2.2 below).

The rationale for extending eligibility from one to two to three years rests on the claim that older workers are *ceteris paribus* less attractive to employers, and thus face more difficulties in finding a new job once permanently separated from their previous one. The empirical basis upon which this claim rests is not clear. Besides, for workers in their fifties entitled to monetary benefits the provisions for “long mobility” alter substantially the rationale of the programme, with the income maintenance aim taking a dominant role. On the other hand, the LM programme does not differentiate eligibility on the basis of gender, while there exists ample evidence – which we confirm – that female workers have a lower re-employment probability than their male counterparts, at any age. Thus a better understanding of the relationship between age, gender and the extended eligibility for the LM programme would be useful for a possible redesign of the programme itself.

The identification of the impact of the whole programme is precluded by the lack of a sensible comparison group made up of ineligible workers suitably approximating the counterfactual for workers eligible to the LM. Only the differential impact of alternative packages of benefits is in principle identifiable. The research question we address in this paper regards the effect of extending the eligibility period from one to two years (workers aged less than 40 and in their forties, respectively) and from two to three years – possibly extended to “long mobility” – (workers in their forties and aged 50 or more, respectively) on the probability of being employed in each of the 36 months subsequent to enrolment in LM. The challenge we face is clear: how to separate the effects

of extended duration of eligibility from the age effect, given that age is the only variable relevant for the duration of eligibility.

Previous research on the LM has largely focused on programme participants aged less than 50 years, *i.e.* on the differential effect of being eligible for two years *vs.* one year, and has used far from satisfactory panel data sets.

A first group of studies (see Brunello and Miniaci, 1997, and Paggiaro and Trivellato, 2002, among others<sup>2</sup>) have exploited regional administrative data resulting from the programme operations for Lombardy – a large region around Milan – and Veneto – the region around Venice, respectively. These data provide poor information on employment spells during the eligibility period as well as after its completion, thus precluding a detailed and robust analysis of the effects of the programme. Because of data constraints, the only outcome variable they consider is the waiting time to a permanent job. As for the identification strategy, it rests on (semi-)parametric specifications of models for transitions in a two-state space: registered in the LM or permanently hired. They use multiplicative hazard models, with a polynomial in age in order to control for age. Eventually, one is left wondering how much results depend on the particular parametric specification assumptions, and to which particular sub-population they refer to<sup>3</sup>.

A more recent strand of papers uses more informative data sets, obtained by linking the administrative archives of the programme and *Netlabor*, an archive resulting from the operations of public labour exchanges, which provides reliable information on working histories and some additional demographics. Caruso and Pisauro (2005) deal with workers from the ML of a small region of central Italy: they focus on the distinction of permanent hires into “*new jobs*” and “*recalls*” by the dismissing firm – the latter being a practice which should be at the margin of the scope of the programme, and resort to semi-parametric proportional hazard models to get descriptive evidence on the issue. More interesting are three working papers by Paggiaro, Rettore and Trivellato (2005), Martini and Mo Costabella (2005) and Martini, Rettore and Trivellato (2006). They analyse populations of workers in the Lists from various small provinces of Northern Italy, and share two basic features: (i) the outcome variable is the monthly re-employment rate during the three years after enrolment in the LM, which allows to observe what happened during

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<sup>2</sup> See Anastasia *et al* (2004) for a detailed recognition of data, methods and main results of this first generation of studies.

<sup>3</sup> In the presence of impact heterogeneity, by design only the mean impact of the second year on workers marginally eligible for the second year, namely those aged 40, is intrinsically identifiable. The intuition is straightforward: the variability in the treatment status – two years *vs.* one year – the analyst needs in order to identify the impact of the treatment, is available only in the sub-sample of workers whose age is in a neighbourhood of 40. If the impact varies with age, there is no way to identify the mean impact for individuals away from the threshold, so strictly speaking the results they got refer to workers marginally eligible for the second year.

enrolment and after exit from the LM for most workers, irrespective of the type of contract – temporary or permanent – a firm can use to initially hire a worker from the Lists; (ii) they identify the differential effect of the additional year of eligibility on re-employment probabilities *via* propensity score matching, using both individual characteristics – age excluded, of course – and past working histories. Paggiaro, Rettore and Trivellato (2005) develop a test on the ignorability assumption implied by matching methods, which consists of splitting controls (and treatments) in two age sub-groups and checking whether the mean outcomes in the two sub-groups resulting after matching differ. Unfortunately, conditional on available information (quite rich indeed), evidence from the test suggests that in their case-study matching methods are not entirely successful in controlling for the age effect.

As for the substantive evidence from these studies, two warnings are in order. They likely suffer from the data limitations and the methodological flaws just mentioned. Besides, the more recent set of papers, chiefly those using matching methods, deals with restricted areas, thus with small populations of workers enrolled in the LM (around 4,000 individuals), who in turn are split up by programme characteristics – firm size and worker’s age at dismissal – and gender. Empirical results are inevitably affected by the small, possibly peculiar domains they refer to and by poor precision: in some instances, they are hardly interpretable. With reference to the differential effect of two years *vs.* one year eligibility, the prevailing evidence can be summarised in two statements: (i) for workers entitled only to the active component of the LM, *i.e.* dismissed by firms with up to 15 employees, the effect of the additional year of eligibility on re-employment probabilities and on the time spent waiting for the first permanent job is not significant; (ii) for workers entitled also to monetary benefits, *i.e.* dismissed by firms with more than 15 employees, the additional year of eligibility has a negative impact: older workers, who draw benefits longer, have significantly lower re-employment probabilities – and a significantly lower hazard to the first permanent job – than their younger colleagues. This effect tends to be larger for women, but not consistently across all the case-studies.

To overcome the limitations of data and methods documented above, we use more informative data in a fully nonparametric framework. In short:

(a) We link files from the *Netlabor* archive, resulting from the operations of public labour exchanges, to file from the *Inps* – the Italian national social security agency – archive. The linkage provides rich information on workers’ labour market histories – wages included – before, during and after the eligibility period. Our population consists of workers registered in the LM in the Veneto region – North-East of Italy, around Venice – from 1995 to 1998. We get information on their working histories from 1975 to 2001.

(b) To identify the effect of extended duration of eligibility we use a Regression Discontinuity Design (RDD; see Hahn, Todd and Van der Klaauw, 2001, and Imbens and Lemieux, 2007), by exploiting the fact that the assignment rule depends deterministically only on age at dismissal. Moreover, we use past working histories of enrolled workers for specification tests on RDD assumptions. Following Lee (2007), to test the validity of the RDD identifying restriction we look at the pre-programme labour market history of workers enrolled in the LM to check whether any abnormal discontinuity emerges at the cut-off points relevant for the assignment to alternative package of benefits.

The paper proceeds as follows. Section 2 illustrates some additional features of the programme that are useful to clarify the evaluation question we address. Section 3 discusses the likely effect of the policy mix. Section 4 expounds the strategy to identify the differential impact of the benefits, based on RDD. Section 5 describes the linked panel data set and presents the main results of the analysis. Section 6 concludes.

## **2. The programme *Liste di mobilità***

### ***2.1. The institutional context: a brief outline***

Italy is among the countries where workers are more protected on the job, by the employment protection regulations and a generous pension system, than in the market, by passive and active labour market policies (see Esping-Andersen, 1990, for a broad review, and OECD, 2004, Ch. 2, for comparative evidence on the role of employment protection regulation).

The protection of workers against “unjustified” dismissals – *i.e.* dismissals due to reasons other than “just cause” or “serious economic reasons” – is fairly high (see Ichino, 2004, for an insightful scrutiny). For comparative purposes – across countries and/or over time, a convenient overall measure of workers’ protection is the OECD’s Employment Protection Legislation (EPL) summary indicator. The summary indicator of EPL strictness at the end of the 1990s is 3.1 for Italy: much higher than for countries like USA (0.7) and, within the European Union, UK (1.0) and Denmark (1.8), but close to – just slightly higher than – Spain, France, Germany, Norway and Sweden<sup>4</sup>.

An additional point is worth emphasizing for Italy. The firm size threshold of 15 employees has broad repercussions on the Italian unemployment insurance and employment protection systems

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<sup>4</sup> OECD (2004), p. 105. Data for 2003, at p. 70, document a neat decline of EPL strictness in Italy, both in absolute and comparative terms. Previous estimates of such indicator suffered from an upward bias for Italy: see Del Conte, Devillanova and Morelli (2004) and OECD (2004), p. 108.

At this threshold there are several discontinuities in labour market regulations (among which the one just mentioned for the LM programme), the main being precisely the provisions against unjust dismissals of permanent employees, who benefit of much stronger protection if employed by larger firms (Schivardi and Torrini, 2004).

As for welfare measures, the picture is basically opposite. The OECD summary measure of net (*i.e.* after tax) replacement rates – which, in addition to unemployment insurance (UI), includes welfare benefits such as social assistance, lone-parent benefits, *etc.* – is around 45% for Italy, well below the 65% OECD average (Martin and Grubb, 2001, Figure 3). Specifically, UI to any worker not eligible for the LM is definitely low. Over the period covered by our analyses, recipients of the standard UI are unemployed individuals who meet the requirement of having been previously employed for of at least 24 (non necessarily uninterrupted) months with SSCs: the replacement rate of standard UI is 30%, and it lasts a maximum of six months<sup>5</sup>. Unemployed individuals looking for their first job – or with previous work experience but not meeting the eligibility requirement above – draw no unemployment benefits at all.

More generally, in Italy the share of public spending on active and passive labour market measures is comparatively modest (Martin and Grubb, 2001, Table 1, and OECD, 2005, Statistical Appendix, Table H).

A further point is worth stressing: the bulk of Italian active labour market policies is made-up of traditional measures, such as training (especially financial support to apprenticeship) and recruitment incentives, with almost no room for new programmes such as welfare to work policies and the so-called “*mutual obligations*” programmes, which combine activation strategies with increased monitoring of job-seekers and enforcement of work tests (OECD, 2005, Ch. 3).

## **2.2. Basic provisions of the LM programme**

### **2.2.1. Enrolment and eligibility duration**

The LM programme is mainly regulated by laws No. 233/1991 and 236/1993<sup>6</sup>. Firms with more than 15 employees<sup>7</sup> (we will refer to them also as medium and large firms), may collectively<sup>8</sup>

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<sup>5</sup> In addition to the case of workers enrolled in the LM, an exception is offered by the *Cassa Integrazione Guadagni Straordinaria* (CIGS). Workers employed by large firms that experienced plant closures or collective redundancies due to structural changes are usually granted access to CIGS: a special fund that pays them substantial benefits while they retain the employment relationship – in principle they are workers temporarily laid off. Workers might stay in this fund for an unlimited number of years, depending on agreements between trade unions and employers’ organizations and on a final decision by Government – indeed, the fund is almost entirely supported by the taxpayer.

<sup>6</sup> Some provisions vary according to industry, worker’s occupation, geographic area, *etc.*, and underwent frequent modifications over time. We just outline the main provisions relevant to our area and period of analysis. For details, see Anastasia *et al.* (2004), pp. 49-64, Caruso and Pisauro (2005) and references therein.

dismiss redundant workers – because of plant closure or reduction or transformation of activity – and automatically enrol them, at a cost, in special registers maintained by regional authorities. Workers dismissed by firms up to 15 employees (we will refer to them as small firms) may also enrol in LM, but for them registration is voluntary. Informed evidence indicates that most eligible workers dismissed by small firms do register in the Lists. To be eligible for the LM the worker must have been at least one year on a permanent contract with the dismissing firm.

Enrolled workers younger than 40 years, aged 40 to 49 and older than 49 are eligible for the LM benefits over one, two and three years, respectively.

An exception to this rule is that during the eligibility period workers are allowed to engage in temporary employment, while maintaining their LM status. The clock measuring time since enrolment in the LM stops as they start a temporary employment spell, and restarts as they complete it re-entering unemployment. The duration of a single temporary employment spell cannot be longer than one year, and the total duration of temporary employment spells experienced by a LM worker cannot be longer than the maximum duration in the LM s/he is in principle allowed – *i.e.* s/he may double her/his stay in the programme. Most importantly, during the temporary employment spell workers entitled to monetary benefits do not receive them.

### 2.2.2. *The passive component, for workers dismissed by medium and large firms*

As for the passive component of the programme, workers dismissed by medium and large firms receive monetary benefits (*indennità di mobilità*). The replacement rate is equal to 80% of the last gross wage during the first year, and drops to 64% – 80% of the first-year benefit – during the second and third year, with a ceiling that varies over time.

Furthermore, a special provision holds for workers older than 49 dismissed by medium and large firms, meeting some additional conditions with respect to retirement rules. They are entitled to remain in the LM, drawing monetary benefits, up to retirement age – as anticipated, this is the so-called “long mobility”. The crucial additional condition for them to be eligible to “long mobility” is to have 28 years of covered employment (*i.e.* with paid SSCs), the three years in the LM being included. Thus, a 50 year old worker with an uninterrupted occupational history should have begun working no later than his/her 25 (or at an even older age if s/he is older than 50 at dismissal).

By contrast, enrolled workers dismissed by small firms receive just the standard UI (as anticipated, 30% of their last wage up to six months), provided that they meet the additional

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<sup>7</sup> The firm size threshold goes up to 50 employees for firms in some branches of retail and sales and transportation.

<sup>8</sup> Those firms should have “collective redundancies”, that is at least five redundancies within a period of four months.

requirement of 24 months of covered employment. As our empirical analyses will focus on workers around the 40 and 50-year threshold, this requirement is generally met.

Workers in the LM should in principle fulfil some obligations with respect to training and job offers. Again in principle, an LM worker who refuses an appropriate job offer by the local public labour exchange is dropped from the programme<sup>9</sup>. However, the enforcement of these eligibility rules is largely absent. Thus, in practice the worker willingness to accept a job offer is not tested and a worker enrolled in the LM can refuse any job offer s/he receives, keeping his/her package of benefits unchanged up to the end of the maximum allowed period in the programme.

### 2.2.3. *The active component*

As for the active component of the programme, firms hiring workers from the LM with a permanent contract enjoy an 18-months long substantial reduction in SSCs, whose size does not depend on the amount of time spent by the worker in the LM nor on his/her age: SSCs paid by the employer drop from the standard rate – in 1998 around 35% – to the fixed amount due for apprentices, about 3% of the standard one. Firms can also hire workers from the LM on a temporary (up to) one-year basis, this way enjoying an (up to) one-year reduction in SSCs. Lastly, firms can largely cumulate these rebates by hiring workers on a temporary one-year contract and then switching to a permanent one as the former expires: this way the rebate lasts two years.

In addition, firms hiring on a permanent contract workers eligible for monetary benefits are entitled to receive up to 50% of the residual benefits the hired worker would have received had s/he remained in the LM. The benefit transfer has a ceiling of one year and two years, imposed on workers aged up to 49 (*i.e.* both one- and two-year eligible) and 50 year or more, respectively. This asymmetry produces peculiar patterns of the overall differential benefit to the hiring firm over time, which we will clarify below.

As we will document shortly, incentives for the hiring firm are substantial and may induce some firms to fraudulently dismiss workers and enrol them in the LM in order to re-hire them, directly or by affiliates or by newly created firms, only to draw benefits. This possibility has been drastically restricted by Law No. 451/1994, which was enacted also to prevent these frauds<sup>10</sup>.

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<sup>9</sup> The appropriateness of a job offer is defined in terms of distance from residence and closeness to previous job/wage.

<sup>10</sup> Re-hiring was formally prohibited during the first six months of enrolment in LM, and the social security agency has been active in order to contrast any practices aimed at evading the law. However, some frauds still appear to occur (see Anastasia *et al.*, 2004, for empirical evidence for Veneto). Moreover, some rules of the programme are still opaque – derogations were occasionally introduced to face occupational crises – and leave room for what might not be fraudulent behaviour but simply improper use of the programme: see Caruso and Pisauro (2005), who, for a region of Central Italy, provide evidence of some confusion between dismissals and temporary lay-offs. In the latter case workers are dismissed and then simply recalled to their old job, a practice that in principle should be at the margin of the scope of the programme.

#### 2.2.4. *The result of the policy mix: various sub-programmes targeted to different populations*

The main features of the LM programme suggest that there are in fact two separate sub-programmes, aimed at two non-overlapping populations.

- (a) The first sub-programme applies to workers who have been collectively dismissed by medium and large firms. (a1) Upon dismissal and subsequent enrolment in the LM, these workers benefit from three different provisions: monetary benefits for themselves and, for the firm that intends to hire them, a SSCs reduction for up to two years and the benefit transfer. (a2) Besides, this sub-programme is fundamentally altered for workers aged 50 years or more meeting the requirements for “long mobility”: for them, the income maintenance goal – hence the passive provisions – become dominant.
- (b) The second sub-programme is relevant to workers dismissed collectively or even individually by small firms. The mix of the active and passive components does not apply to them. Within the ML programme they benefit only from the SSCs reduction. Of course, apart from that they may draw the standard UI, if they are eligible to it.

The common feature of the two sub-programmes is the duration of eligibility determined by the worker’s age at dismissal. This common rule motivates looking at both sub-programmes in the same analysis. However, the differential effect one should expect from the packages of benefits associated to the eligibility duration is very likely to vary across sub-programmes, as well from the 40 to the 50-year threshold for workers eligible to monetary benefits. .

#### 2.3. *LM in an international perspective*

It is worth briefly gauging the peculiar design of the LM programme within an international perspective. The core of LM programme consists of a combination of two well-established measures: an employment subsidy paid to the hiring firm; monetary benefits paid to the worker. Besides, the policy mix varies according to workers’ age at dismissal and dismissing firm size. While such variation in the policy mix is peculiar to the LM programme, the two basic ingredients – the active and the passive component – and their combination are shared by several active labour market policies in developed countries.

The cross-country comparative empirical evidence about employment subsidies suggests that they “*can yield significant net employment gains and help maintain workers’ attachment to the labour force. However, employment subsidies should be of short duration, targeted and closely monitored*” (Martin and Grubb, 2001, p. 33).

There is also abundant empirical evidence that UI reduces the hazard to employment up to the time close to the expiration of the benefit (see Atkinson and Micklewright, 1991, and Meyer

1990, among many others). More success stories are found when UI is complemented with employment bonuses – *i.e.* cash payments to UI recipients who find a job quickly and keep it for a specified length of time – or with combinations of services to improve job search and increase enforcement of work search rules (Meyer, 1995).

Looking at the policy mix, a peculiar feature of the LM programme is the lack of any “activation” strategy, aimed at accompanying the two components just mentioned. As research largely documented by OECD and several other studies suggests, the synergy between the active and passive components of a labour market programme is vital if one seeks to enhance its effectiveness. From that perspective, despite its benefit transfer component the LM rests essentially a traditional programme. It does not reflect the shift in the policy stance towards greater “activation” and a tightening of the eligibility rules for benefit receipt noticeable in the last decade in many OECD countries (Martin and Grubb, 2001, OECD, 2005, Chapters 3-5, Kluve *et al.* 2007; specifically for the US see Blank, 2002, and Grogger and Karoly, 2005).

### **3. What are the likely effects of extended eligibility?**

How do we expect the agents involved to react to the mix of incentives created by the LM programme? We address the question by focusing mainly on the differential effect of being eligible for two years of benefits instead of just one. Broadly speaking, the issue can be formulated as follows: *ceteris paribus*, in which direction does allowing workers just above the 40-year threshold to stay in the programme for two years affect their chance of re-employment relative to what would have happened to them with one year of benefits?

With the standard job search model as a background (Mortensen and Pissarides, 1999), it is apparent that there are two contrasting incentives of the LM programme: (i) the incentive to firms, which benefit from the rebate on SSCs (and in some cases from the bonus transfer), to provide workers enrolled in the LM with more job offers that they would otherwise receive; (ii) the incentive to workers, particularly to those drawing monetary benefits from the LM programme, to increase their reservation wage, then to refuse the job offers they might receive, at least over a large fraction of their eligibility period.

In comparative terms, both these incentives tend to be higher for workers under treatment, because of their extended eligibility. From a theoretical point of view, the sign of the differential treatment effect is *a priori* uncertain, and depends on which of the two differences in incentives prevails. Besides, it might vary over the eligibility period, and obviously across sub-programmes and gender. Furthermore, it will inextricably mixed with the provisions about engagement in temporary employment. Thus, the differential treatment effect can only be sorted out empirically.

### 3.1. A simplified example around the 40-year threshold: from the potential employer's point of view

Before moving to the empirical evaluation study, we elucidate the issue by presenting some computations of the various pieces of benefits – both to workers and firms – and their variation over time, in a highly simplified set-up. To illustrate the point, we build up on the example summarized in Figure 1: the benchmark is given by an employee hired on a permanent basis from the market, whose annual gross wage<sup>11</sup> is approximately 13,000 Euros. This is the modal gross wage for a blue collar aged around 40 years old in a sector such as textile, in 1998.

Let us look at the issue from the employer's point of view. Adding to the annual gross wage the SSCs paid by the employer, this representative worker over two years costs approximately 34,250 Euros (Figure 1, first bar on the left). To this benchmark, we compare the cost the employer incurs by hiring from the LM a worker aged 40 or a comparable worker aged 39 – receiving or not receiving monetary benefits, respectively – under four different hiring strategies, that result from combining the type of contract – a permanent as opposed to a first temporary-then permanent contract – and the timing of the hire with respect to the time the worker entered the LM – immediately after the worker's registration as opposed to one year later.

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Figure 1 about here  
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No matter for the worker's age around the 40-year threshold, for his/her eligibility for monetary benefits and for the time s/he already spent in the LM, the best strategy for the employer is to hire a worker from the LM on a temporary one-year contract and then to switch it to a permanent one. This strategy provides a saving over the two years labour cost worth approximately 8,000 Euros (23% of the labour cost; Figure 1, third bar from the left).

In our example, the employer saves 4,350 additional Euros (13% of the labour cost)<sup>12</sup> by hiring a worker eligible for monetary benefits on his/her first day in the LM, irrespective of his/her age<sup>13</sup> (Figure 1, fifth bar from the left). Note that if the worker is not eligible for monetary benefits,

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<sup>11</sup> Gross of SSCs paid by workers and personal income taxes. As it will be clarified in Section 3.2, for such a wage the ceiling for the monetary benefits to an eligible worker in the Lists is binding.

<sup>12</sup> Note that the relative weight of the bonus transfer – with respect to total savings from hiring a worker from the LM – varies when the ceiling to monetary benefits is binding, *i.e.* when it is lower than the 80% replacement rate. Clearly, the greater the difference between the 80% replacement rate and monetary benefits (otherwise stated, the higher the worker's previous gross wage), the lower will be the relative importance of the bonus transfer. In our example monthly gross wage was set at 1,000 Euros, slightly higher than the threshold corresponding to the ceiling to monetary benefits, which is therefore effective (though marginally: 725 Euros *vs.* the hypothetical 800 Euros implied by the replacement rate rule).

<sup>13</sup> Here and in the following of the example, variation of age is always meant to be around the 40-year threshold.

the employer savings on labour cost do not vary with worker's age nor with the time s/he already spent in LM. Note, further, that if the worker is eligible for monetary benefits, the employer savings on labour cost do not vary with worker's age only if the hiring takes place the very first day s/he enters LM.

As seen from the point of view of an employer who is considering to hire from the LM a worker eligible for monetary benefits, the difference between hiring a worker aged 40 and a comparable worker aged 39 becomes relevant as time spent in LM goes by. The effect is to rise savings on labour cost:

- during the first year by an amount equal to  $3,479 \cdot (t/365)$  Euros,  $t=1...365$ , where  $t$  is the number of days the worker has been enrolled in the LM at the time the hiring takes place. Thus it is zero the first day in the LM, then increases linearly up to a peak of 3,479 Euros at the end of the year<sup>14</sup>;
- during the second year by an amount equal to  $\{7,968+3,479 \cdot [(1-(t-365)/365)]\}$  Euros,  $t=366...730$ , as for workers aged 39 the eligibility period expired.

Still with reference to our example, Figure 2a presents the savings over two years from hiring a worker from the LM as a function of elapsed time from his/her enrolment for the best hiring strategy – first temporary-then permanent contract, for workers entitled to monetary benefits just above and below the 40-year threshold, respectively. The time paths of the savings have clear patterns; as a result, the additional advantage from hiring a worker holding a two-year eligibility duration presents a peculiar time profile, with marked kinks. An employer willing to hire from the LM will prefer workers above the 40-year threshold to comparable workers below it as long as they already spent some time in the LM: their additional advantage has a substantial jump immediately after one year of stay (see Figure 2b)<sup>15</sup>.

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 Figure 2 about here  
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From Figures 1 and 2 it is also apparent that the bulk of savings for the hiring firm is represented by the massive rebate on SSCs. In the case of the best hiring strategy just considered, it goes from 65% to 70% of total savings (when hiring a worker the first day s/he enters LM or a worker aged 40 after one year, respectively). Besides, it coincides with total savings – by the way

<sup>14</sup> In relative terms, the fraction of savings is as large as  $[3,479 \cdot (t/365)]/[7,968+3,480 \cdot (t/365)]$ , and reaches a peak of 30% at the end of the first year.

<sup>15</sup> The employer should also prefer workers eligible for monetary benefits to comparable workers ineligible to them (for the latter, the saving will consist of the SSCs rebate only, and will stay constant along the eligibility period). In the case of the best hiring strategy and for a hiring taking place the day the worker enters the Lists the relative advantage is 35%.

still substantial: 23% of the two years labour cost – in all circumstances when there is no bonus transfer, and specifically at the end of eligibility period.

One implication of these facts is that it might not be all that crucial to a potential employer whether the LM worker to be hired is entitled or not to monetary benefits, and whether s/he is above or below the 40-year threshold, because in all cases the employer receives the same rebate on SSCs, as long as the worker is eligible. The important difference for the employer is that workers below the 40-year threshold must be hired during the first year in the LM to carry the SSCs rebate with them, while older workers in their forties have an additional year to be hired with the rebate.

### *3.2. A simplified example around the 40-year threshold: from the worker's point of view*

Let us now consider the issue from the worker's point of view. We build on the case of a worker enrolled in the LM in 1998, who, if eligible to monetary benefits, does not face a binding ceiling for them. The basic computations are as follows. For an enrolled worker eligible to monetary benefits the ceiling for monetary benefits was set at 725 Euros for the first year, which corresponds to a monthly gross wage of 906 Euros, and to an yearly gross wage close to 11,800 Euros. However, the rate for SSCs paid by a LM beneficiary on gross monetary benefits is much lower than the one paid by a regular worker on gross wage<sup>16</sup>, and these contributions are fully removed after the first year. Thus, for a worker in the LM for whom the ceiling is not binding, the take-home monetary benefits are approximately 83% of the previous take-home pay during the first year, and remain higher than 70% afterwards<sup>17</sup>.

As an example, in the case of a worker enrolled in the Lists in 1998 and with a gross monthly just at the ceiling for that year – 906 Euros, the monthly take-home monetary benefits for the first year amount to 752 Euros. If the worker is in her/his forties, s/he has two year eligibility, and the monthly take-home monetary benefits s/he might receive in the second year stay higher than 635. The advantage over a comparable worker with two years of covered employment dismissed by a small firm, thus eligible only to the standard UI, is remarkable. Actually, the latter worker will draw some 275 Euros per month, for a maximum of six months.

How does the economic problem s/he has to solve change if his/her eligibility period switches from one to two years? Let us look, first, at the case of a worker with no monetary benefits. With the standard UI not varying with age, for a worker aged 40 the additional year of eligibility essentially doubles the length of the period over which his/her chance of getting job

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<sup>16</sup> The SSC rate is 5.54% vs. 9.19%.

<sup>17</sup> Moreover, for a worker in the LM with no other sources of income, the after-tax replacement rate of monetary benefits is even higher, and declines more moderately after the first year, because the personal tax system is progressive, with a tax-exempt initial amount of income.

offers is enhanced by the LM<sup>18</sup>. Other things being equal, the longer period s/he has available for search under the favourable conditions provided by the LM should result in a higher reservation wage during the first year spent in LM: conceivably just a bit higher, because s/he too will be severely constrained by the poor resources the standard UI provides to live on. On the other hand, during the second year s/he will benefit from a positive difference in the rate of arrival of job offers, as a comparable worker aged 39 will no longer carry the hiring subsidy in favour of potential employers. Summing up, the expected pattern of the effect of the additional year of eligibility on the re-employment probabilities is not decreasing over time: possibly negative or nil during the first year, but positive after the first year.

In the case of a worker with monetary benefits, switching his/her eligibility period from one to two years (i) doubles the period over which s/he benefits from higher chances of getting job offers, (ii) increases the differential benefit s/he provides potential employers in a highly non-linear way as function of the time already spent in the LM, as suggested by the pattern of differential savings to the hiring firm shown in Figure 2b; and, mainly (iii) doubles the period over which s/he has resources to live on while searching for a new job (though they decline by some 15% during the second year).

The differential benefit to the hiring firm – which should translate into an increased number of job offers the worker entitled to a two-year eligibility is expected to receive – is only marginally positive during the first year, particularly when time spent in the LM is short<sup>19</sup>. By contrast, it will become remarkably higher during the second year, as a comparable worker entitled to the one-year regime will carry no benefit at all to the hiring firm. Thus, under the assumption that duration of stay in LM is not perceived by the potential employer as a stigma and that reduction in take-home monetary benefits during the second year is perceived by the worker as negligible, a worker aged 40 during the second year in the LM can do almost as well as a worker aged 39 during his/her first year. Summing up, the two-year eligibility period will likely result in lower re-employment probabilities during the first year, because a worker aged 40 can wait for the second year in order to start behaving the way s/he would have behaved in the absence of the additional year of eligibility. As for the employment probabilities during the second year, the sign of the differential effect is dubious, because of the just-mentioned contrasting advantages: on reservation wage (higher, since in the counterfactual world the worker would have not received any monetary benefits) and on the

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<sup>18</sup> The additional year should not affect the rate of arrival of job offers during the eligibility period, unless the duration of stay in LM is perceived by the potential employer as a signal of poor “employability”).

<sup>19</sup> Indeed, differences in the rate of arrival of job offers will remain modest during the entire first year in the LM, because of the dominant role played by the SSCs rebate in the savings for the hiring firm (see again Figure 2b).

flow of job offers (higher too, since in the counterfactual world the worker would have not carried any employment subsidy to the potential employer). If we are willing to admit a prevailing role of monetary benefits, as the longer period of search made possible by the additional year of eligibility with monetary benefits in the end might result in better jobs, re-employment probabilities will also be lower during the second year. This prediction, however, should be taken as tentative and has to be corroborated (or denied) by empirical evidence, because of the concomitant higher flow of job offers during the second year induced by the subsidy to the potential employer.

Of course, the size and even the sign of the differential effects of the two-year *vs.* one-year eligibility for the LM become blurred if we relax the two simplifying assumptions just made, *i.e.* if we admit that (i) the duration of enrolment in Lists might be perceived by potential employers as a signal of poor “employability”, and that (ii) the reduction in take-home monetary benefits might severely constraint the worker’s living conditions.

### 3.3. *The case of the 50-year threshold*

If we move to the differential treatment effect of three *vs.* two years eligibility, the line of reasoning is similar for workers not eligible for monetary benefits.

For 50 year old workers entitled to monetary benefits, who are allowed to stay in the programme for three years – and even more in the case of “long mobility”, the issue of the differential effect in their chance of re-employment, relative to what would have happened to them with two year of benefits, is far more complex. A first complication comes from the fact for them the benefit transfer has a ceiling of two years, while it reduces to one-year in the counterfactual. As a consequence, additional savings on labour costs for an employer permanently hiring a worker aged 50 from the ML extend over the entire eligibility period<sup>20</sup> – the first day the worker enters the Lists included. Indeed, with respect to the counterfactual the benefit transfer component of savings almost doubles if the permanent hire takes place the very first day the worker enters the LM.

This complication, however, is minor: it only entails some further calculations. The real challenge arises from the “long mobility” provisions. As anticipated, they alter the very same goal of the LM programme. Most workers above the 50-year threshold eligible for “long mobility” are likely to look just at the income maintenance component of the programme, and use it as a bridge to retirement. In other words, they will behave not as unemployed, actively searching for a new job, but as to-be retired persons, *de facto* out-of-the labour force. Thus, it is problematic to argue about the proper differential effect of extended duration of eligibility as separated from the “long mobility” effect. Again, the differential treatment effect can only be sorted out empirically, and it

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<sup>20</sup> The obvious exclusion refers to the last admissible day in the Lists.

will refer to the bulk of the provisions for workers aged 50 years, relative to the counterfactual of two-year eligibility.

#### 4. The design of the evaluation study: RDD

Our aim is to identify the differential effect of extended duration of eligibility at the 40 years and 50-year threshold, respectively<sup>21</sup>. We present our approach with reference to the 40-year threshold. The extension to workers around their fifties is operationally straightforward; however, the interpretation of results for those entitled to monetary benefits has to take into account that we are assessing an overall differential effect, which includes the impact of “long mobility”..

Since the duration of the eligibility period varies across workers depending on their age at the time of dismissal, the econometric problem we face is that the differential effect of the second year of eligibility might be obscured by the age affect – *i.e.* the different composition with respect to age of the two sub-groups receiving the alternative packages of benefits. Indeed, the treatment status  $I$ , denoting eligibility for the second year of benefits, is a deterministic function of age according to the rule:

$$I = \begin{cases} 1 & \text{age } 40-49 \\ 0 & \text{age } \leq 40 \end{cases} . \quad (1)$$

The outcome we look at is whether the worker is employed in each of the 36 months subsequent to his/her enrolment in the LM, whether on a temporary or a permanent contract. Let  $Y^T$  and  $Y^{NT}$  be the outcomes<sup>22</sup> a specific worker would experience being exposed to and denied the treatment, respectively. By contrasting the mean outcome experienced by the treatment group to the mean outcome experienced by the comparison group, we obtain the following identity:

$$E[Y^T | I = 1] - E[Y^{NT} | I = 0] = E[\alpha | I = 1] + \{E[Y^{NT} | I = 1] - E[Y^{NT} | I = 0]\}, \quad (2)$$

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<sup>21</sup> We do not address the issue of the differential effect of being eligible to monetary benefits – an interesting, and classical, evaluation question – for several reasons. First of all, there are many studies which have looked on effects of the unemployment benefit system, in more detail and with more informative data sets (some references are in Section 2.4 above). Second, in our case the firm size threshold of 15 employees, which decides about eligibility to monetary benefits, is relevant for several other discontinuities in labour market regulations (see Section 2.1 above). This raises a hardly solvable identification issue, because workers hired by small firms may be different in many unobservable ways from workers employed by larger firms (see Paggiaro, Rettore and Trivellato, 2005, pp. 16-17, for empirical evidence that the set of matching variables available to them is not rich enough to compensate for the different composition of the pools of workers dismissed by firms below and above the 15-employee threshold, respectively). Furthermore, information on firm size available from *Inps* data does not exactly match the firm size definition relevant to the LM, so there would be the additional problem of measurement errors around the threshold.

<sup>22</sup> The same notation holds also for the other “auxiliary” outcome variables used in the empirical analysis: linkage rates and gross real weekly wages.

where  $E[\alpha | I=1]$  is the mean effect on the treatment group, and the difference in brackets is selection bias. By design workers in the treatment group are older than workers in the comparison group, which implies that the observed difference between the two groups in the outcomes includes the likely effect of age<sup>23</sup>.

In our case, a crucial feature of selection bias is that assignment to the treatment depends deterministically on age, an observable characteristic of the subjects. A suitable strategy in this situation is RDD (see Hahn, Todd and Van der Klaauw, 2001, among others), which exploits the near independence between the treatment status  $I$  and the potential outcomes  $(Y^T, Y^{NT})$ , that holds in a neighbourhood of the threshold for assignment<sup>24</sup>:

$$(Y^T, Y^{NT}) \perp I \mid \text{age} = 40. \quad (3)$$

Under the assumption that the association of potential outcomes with age is smooth, the straightforward intuition is that treatments close to the threshold in the absence of treatment would experience the same outcome as controls close to the threshold, since they are approximately the same with respect to age – the only individual characteristic relevant for the assignment rule. Thus, any discontinuity of the conditional distribution of the outcome as a function of age around the 40-year threshold can be interpreted as differential treatment effect.

The drawback of this design is that if the programme impact is heterogeneous across subjects – as in most cases it is likely to be – then it only allows to identify the mean effect in a neighbourhood of the threshold. In that sense, “*the design has fundamentally only a limited degree of external validity, although the specific average effect that is identified may well be of special interest*” (Imbens and Lemieux, 2007).

The inferential problem of estimating the mean effect translates into the problem of estimating the conditional expectations of the two potential outcomes, around the threshold. Under assumption (3), we can separately estimate the mean outcome on the two sides of the threshold: the mean of  $Y^{NT}$  conditional on age among workers not older than 40, and the corresponding conditional mean of  $Y^T$  among workers older than 40. We will use nonparametric methods, specifically local linear regression (LLR)<sup>25</sup>, to estimate these conditional expectations, as proposed by Hahn Todd and Van der Klaauw (2001)<sup>26</sup>.

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<sup>23</sup> For a thorough review of econometric methods to identify the impact of labour market policies see Heckman, Lalonde and Smith (1999).

<sup>24</sup> This is the “*Sharp*” version of RDD, as the probability of receiving the treatment shifts from zero to one around the threshold. A jump smaller than one results in the so called “*Fuzzy*” RDD (Imbens and Lemieux, 2007).

<sup>25</sup> The choice of a local regression with first order polynomials has many theoretical advantages. First, Fan and Gijbels (1996) show that a first order local polynomial allows to eliminate problems of estimation at a boundary point, common

Weights to estimate local polynomials follow a tricube function (Cleveland, 1979), while the bandwidth is chosen by using a version of the AIC criterion proposed by Hurvich and Simonoff (1998). Inference used to build confidence intervals follows the approach proposed by Cleveland and Grosse (1991), who show that LLR estimates have a  $t$  distribution and derive a method to calculate degrees of freedom. Thus, confidence intervals are wider and have a better coverage if compared to the usual normal approximation, particularly with a limited sample size.

## 5. The empirical study

### 5.1. Data

We carry out the analysis on the population of workers enrolled in LM in the Veneto region in the years 1995-1998. The list of workers comes from an *ad hoc* file from *Netlabor*, which includes also some information on the process leading to enrolment. In principle data are available since 1991 – the year when the programme started – to 2005. The motivation for restricting to the 29,540 workers enrolled between 1995 and 1998<sup>27</sup> is twofold. Years from 1991 to 1994 face serious problems of data quality. Besides, this way for each worker we have at least three years of labour market history after s/he enrolls in the Lists, essential for estimating the medium term mean effects at the thresholds of extending the eligibility.

The analyses will be systematically carried out separately (i) for the 40-year and 50-year threshold, (ii) for the two sub-programmes of the LM – the one applying to workers collectively dismissed by medium and large firms and the other to workers dismissed by small firms, and (iii) by gender.

Before moving to the empirical analyses, it is useful to clarify that Veneto is a well-developed region, with a rather tight labour market and a *per capita* GDP some 15% higher than the national average. In 1998, the employment rate was 59.6% compared to 52.9% in Italy, while unemployment rate was 6.1% vs. 11.4% in the whole country<sup>28</sup>. Thus, while our main results would

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to standard nonparametric methods, which have a slower rate of convergence. On the other hand, higher order polynomials are potentially useful only if their order is odd; besides, they rarely bring enhancements in estimation, while leading to theoretical and computational complications and to highly unstable results.

<sup>26</sup> We carried out many sensitivity analyses, both for the specific choices inside these methods and for a comparison with alternative methods, as splines, local regression with different polynomial order or simple parametric methods. The main evidence on all sub-groups and outcomes is the same with all sensible methods, thus our results seem robust.

<sup>27</sup> We exclude workers with more than one LM spell during this period (about 3%). The main reason is that for these workers the history before and/or after enrolment is strongly influenced by other LM enrolments, so that the interpretation of their behaviour is different when compared to workers enrolled just once.

<sup>28</sup> Employment rate for working ages, 15-64. These data, as well as those on unemployment, are revised official estimates from the Labour Force Survey. Comparative empirical evidence for adjacent years is similar.

reasonably generalise to most of Northern and Central Italy, who feature not dissimilar rates of employment and unemployment, they by no means can be taken as representative of the whole of Italy<sup>29</sup>. As for possible general equilibrium and spill-over effects, it is worth noting that the average yearly flow of workers enrolled in the LM – less than 8,000 – is still a modest fraction of the stock of the unemployed in the region – around 100,000. This suggests that effects of the LM on unemployed workers ineligible for LM as well as on the functioning of the labour market should be negligible.

Figure 3 shows the distribution of enrolled workers by age, stratified by entitlement to monetary benefits and gender. The main evidence is a strong discontinuity around the 50-year threshold for workers with monetary benefits, especially for men. As this is exactly the threshold for potential entitlement to “long mobility”, workers dismissed by medium and large firms seem to be “chosen” by considering also the peculiar differential advantages brought to workers by the “long mobility” provisions. We will discuss the potential selection effect induced by this process in Section 5.2. Another interesting evidence regards the large fraction of women, mostly young, without monetary benefits among the population of workers in the Lists. As they can only have access to the standard UI, they make up a substantial group of potentially weak workers.

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Figure 3 about here  
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Working histories before and after enrolment in the LM are reconstructed from the *Inps* files. We use a linked panel data set from *Netlabor* and *Inps* archives, that provides us with employment histories and wages between 1975 and 2001. The file contains 27,565 workers enrolled in the LM (93.3% of our population). Among these, we select those whose enrolment in the LM is uniquely associated to the end of an employment spell from *Inps*. This choice is fairly conservative, and pays a moderate loss in the linkage rate for a high level of protection against false positives. We are left with 24,178 workers, and from these we drop 534 (2%) further workers, who present problems of missing data or inconsistencies in working histories and/or wages. In this case too, a small loss in the linkage rate is balanced by high protection against measurement errors.

The final output of the linkage process is a sample of 23,644 enrolled workers: 80% of our original population, and 86% of those enrolled in the ML according to the *Inps* archives. Figure 4 presents the linkage rate by age for the four sub-groups defined by entitlement to monetary benefits

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<sup>29</sup> The main reason for that is the comparatively poor situation of Southern Italy, in terms of both GDP and employment. Besides, the LM programme itself is differentiated for workers residing in Southern Italy: for them, the length of the eligibility period is further extended by one year, for any age group.

and gender. The only noticeable evidence is again a discontinuity around the 50-year threshold for workers with monetary benefits, with older workers who have a significantly lower linkage rate. We refer to Section 5.2 for an assessment of the potential effect of this evidence.

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Figure 4 about here  
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Table 1 shows the breakdown of linked workers by entitlement to monetary benefits and age group.

- Workers aged less than 40 years – with just one year of eligibility – are two out of three. The fraction goes up to 81% among women without monetary benefits, who represent more than half of the whole age group.
- There is a majority of workers without monetary benefits (59,5%), *i.e.*, dismissed by small firms, but the difference is apparent only for women.
- Finally, there is a much higher rate of workers aged more than 49 among monetary benefits recipients, plausibly mostly because of the opportunities of “long mobility”.

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Table 1 about here  
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We use the monthly employment state as the main outcome variable for estimating the differential effects of the policy associated with extended duration of eligibility (as well as for robustness checks). Gross weekly real wage<sup>30</sup> is an additional outcome variable we shall use essentially to perform some robustness checks. These variables were constructed from some files of the *Inps* archives<sup>31</sup>.

The employment state of the  $i$ -th individual in month  $t$  is set to one if s/he worked at least one day during that month. Our mean outcome variable will be the mean value of the employment state, *i.e.* the “Employment rate”.

As for gross wage, for each record we assume that the weekly wage is the same for all months; in the case of multiple records per month, we associate to each month the higher weekly

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<sup>30</sup> “Real” wage in Euros is at 2003 prices and is used to make sensible comparisons of wages over time, for different cohorts of enrolled workers.

<sup>31</sup> These are the so-called O1M files. Each record represents a yearly social security spell, and contains the number of worked days and weeks, a sequence of 12 monthly dummies that identify month(s) in which the spell took place, and total wage. Thus, an uninterrupted working spell longer than one year is split up in several yearly spells with yearly wage. Moreover, during a specific year it is possible to observe more than one record for the same worker, each with the corresponding yearly wage, mainly in case of job changes.

wage recorded with a positive dummy for that month<sup>32</sup>. For months without job spells, weekly wage is set to zero. “Gross real weekly wage” is then defined as the average wage for workers, thus excluding null wages. Therefore, the sub-sample of workers on which the average wage is computed is different across months, and comparisons need to be carried out with the usual caution related to composition problems.

## 5.2. Specification tests on RDD assumptions

As we stressed in Section 4, our goal is to identify the average effect of extending the duration of eligibility by exploiting the fact that age is the only variable relevant for the assignment rule. We use a RDD to compare enrolled workers who are around the 40 and 50-year thresholds, respectively. Following Lee (2007), we carry out a preliminary test on the RDD identifying restriction..

There is more than one threat to the validity of the design. First, it might be the case that employers and trade unions bargain on the composition of the list of workers to dismiss, taking into account also the amount of benefits they would receive from the LM. A process to selectively choose dismissed workers from the pool of employees on the two sides of the cut-off point could destroy the validity of the RDD<sup>33</sup>. In fact, the discontinuity in Figure 3 particularly large at the 50-year cut-off for men eligible to monetary benefits could be interpreted this way. Second, as we saw in Figure 4, another selection effect affecting the same age group is related to linkage rates. In this case, however, some hints on the direction of the potential bias come from additional data in *Netlabor* archives regarding the reasons of exit from the LM<sup>34</sup>. The linkage process excludes mainly workers who are not observed to find a new job during enrolment in the Lists and then directly retire, so that the true employment rate for workers over 50 with monetary benefits is lower than the one observed in the linked sample. Thus, the huge differences we will observe between who is entitled to retirement and their younger colleagues can be considered as a lower bound of the true ones.

A simple way to test whether these selection processes produce a differential composition of

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<sup>32</sup> Wages are recorded as gross pay in Euros for the year-spell considered. Preliminary analyses suggested that the best way to identify the spell length is the number of worked weeks (number of days is definitely less reliable, as documented by many null or inconsistent values). For each record, it is thus possible to define a gross real weekly wage as the ratio of yearly wage to the number of worked weeks. When there are multiple records per month, they are mainly due to job changes, which makes our assumption reasonable. The only rare exceptions are simultaneous (mainly part-time) job spells, each related to a non-negligible wage.

<sup>33</sup> The discussion in Lalive (2007) on the possible delay of a firing in order to let the worker become eligible for specific benefits is also relevant here.

<sup>34</sup> These variables have many problems of missing or inconsistent data, so that we just use them for a qualitative analysis of the direction of the potential bias.

workers enrolled in the LM around the cut-off points, is to look at their pre-programme working history. Consider Figure 5. It plots the employment rate, conditional on age for workers enrolled in the LM three years before enrolment<sup>35</sup>. Since it is hard to think of a causal effect of the LM programme on the employment state experienced by a worker three years before entering the LM, any discontinuity at the cut-off points should be interpreted as a sign of differential composition around the cut-off point with respect to characteristics relevant for the employment status. Happily, in Figure 5 no significant discontinuity appears at the cut-off points. Similar evidence comes from Figure 6 for wages earned by workers enrolled in the LM and at work three years before enrolment. This confirms that workers aged 39 and 40, and in this case also workers aged 49 and 50, had the same working history before entering the programme.

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Figures 5 and 6 about here  
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### ***5.3 The impact of a longer duration of eligibility on re-employment probabilities***

Figure 7 shows the age profile of the re-employment rates three years after enrolment, thus when most workers already dropped out from the LM. Compared to Figure 5, the age profile is much different, with an essentially decreasing pattern. This happens because we are now conditioning on workers who had a permanent job and were dismissed, while before enrolment younger ones might have been searching for their first job. Nevertheless, the age profile shows no significant discontinuities around the thresholds, except for a major drop of employment at 50 years for workers with monetary benefits, thus again those who can use “long mobility” as a transition to retirement: for men the employment rate drops from 58.7% below the threshold to 22.6% above it, while for women it drops from 47.1% to 20.0%.

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Figure 7 about here  
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As treatments vary with time differently for the three age groups, it is interesting to see whether and how the differential effects (if any) change over time. This is easily done by carrying out LLRs – then estimating the conditional expectations of the potential outcomes around the two cut-off points – repeatedly, each time at a different distance, in months, from enrolment. Figures 8 and 9 display the employment rates estimated around the 40 and 50-year thresholds, respectively, during the three years before and after enrolment. Estimates for the three years before enrolment

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<sup>35</sup> Similar results hold at different distances from enrolment. See Figures 8 and 9 hereafter for details.

confirm what was documented by Figure 5: around both thresholds, workers in the Lists have no significant differences in their previous employment history<sup>36</sup>.

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Figures 8 and 9 about here  
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We focus now on what happens after enrolment. We look first at the 40-year threshold. Figure 8 shows an increasing pattern of employment rates for all workers, with a much steeper growth for workers without monetary benefits<sup>37</sup>. As regards differential effects, there are no important differences with the evidence from Figure 7: there are no significant discontinuities at any distance from enrolment for all sub-groups. As the 40-year cut-off passed all tests on RDD identifying restrictions, we may safely conclude that at this threshold there are no differential effects when we move from one to two years of eligibility.

The only exception are women with monetary benefits. The estimated differential effects for them, though almost never significant, show a peculiar time pattern. During the first year after enrolment employment rates are substantially equal, as they are after three years. However, starting from the 12<sup>th</sup> month they keep to quite different time paths. Women younger than 40 show a gradual growth of the employment rate, which leads them close to the final value of 64.8% starting already from the 21<sup>th</sup> month. On the contrary, women older than 40 get to the final employment rate of 61.5% after staying flat around a 50% employment rate during the whole second year, when those still in the LM draw monetary benefits. After 24 months, the employment rates for women below and above the 40-year threshold are 65.8% and 50.5%, respectively, with a significant difference of more than 15 points<sup>38</sup>. Employment rates for women over 40 start to grow again during the third year, when entitlement to monetary benefits expires<sup>39</sup>. Thus, for women entitled to monetary benefits around the 40-year cut-off, there appears to be a differential effect of duration of eligibility: not on the medium term level of employment rate, but on the way they reach that level in through time, with women entitled to longer monetary benefits who delay their re-entry in the labour market (we will see in Section 5.4 that this process involves mainly women with low wage jobs).

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<sup>36</sup> Data on wages, not presented here for sake of brevity, exhibit a similar pattern.

<sup>37</sup> We point out again that we cannot compare, in a causal sense, these workers with workers eligible to monetary benefits, for the reasons given in footnote 21.

<sup>38</sup> For women with monetary benefits, the 23<sup>rd</sup> and 24<sup>th</sup> months after enrolment are the only two months where 95% intervals do not overlap (see Figure 8).

<sup>39</sup> The exact moment depends on temporary contracts.

The estimated differential effects around the 50-year old threshold are shown in Figure 9. It confirms for the whole period of three years after enrolment what Figure 7 displayed just for the 36<sup>th</sup> month. Differential effects are never significant for workers without monetary benefits, while they are significant for workers entitled to monetary benefits, from the 1<sup>st</sup> month for men and from the 4<sup>th</sup> for women<sup>40</sup>. Besides, effects seem to be larger as time goes by. As an example, after one year the employment rate is halved: from 55.7% to 27.7% for men below and above the threshold, respectively, and from 32.1% to 17.1% for women.

Summing up, we observe a medium term downward effect on employment rates only for workers just over 50 who are entitled to monetary benefits: an evidence which confirms that for them enrolment in the ML is often a first step towards retirement<sup>41</sup>. For all the other workers, irrespective of the fact that they are entitled to monetary benefits or have only access to the active part of the programme, the probability of being re-employed after three years does not depend on maximum allowed duration of eligibility in the LM.

Nevertheless, for women with monetary benefits there is an interesting short term effect around the 40-year old threshold. The employment rate after one year is about 50% and it gets to more than 60% after three years, both for women below and above this threshold. What changes is the time path according to which the employment rate moves from 50 to more than 60% for the two sub-groups. Women entitled to monetary benefits for just one year reach 60% before the end of second year, while for those entitled to two years of monetary benefits the increase takes place during the third year. As a result, for the latter at the end of the second year there is a 15 percentage points negative differential impact on employment rate.

#### ***5.4 Robustness checks on bias due to the different “quality” of jobs and workers***

After having depicted the (few) differential effects of extending the duration of eligibility on employment rates, we address now a related question: do the provisions on different duration of eligibility have some “qualitative” effects on re-employment after enrolment? Again with the standard job search model as a background, it might well be that entitlement to a longer stay in the LM will affect the kind of match. Workers allowed to stay longer, especially if they draw monetary benefits, might be more selective in their search and job acceptance behaviour, and end up in a better match.

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<sup>40</sup> For women the difference is stably significant at 95% only from the 13<sup>th</sup> month, also because of very high standard errors (s.e.) – about 5 percentage points – for women under the 50-year threshold.

<sup>41</sup> Note that, as already pointed up, for workers older than 50 the selection process could take to an overestimate of employment rates, so that estimates of the differential effects can be taken as lower bounds of the true ones.

Within our data set, a sensible proxy for the “quality” of the job is the gross real weekly wage after enrolment for workers who got a new job<sup>42</sup>. Figure 10 presents LLR estimates for weekly wages three years after enrolment, and shows no significant differential effects for all groups. The only apparent differences, still not significant, regard again workers aged 50 with monetary benefits: out of these workers, the few ones who get back to a new job have a higher mean wage than the re-employed workers aged 49<sup>43</sup>.

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Figure 10 about here  
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However, a word of caution is in order. We have to consider that these wages are observed only for the workers who are re-employed three years after enrolment. Clearly, they are a selected sample from the entire pool of workers enrolled in LM, which leads to a potential selection bias. As an example, the higher wages of the few workers over 50 who are re-employed after enrolment may not depend on the provisions of the programme about duration of eligibility; they could simply have got better wages also in the counterfactual, and even in the absence of the programme. A straightforward way to check this is, again, to compare workers’ behaviour before enrolment in the LM, in that case on the sub-samples who are found to be employed three years after enrolment – *i.e.* exactly the same samples considered in Figure 10. For these sub-samples, Figures 11 and 12 show no evidence of significant discontinuities on employment rates and weekly wages three years before enrolment<sup>44</sup>, respectively. Moreover, Figure 12 is quite similar to Figure 10 also for those patterns around the thresholds which exhibit some peculiarities (though not significant): workers over 50 with monetary benefits who got back to work after enrolment had (still not significantly) higher wages also before enrolment. The overall evidence supports the conclusion that the programme does not have any differential effect on mean wages.

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Figures 11 and 12 about here  
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<sup>42</sup> To our purpose, weekly wages for all enrolled workers, thus including zero wages for those still unemployed, are definitely less appropriate outcome variables, as they are affected both by positive wages and employment rates. By the way, in most cases we will find differential effects of duration of eligibility neither in employment rates nor in wages conditional to employment; thus, we may conclude that also the joint distribution of employment and wages will not be affected by the different provisions on maximum allowed duration in the Lists.

<sup>43</sup> For men the mean wage rises from 424 to 453 Euros (s.e. about 10 for both groups), while for women the difference is higher (318 vs. 357) but s.e. are higher too.

<sup>44</sup> Similar evidence comes from comparing outcomes at different time lags before and after enrolment.

Nevertheless, the absence of differential effects of the programme on mean wages still leaves room for potential differential impacts on the distribution of wages. Figure 13 presents the estimates of some selected quantiles of the wage distribution three years after enrolment<sup>45</sup>. No discontinuities appear around the thresholds. A different pattern is found, again, only for older workers with monetary benefits: the higher mean wages observed in Figure 10 are entirely due to a higher right tail, while the distribution up to the third quartile shows no discontinuities<sup>46</sup>. For men, the ninth decile is 608 Euros (s.e. 35) at 49 years, 784 (s.e. 46) at 50 years, with a 176 Euros difference, at the limit of the 5% significance level. For women the difference is even higher (624-402 = 222 Euros) but not significant, due to a much higher s.e. for the older ones (112 vs. 26 for 49ers).

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Figure 13 about here  
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Finally, women with monetary benefits around the 40-year threshold show a peculiar time pattern also for the distribution of wages. As we have seen, women above the threshold are characterised by a delay in re-employment, but with no significant effects on mean wages. Figure 14 shows how the distribution of wages is affected by the different time path of return to a job of women below and above the threshold. The second year after enrolment, that is the only period where differences in employment rates are significant, is also a period with significant differences in the distribution of wages. The first decile is 137 Euros (s.e. 11) for women under 40 years, while it goes up to 218 Euros (s.e. 13) for women aged 40, with a strongly significant difference of 81 Euros. The difference declines to 46 Euros, but is still significant, at the first quartile, the estimates being 213 (s.e. 8) and 259 Euros (s.e. 5), respectively. The strong contraction in the left tail is partly balanced by a smaller right tail, but here differences are smaller and not significant.

By contrast, discontinuities during the first and third year after enrolment are always smaller and never significant for all estimated quantiles. The main final evidence is that women with monetary benefits over the 40-year threshold (*i.e.* with two years of potential stay in the LM) who choose to delay their re-employment are mainly the ones in the left tail of the wage distribution. These women make the most of the passive component of the programme, spending all the time they are allotted to in the Lists. They go back to work only when monetary benefits expire; then they have to reduce their reservation wage, and accept jobs with comparatively lower wages,

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<sup>45</sup> With the only relevant exception of women with monetary benefits, who are analysed just below, evidence is the same at different time distances from enrolment.

<sup>46</sup> This evidence should be taken with caution, due to the small sample sizes of these sub-groups, especially on the tails

reasonably of comparatively lower “quality”. On the contrary, their younger colleagues, who can stay in the LM just one year, had to accept low wage (and low “quality”) jobs much before them.

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Figure 14  
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## 6. Summary and concluding remarks

In this paper we have estimated the average differential effects of various packages of provisions of *Liste di mobilità*, an Italian labour market programme targeted to dismissed employees, in a RDD framework. The empirical analysis has been carried out on the population of workers of the Veneto region who entered the programme in the years 1995-1998, for whom we exploited a new linked administrative panel data set.

Actually, the LM programme is made up of two separate sub-programmes, addressed to different non-overlapping sub-populations of workers. A first sub-programme applies to workers collectively or even individually dismissed by small firms, with less than 15 employees, and its provision consists of a massive cut in SSCs to any firm recruiting a worker from the LM. The duration of eligibility depends only on workers’ age at the time of dismissal: one year for workers up to 40, two years in the 40-49 age group, three years for workers older than 50. However, the variability of duration of eligibility does not affect the amount of the cut in SSCs. We exploit this variability to evaluate the differential effect of extending the duration of eligibility, in a RDD framework, separately for men and women. The clear evidence is that there are no differential effects for workers aged around the 40 and 50-year thresholds. Thus, the extended duration of eligibility to (the main part of) the “active” component of the programme has no impact on re-employment probabilities.

The second sub-programme applies to workers collectively dismissed by medium and large firms, and it adds to the “active” component a “passive” one, which consists of generous monetary benefits to enrolled workers. The duration of eligibility has the same age structure as the previous sub-programme, but with an important implication: monetary benefits last as long a worker is allowed to stay in the LM, and decline moderately with time spent in the Lists. There is also an additional active part, a benefit transfer to the hiring firm, which however plays a minor role in the mix of benefits to the hiring firm. Most importantly, a special provision – the so-called “long mobility” – holds for workers aged 50 years or more, who under mild conditions may use the LM as a bridge to retirement. These provisions alter fundamentally the aim and the working of the

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of the distribution.

programme. We still used the same RDD framework to evaluate the effect of extended duration of eligibility at the 50-year cut-off, but in interpreting the results we had to take into account that above the threshold a substantial variant of the sub-programme is in operation.

Results around the 40-year threshold show no significant effects of extending eligibility (and monetary benefits) from one to two years on re-employment probabilities up to three years after enrolment. This contrasts with most previous studies on the LM, which found a negative differential effect of the two years duration of eligibility on the transition to a new job. The main problem of previous research was the difficulty of identifying the differential treatment effect, as properly distinguished from the age effect. Within a RDD framework, and with our design validated by a set of overidentification tests, we are confident that our results are robust.

The only significant differential effect around the 40-year threshold is a delay in re-employment for women during the second year after enrolment, mostly for women with low wages. As after three years the effect vanishes, this evidence suggests that women are more responsive to monetary benefits and use them at their best, possibly because in the early forties they have also to face family commitments, chiefly young children care<sup>47</sup>.

Effects are much stronger around the 50-year threshold. Slightly more than 20% of worker aged 50 go back to work after enrolling in the LM, while the re-employment rates are close to 50% for women and 60% for men aged 49. This means that the additional provision related to “long mobility” is highly effective, and changes radically the goal of the programme, with almost the entire emphasis cast on the income maintenance component.

Additional robustness checks on wages provide evidence that these results are not affected by any appreciable selection bias associated to the “quality” of jobs or workers.

Some final comments on policy suggestions from our results are appropriate. If the LM programme aims at increasing the re-employment probabilities of dismissed workers, and particularly to favour the transition to employment of older workers, it must be profoundly reconsidered and substantially redesigned. The main hints can be summarised as follows.

- (i) The fact that there is no differential effect on re-employment probabilities around the 40-year threshold, for workers both with and without monetary benefits (the minor exception being peculiar time profile of re-employment rates for women with monetary benefits), and that the same is true for the 50-year threshold for workers without monetary benefits, is a clear signal that the programme is badly designed. The more generous, mainly “passive” provisions

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<sup>47</sup> This is merely conjectural, and needs additional data on family composition to be investigated.

for older workers are of no help at all in getting them back to work. They just make the programme more expensive..

- (ii) The provisions of “long mobility” do have perverse effects on workers aged 50 or more entitled to monetary benefits. They operate as an incentive to early retirement. This is in patent contrast with the concern by the European Union (EU) for increasing the employment rate of older workers. This concern should be particularly relevant for Italy, that lags well behind the EU average in this respect.
- (iii) There are strong differences in re-employment probabilities by gender, across both sub-programmes and for all the age groups. Therefore, a sensible redesign of the programme should shift (the main part of) the variability of benefits, both to workers and firms, from age to gender, and provide more generous packages of benefits to women.
- (iv) For workers drawing monetary benefits, a smoother and sharper phasing-out of monetary benefits would likely help stimulating them to go back earlier to employment.
- (v) Finally the implementation of “activation” provisions, monitoring of job-seekers and enforcement of work tests appears to be essential to characterise the LM programme as a welfare to work policy.

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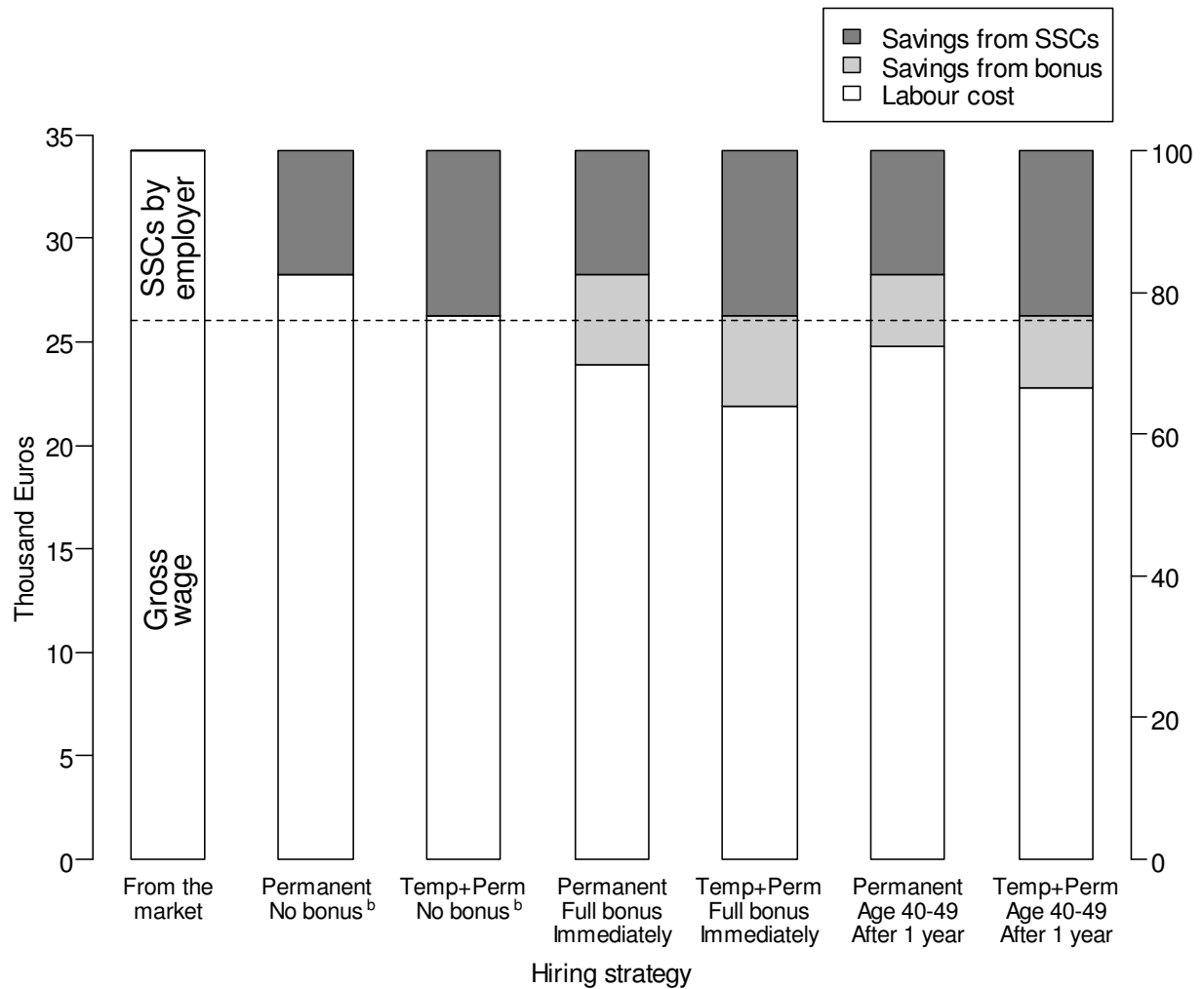
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**Table 1:** Workers enrolled in LM in Veneto during years 1995 to 1998, by gender, entitlement to monetary benefits and age group

Age	<i>Men with monetary benefits</i>		<i>Men without monetary benefits</i>		<i>Women with monetary benefits</i>		<i>Women without monetary benefits</i>		<b>Total</b>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
<40	2127	45.2	2929	60.2	2808	65.1	7921	81.1	15785	66.7
40-49	1392	29.6	1185	24.4	1037	24.1	1366	14.0	4980	21.1
>49	1183	25.2	751	15.4	465	10.8	480	4.9	2879	12.2
<b>Total</b>	4702	100.0	4865	100.0	4310	100.0	9767	100.0	23644	100.0

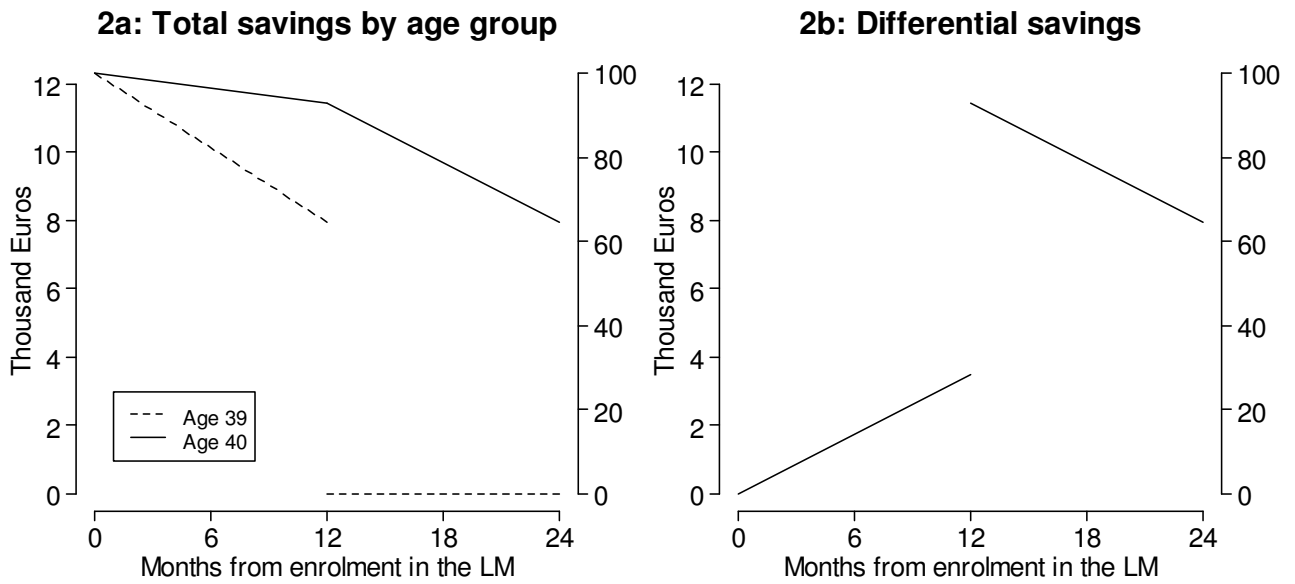
**Figure 1:** Total labour cost and savings over two years for a hiring firm under alternative strategies of hiring a worker from the LM: some typical cases <sup>a</sup>



<sup>a</sup> Working assumptions: annual gross wage 13,000 Euros; SSC rates and monetary benefits ceiling effective in 1998.

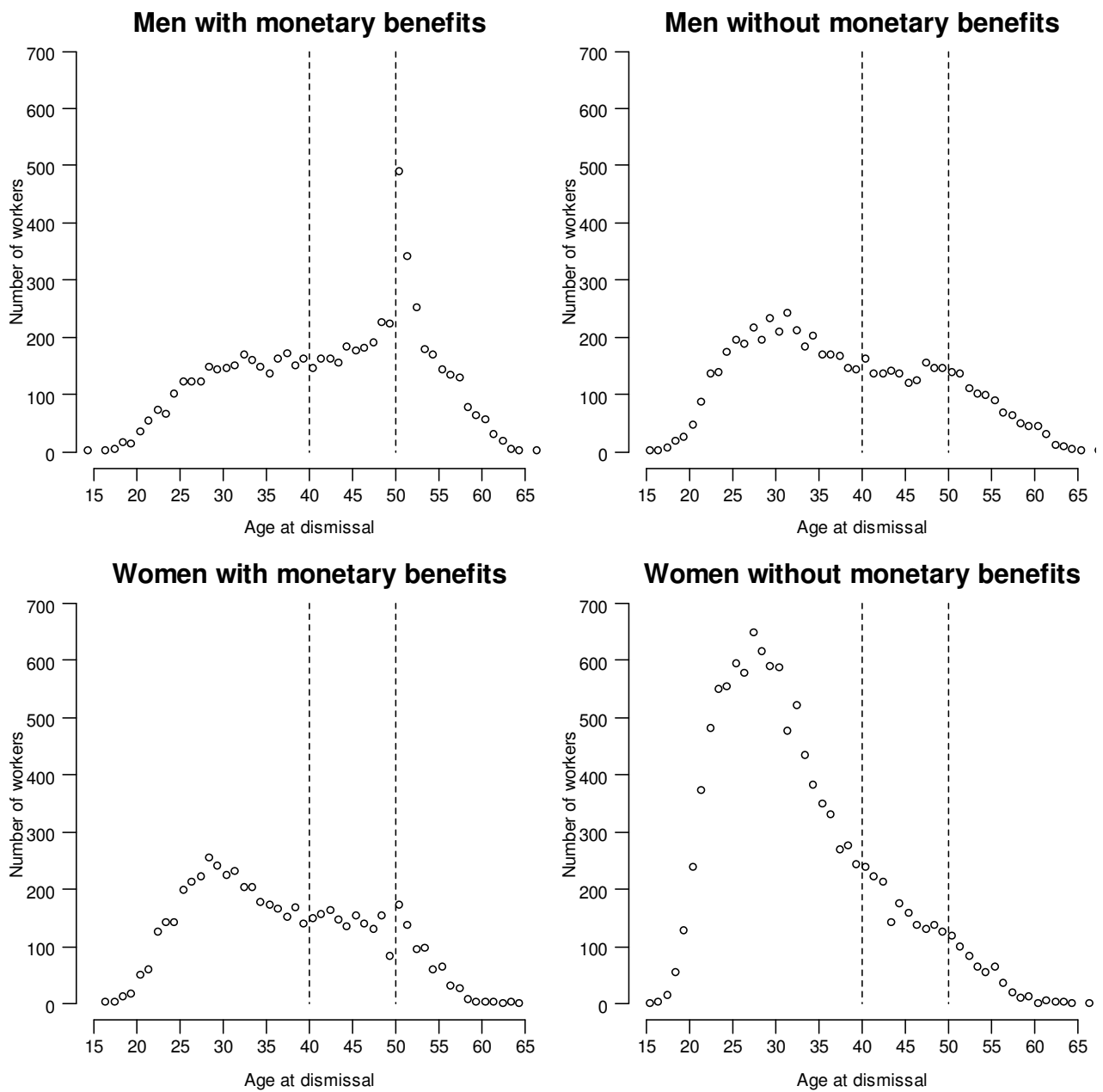
<sup>b</sup> Benefits when hiring (i) a worker without monetary benefits or (ii) a worker aged less than 40 with monetary benefits the last day of the first year or (iii) a worker aged 40 to 49 with monetary benefits the last day of the second year.

**Figure 2:** Savings over two years for a hiring firm as function of the time elapsed since enrolment in the ML, under the hiring strategy “first temporary-then permanent contract” of a worker entitled to monetary benefits, age 40 vs. 39 <sup>a</sup>

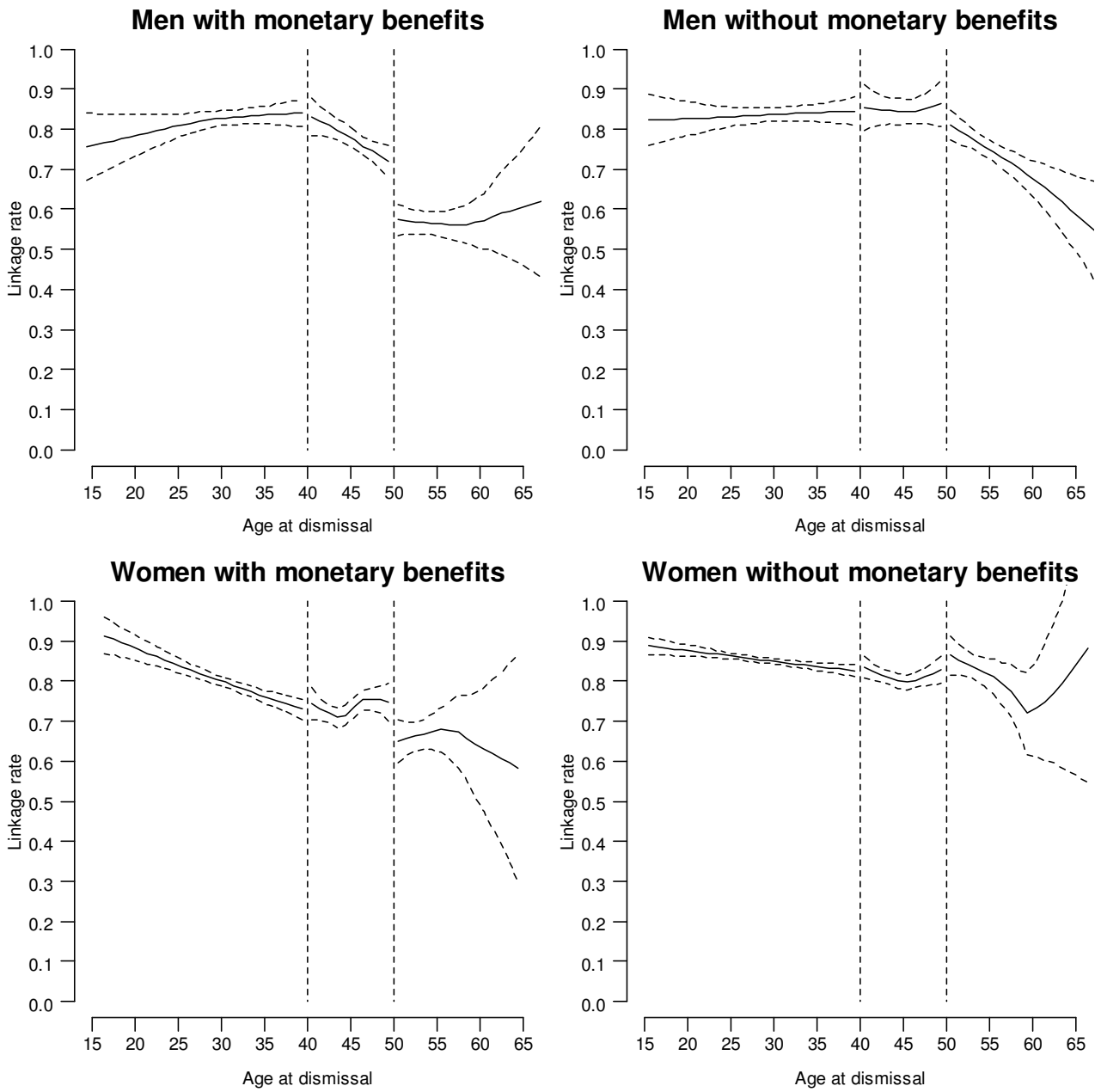


<sup>a</sup> Working assumptions as in Figure 1.

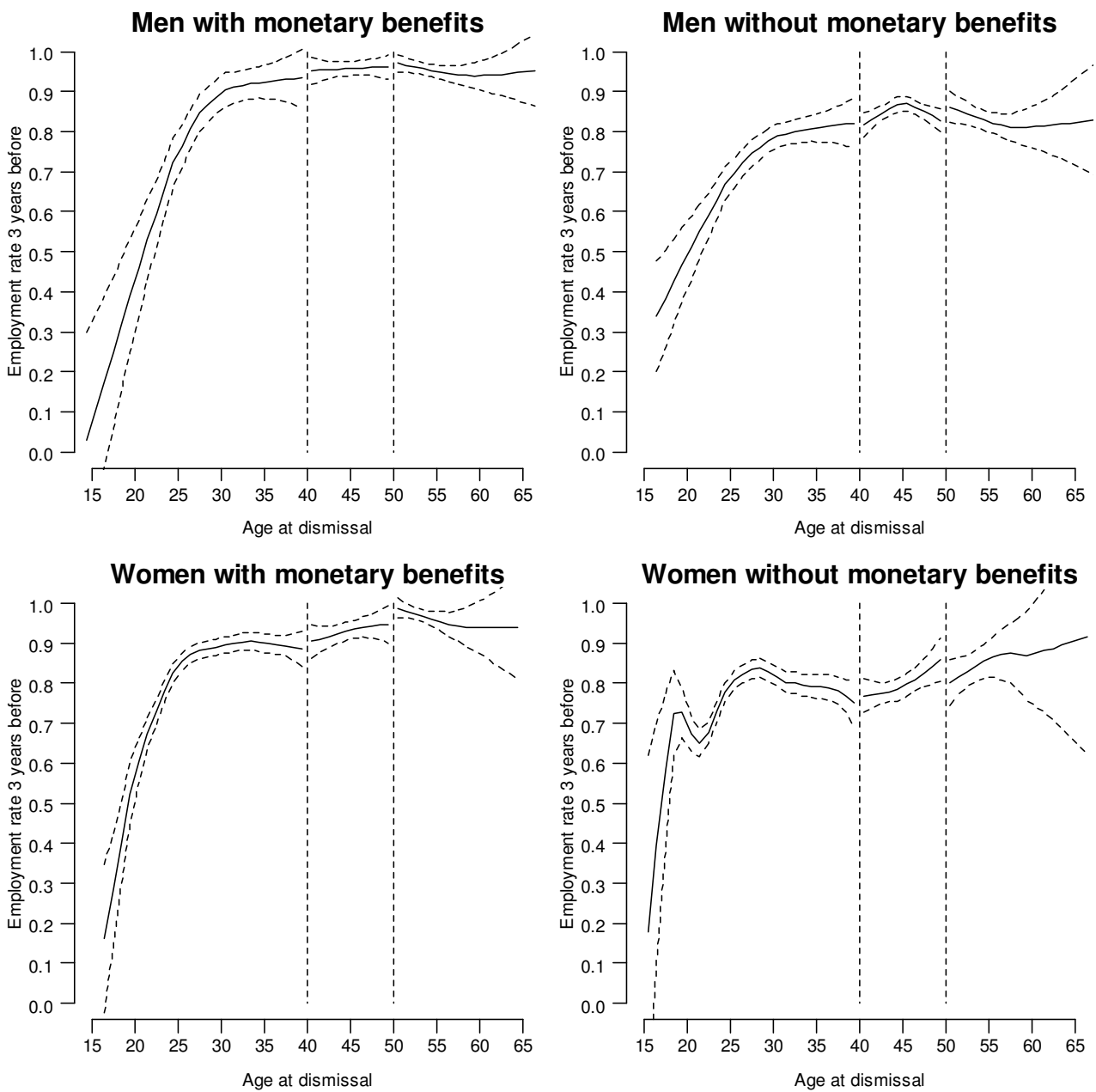
**Figure 3:** Workers enrolled in the LM in Veneto during years 1995 to 1998 by entitlement to monetary benefits, gender and age



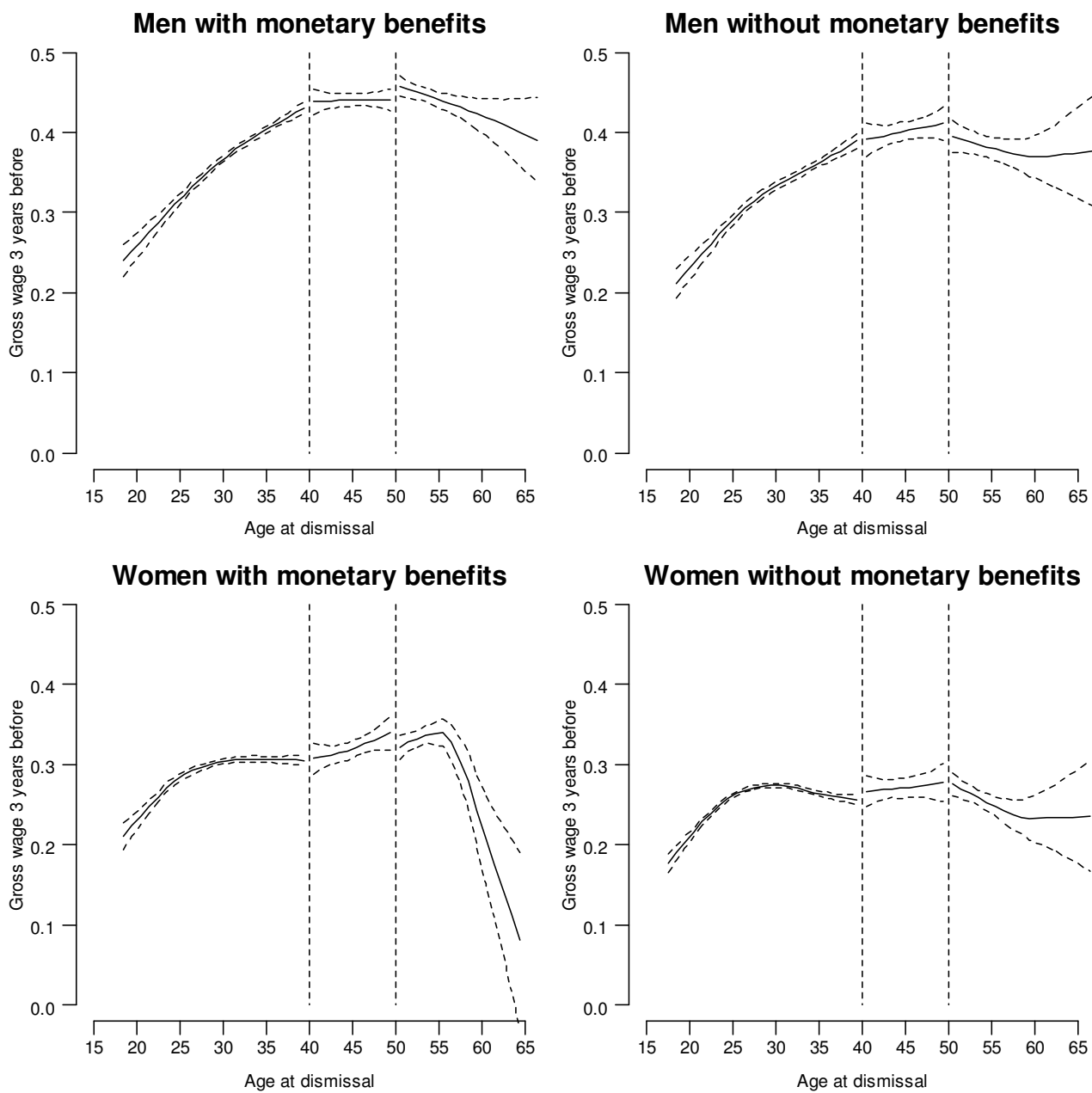
**Figure 4:** Linkage rate of workers enrolled in the ML by entitlement to monetary benefits, gender and age (LLR estimates and 95% confidence intervals)



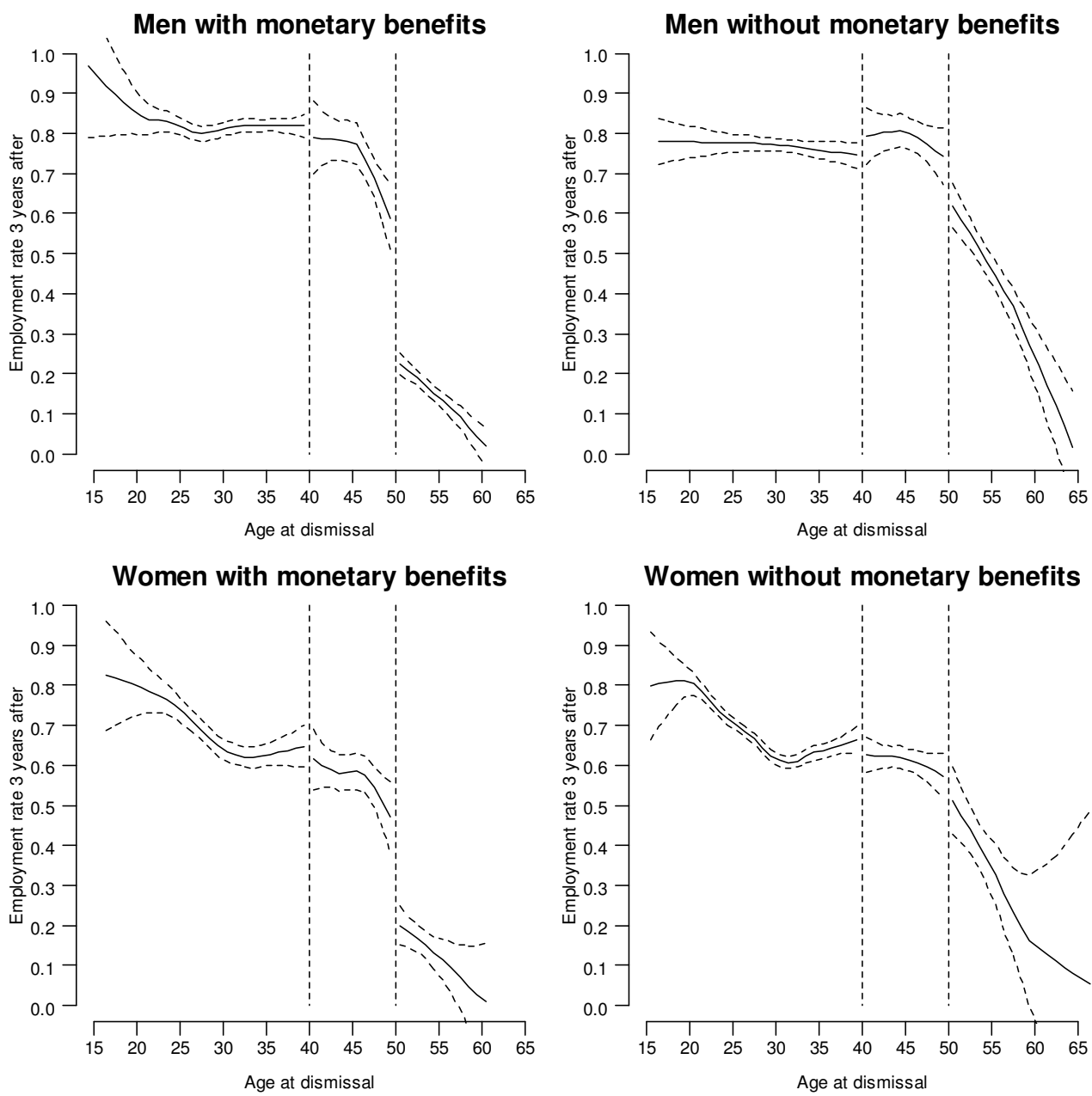
**Figure 5:** Employment rate 3 years before enrolment in the LM, by entitlement to monetary benefits, gender and age (LLR estimates and 95% confidence intervals)



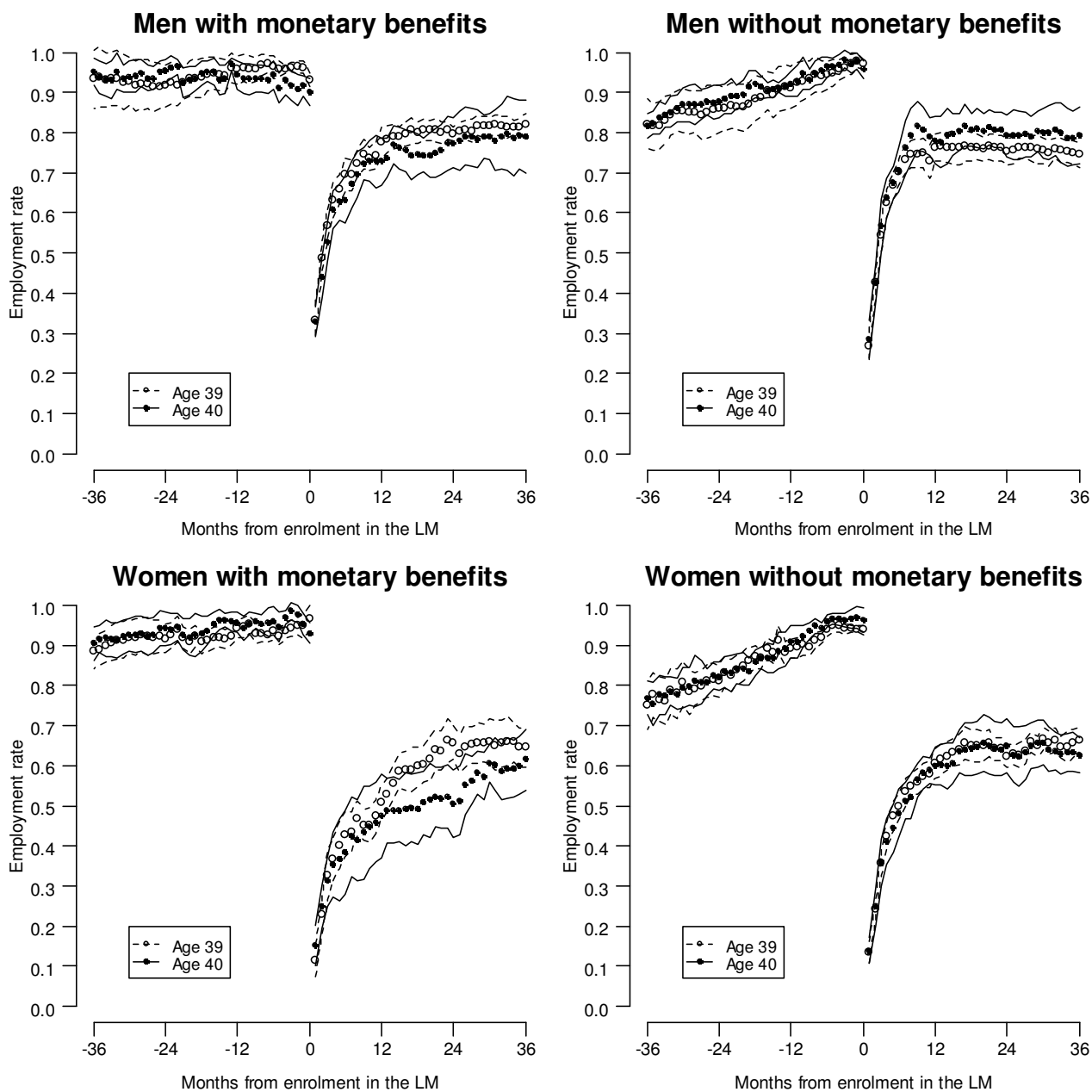
**Figure 6:** Mean gross real weekly wage (thousand Euros 2003) 3 years before enrolment in the LM, by entitlement to monetary benefits, gender and age (LLR estimates and 95% confidence intervals)



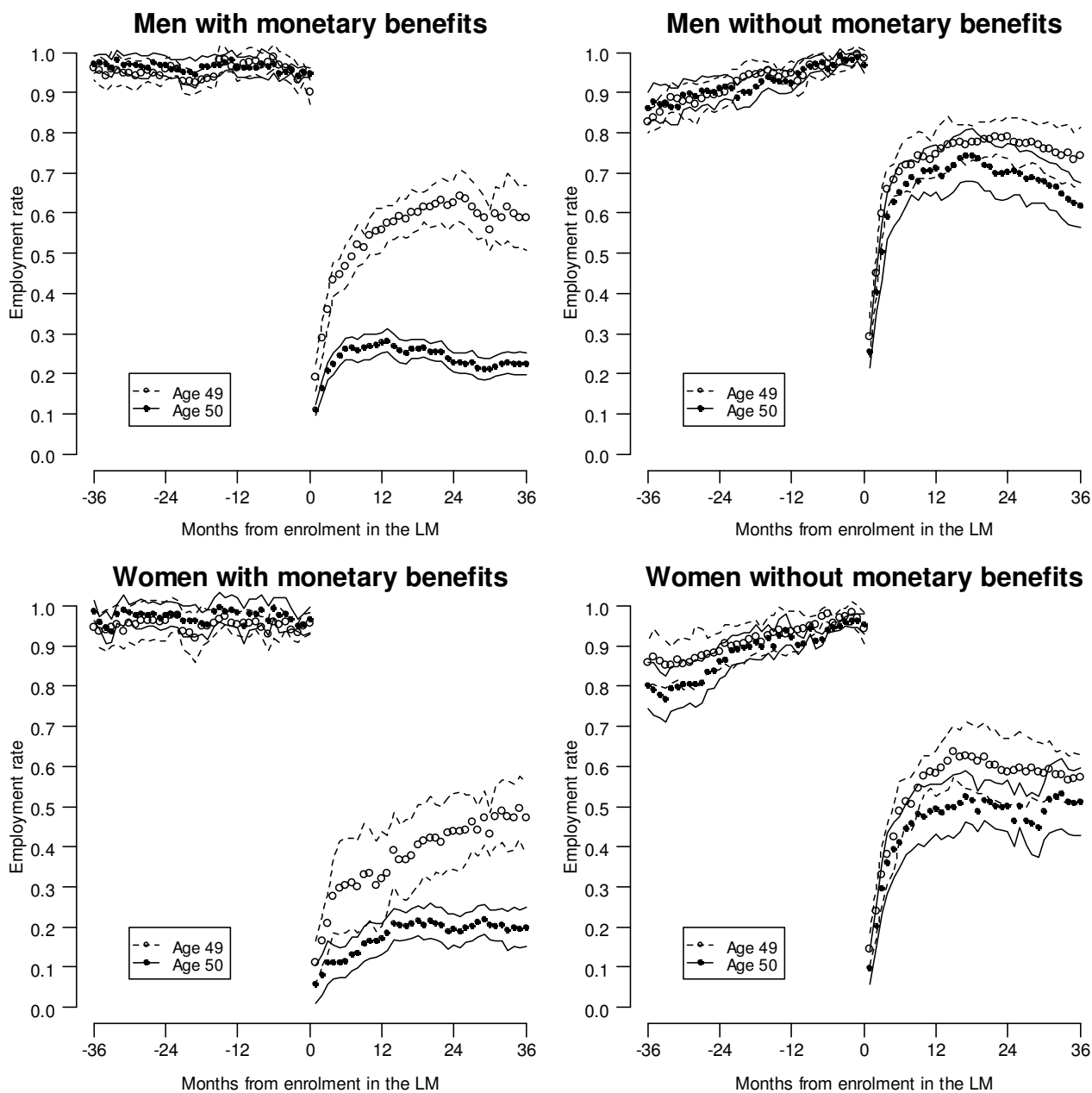
**Figure 7:** Employment rate 3 years after enrolment in the LM, by entitlement to monetary benefits, gender and age (LLR estimates and 95% confidence intervals)



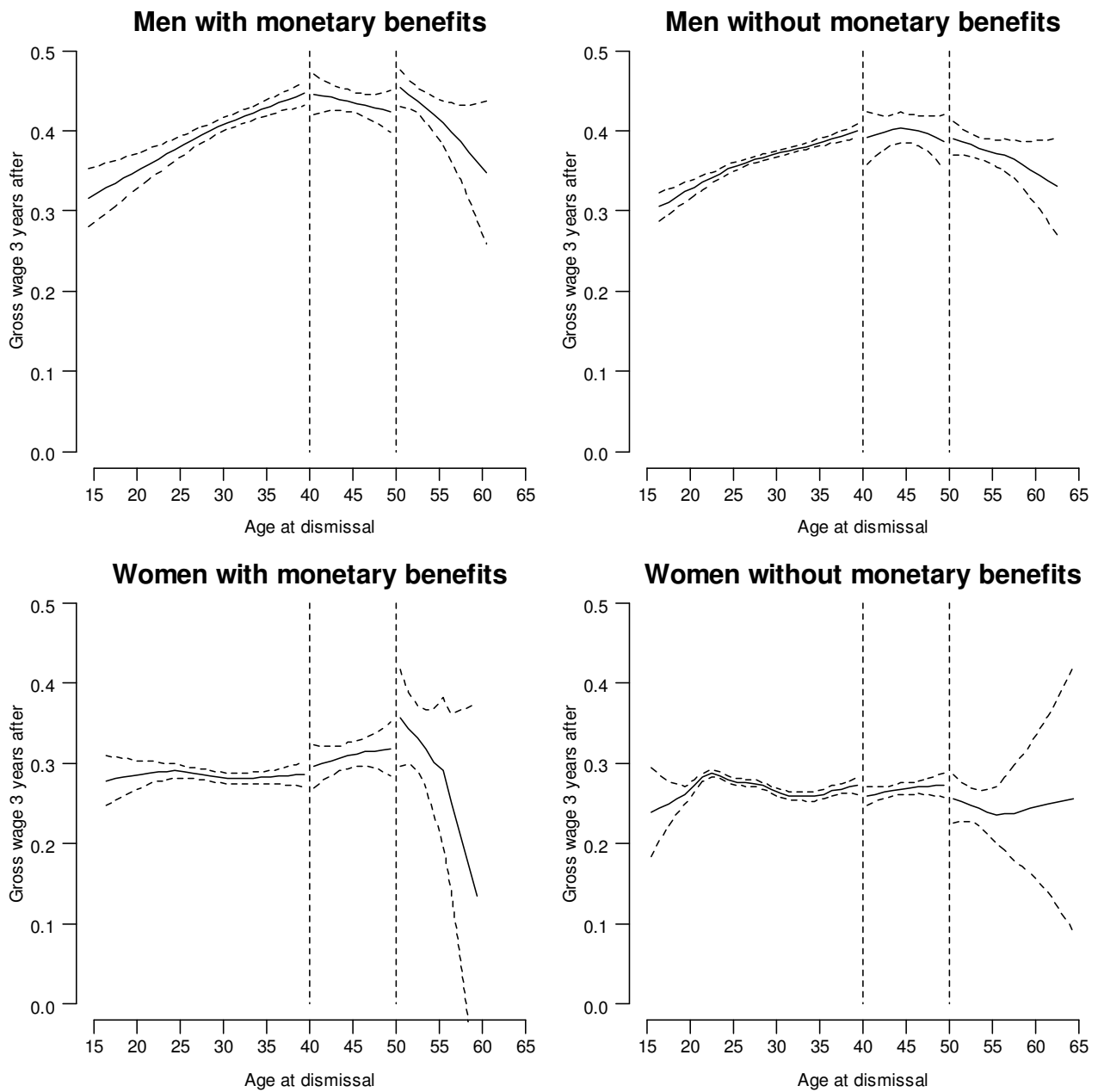
**Figure 8:** Employment rate around the 40-year threshold before and after enrolment in the LM, by entitlement to monetary benefits and gender (LLR estimates and 95% confidence intervals)



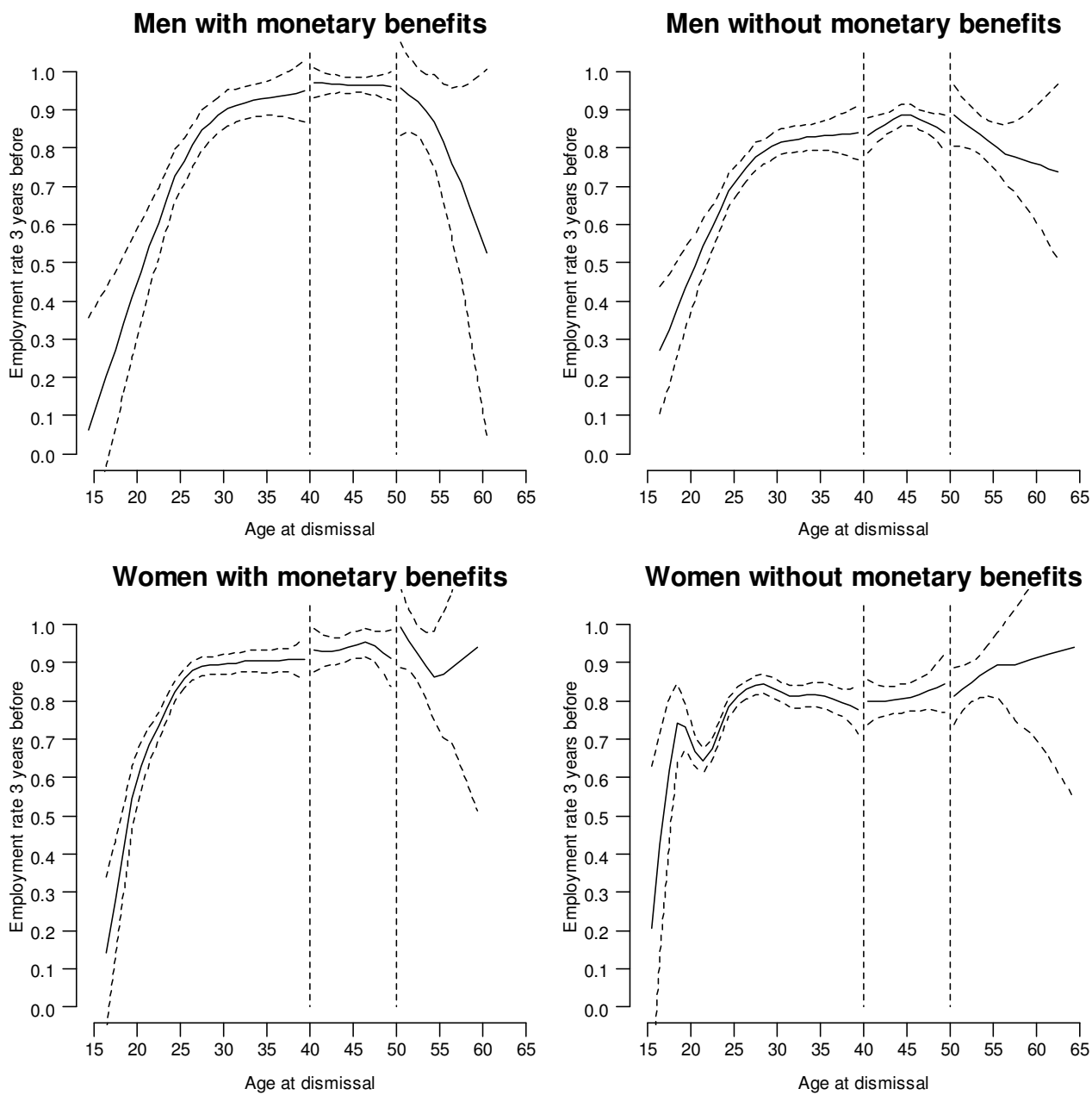
**Figure 9:** Employment rate around the 50-year threshold before and after enrolment in the LM, by entitlement to monetary benefits and gender (LLR estimates and 95% confidence intervals)



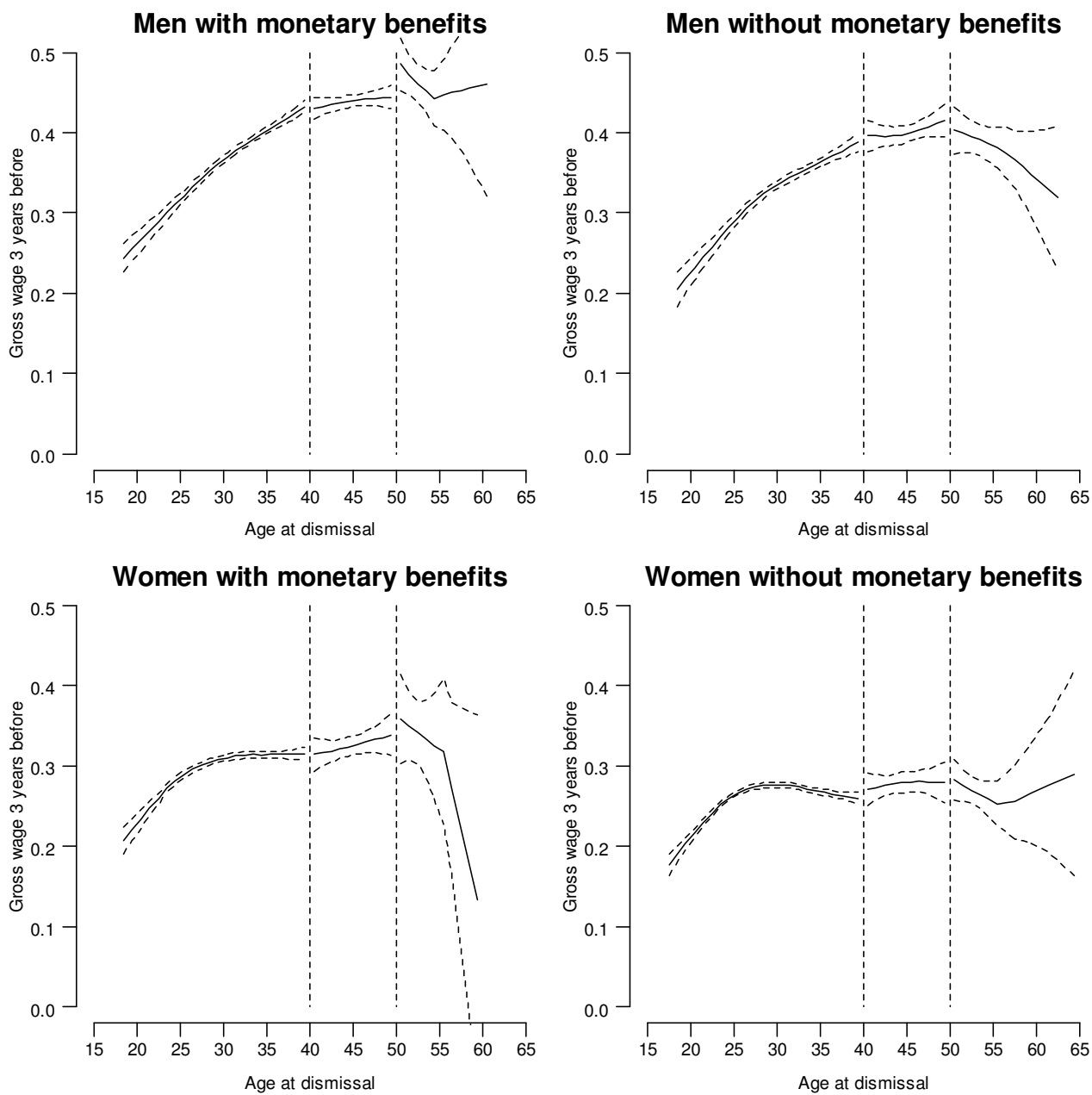
**Figure 10:** Mean gross real weekly wage (thousand Euros 2003) 3 years after enrolment in the LM, by entitlement to monetary benefits, gender and age (LLR estimates and 95% confidence intervals)



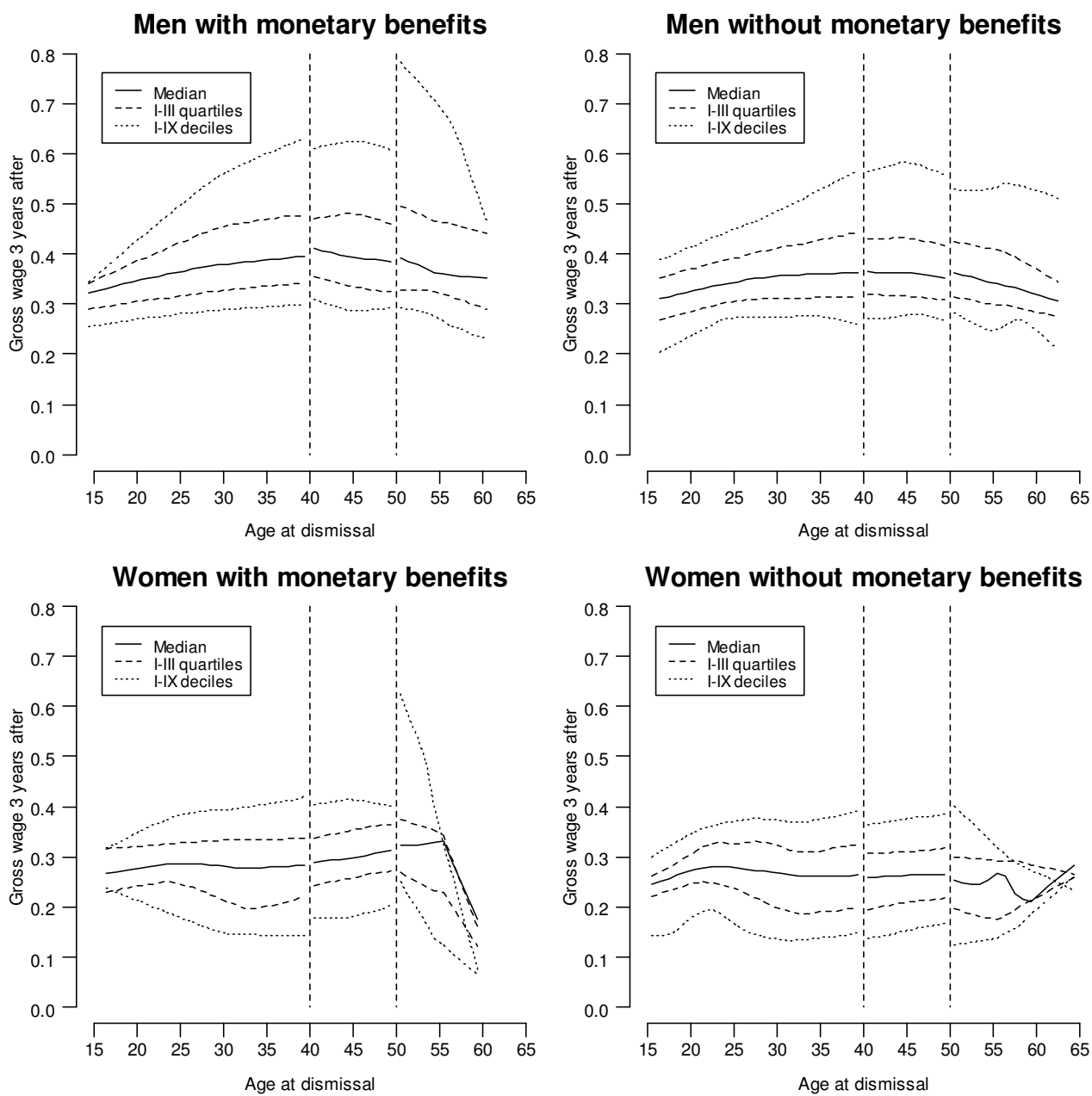
**Figure 11:** Employment rate 3 years before enrolment in the LM for workers employed 3 years after enrolment, by entitlement to monetary benefits, gender and age (LLR estimates and 95% confidence intervals)



**Figure 12:** Mean gross real weakly wage (thousand Euros 2003) 3 years before enrolment in the LM for workers employed 3 years after enrolment, by entitlement to monetary benefits, gender and age (LLR estimates and 95% confidence intervals)



**Figure 13:** Estimated quantiles of gross real weekly wage 3 years after enrolment in the LM, by entitlement to monetary benefits, gender and age (LLR estimates)



**Figure 14:** Estimated quantiles of gross real weekly wage for women with monetary benefits by age, at various years before and after enrolment in the LM (LLR estimates)

