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Labour Mobility, Pension Portability and the Lack of Lock-In Effects

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Labour mobility, pension portability and the lack of lock-in effects*

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Abstract

This paper revisits the question of whether defined benefit pension plans inhibit labour mobility. Using national register data for three distinct 3 year periods, we define and calculate a measure of changes in individual pension entitlements which we term *potential portability gain*. Estimation results indicate that the effect of portability gains on the propensity to change jobs is either weak or non-existent, and there are no signs of gains or losses in pension entitlements being reflected in wages for job changers. We conclude that potential portability gains or losses in occupational pensions are of negligible importance for labour market mobility.

JEL codes: J26, J33, J62.

Keywords: labour market mobility, defined benefit occupational pensions, matched employer-employee register data.

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1 Introduction

A feature of defined benefit (DB) occupational pensions is that changing jobs entails gains or losses (depending on the age at transition) in terms of overall pension entitlements. These are frequently seen as inhibiting labour mobility between pension and non-pension jobs, and between firms where both jobs have DB entitlements. In this paper we develop a new and robust measure of the potential portability loss in DB pensions, which we term the *potential portability gain*. The measure is robust since it depends on quite weak modelling assumptions and is constructed for all employees. With the potential portability gain as the leading actress, this paper sheds light on the link between the non-portability of DB pensions and labour market mobility by addressing the following questions: (i) Is labour market mobility affected by gains and losses related to defined benefit occupational pensions? (ii) Are these gains and losses in pension entitlements reflected in wages for those who do change jobs?

A literature going back to Lazear (e.g. Lazear and Moore (1984)) argues that the separation of the value of marginal product of labour and wages at any point in time may be in the interests of employers seeking to retain the services of employees who have accumulated both establishment specific and generic human capital.[1] Ippolito (1987) is another example of early studies showing how the timing of compensation may affect quit rates.

In the public sector, civil service pension rights are typically not fully portable and labour flows between the public and private sectors carry a loss. The underlying reasoning here is that governments find it convenient, for reasons related to current budget balance, to delay part of the compensation of public officials.

On the other hand, the theory of labour market search stresses the role of labour market mobility in developing good matches of individuals and jobs. Inefficiencies may arise in the labour market if employees covered by DB pensions

[1] In earlier contributions Lazear also argues that in a setting with lifetime contracts, deferred compensation could be a way of minimizing the cost of inducing optimal effort from both younger and older workers (see e.g. Lazear (1981)). In such a setting, occupational pensions would be considered as an "extreme" form of deferred compensation, as a considerable amount of the total payment is being withheld until retirement.

tend to change jobs more or less often than they would if pension entitlements were fully portable. In this context, portability of pensions across countries, particularly within the EU, has caught attention. Fenge and Von Weizsäcker (2010) look at portability losses following cross country mobility and identify features of public pension systems which create these losses.

The issues above raise the question of the extent to which defined benefit pension plans inhibit labour mobility. Although defined contribution (DC) plans are becoming more dominant in developed economies, DB plans are still very important in many public sectors, and also in the private sector in many countries. Even if these are often closed to new entrants, DB plans have been promised to workers entering retirement for decades to come.

Our analysis is based on a large sample of workers extracted from a unique source of linked employer-employee register data, providing demographic information and career histories of the entire Norwegian working-age population. In addition, annual balance sheets data of each company identify which companies are operating an occupational pension plan. We link the two data sources to identify labour flows between full-time, full-year jobs, with no spell of unemployment, long-term sick leave, disability, or receipt of social security in-between jobs. The observed job changes are therefore likely to be voluntary and not much contaminated by layoffs.

To study the impact of DB pensions on labour market mobility, we propose and calculate a measure of changes in individual pension entitlements resulting from a change of jobs, which is termed *(potential) portability gain (PPG)*. This is defined as the increase (or decrease) in the expected replacement rate, measured as the projected total pension relative to the projected final wage under the assumption of identical wage trajectories in the old and in the new job. The potential portability gain can thus be measured for all individuals, whether they change jobs or not, and does not rely on construction of unobserved alternatives. We argue that it captures essential features of pension related job movement costs in the labour market.

The potential portability gain varies with age, wage and tenure, and calculated annual values range from about -10 to about +7 per cent of final wages for different groups of potential movers. Most workers are facing gains and losses within the range of ± 2 per cent, however, and a portability gain of -2 per cent gives an accumulated loss of around 30 per cent of the annual final wage (assuming a retirement period of 15 years). Due to the complex rules for portability, which we apply in full detail, there is variation in portability gain which is not perfectly correlated with age, wage and tenure.

Using the potential portability gain as a proxy for the pension costs of changing jobs, we employ probit models to estimate job change propensity equations. The analysis makes use of a wide range of individual and firm specific characteristics, and reveals no signs of lock-in effects due to DB pensions. As a second step we run wage change regressions to investigate whether the lack of lock-in effects may be explained by the portability gains and losses being reflected in new wages for those who do change jobs. Again, there are no signs of any clear association between wage changes and portability gains. Finally, we run standard wage regressions of the wage level on the PPG both before and after a job change. These regressions show the same relationship between wages and potential portability gains before and after a job change. We take this to mean that the estimated coefficients are not reflecting any wage compensation, but rather the structural relationship between wages and PPG. This leads us to suggest that occupational pensions are of limited importance for labour market mobility, contrary to what theoretical reasoning would suggest.

The paper is organized as follows: Section 2 gives an overview of the existing empirical literature on labour market mobility and pension portability, and explains how our contribution adds to the picture. This is followed by a brief description of the Norwegian occupational pension system, which until recently was dominated by defined benefit pensions, and of the sources of portability gains and losses used in the analysis (Section 3). Section 4 defines the potential portability gain and develops the framework for our analysis, and Section 5

describes data sources and the main sample consisting of 557,000 full-time, full-year workers between the age of 25 and 57. Based on actual data we calculate PPGs for all workers in the sample and use these values in the econometric analyses presented in Section 6 and 7.

The job change analysis is based on a sample consisting of all full-time workers observed in one private sector OP-covered job throughout 2001 and in one private sector OP-covered job (not necessarily the same) throughout 2003. Results presented in Section 6 reveal no signs of lock-in effects due to DB pensions. In Section 7 we restrict attention to workers who changed jobs during 2002. Regressing wage changes on PPG and a set of controls we find no signs of portability gains and losses being offset by wages. Moreover, wage regressions show the same coefficient for PPG on wages before and after a job change, which we interpret as lack of wage compensation for portability losses. Section 8 concludes.

2 The literature

Identification of any effect on labour market mobility of pension portability gains and losses is a challenging task, and this is reflected in the existing empirical literature. As pointed out by Gustman and Steinmeier (1993), tenure and quit propensities appear to vary between non-pension and pension covered jobs, and not to any great extent between DC and DB plans. In an econometric analysis of job changes, they find that the backloading component is of minor importance, whereas persons in pension covered jobs are in better positions, so their alternatives are relatively less attractive and they have less to gain by moving. Gustman and Steinmeier also argue that the losses are relatively small and thus can easily be compensated by a wage increase. The mobility among pension covered workers was one third of that among the non-pension covered, and of the difference of 14 percentage points, less than 1 was due to backloading and around 8 to the remaining compensation being high compared to their

alternatives.

The major challenge related to the identification of mobility effects is that we observe only the option which was actually chosen: the new job for those who move and maybe a changed compensation for those who stay. Pre-selection into pension covered jobs may result in unobserved and systematic differences in preferences and options between pension covered and non-covered workers. Pension covered workers may have higher productivity so they get a higher total compensation, and they may differ in preferences, by being for instance more forward looking and thus tending to prefer a package with a larger pension component. Separation of the effects of selection and incentives therefore becomes difficult.

The existing literature generally relies on estimating the job change options by imposing a correlation structure or by using instruments, sometimes from institutional changes or special features of pension systems. Mealli and Pudney (1996) focus on the unobserved characteristics of pension covered workers by allowing for unobserved heterogeneity in a duration model with competing risks. They find substantially longer duration of pensionable jobs, but do not find evidence that selection is important. Hence they conclude (tentatively) that the pension coverage is the direct cause of lower mobility. However, they only distinguish between three types of jobs, pensionable, non-pensionable and other employment (mainly self-employment), without any further characteristics. Other characteristics with the pensionable job could therefore well be the cause of the results.

Rabe (2007) estimated alternative (also counter factual) wages for movers and stayers in a switching regression approach, with geographical proximity to parents as an instrument, assuming that it affected mobility but not wages. There was no attempt to control for selection into pre-mobility pension coverage or wage level. Alternative wages are modelled and predicted, and there is no use of actual pre-mobility wages. Mobility is then estimated as a function of pension coverage or pension capital loss, both of which do significantly hinder mobility,

as well as of the predicted wage difference between moving and staying. The latter was entered in terms of current wage without any attempt to construct life long variables, and was not significant.

The unobserved characteristics of pension covered workers is the focus of Ippolito (2002), who uses voluntary pension contributions to distinguish "savers" from other types of workers. This proves more predictive of mobility behaviour and supports the notion that selection is more important than incentives in explaining quit behaviour.

Finally, Disney and Emmerson (2004) utilize a feature of the British occupational pension system, whereby workers may choose not to participate in the OP of the firm, but instead opt to take part in a system run by the state. Their findings indicate that there are indeed selection mechanisms at work, and the incentive effect is much less clear.

In this study we have chosen to rely on as few assumptions as possible when looking for an effect on mobility of pension portability gains and losses: We develop a measure termed *potential portability gain*, which is the change in pension entitlements incurred by a person moving to another firm with the same pension type and the same future wage trajectory. This measure circumvents the problem of identifying potential wage change and changes in pension entitlements from all potential job movements. The potential portability gain may be either positive or negative, depending on the age at transition.

Our measure does not rely on actual job change alternatives and can be calculated for all workers, based on their current age, wage, tenure and pension coverage. We argue that the potential portability gain is influenced by tenure, age and wage in a way that is unlikely to be exactly reflected in employer preferences and therefore not completely offset in a new job. Hence, the smaller the potential portability gain (or the larger the potential loss), the lower the probability of moving and the higher the new wage received by those who actually move. If there is a lock-in effect, we should find evidence of these two relationships.

3 Occupational pensions in Norway

All residents are covered by the public pay-as-you-go National Insurance System (NIS). It consists of a minimum pension and a fairly flat earnings related pension. All earnings up to roughly twice the average annual full time earnings count, but the resulting maximum pension from stable earnings at this level is only about two thirds of average annual full time earnings. The occupational DB-based pensions add on to the NIS and are separate for the public and the private sector. The public sector OP is fully integrated with the (universal) public pension system and will give 66% of final wage with 30 years of service. The private sector OP is supplementary to the public pension, but is usually designed to give a compensation which targets a given percentage of final wage, most often between 60 and 66%, when taken together with the public pension. The requirement for full accrual is typically 30 years of membership.

A newly hired in an enterprise with a pension plan will automatically enter into the plan, since these plans have to cover all employees in a given enterprise if contributions are to be tax preferred. Depending on the age at transition, the employee may or may not earn a full pension in the new enterprise. If a person moves from a private sector enterprise with an OP of the DB type after at least one year of employment, the entitlements from the previous enterprise will be converted into a deferred entitlement with no further contributions. It is converted into a pension at retirement, almost universally at the age of 67. This is what Ippolito (1987) calls quit pension, which we will denote QP. In the public sector, three years are required for a deferred pension, but shorter employment will count if the persons return to the public sector.

For an individual changing jobs, even if the sum of tenure in the initial and in the next enterprise is sufficiently high to fulfill the requirement for full accrual, the sum of QP and the pension from the new enterprise (NP) may not equal the pension she would have received from the old enterprise if she had chosen to stay ("stay pension" in the terms of Ippolito (1987), here denoted SP). The

reason for this is the low return on the QP according to current rules. On the other hand, if the sum of years of accrual is large enough, there may be a gain in terms of pension benefits resulting from a change of jobs. If the person manages to achieve full accrual in the new job, any previous entitlements come on top of the benefits accumulated in the new job.

Portability loss is a fairly common feature of DB plans across countries, but the magnitude of the loss depends on the specific rules. Blake and Orszag (1998) give a thorough description of the British case. As for the case of Norway, where occupational pensions are usually designed to add on to the public pension, indexation of public pensions will matter also for the portability loss. Complex regulations imply that even when restricting attention to the potential portability gain, which is calculated under the assumption of identical wage trajectories in the initial and the new job, gains or losses will depend on a number of parameters, like age, retirement age, replacement rate, and various financial parameters. The replacement rate is set at 66 per cent, which is the most common, and we assume retirement at the age of 67[2]. As for the financial parameters we follow the general accounting recommendations for Norway used in the observation period: An annual wage growth of 4.5 per cent, an annual adjustment of the Basic amount (G)[3] of 4.25 per cent, a capital return for the insurance company managing the firm's OP of 5.75 per cent, and 1.7875 per cent in annual return on the QP (which corresponds to 65 per cent of the actual capital return minus three per cent, i.e. 0.65*(5.75 - 3) = 1.7875). These parameter values are used from Section 5 and onwards, along with observed wage and age, to calculate individual values of PPG. These values are widely used and we refer to Hernæs et al. (2011) for stylised calculations illustrating the sensitivity of PPG to alternative parameter values.

[2]Although actual retirement usually takes place before the age of 67, we are comparing alternatives assumed to reflect expectations at a much earlier age.

[3]The Basic amount is frequently referred to as G, and is a central feature of the public pension system in Norway. G is adjusted every year, with a nominal rate of growth varying between 2 and 14% since its introduction in 1967. For further details on G and on the public pension system in general, see e.g. Iskhakov (2008).

4 A measure of potential portability gains

In this study we have chosen to rely on as few assumptions as possible when we look at the impact of DB pensions on labour market mobility. To do this, we define and calculate a measure of changes in individual pension entitlements resulting from a change of jobs, which is termed *(potential) portability gain*. This is defined as the increase (or decrease) in the projected pension compensation rate, which is the projected pension divided by the projected final wage. Due to the complex rules for portability, which we apply in full detail, there is variation in portability gain which is not perfectly correlated with age, wage and tenure.

Our starting point is a simple model where we define a function for the decision of whether to change jobs at age a:

$$M_a^* = W_a^N + P_a^N + Q_a - W_a^C - P_a^C, \tag{1}$$

where W_a^N is the present value of the expected wage stream up to retirement resulting from a change of jobs at age a, $P_a^N = f^N\left(W_a^N\right)$ is the present value of the expected pension stream in the new job, which is assumed to be a function only of the present value of the new wage (although the actual calculation is more involved), W_a^C is the present value of the expected wage stream up to retirement in the current job, $P_a^C = f^C\left(W_a^C\right)$ is the present value of the expected pension stream from the current job, and Q_a is the present value of the quit pension from the current job.

Even with identical wage trajectories and pension plans in the two jobs, the two functions $f^N(\cdot)$ and $f^C(\cdot)$ are not the same. In the current job, also previous earnings influence the functional form, whereas in the new job only earnings from age a and onwards will count.

The job change indicator is defined as

$$M_a = \begin{cases} 1 & \text{if } M_a^* > 0, \\ 0 & \text{otherwise,} \end{cases}$$

and the probability of changing jobs is

$$P\left[M_a = 1\right] = P\left[W_a^N + P_a^N + Q_a > W_a^C + P_a^C\right] \tag{2}$$

To distinguish between what we assume to be more and less observable variables and arrive at our potential portability gain, we define the cash wage increase from the job move as

$$\Delta W_a = W_a^N - W_a^C, \tag{3}$$

and we express the pension in the new firm as follows:

$$P_a^N = f^N\left(W_a^C\right) + f_\Delta^N\left(W_a^C, \Delta W_a\right) \tag{4}$$

The first term on the right hand side of (4) is the pension which would have come from a wage identical to the one in the current firm, and the second term is the extra pension due to a wage increase. The extra pension from the wage increase is a function of both the level of wage and the increase in wages. The probability of a change of jobs can now be expressed as

$$P\left[M_a = 1\right] = P\left[\Delta W_a + f_\Delta^N\left(W_a^C, \Delta W_a\right) > P_a^C - Q_a - f^N\left(W_a^C\right)\right] \tag{5}$$

The left hand side of the inequality in (5) is observable only for those who change jobs, and the discussion above along with the cited literature clearly show the problems with estimating non-realized alternatives. In contrast, with our data we are able to compute the right hand side for all individuals. This expression can be interpreted as the gain from staying in the current job, compared to changing to a new job with identical wage and wage growth. Both jobs are assumed kept until retirement. For more convenient use in the analyses, we define the gain from moving to a new job with identical wage compared to staying, and term this the potential portability gain (PPG):

$$PPG_a = Q_a + f^N\left(W_a^C\right) - P_a^C \tag{6}$$

We may now write equation (5) as

$$P\left[M_a = 1\right] = P\left[\Delta W_a + f_{\Delta}^{N}\left(W_a^C, \Delta W_a\right) + PPG_a > 0\right] \tag{7}$$

A change of jobs will take place if the gain in wages plus the increase in pensions in the new job plus the portability gain is positive. If the portability gain is negative, the gain in wages will have to outweigh this for a change of jobs to be profitable.

Rather than trying to impute a complete set of alternatives for all individuals, which would imply making quite strong assumptions, we assume that the lower the PPG (or the higher the portability loss), the less likely is a job change. We assume this to be the case without imposing any structure on the wage gain and the ensuing gain in the pension in the new job. The rationale is that factors like age, wage, firm tenure and the specificities of the pension system influence the PPG in ways that are unlikely to be fully indicative of productivity in a way that would imply complete compensation in a competitive labour market.

Given that a job change has taken place, we assume in a similar manner that the PPG has influenced the worker's reservation wage, so that the wage increase will be higher for lower PPG (or higher portability loss). Thus, for those who have changed jobs, we assume

$$-PPG_a < \Delta W_a + f_{\Delta}^{N}\left(W_a^C, \Delta W_a\right) \tag{8}$$

Both because of discounting and because a wage compensation will have effect from the age at job change and up until retirement, the relationship between PPG and wages is expected to vary with age. The econometric specifications are given in Section 6 and 7.

5 Data, samples and measurement

5.1 Data sources

We have two main sources of data. One is a set of register data, obtained from Statistics Norway and based on administrative registers. These cover the whole population over the period 1992 through 2007 and give demographic and labour market information for all residents. In particular, all job spells are identified separately with the wage received and the organizational number of the enterprise and of the establishment.

The second type of data is enterprise based financial information recorded by the authorities, for all enterprises. In the observation period, all pension entitlements of any significance were of the DB type. Enterprises with a DB pension plan for the employees have to set aside assets to cover pension liabilities. These assets are kept in legally separate entities (funds or contracts with an insurance company) in order to safeguard them against company failure. The contributions are usually made annually, based on estimates of pension liabilities and assets. In the annual accounts for the enterprise, pension assets and liabilities are usually not identical, and under or over funding enters the balance.[4] These data are available for the years 1992 through 2005, and enable us to identify enterprises operating a DB pension plan. The magnitude of the pension balance itself is not informative in our context, the interesting thing is whether it occurs or not. The probability of exactly nil balance is negligible.

Since the register data set does not contain information on pension plan participation, we use the enterprise number to link enterprise information, in particular OP status of the enterprise, to each employee. The OP regulations stipulate that if the pension contribution is not to be taxed as profit in the enterprise, a number of requirements must be met. Among these are the requirements that a pension plan has to cover all employees and that the compensation rate is non-increasing in wages (in practice it is constant). Therefore, these data sets

[4] In the case of changes in regulations, any resulting under-funding may be smoothed for up to 20 years, so that only a part of this will affect cost and the balance sheet.

allow us to divide the private sector enterprises into two sub-groups, the ones that offer OPs and the ones that do not, based on whether or not the reported pension liabilities are different from zero. Based on this classification we infer that a full time worker hired in an OP enterprise is covered by the enterprise's OP scheme.

In the following we use the term job change if the organizational number of the individual's enterprise and that of the establishment changes from 2001 to 2003. Enterprise and establishment are defined as in the Norwegian official statistics.[5] In the private sector, an enterprise is a legal unit and may comprise several establishments. Enterprise level job changes are the most relevant in this setting, since pension plans are operated at the enterprise level and pension rights are unaffected by job changes between establishments within an enterprise. The additional requirement that there should also be a change of establishment is imposed to avoid counting mergers or acquisitions as job changes. These are changes where we do not expect individual incentives to play a role, and where the employees will keep their OP entitlements.

5.2 The main sample

Starting from a full sample of more than two million individuals with employment and more than 113,000 public and private sector enterprises with at least one employee in 2001, we impose a number of restrictions before we reach our final sample. First, given the rules of pension coverage, we focus on shifts between permanent full-time jobs, and after limiting the sample to full time workers[6] who held the same job throughout 2001, the sample is reduced to about one million employees. We focus the analyses on direct job-to-job transitions by excluding those who received disability pensions, unemployment or social security benefits during the transitional year (2002), and those who participated in vocational

[5] See http://www.ssb.no/naeringsliv_en/.

[6] Full time workers are identified on the basis of three criteria that are required to be fulfilled simultaneously: they are classified as full time workers, working at least 32 hours per week, and with a weekly salary of at least 500 NOK. The labour force in 2001 was 2.3 million persons, including self-employed, part-time employed and unemployed.

rehabilitation. Also, we exclude those working in firms in which the level of employment changed by more than 75 per cent during 2001, and those working in primary industries. We retain only workers who were working full time and holding the same job throughout 2003. Requiring also that demographic information and information on the pension status of the firm are available, and restricting attention to workers between the age of 25 and 57 in 2001, we are left with a sample of 557,000 individuals (Hernæs et al. (2011)). From this sample we construct separate sub-samples for the job change and wage change analyses.

6 The impact of PPG on the propensity to change jobs

6.1 The job change sample

For this section we restrict attention to the private sector, and to workers covered by defined benefit occupational pensions in both 2001 and 2003. The rationale for imposing the restriction on OP coverage is threefold. First, we know from a companion study that most job-changes are intra-sectoral, see Hernæs et al. (2011). Second, including inter-sectoral movers would require a more involved and less transparent analysis than the one to be presented in the following sections, with two different values of PPG for each individual and with four potential outcomes ('stay', 'move to the public sector', 'move to a private sector OP covered job', 'move to a private sector non-covered job') instead of only one. Finally, we show in Hernæs et al. (2011) that those moving to the private sector without pension coverage have the lowest initial wages *and* the lowest change in wages between old and new job. This gives reason to suspect that these job-changes contain a lot of lay-offs.

Descriptive statistics for the job change sample are given in Table 1. Three quarters of the sample are men, and about five per cent did change jobs during

2002. When compared to official statistics[7] covering the employed population, very few in our sample have completed only compulsory education, and we have somewhat fewer with university degrees. As for the distribution of workers over different industries, workers in Manufacturing appear to be heavily over-represented whereas workers in Construction are under-represented, compared to official statistics over full-time workers. More detailed statistics over average wages for the sample are provided in Table 8 in Hernæs et al. (2011). When compared to the entire population of full-time workers, average wages are markedly higher for our sample, and we also note that average wages are higher for movers than for stayers in both 2001 and 2003.

Table 1: Descriptive statistics (job change sample)

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**
Potential portability gain	-0.009	0.019	-0.106	0.07
Years of tenure (2001)	8.766	6.882	1	41
Age (2001)	41.866	8.910	25	57
lnWage (2001)	12.766	0.359	11.571	15.904
lnWage (2003)	12.850	0.367	11.573	16.102

Dummy variables

Variable	**Mean**	**Variable**	**Mean**
Mover	0.053	*Industry*	
Male	0.754	Mining and quarrying	0.034
Sickness/maternity leave	0.174	Manufacturing	0.416
Immigrant	0.037	Electricity + Construction	0.056
Married (2001)	0.568	Wholesale and retail trade, ...	0.190
Educational attainment		Hotels and restaurants	0.010
Compulsory	0.106	Transport, storage and communication	0.084
Lower secondary	0.250	Financial intermediation	0.065
Upper secondary	0.383	Real estate and business activities	0.115
Bachelor level	0.187	Education + health and social work	0.014
Master and PhD level	0.074	Other services	0.018
Region of residence		*Change in employment (2001)*	
East	0.213	$[-75\%, -50\%)$	0.027
South	0.171	$[-50\%, -25\%)$	0.017
West	0.223	$[-25\%, 0\%)$	0.447
Mid	0.113	0%	0.019
North	0.049	$(0\%, 25\%]$	0.445
Oslo	0.215	$(25\%, 50\%]$	0.037
Other areas	0.015	$(50\%, 75\%]$	0.007
n = 183,681			

[7] Provided by Statistics Norway, see http://www.ssb.no/english/.

6.2 Calculated portability gains

Figure 1 shows box plots[8] of the potential gain for individuals who in 2001 were employed in a private sector enterprise with an OP, assuming this has a 66% compensation rate, for a possible move to another job with the same wage, same expected wage growth (4.5% each year), and the same pension as in the initial job. All employees are assumed to retire at the age of 67, and as in Section 3 we assume an annual return to the QP of 1.7875%. Under these assumptions, the potential portability gain is defined as *the increase (or decrease) in compensation rate resulting from a change of jobs, measured in terms of projected final wage.*

The measure takes on only positive values for workers below the age of 36 in 2001. These workers may still obtain a full pension in a new job (assuming the usual 30 years for full accrual), which makes the QP from the initial job a pure bonus. Starting from the age of 36 (in 2001) negative values become increasingly common. Full accrual in the new job is no longer possible, and the QP is increasingly insufficient to cover the difference between the pension from the current job, which would have given a 66% replacement rate, and the pension from the new job.

Figure A2 and A3 (in the appendix) give box plots of the potential portability gain for the same sample as in Figure 1, plotted separately for those who did change jobs during 2002 (movers) and those who did not (stayers). These plots give no indications of systematic differences between movers and stayers in terms of the potential portability gain. This lack of systematic differences between the potential portability gains of movers and stayers is confirmed by Table A1 (in the appendix), which gives results from a linear regression of potential portability gain on the log of wage, tenure (quadratic term), age (cubic

[8] The lower and upper hinges of the boxes indicate the 25^{th} and 75^{th} percentiles, respectively, denoted by $x_{[25]}$ and $x_{[75]}$, and the horizontal lines cutting through the boxes indicate the median. The vertical lines below and above the boxes are called adjacent lines, and the markers on each end of the lines indicate lower and upper adjacent value, respectively. Adjacent values are calculated as described in the Stata Manual [G] Graphics: Define x_i as the ith ordered value of x, and define U as $x_{[75]} + \frac{2}{3}(x_{[75]} - x_{[25]})$ and L as $x_{[25]} - \frac{2}{3}(x_{[75]} - x_{[25]})$. The upper adjacent value is x_i such that $x_i \leq U$ and $x_{i+1} > U$, and the lower adjacent value is x_i such that $x_i \geq L$ and $x_{i+1} < L$. Observations above (below) the upper (lower) adjacent values are not shown in the figure.

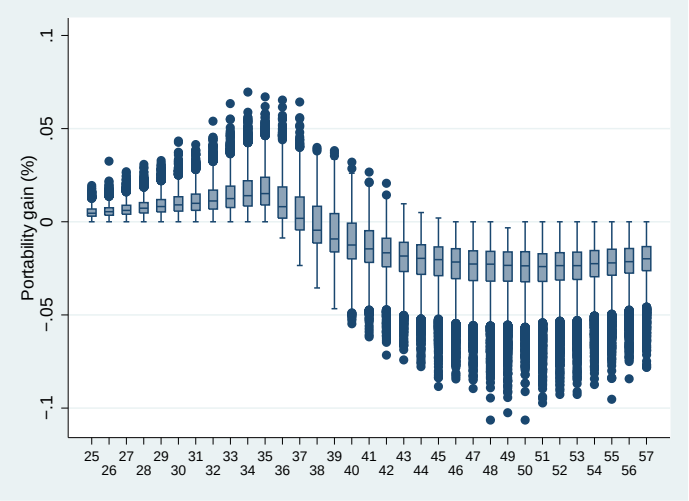

Figure 1: Potential portability gain by age (2001). Initially employed in private sector w/OP, hypothetical move within sector/to public sector.

term), and an indicator taking the value 1 for movers. The regressions are run separately for workers below and above the age of 36 in 2001 (Sample I and Sample II, respectively). These regressions also show that for the younger part of the sample, almost all observed variation in the potential portability gain is explained by wage, age and tenure, whereas more than 40 per cent of the variation is not explained by these controls for the older part of the sample. Such an amount of exogenous variation in our main variable of interest should be sufficient to identify effects on mobility and wages, if any such effects are present.

6.3 Econometric analysis

We assume that the decision of whether to change jobs during a given year t may be described in terms of the following function:

$$\begin{aligned} M_{ij}^{t*} &= \beta_0 + \beta_1 W_{ij}^{t-1} + \beta_2 PPG_i^{t-1} + \mathbf{x}_i^{t-1}\boldsymbol{\beta}_3 + \mathbf{y}_j^{t-1}\boldsymbol{\beta}_4 + e_{ij}^{t-1} \\ &= \mathbf{X}_{ij}^{t-1}\boldsymbol{\beta} + e_{ij}^{t-1}, \\ M_{ij}^{t} &= 1\left[M_{ij}^{t*} > 0\right], \end{aligned} \tag{9}$$

where W_{ij} is (the log of) individual i's wage/earnings in firm j, PPG_i is potential portability gain for individual i, $\mathbf{x}_i$ is a vector of individual specific characteristics (years of tenure, dummies for gender, highest level of completed education, age, marriage status, immigrant status, whether sickness or maternity leave benefits have been received during 2002, and region of residence), and $\mathbf{y}_j$ is a vector of firm specific characteristics for firm j (dummies for industry and dummies for the relative change in the number of employees during 2001). e_{ij} is assumed independent of all other right hand side variables and to have a standard normal distribution. All right hand side variables are measured in year $t-1$.

The impact of the different covariates on the propensity to change jobs may be estimated by means of a probit model based on (9). $\hat{\boldsymbol{\beta}}$, the probit estimator, will have a causal interpretation if all factors influencing the propensity to change jobs are included in (9). We believe that we have done a decent job in exploiting the data we have at hand, but there may still be unobserved confounding factors causing an omitted variables bias (or endogeneity bias). There may for instance be something like an "innate ability" determining individual productivity. Such an unobserved factor is likely to be correlated with the observed wage of each individual (and thus also with PPG) and *could* also be correlated with the propensity to change jobs. If this is the case, $\hat{\boldsymbol{\beta}}$ will be biased, but the direction of the bias is not clear.

It seems reasonable to assume that people of different ages put different relative weights on PPG and current wage, as the importance of the current wage decreases while the importance of PPG increases with age. We want to avoid making explicit assumptions about time preferences and discounting, and argue that such heterogeneities may be accounted for by dividing the sample into different age groups.

Table 2 shows average marginal effects[9] from probit estimation of (9), where

[9] Average marginal effects from probit models are hard to compute when one or more of the explanatory variables are functions of other explanatory variables (see Bartus (2005)). To get around this problem we use residuals from linear regressions of portability gain on years of tenure and lnWage in stead of the portability gain variable itself when estimating the probit

we have split the sample into five separate age groups. The estimated marginal effect of portability gain on the propensity to change jobs has the expected positive sign in four out of five cases, but none of the estimated coefficients are significantly different from zero. The average marginal effect is negative for the sub-sample consisting of individuals of age 35-39, but this is also the smallest in absolute value. Although imprecisely estimated, the average marginal effect of portability gain for individuals of age 40-44 indicates that an increase in the potential portability gain of one percentage point is associated with an increase in the propensity to change jobs by about 0.4 percentage points. This is higher than the marginal effect of tenure (-0.2 percentage points), but lower than the effect of receipt of sickness or maternity leave benefits (-1.3 percentage points). The relative frequency of movers for this age group is 5.2 percent.

We take the lack of significance and the modest magnitudes of the $\hat{\beta}_2$s as clear indications that there are no effects of potential portability gains on the propensity to change jobs during a given year. With sample sizes between 30 and 45 thousand individuals, we claim that any reasonably clear effects of potential portability gains on mobility would be identified in our framework.[10] If gains and losses related to defined benefit occupational pensions are of any importance on the labour market, one would thus expect to find that these gains and losses are reflected in wages. This is investigated further in the following section.

7 The impact of PPG on wages

7.1 The wage change sample

For this part of the analysis we include only those who did change jobs during 2002. We do no longer restrict attention to the private sector, but consider

models.

[10] As a robustness check we have run the same estimations for two additional time periods: 1997-1999 (falling unemployment) and 1999-2001 (low and stable unemployment). Results are largely the same for all three time periods and when we make a pooled sample out of the three periods. From this we conclude that the reported results are not driven by specific labour market conditions (unemployment was rising from 2001 to 2003).

Table 2: Job change propensity equation, average marginal effects

Parameter (Age in 2001)	SampleI (25-34)	SampleII (35-39)	SampleIII (40-44)	SampleIV (45-49)	SampleV (50-57)
PPG†	0.0652	-0.0325	0.413	0.334	0.0568
	(0.596)	(0.140)	(0.211)	(0.236)	(0.308)
Tenure (yrs)	-0.00424***	-0.00277***	-0.00242***	-0.00180***	-0.00109**
	(0.00118)	(0.000562)	(0.000485)	(0.000429)	(0.000366)
lnWage	-0.0123	-0.00551	0.000342	0.00212	0.00198
	(0.00754)	(0.00765)	(0.00882)	(0.00997)	(0.00831)
Education					
Compulsory	-0.00435	-0.0110*	-0.00384	-0.00673	-0.00574
	(0.00486)	(0.00521)	(0.00466)	(0.00471)	(0.00384)
Lower secondary	-0.0110**	-0.00829**	0.00585	-0.000124	-0.00339
	(0.00389)	(0.00311)	(0.00385)	(0.00373)	(0.00240)
Bachelor	0.0179**	0.0177*	0.0189**	0.0174*	0.00636
	(0.00627)	(0.00697)	(0.00672)	(0.00758)	(0.00772)
Master/PhD	0.0332*	0.0381*	0.0276*	0.0176	0.0150
	(0.0129)	(0.0158)	(0.0136)	(0.0132)	(0.0122)
Sickn./Maternity	-0.00906**	-0.00645*	-0.0131***	-0.00154	-0.00426
	(0.00279)	(0.00301)	(0.00347)	(0.00392)	(0.00266)
Chg.emp.					
$[-75\%, -50\%)$	0.141***	0.174***	0.175***	0.185***	0.163***
	(0.0292)	(0.0219)	(0.0192)	(0.0215)	(0.0254)
$[-50\%, -25\%)$	0.0616**	0.0791**	0.0817**	0.0400	0.0660*
	(0.0225)	(0.0250)	(0.0278)	(0.0231)	(0.0299)
0%	-0.000323	-0.0144	-0.0119	-0.0189	-0.0147
	(0.0151)	(0.0110)	(0.0123)	(0.00987)	(0.00758)
$(0\%, 25\%]$	-0.0212**	-0.0204**	-0.0114	-0.0104	-0.00775
	(0.00820)	(0.00776)	(0.0108)	(0.0102)	(0.0102)
$(25\%, 50\%]$	-0.0353**	-0.0351***	-0.0208*	-0.0292***	-0.0167*
	(0.0109)	(0.00711)	(0.00822)	(0.00694)	(0.00710)
$(50\%, 75\%]$	-0.0347*	-0.0116	-0.0140	-0.00151	0.00454
	(0.0143)	(0.0184)	(0.0197)	(0.0223)	(0.0205)
N	45685	31399	31149	29992	45456
pseudo R^2	0.059	0.069	0.069	0.073	0.070
log-likelihood	-11269.8	-6616.0	-5879.3	-4899.9	-6409.7
# of clusters	3671	3516	3518	3465	3769

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in parentheses, clustered on firms. Additional controls are dummies for gender, region of residence, industry, immigrant status and marriage status.
† Residuals from linear regression of potential portability gain on years of tenure and lnWage.

three different types of job flows: 11,061 job changes from private sector pension covered jobs into other private sector pension covered jobs, 1,772 job changes into the public sector, and 1,643 job changes from the public sector into private sector pension covered jobs.[11] We have excluded extreme observations presumably comprising lay-offs and measurement errors, defined as wage change over the transitional year of less than -20 per cent or more than 100 per cent, or a wage growth of the subsequent period up to 2007 of less than -40 per cent or more than 300 per cent.

Table 3: Wages and portability gain for job movers 2001 - 2003

	Number of persons	Wage initial job (2001)	Relative wage change 01-03	Relative wage growth 03-07	PPG	QP	PPG-QP
Age (2001)			Private OP - Private OP				
25-29	1845	335609	0.141	0.318	0.006	0.006	0
30-35	2474	400632	0.096	0.323	0.012	0.012	0
36-41	2370	432333	0.071	0.303	-0.006	0.021	-0.027
42-47	1937	449029	0.056	0.262	-0.022	0.031	-0.054
48-54	1766	432103	0.031	0.218	-0.024	0.044	-0.068
55-57	669	424072	0.027	0.146	-0.019	0.055	-0.075
All	11061	411496	0.077	0.280	-0.007	0.024	-0.030
			Public - Private OP				
25-29	253	292333	0.213	0.315	0.018	0.018	0
30-35	370	362149	0.133	0.316	0.031	0.031	0
36-41	391	378473	0.092	0.251	0.016	0.040	-0.024
42-47	291	374940	0.079	0.229	0.006	0.047	-0.041
48-54	263	366937	0.047	0.180	0.002	0.052	-0.050
55-57	75	369169	0.022	0.137	-0.001	0.049	-0.050
All	1643	358635	0.107	0.255	0.015	0.038	-0.023
			Private OP - Public				
25-29	295	338710	0.129	0.339	0.006	0.006	0
30-35	420	394001	0.104	0.294	0.011	0.011	0
36-41	390	444936	0.106	0.259	-0.008	0.017	-0.025
42-47	356	493005	0.082	0.245	-0.021	0.022	-0.043
48-54	245	460537	0.084	0.201	-0.019	0.029	-0.048
55-57	66	449407	0.136	0.147	-0.015	0.033	-0.048
All	1772	427160	0.103	0.266	-0.006	0.017	-0.023

[11] The other six types of flows between the three sectors are either (i) assumed to contain many lay-offs, or (ii) do not carry portability gains or losses.

As can be seen from Table 3, the QP increases with age among movers, but not enough to completely offset the direct loss of pension entitlements. Hence, a job change becomes less attractive in terms of pensions with increasing age. There are, however, some sector differences.

The QP from the public sector is higher than from the private sector, and for those who move from the public to the private sector there is an average portability gain of 1.5 per cent, falling with age from 3.1 per cent to -0.1 per cent. Hence, those moving from the public to the private sector will on average get a higher total pension than if they had chosen to stay, before we take into account the wage change following the change of jobs. This is due to a lower wage level in the public sector. With an OP which tops up the progressive NIS, the OP entitlements are lower for lower wages, from which it follows that the PPG will be less negative or even positive.

For the other two types of flows, between private sector jobs and from the private to the public sector, there is an average loss, but the same age pattern. For the youngest age groups there are (small) pension gains.

For those who move between private sector OP firms, wages change on average by 7.7 per cent and then grow by 28 per cent from 2003 to 2007 (Table 3). For the other two flows, the average change is a little higher and the average four year growth a little lower. In all three cases, the wage growth declines with age at transition, but the (immediate) wage change shows a less regular pattern across age groups.

7.2 Econometric analysis

To investigate whether portability gains and losses are reflected in wage changes, we regress in turn the immediate relative wage increase following a change of jobs and the subsequent relative wage growth on PPG. We do this for the three groups of movers described above: those moving between private sector pension covered jobs, those moving from a private sector pension covered job and to a public sector job, and those moving from a public sector job and to a private

sector pension covered job. Potential portability gains are calculated for all individuals, and we assume that lay-offs are of no great importance for these flows of workers.

Persons leaving from the same firm might have traits in common. The firm may for instance have problems, motivating employees to seek other employment even if they are not laid off. That might give them less time to search and therefore lead them to accept a lower wage. Similarly, there may be common traits for persons going to the same firm, which for instance may be in a recruiting phase and thus bidding up wages. For these reasons we also estimate models with firm level effects. In addition, we control for gender, tenure, industry, education and the change in the number of employees during 2002 in the initial firm.

First, we estimate the basic model separately for different age groups, assuming that the error terms are independent and identically distributed within each age group:

$$\Delta W_{ia} = \sum_a \alpha_a PPG_{ia} \cdot D_{ia} + \mathbf{X}_{ia}\boldsymbol{\beta} + \varepsilon_{ia}$$

ΔW_{ia} is defined as in Table 3, namely as the relative wage change from 2001 till 2003 and as the relative wage growth over the period 2003 through 2007. PPG_{ia} is the potential portability gain for individual i in age group a, D_{ia} is an indicator taking the value 1 if individual i belongs to age group a and 0 otherwise, and $\mathbf{X}_{ia}$ is a vector of covariates (gender, tenure, education, wage quartile and industry). Results form the baseline specification are reported in Table 4.

To allow for firm level random effects we let the error terms be correlated within firms, in turn for the initial and for the destination firm. We also estimate with an additional fixed wage change effect for each firm, again in turn for both the initial and for the destination firm. See Hernæs et al. (2011) for details. The estimated PPG coefficients from the specification with firm level fixed and

Table 4: The impact of PPG on relative wage change (2001-2003) and on relative wage growth (2003-2007)

	Wage change		Wage growth	
PPG by age				
25-29	-0.841	(0.952)	10.566***	(1.223)
30-35	-1.691	(0.424)	4.698***	(0.544)
36-41	0.548	(0.341)	-2.188***	(0.437)
42-47	1.877***	(0.250)	-2.013***	(0.321)
48-54	2.454***	(0.267)	0.112	(0.343)
55-57	3.088***	(0.485)	2.406***	(0.622)
Male	0.035***	(0.004)	0.082***	(0.005)
Tenure (yrs)	0.002***	(0.000)	0.001	(0.001)
Education				
Compulsory	-0.006	(0.016)	0.037*	(0.021)
Higher	0.041***	(0.005)	0.117***	(0.007)
PhD	0.055**	(0.018)	0.150***	(0.023)
Unknown	0.046**	(0.014)	0.165***	(0.018)
Chg.emp.	0.021***	(0.005)	0.014*	(0.006)
N	11061		11061	
R^2	0.099		0.437	

The estimation sample consists of movers between private sector OP covered jobs. Additional controls are dummies for industry (NACE level 1), and reference for education is upper secondary.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in parentheses.

random effects are shown in Table 5.

For individuals above the age of 35, where there are potential losses (negative values of PPG), there are no significantly negative effects of PPG on the immediate wage increase following the job change. Such effects would have indicated a wage compensation for the portability loss. Some coefficients are significantly positive and some are not significant. This holds regardless of whether firm level fixed effects are included.

For individuals under the age of 36, we get negative coefficients significant at the 1% level only when the specification includes fixed or random effects for the destination firm (2003). Given that the potential portability gains are fairly small for this age group (see Table 3), we do not put much weight on this.

The wage growth is observed over four years, and will reflect a delayed compensation such as an improved career path. For those aged 36 and older, coefficients for two of the four age groups are significantly negative. With firm level

Table 5: The impact of PPG on relative wage change (2001-2003) and on relative wage growth (2003-2007) with firm level fixed/random effects

	Firm level fixed effects		Firm level random effects	
	2001	2003	2001	2003
Dep. var.: wage change				
PPG by age				
25-29	-1.5894	-2.2424***	-2.1024*	-2.5682***
30-35	-1.4283	-0.4253	-0.3308	-0.3658
36-41	-0.4449	-0.0062	-0.1477	0.0382
42-47	0.3374	0.2492	0.4029	0.3870
48-54	0.9476***	0.7950***	0.8581***	0.7568***
55-57	1.0203	0.9290*	1.1574***	0.9973*
Dep. var.: wage growth				
25-29	4.5570***	4.5800***	4.6358***	4.5963***
30-35	1.2055	0.9479	1.5196***	1.4800***
36-41	0.0909	0.3944	0.3984	0.3991
42-47	0.5465	0.5551	0.7001*	0.7056*
48-54	2.0910***	2.0853***	2.1892***	2.2092***
55-57	5.2385***	5.2690***	5.1189***	5.2423***
N	11061			

The estimation sample consists of movers between private sector OP covered jobs. Additional controls are years of tenure and dummies for industry, wage quartile, gender and education. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

fixed effects, all coefficients are either not significant or significantly positive. For those under the age of 36, there are no significantly negative coefficients.

Results for the two other types of flows give no significantly negative coefficients for individuals of age 36 and older. The same results are obtained with data for job changes for the time periods 1997-1999 and 1999-2001. These results are reported in Hernæs et al. (2011).

We take this as further evidence that potential portability gains or losses have no impact on the propensity to change jobs. The median PPG for individuals in the age interval 40-60 years is around -2 to -3% of final wages. Assuming a life expectancy of 80 years, this gives 13 years with this loss. Just adding up without discounting gives a total loss of around 30% of the final wage. Discounting will reduce the magnitude of the loss. For some, however, the loss is several times this magnitude.

To follow up on this conclusion, we note that aside from any compensation effect, the variation in PPG is driven by a combination of wage, age and tenure. This relationship can be expected to show up in a standard wage regression run before a job change. After a job change, one would expect any compensation to show up in a different (smaller) coefficient for PPG on wages. Hence, any difference between the before and after estimates should indicate compensation. As shown in Table 6, the estimates for PPG are practically identical and certainly not statistically different. This supports the conclusion that there is no wage compensation for a potential portability loss and is thus indicative of no lock-in effects. Looking at the other two types of flows and the other time periods, the coefficients are different before and after job change in only one of the four cases, see Hernæs et al. (2011) for details.

Table 6: The impact of PPG on log-wage 2001 and log-wage 2003, specification w/firm level fixed effects

	Log-wage 2001		Log-wage 2003	
PPG	-4.4861***	(0.2395)	-4.7072***	(0.2282)
Age (2003)	-0.0379***	(0.0005)	-0.0417***	(0.0005)
Male	-0.2147***	(0.0071)	-0.2182***	(0.0068)
Tenure (2003)	-0.0033***	(0.0006)	-0.0030***	(0.0006)
Education				
Compulsory	-0.1380***	(0.0211)	-0.1427***	(0.0201)
Higher	0.2423***	(0.0073)	0.2384***	(0.007)
PhD	0.4956***	(0.0232)	0.4999***	(0.0222)
Unknown	0.3638***	(0.0181)	0.3634***	(0.0172)
Chg.emp.	0.021***	(0.005)	0.014*	(0.006)
Constant	15.5670***	(0.0217)	15.7688***	(0.0207)
N	11061		11061	
R^2	0.595		0.649	

The estimation sample consists of movers between private sector OP covered jobs. Additional controls are dummies for industry (NACE level 1), and reference for education is upper secondary. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in parentheses.

8 Conclusions

The picture emerging from this analysis is that there is no discernible lock-in effect of the occupational pension system in Norway, neither in the period 2001 - 2003 with rising unemployment, nor in the period 1997 - 1999 with falling unemployment or in 1999 - 2001 with constant unemployment. We have defined the potential portability gain (PPG) from a job change as *the increase (or decrease) in the replacement rate, measured as the projected pension relative to the projected final wage in the initial job.* The PPG is positive from a job change up to the age of 35, while it is possible to obtain a full pension in the new job (assuming the usual requirement of 30 years for full accrual) and the QP from the initial job comes as a pure bonus. After that age the PPG is increasingly negative, since full accrual is no longer achievable in the new job and the QP is increasingly insufficient to cover the difference between the old and the new pension.

We construct this measure of portability gains for a large sample of Norwegian workers employed in OP-covered jobs throughout both 2001 and 2003. For

these workers, the calculated values range from about -10 to about +7 per cent of final wages, but most workers are facing fairly moderate gains and losses. Econometric analyses reveal no clear effects of potential portability gain on the propensity to change jobs (during the transitional year 2002), and we find no signs of portability gains and losses being offset by wages. As a final check on wage effects from PPG, we run standard regressions of wages on PPG and controls for those who changed jobs, both before and after the job change. The coefficients for PPG are very similar, as they would be if they reflected a structural relationship rather than a compensation for pension portability losses.

There may be several explanations for these results. First, potential job movers rely on perceptions of alternative compensation packages, in principle covering all remaining years until retirement. Since the magnitude of the portability gain is not too large (standard deviations of about $\pm 2\%$ around group averages), a perception of higher wage growth in the new job might easily outweigh the loss. It is therefore not unreasonable that we find no effect on labour market mobility, especially not when uncertainty is added to the picture. Even so, it is worth noting that there is little sign that the loss that would follow from a move into a job with the same wage is actually compensated through a higher wage in the new job.

As for the data, there is of course a problem that we may have a mix of quits and layoffs. We have tried to reduce this problem by looking only at individuals moving between full-time, full-year pension covered jobs, and excluded persons with spells of unemployment or receipt of social security benefits during the transitional year.

If the results are to be taken at face value, in that there are no lock-in effects due to the Norwegian DB system, then one can leave aside the concern about occupational pensions reducing labour market mobility. Although we have not looked specifically at the movements between the private and the public sector, the results indicate that there must be other reasons for the lack of mobility between the two. As a final remark, we note that a lock-in effect may still arise

in a situation where DB plans are generally closed to new entrants and where the alternative DC plans are less generous. The potential losses would then be higher than those observed in our data.

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A Appendix

A.1 Potential portability gain, stayers vs movers

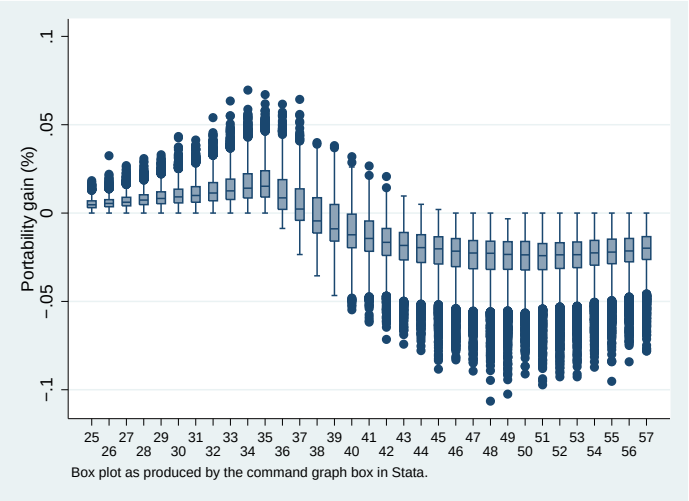

Figure A2: Potential portability gain by age (2001) for stayers. Initially employed in private sector w/OP, hypothetical move within sector.

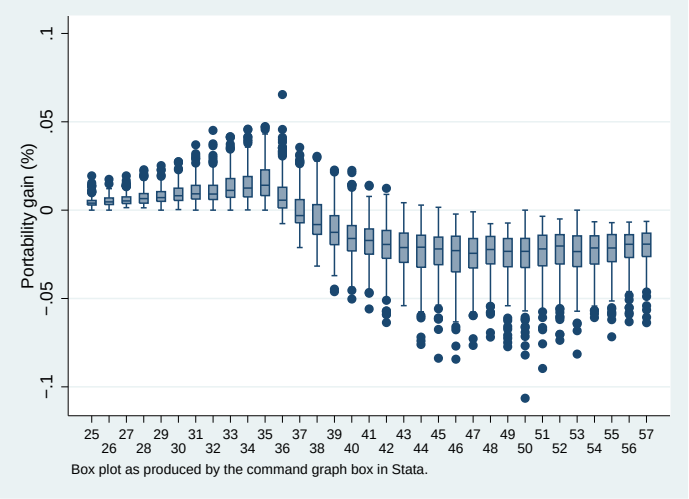

Figure A3: Potential portability gain by age (2001) for movers. Initially employed in private sector w/OP, hypothetical move within sector.

A.2 Variation in potential portability gains

Table A1: PPG regressions, young and old

	Sample I		Sample II	
mover	0.0000596	(0.0000367)	-0.000629***	(0.000140)
lnwagetm1	0.0100***	(0.0000309)	-0.0164***	(0.0000776)
t_tm1	0.00238***	(0.00000984)	-0.000632***	(0.0000136)
t_tm1_2	-0.0000348***	(0.000000635)	0.0000308***	(0.000000493)
agetm1	-0.00351**	(0.00115)	-0.0507***	(0.000942)
age2	0.0000744	(0.0000381)	0.000904***	(0.0000205)
age3	-0.000000189	(0.000000420)	-0.00000529***	(0.000000147)
_cons	-0.0840***	(0.0114)	1.124***	(0.0143)
N	51858		131823	
R^2	0.925		0.584	

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$