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論台灣在1999到2020之間的所得流動
An evaluation of wage transitions and wage mobility in
Taiwan from 1999 to 2020

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Taiwan from 1999 to 2020

本論文係洪碩威君（學號 R10323033）在國立臺灣大學經濟學系
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通過及口試及格，特此證明

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楊壽中

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賴宇子

郭漢豪



致謝

終於可以寫這個部份了。原本以為把碩論寫完是一件容易的事，找個有興趣的主題，研究一下，把結果寫下來就好了。然而，有熱忱是一回事，這份熱忱能燃燒多久，能否轉換為論文主題又是另一回事。一開始讀了不少有趣的東西，但想不出一個能做的題目，後來摸索了很久，最後大方向也訂了下來。光這個過程就花了不少時間。從此並沒有一帆風順，在靈感和新想法萌芽的時候，熱忱會高漲，在這些想法碰壁的同時，熱忱也會慢慢地消磨殆盡。要憑著一股腦的興趣寫完一篇論文，似乎不是這麼現實。這些新想法的誕生，也不是這麼規律的。有時是讀了一些新的東西，有時是和不同的人聊了一會，有時只是靈光乍現，有時會在挫折的盡頭驀然顯現。有些點子在過程中放棄了，有些變成了日後完成這篇碩論的養分，但不論如何，這個過程大概都是有價值的。然後在這種反覆的過程中，我開始稍微體認到學術這條路大概跟想像中不是同一回事，至於未來會不會回到這條路上，那就再說了。

很感謝楊睿中老師容忍我一拖再拖，偶爾甚至還會音訊全無，在討論當中給了不同的想法與回饋。也很感謝郭漢豪老師以及賴宗志老師在時間有點倉卒的時候願意擔任口試委員，也給了不少有用的建議。再來在完成碩論的過程中，有幾個和我同時在寫碩論的朋友，雖然有時候寫得很掙扎，但看到別人也在掙扎，心情就會多少好受一點。要感謝的人還很多，父母、教過我的教授、某個讓我在口試前壓力有點大、跑去台中晃的時候讓我借宿的朋友、那些和我聊過、一起吃飯、打球的人、在攀岩館一起挑戰路線的岩友，甚至是飲料店的店員、常吃餐廳的員工，要感謝的人真的太多了，在此致上最深的謝意。沒有你們，我還真不知道能不能順利寫完。

2024.08.06 洪碩威

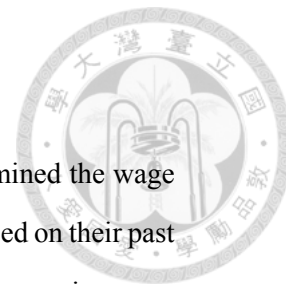
中文摘要



利用家庭動態資料庫的資料，我探討了台灣所得流動的狀況。我將研究中的受試者依照他們過去的薪資進行分類，並利用邏輯斯迴歸分析的方式檢視了台灣在 1999 到 2020 之間的所得流動與所得轉換。考慮短期的情況時，可以發現到對於失業的個體而言，向上流動的趨勢有所減少。同時，對於有工作的族群而言，失業的風險有越來越低的趨勢。在所有的個體中，控制了年齡的影響後，在 1964-1976 年間出生的人相對於其他世代的人享有更好的流動條件。年齡主要對於所得較低的族群而言有負面的影響。同性別之間存在著流動條件上的差距，而這個差距對於薪資水準在第 25 個百分位數底下的人較大，而對於所的水準越高的族群來說，流動條件的差距也隨之減少。對於所得水準最高的族群而言，性別間的差距在長時間之下甚至是可以忽略的。職業的選擇也會影響到流動性。在政府機關工作的受試者，不論在短期或長期的情況底下，都會有較低的向下流動以及較高的向上流動。同時，長期而言，這些人甚至有機會成為薪資水準最高的一群人。相對的，自雇的族群雖然擁有在短期就躍升到薪資分布的頂端，然而這些人整體上暴露在與其他人相同的向下流動的風險當中。

關鍵字：所得流動、所得轉換、所得分布、異質性效果、性別差距、職業特性

Abstract



Using data collected in the Panel Study of Family Dynamics, I examined the wage mobility in Taiwan. Individuals are grouped in different salary groups based on their past salaries. A logit model is applied on the individuals on different groups to examine wage transitions within different transition periods in the span of 1999-2020. In the short term, the upward mobility for the unemployed has decreased throughout time, while employed individuals have become more resilient to unemployment. Gender gaps exist and are most severe for women with salaries below the 25th percentile, and the gap is less severe at the upper half of the wage distribution. Among all respondents of the study, individuals that are born from 1964-1976 have an advantage over other cohorts in mobility even controlling for age. Age displays a negative effect mostly for individuals with lower salary. The gap at the top of the wage distribution is even ignorable in the view of longer transition periods. Occupation characteristics affect mobility. Working for a government organization decreases downward mobility and improves upward mobility in all time spans, and it even provides opportunities to reach the top of the wage distribution in the long term. On the other hand, though self-employment provides opportunities to earn more than the 75th percentile even in the short term, it does not provide insurance against downward mobility for most salary groups.

Keywords: wage mobility, wage transitions, wage distribution, heterogeneous effects, gender gap, occupation characteristics

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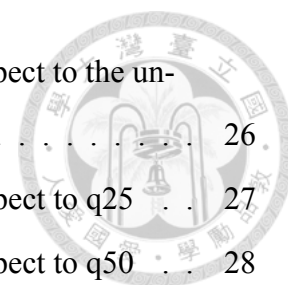
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1 Introduction

Low salary for younger generations in Taiwan has been a hotly discussed issue over the last two decades. From 2000 to 2020, the average real total earnings has only increased from NT\$51,063 to NT\$55,364. In addition, the growth of earnings seems to deviate quite a lot from the GDP growth. In the same period, the annual real growth of GDP has been over 2% on average. This also implies that inequality has become more severe. While these are essential issues, something less talked about is the wage mobility. Suppose that if individuals with a relatively low salary currently, but in fact they have the opportunities to earn more in the future, then the problem of low salary and inequality will be less severe. With a high wage mobility, inequality in terms of lifetime earnings may actually be smaller (Buchinsky and Hunt, 1996). In addition, wage inequality might be more acceptable under high mobility (Bachmann, Bechara, and Schaffner, 2016). Hence, it would be essential to investigate wage mobility for different generations, its evolution over time, and how individual characteristics affect the opportunities to rise in the wage distribution.

The term "wage mobility" is used differently under different contexts. A defining feature of mobility is about how much each recipient earns at two or more points over time (Fields, 2008). Still, it may refer to different ideas. Overall, wage mobility can be categorized into two types: intergenerational and intragenerational. The former emphasizes on the mobility between generations, which usually points to the mobility between parents and children. On the other hand, the latter focuses on changes of an individual within a certain period. Some focuses on the fluctuation of income over time, while others see mobility as an equalizer of longer-term income. I will focus on the mobility concept regarding positional movement, which refers to whether individuals change in ranks or different positions (e.g. quantiles, deciles) in the wage distribution.

In the literature, different methods are applied to approach the issue. Dickens (2000) directly calculated the transition matrices from the sample between deciles and summarized them in a mobility index. Formby et al. (2004) discussed various ways of how the transition

matrices are constructed. They also derived large-sample properties of the transition probabilities between groups. Buchinsky and Hunt (1999) estimated the transition probabilities non-parametrically with a kernel density estimator, which takes the effect of different variables into consideration. For parametric estimations, Bachmann et al.(2016) and Tansel et al.(2019) both considered wage transitions with a multinomial logit model.

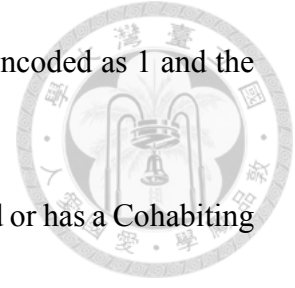
2 Data Description

Data in this paper is gathered from the Panel Study of Family Dynamics (家庭動態調查). Starting from 1998, the study collects personal information about individuals and their family members, with the aim of tracking them over the following years whenever possible. Up to the present time, it has been conducted in 18 various years, with the most recent being in 2020. Collected information includes basic demographic variables, employment, occupation, education, family relations, health, and so on. Moreover, the cohorts of respondents have increased as time goes on. Up to now, a total of five cohorts have responded to the questionnaires, including some of their offspring. These responds collectively form a panel dataset with possibly unequal gaps in between years. Throughout the years, the questionnaires have been revised multiple times throughout the years to adapt to the current society, but most variables used are collected since the initial study.

The following variables are included in the analysis to assess their impact on wage mobility and transitions:

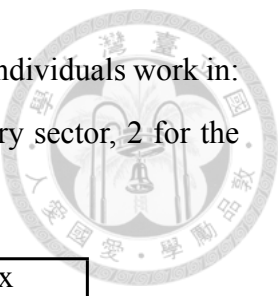
- salary: average monthly income over the past year, evaluated in NTD dollars.¹
- age: individual's age.
- city: a dummy that indicates whether the individual lives in a special municipality(直轄市).

¹Some individuals did not report their salary but instead reported their approximate salary(e.g. 20000-30000) or their year earnings. For the former case, salary is replaced with the mean of the lower and upper bound of the interval (so 25000 for the example) For the latter case, salary is replaced with the year earnings divided by 12.



- gender: a dummy that indicates the individual's gender. Male is encoded as 1 and the rest, including female and others are encoded as 2.
- marriage: a dummy that indicates whether the individual is married or has a Cohabiting partner.
- hours: self-reported of average working hours in a week. Values higher than 84 are top-coded.
- own-boss: a dummy that indicates whether an individual is self-employed.
- gov-boss: a dummy that indicates whether an individual is employed at a government organization.
- regular: a dummy that indicates whether an individual receives her salary on a regular basis(daily or monthly).
- low-educ: a dummy that indicates an individual whose highest level of education is below university.
- medium-educ: a dummy that indicates an individual whose highest level of education is exactly university or its equivalent.
- high-educ: a dummy that indicates an individual whose highest level of education exceeds university.
- cohorts: A categorical variable that denotes the cohort to which individuals belong. Cohorts are defined as follows: 1 for those born in 1953-1963, 2 for those born in 1935-1954, 3 for those born in 1964-1976, 4 for those born in 1977-1983, 5 for those born in 1984-1991, and 6 for the offspring of the main respondents above 25. The label given to the five cohorts also indicate the order they are included into the study.

- industry: A categorical variable that denotes the industry to which individuals work in: 0 for those unemployed or do not report their job, 1 for the primary sector, 2 for the secondary sector, and 3 for the tertiary sector.



Variables	mean	std	min	max
salary	46,462.13	60,640.88	8,000.00	7,000,000.00
age	39.54	9.79	25.00	81.00
city	0.54	0.50	0.00	1.00
gender	1.41	0.49	1.00	2.00
marriage	0.59	0.49	0.00	1.00
hours	47.08	14.22	0.00	84.00
own-boss	0.15	0.36	0.00	1.00
gov-boss	0.10	0.30	0.00	1.00
regular	0.79	0.41	0.00	1.00
low-educ	0.60	0.49	0.00	1.00
medium-educ	0.30	0.46	0.00	1.00
high-educ	0.10	0.30	0.00	1.00
years	-	-	90	107
cohorts	-	-	1	6
industry	-	-	0	3
observations	37,948	-	-	-

Table 1: Descriptive statistics of the variables of individuals with salaries higher than half of the minimum salary

Table 1 reports the descriptive statistics of the variables of individuals with salaries above half of the minimum salary. The main reason to display the statistics in two separate tables is that there are a large number of respondents with zero or really low salaries.² Most variables are job-related factors, so including these individuals does not make sense. To address the problem, I assume that people with a salary lower than half of the minimum salary is basically unemployed. The descriptive statistics for respondents with salaries below half of the minimum salary are reported in table 2.

It could be seen that the average salary is lower than the official numbers. Unit non-response could be an underlying factor, where some proportion of households do not participate in surveys(Korinek et al.,2006). For example, Goyder et al(2002) found that people

²As an example, one respondent answered 26 for his salary, which is quite abnormal. I also excluded respondents that reported themselves as being retired.



Variables	mean	std	min	max
salary	600.86	1817.08	0.00	11000.00
age	52.90	12.97	25.00	85.00
city	0.30	0.46	0.00	1.00
gender	1.68	0.46	1.00	2.00
marriage	0.66	0.47	0.00	1.00
hours	7.64	18.60	0.00	84.00
own-boss	0.15	0.36	0.00	1.00
gov-boss	0.02	0.14	0.00	1.00
regular	0.05	0.21	0.00	1.00
low-educ	0.91	0.29	0.00	1.00
medium-educ	0.07	0.25	0.00	1.00
high-educ	0.02	0.14	0.00	1.00
observations	11,912	-	-	-

Table 2: Descriptive statistics of the variables of individuals with salaries lower than half of the minimum salary

with lower socio-economic status are more likely to respond to surveys than their higher strata counterparts. A similar issue is item non-response, which refers to that some participants may refuse to answer specific questions (Korinek et al., 2006). In the Panel Study of Family Dynamics, individuals who did not respond to the question on salary would be coded 0. Although most of them reported themselves as unemployed in the questionnaires, still few of them remain ambiguous. As Riphahn and Serfling (2005) found that there is a weak tendency for non full time employed respondents to refuse an answer on income and wealth questions, treating those as individuals with low salary might be imperfect but somehow reasonable.

3 Mobility and Transitions

A transition model is constructed to analyze wage mobility :

$$P(y_t \leq f_{k,t} | X_t, y_{t-p} \in I_{j,t-2}) = L(\alpha_{j,k} + \beta_{j,k} X_t) \quad (1)$$

where y_t is the salary in year t , and $f_{k,t}$ is a wage threshold which will be defined soon. L is a nonlinear function. If not explicitly mentioned, the logistic function is applied. X_t is a vector

of covariates including time fixed effects. p is the transition period. In the next section, $p = 2$ is chosen, and in the following section, longer transition periods are examined. Due to the fact that the study is not conducted every two years regularly, some observations are dropped inevitably. The number of observations and unique respondents used in each observation is given in the appendix.

$f_{k,t}$ is a wage threshold defined by:

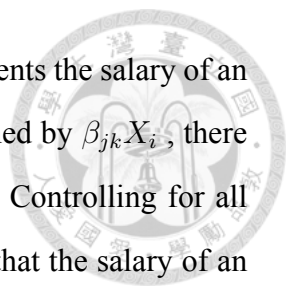
$$f_{k,t} = \begin{cases} 0.5 m_t & \text{if } k = u \\ q_{k,t} & \text{if } k \in \{25, 50, 75\} \end{cases}$$

where m_t is the minimum salary that year, and $q_{k,t}$ is the k th quantile of the salaries in year t . The quantiles are estimated using only observations with positive salaries, since there are a significant number of individuals with no salary. $I_{j,t}$ are intervals that separate individuals into different groups by their salaries in year t using the same cutoff points for $f_{k,t}$, which are defined by:

$$I_{j,t} = \begin{cases} [0, 0.5 m_t] & \text{if } j = u \\ (0.5 m_t, q_{25,t}] & \text{if } j = 0 \\ (q_{25,t}, q_{50,t}] & \text{if } j = 1 \\ (q_{50,t}, q_{75,t}] & \text{if } j = 2 \\ (q_{75,t}, \infty) & \text{if } j = 3 \end{cases}$$

Finally, $\alpha_{j,k}$ are the constants for the combination of thresholds and salary groups, $\{j, k\}$, and $\beta_{j,k}$ are the slope coefficients for $\{j, k\}$.

The model captures the probability of an individual ending up with a salary lower than the given quantile, conditional on individual characteristics and their salaries two years ago. Thus, it evaluates how difficult it is to climb up the wage ladder and get pass the threshold k . In literature, this is termed as the staying probability.



The linear component $\alpha_{jk} + \beta_{jk}X_i$, can be treated as a force that prevents the salary of an individual to exceed the threshold $f_{k,t}$. While part of the force is explained by $\beta_{jk}X_i$, there is still a fraction of it that remains unexplained, which is the constant. Controlling for all other factors, a large constant term would suggest a higher probability that the salary of an individual stays beneath the threshold, and a relatively small constant would suggest a higher likelihood to exceed it.

The linear component is closely related to the wage mobility. As an example, for $j = 1$, the thresholds $q_{50,t}$, $q_{75,t}$ would influence the upward mobility of an individual within group, whereas the thresholds $0.5m_t$, $q_{25,t}$ would influence the downward mobility. To be more specific, a larger $\alpha_{1,50}$ and $\alpha_{1,75}$ indicates lower upward mobility, while a smaller $\alpha_{1,u}$ and $\alpha_{1,25}$ indicates lower downward mobility. Since the linear component contributes to the wage mobility, hereafter it will be referred to as the mobility factor.³

With the presence of dummy variables, the constant is not uniquely identified unless we impose restrictions. Unlike common practices that set a reference group in each dummy variable, I restrict the coefficients on all dummies (including the time fixed effects) to have a zero weighted sum, which is similar to how the entity fixed effects are estimated. This is equivalent to demean all of the dummies by their sample mean. In addition, continuous variables are demeaned. These manipulations yield two advantages: First, α_{jk} becomes the average mobility factor and $L(\alpha_{jk})$ becomes the staying probability of an average person⁴. Moreover, the time effects can be seen as the fluctuations of the mobility factor over time, allowing analysis of the wage mobility through time.

In the following sections, transitions between a two-year period will be referred to as short-term, and for cases where the transition period $p \in \{4, 6, 8\}$, they will be referred to as longer-term.

³A larger mobility factor may actually suggest immobility in some cases, so it makes sense to call it the "immobility factor", but I would like to keep the name shorter.

⁴Since all variables are demeaned, a person with all characteristics at the group mean will have a mobility factor equal to the constant. While I refer to it as an average person, it should be noticed that such person does not exist in reality.



4 Short-Term mobility

4.1 Average Mobility Factor

The regression tables are placed in the appendix for ease of presentation. The estimated constants are all significant at the 0.01 level. For each percentile, the average mobility factor is higher for individuals with a lower salary level two years ago, and for each group, the average mobility factor are increasing towards the upper percentile. To present it more effectively, the average mobility factor of each salary group is presented in the form of a transition matrix. For example, the probability that an individual with a salary from the 25th percentile up to the median two years ago turns out to have a salary in between the median and the 75th percentile can be calculated as:

$$L(\alpha_{1,75} + \beta_{1,75}X_i) - L(\alpha_{1,50} + \beta_{1,50}X_i)$$

If we further assume that the individual is average in the group, then only the constant have an effect on the transitions.

	U	<25	25-50	50-75	>75
U	0.9167	0.0618	0.0129	0.0080	0.0005
<25	0.0459	0.7216	0.1980	0.0335	0.0010
25-50	0.0025	0.1769	0.5923	0.2175	0.0108
50-75	0.0004	0.0260	0.1793	0.6411	0.1532
>75	0.0002	0.0074	0.0186	0.1676	0.8060

(a) Average person

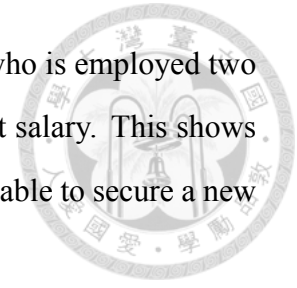
	U	<25	25-50	50-75	>75
U	0.7302	0.1304	0.0663	0.0515	0.0215
<25	0.1773	0.5171	0.2343	0.0538	0.0175
25-50	0.0821	0.1480	0.5079	0.2320	0.0300
50-75	0.0418	0.0309	0.1654	0.5839	0.1780
>75	0.0270	0.0125	0.0255	0.1672	0.7679

(b) Unconditional mean

Table 3: Comparison of wage transitions between an average person in group and the sample mean

Table 3(a) shows the estimated transition probabilities of an average person within each group. For all transition matrices, the Left column indicates which group individuals belong to two years ago, and the top row indicates where they end up after two years. First, within a two year period, an average person in the group often stay in the same group as she did two years ago. The rigidity is especially high at the very top and bottom of the wage distribution. Second, while upward and downward transitions occur occasionally, both are mostly restricted

to the nearby groups. In addition, across all groups, an average person who is employed two years ago rarely end up unemployed, even for the group with the lowest salary. This shows that either an average person is resistant to unemployment, or that she is able to secure a new job shortly after leaving the previous job.



	U	<25	25-50	50-75	>75
U	0.1865	-0.0686	-0.0535	-0.0435	-0.0210
<25	-0.1315	0.2044	-0.0362	-0.0203	-0.0165
25-50	-0.0796	0.0289	0.0844	-0.0145	-0.0193
50-75	-0.0414	-0.0049	0.0139	0.0573	-0.0248
>75	-0.0268	-0.0050	-0.0068	0.0004	0.0382

Table 4: Difference between the transition probabilities of an average person and the unconditional transition probabilities

An average person within the group in general do not possess the same transition probabilities compared to the unconditional probabilities of the group⁵. Table 2(b) reports the unconditional transitional probabilities. Comparing the two, the relative magnitude of the probabilities are similar, though a higher mobility can be observed, which refers to the differences in the mobility factor within each group. Some individuals have a higher probability to rise in the wage ladder, and some are at higher risk of falling down. Therefore, the probability for individuals to stay in the same group two years ago drops substantially, while more transitions upwards and downwards are observed.

The difference between between the transition probabilities of an average person in each group and the unconditional transition probabilities also indicates some form of in-group inequality. The differences are reported in table 4. For individuals with salaries under $q_{25,t}$, wage rigidity is much higher. An average person in these two groups has a much higher probability to stay within the same group, in return for a much lower probability to go unemployed. The pattern is similar for higher salary groups, though with a smaller magnitude.

⁵The unconditional probability of the group is obtained by directly calculating how many percentage of people in the group end up in each interval from the data. For short, I will refer to it as unconditional probability or unconditional mean

Additionally, the magnitude shrinks towards the top of the wage distribution.



4.2 Time Trends

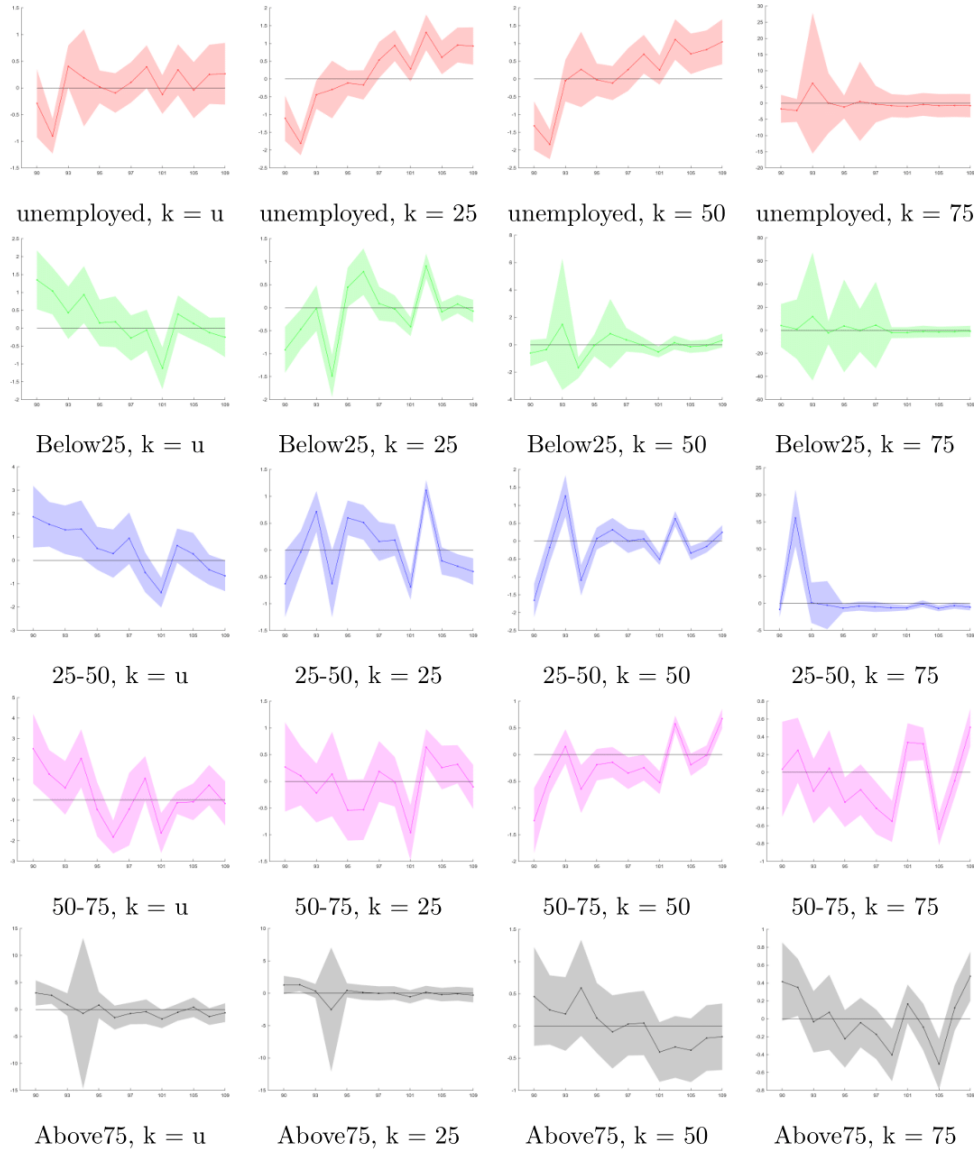


Figure 1: Time trends of all combinations of group and threshold

Figure 1 plots the estimated time effects and their 95% confidence intervals of each group with respect to different thresholds. For the unemployed group, it is clear that upward mobility has decreased over the years. This is especially clear with the thresholds $q_{25,t}$ and $q_{50,t}$,

where a significant positive trend can be detected. This suggest that mobility for unemployed individuals has worsened throughout the years. For individuals who are employed, a negative trend can be found with respect to the unemployment threshold for individuals with a salary below median, indicating that downward mobility towards unemployment has dropped. In other words, individuals have been more likely to stay employed recently.

Considering other thresholds, there appears to be a slightly increasing downward mobility for individuals with a salary between $q_{50,t}$ and $q_{75,t}$ to drop below $q_{50,t}$. In addition, for individuals with salaries above median, the time trends for the threshold $q_{75,t}$ has moved synchronously. While they dropped a bit around 2012-2016, it started to rise again afterwards, suggesting that earning a salary above $q_{75,t}$ has become slightly harder. Overall, there are fluctuations of the time trends, however, most of them are not significant different from zero and noticeable patterns exist only in a few cases.

4.3 Age and cohort

Among all cohorts, individuals from cohort 3, which are the respondents born between 1964 and 1976, have the most significant differences compared to others. Across most thresholds and groups, they seem to be relatively secure from downward mobility and more likely to embrace opportunities for upward mobility in general. However, they are equally prone to unemployment risks compared to other cohorts. Moreover, those with a salary below the 25th percentile do not enjoy the same advantage.

On top of this observation for cohort3, some patterns can be observed. To begin with, unemployed individuals that are younger have a slightly higher chance to rise above the median compared to the older generations. Nevertheless, this is not seen in other thresholds. For employed individuals with salaries lower than the 25 percentile, older cohorts face a lower barrier to move beyond $q_{25,t}$, while younger cohorts struggle more to pass the threshold. A similar phenomena is observed for individuals with salaries between the median and 75 percentile facing the threshold $q_{75,t}$. For individuals with the highest earnings, the oldest generation has

a higher downward mobility towards the nearby lower group, but besides that, cohorts do not impact much. In brief, cohorts play a part in the transitions, but their effects are not applicable to all groups and thresholds.

Age displays an effect on the transitions even after controlling for cohorts. It mostly affects individuals with lower salary confronting lower thresholds, and whenever it is significant, age imposes a disadvantage for individuals. Hence, though the staying probabilities for unemployed individuals seem to be high, younger generations will not be trapped in the group as much. The effects becomes mainly insignificant when the threshold is higher than $q_{50,t}$. The only exception is for individuals with the highest salaries, for whom age yields a minimal advantage that prevents downward transitions to occur.

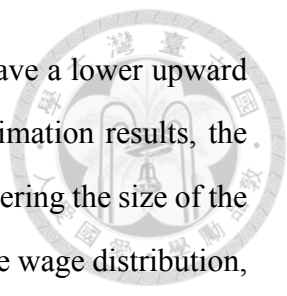
4.4 Gender

Across all percentiles and salary groups, the coefficients on gender are positive and significant, indicating that women have a disadvantage in wage mobility across all groups and thresholds, though the effects are of various magnitudes. The gap between genders would depend not only on gender itself but also the individual's characteristics and the average mobility factor of each group and threshold. The gap is quantified by the differences in probabilities. I compare the differences in the transition matrices of opposite genders, while fixing other characteristics at the average level in the group.

Table 5: Gender gaps in terms of transition probabilities

	U	<25	25-50	50-75	>75
U	-0.0781	0.0464	0.0177	0.0134	0.0006
<25	-0.0175	-0.1918	0.1617	0.0467	0.0009
25-50	-0.0024	-0.0728	-0.0255	0.0955	0.0052
50-75	-0.0003	-0.0118	-0.0388	-0.0068	0.0578
>75	-0.0003	-0.0039	-0.0063	-0.0259	0.0364

Table 5 reports the differences. The numbers are obtained by directly subtracting the transition matrix for female from the transition matrix for male. The probabilities of staying



in the same groups are highlighted with a box. For all groups, women have a lower upward mobility and higher mobility. While this is not surprising from the estimation results, the magnitude and the pattern in differences may be more interesting. Considering the size of the differences, gender gaps turn out to be more severe in the lower part of the wage distribution, while it seems to be moderated in the upper half. Among all groups, the gender gap appears to be the largest with the lowest salary group, where women are 20-percent likely to stay within the same salary group compare to men. On the contrary, the gap is around 6 percent in the group with salaries within the median and $q_{75,t}$, and slightly below 4 percent at the top. They still exist, though the magnitude is smaller compared to the groups with lower salaries.

In terms of the pattern, though the gaps are more obvious in the transitions within the nearby group, they are also exhibited in certain transitions that are less likely to happen. Specifically, there are noticeable differences for the unemployed and individuals with a salary lower than the 25 percentile. Men in these two categories are more likely to rise upwards by two groups with a minor but noteworthy amount. Furthermore, the difference are ignorable for the probability that employed workers become unemployed, while for the unemployed, women are less likely to change their positions in the wage distribution.

4.5 Occupation Characteristics

Among all employment choices, self-employing and working in a government organization may be the most contrary choices. Across groups, both choices do not affect the transitions towards unemployment much. With respect to the threshold $q_{25,t}$, the two choices seem to have a distinct impact. Self employment seems beneficial for the upward mobility of lower salary groups, and an occupation in a government organization seems to inhibit downward mobility. A pattern consistent with the above can be found with the threshold $q_{50,t}$, except that an occupation in a government organization also induces upward mobility for groups with salary lower. The story changes when it comes to the threshold $q_{75,t}$. Working in a government organization in general does not help to pass the threshold for individuals with salaries below

that threshold. However, for individuals that already earned more than that, working for the government also prevents downward transitions. In contrast, self employment provides some help for all groups to exceed the 75th percentile in salary, though it does not benefit the individuals with the top salaries. To summarize, occupations in government organizations are stable and surpasses the median consistently. While it does not guarantee salaries that exceed $q_{75,t}$, once it does, individuals are less likely to move downwards in the wage distribution. On the other hand, self employment entails opportunities to earn more, possibly higher than $q_{75,t}$, though it is less secure to downward mobility.

In terms of the stability of income, jobs with a regular payment facilitates upward mobility and prevents downward ones for all groups and thresholds except for the threshold $q_{75,t}$. The stability of income seems to be peripheral to reach the higher part of the wage distribution. Lastly, working more is always helpful for all groups regardless of the thresholds.

5 Longer-Term mobility

It would be reasonable to think that movements in the wage distribution are less likely to occur within a two-year period due to the existence of wage rigidity. Therefore, observations made within a two-year period may alter when the transitions period is extended. In this section, I examine longer transition periods to see whether there are different patterns associated with mobility under longer time spans.

5.1 Transition Patterns

Table 6 reports the unconditional transition probabilities in various transition periods. As the period lengthens, some patterns that hold across different salary groups can be established. The most noticeable feature is that the probability of staying in the same group shrinks over time, indicating an increase in mobility. Surprisingly, upward and downward mobility both contributes to the increase in mobility, and the contributions vary across groups. For individ-

	U	<25	25-50	50-75	>75
U	0.7302	0.1304	0.0663	0.0515	0.0215
<25	0.1773	0.5171	0.2343	0.0538	0.0175
25-50	0.0821	0.1480	0.5079	0.2320	0.0300
50-75	0.0418	0.0309	0.1654	0.5839	0.1780
>75	0.0270	0.0125	0.0255	0.1672	0.7679

(a) 2-year transition

	U	<25	25-50	50-75	>75
U	0.6869	0.1515	0.0750	0.0538	0.0328
<25	0.2062	0.4706	0.2318	0.0643	0.0270
25-50	0.1061	0.1717	0.4452	0.2331	0.0439
50-75	0.0568	0.0408	0.1729	0.4877	0.2418
>75	0.0343	0.0172	0.0363	0.1552	0.7571

(b) 4-year transition

	U	<25	25-50	50-75	>75
U	0.6757	0.1569	0.0689	0.0543	0.0442
<25	0.2441	0.4452	0.2089	0.0666	0.0352
25-50	0.1287	0.1931	0.3869	0.2332	0.0582
50-75	0.0614	0.0561	0.1674	0.4330	0.2822
>75	0.0362	0.0203	0.0353	0.1427	0.7655

(c) 6-year transition

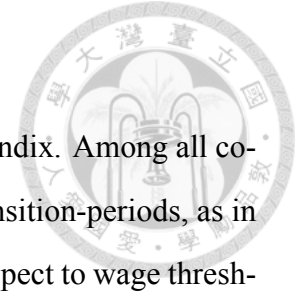
	U	<25	25-50	50-75	>75
U	0.5881	0.1871	0.0862	0.0738	0.0648
<25	0.2363	0.4368	0.1953	0.0892	0.0423
25-50	0.1272	0.1859	0.3575	0.2501	0.0793
50-75	0.0726	0.0549	0.1673	0.4090	0.2961
>75	0.0403	0.0236	0.0375	0.1449	0.7537

(d) 8-year transition

Table 6: Unconditional transition matrices of different time spans

uals with salaries lower than the median, downward mobility accounts more to the increase. On the contrary, for individuals with salaries between the median and the 75th percentile, the decrease in the staying probability is mostly transferred to transitions towards the top of the wage distribution. For unemployed individuals, upward mobility increases over time, while individuals at the top of the wage distribution seems to have similar mobility conditions over time.

Some other observations could be made. Transitions towards unemployment increases as the transition period becomes longer, which could be partially due to the fact that people quit as they get older. Additionally, transitions that spans above two salary groups above occur more frequently. A rather interesting phenomenon is that individuals with the lowest salaries have an even smaller chance to rise to the top of the wage distribution compared to the unemployed, and a similar chance to earn pass the median. This implies that some unemployed individuals might once be at the higher half of the wage distribution. This coincides with the fact that individuals at the upper half of the wage distribution undergoes transitions towards unemployment more than transitions towards low salaries.



5.2 Individual Characteristics

The regression tables for longer transition periods are placed in the appendix. Among all cohorts, individuals from cohort 3 benefits the most even under longer transition-periods, as in the case of a 2-year transition. The effects are mostly significant with respect to wage thresholds above the unemployment threshold. As in the 2-year case, younger cohorts have a worse mobility condition compared to older cohorts whenever an effect is detected. Controlling for cohorts, age negatively affects individuals with salaries lower than the median, and it is mostly insignificant for higher thresholds.

	U	<25	25-50	50-75	>75
U	-0.0770	0.0453	0.0179	0.0133	0.0006
<25	-0.0176	-0.1913	0.1617	0.0463	0.0010
25-50	-0.0024	-0.0728	-0.0255	0.0954	0.0053
50-75	-0.0003	-0.0117	-0.0391	-0.0071	0.0583
>75	-0.0003	-0.0040	-0.0063	-0.0258	0.0364

(a) 2-year transition

	U	<25	25-50	50-75	>75
U	-0.0989	0.0615	0.0184	0.0167	0.0024
<25	-0.0298	-0.1544	0.1386	0.0383	0.0074
25-50	-0.0023	-0.1229	0.0127	0.1001	0.0124
50-75	-0.0006	-0.0203	-0.0529	0.0137	0.0601
>75	-0.0002	-0.0055	-0.0088	-0.0183	0.0329

(b) 4-year transition

	U	<25	25-50	50-75	>75
U	-0.0686	0.0200	0.0297	0.0157	0.0032
<25	-0.0467	-0.1633	0.1849	0.0238	0.0013
25-50	-0.0075	-0.1496	0.0453	0.0948	0.0169
50-75	-0.0009	-0.0258	-0.0733	0.0343	0.0657
>75	-	-	-	-	-

(c) 6-year transition

	U	<25	25-50	50-75	>75
U	-0.0912	0.0149	0.0580	0.0174	0.0008
<25	-0.0321	-0.2328	0.1747	0.0892	0.0010
25-50	-0.0058	-0.1704	0.0172	0.1388	0.0202
50-75	-0.0011	-0.0287	-0.0537	0.0297	0.0538
>75	-	-	-	-	-

(d) 8-year transition

Table 7: Gender gaps of different transition periods

Table 7 reports the estimated gender gaps of different transition periods. Overall, the coefficients on gender are quite similar compared to the ones estimated within a 2-year period. Nevertheless, for individuals at the top of the wage distribution, the effects of gender are mostly insignificant for a 6-year and 8-year transition period. This may indicate that for longer transitions, the gender gap for individuals at the top of the wage distribution eventually shrinks so that men and women have similar mobility conditions. In contrast, gender gaps for groups with salaries below the 75th percentile are still significant. Furthermore, gender differences seem to become more severe in the view of longer transition periods.

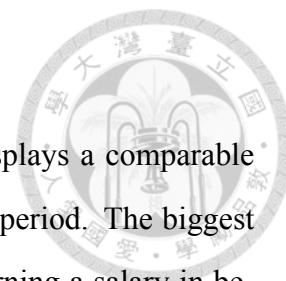
5.3 Occupation Characteristics

The effects of having an occupation for a government organization displays a comparable transition pattern in longer transition periods as in the 2-year transition period. The biggest difference is that the job also becomes advantageous for individuals earning a salary in between the median and the 75th percentile to exceed the highest threshold. This implies a slow but steady growth of occupations of a government organization. On the other hand, the effects of self-employment seem to be quite consistent in different transition periods. Self-employment invokes a positive effect for upward transitions, especially for individuals in the lower salary groups. Meanwhile, individuals at the upper half of the wage distribution as vulnerable to downward mobility as for other jobs, with little evidence suggesting that they might even more vulnerable. In the case of a 4-year transition period, these people are even more susceptible to downward transitions towards the lower half of the wage distribution. Finally, working more and a more regular job are always helpful in terms of mobility.

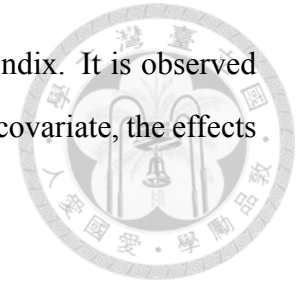
While the conclusions are consistent over different transition periods, it should be noticed that in the model setting, it is possible that individuals switch between jobs during the transition period. Therefore, The captured effects may actually represent the ones with a shorter transition period.

6 Robustness Check

In section 4.3, I concluded that cohort 3 enjoys the best mobility condition among all cohorts. This advantage could arise from the fact that individuals from cohort 3 are between 25 to 56 years old in the span of the studies. This range of age is when individuals are most likely to stay in the labor market, earn more money, and climb up in the wage distribution. In contrast, other cohorts may either be towards the end of their career or simply just starting to work. Although age is controlled in the regressions, it is likely that there are non-linear effects of age. Taking this into consideration, I added squared age as a control factor in the regressions



with a two-year transition period. The results are presented in the appendix. It is observed that though the advantages of cohort 3 are moderated with the additional covariate, the effects are still significant in most cases.



7 Conclusion

Using data collected in the Panel Study of Family Dynamics, I examined the mobility of individuals in different salary groups with respect to wage thresholds within different transition periods. Wage mobility is investigated by looking at the mobility factor, which is correlated to the likelihood of the occurrence of transitions for individuals at different wage thresholds and in different salary groups.

For a two-year transition period, the results show that, first, being average in a group indicates limited mobility in both downward and upward directions. Moreover, transitions are restricted to the nearby group with high probability of staying in the same group. In terms of the changes in mobility through time, upward mobility for unemployed individuals has slightly deteriorated throughout the years. In addition, employed individuals seem to be more immune to transitions toward unemployment.

Individual traits displays heterogeneous effects on different salary groups. Individuals born in the span of 1964 and 1976 has a higher upward mobility and lower downward mobility compared to other groups. In addition, whenever the effect is significant, older cohorts have an advantage except for the opportunities that unemployed individuals exceed the median. Age imposes a disadvantage mostly for individuals with salaries lower than the median. It becomes mostly insignificant considering thresholds above the median. Concerning differences between gender, the mobility conditions are worse for women. The gap for individuals with salaries below the 25 percentile have the greatest size, and the gaps tend to shrink towards the upper part of the wage distribution. Occupation types have influence on different groups and wage thresholds. In general, occupations in a government organization prevents indi-

viduals from downward mobility and provides chances for upward mobility at all thresholds except $q_{75,t}$, though it does not provide opportunities to reach the top of the wage distribution. On the other hand, self-employed individuals are more likely to reach the top, they are less secure to downward mobility.

For longer transition periods, for most groups, both upward and downward mobility increases and individuals are less likely to stay in the same salary group. However, the mobility pattern of individuals at the top of the wage distribution remains similar even for longer periods. Regarding different characteristics, most conclusion drawn in the short-term hold, with some exceptions. The major difference is that gender gaps are moderated by longer transition periods for individuals at the top of the wage distribution, while for individuals who earn less, the differences become more severe. Regarding occupation, jobs in a government organization yields opportunities to reach the top section of the wage distribution, while self-employed individuals are still more vulnerable to downward mobility.

The results are partially limited due to the study period and the missing values of the original data. The most important one could be working experience and tenure, which would affect individual mobility. In addition, respondents consist of a large number of unemployed individuals. Although grouping individuals by salary solves a part of the problem, the sample might be not be enough representative of the true population. Nevertheless, these problems seem to be unsolvable in the present.

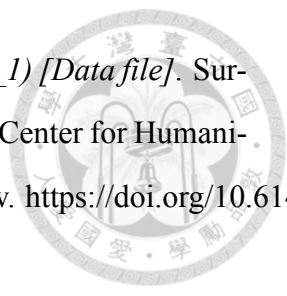
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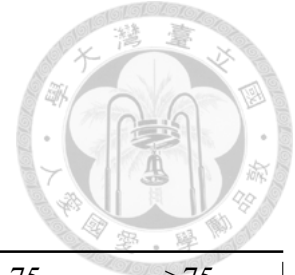
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9 Appendix



9.1 Additional descriptive statistics

Groups	U	<25	25-50	50-75	>75
total observations	6,694	4,461	6,190	7,673	5,854
unique respondents	2,650	2,296	3,085	3,351	2,051
ratio	2.562	1.943	2.007	2.230	2.854

Table 8 reports the total observations, unique id's and the ratio of the two. The same individual may appear in two different groups in different years due to transitions. Intuitively, a higher ratio indicates that a respondent stays in the same group longer and a lower ratio indicates that individuals leave the group at a higher frequency. From here, it could be seen that rigidity is higher at both ends of the wage distribution and there is more mobility in the middle.

Table 8: Number of observations used in the 2-year transition model

Groups	U	<25	25-50	50-75	>75
salary	8514.755	21548.965	31709.015	45078.273	82840.573
age	52.908	42.336	39.313	39.500	41.872
city	0.327	0.485	0.559	0.572	0.628
gender	1.691	1.646	1.458	1.332	1.263
marriage	0.680	0.587	0.580	0.651	0.755
weekly-hours	17.072	39.052	43.227	45.565	47.045
own-boss	0.156	0.162	0.137	0.147	0.160
gov-boss	0.024	0.040	0.055	0.119	0.197
regular	0.224	0.690	0.782	0.823	0.845
low-educ	0.889	0.765	0.661	0.569	0.390
medium-educ	0.084	0.210	0.304	0.332	0.372
high-educ	0.028	0.025	0.035	0.099	0.238

The group means of the salary is never used in the analysis. They are just listed for reference.

Table 9: Group means of key variables

9.2 2-year transition period

Table 10: Staying probabilities within a 2-year transition period with respect to the unemployment threshold

	Unemployed	below25	25-50	50-75	above75
constant	2.399*** (0.084)	-3.035*** (0.118)	-6.000*** (0.306)	-7.844*** (0.583)	-8.362*** (0.858)
age	0.051*** (0.014)	0.070*** (0.019)	0.057* (0.030)	0.028 (0.033)	0.045 (0.046)
city	-0.155 (0.139)	-0.331* (0.193)	0.185 (0.254)	-0.563** (0.279)	0.195 (0.473)
gender	0.879*** (0.135)	0.428** (0.181)	1.163*** (0.238)	0.947*** (0.321)	1.328*** (0.471)
marriage	-0.432*** (0.141)	-0.064 (0.193)	-0.648*** (0.242)	-0.327 (0.303)	0.661 (0.527)
weekly-hours	-0.045*** (0.003)	-0.055*** (0.005)	-0.057*** (0.007)	-0.079*** (0.010)	-0.060*** (0.011)
own-boss	-0.253 (0.163)	-0.431* (0.228)	-1.258*** (0.311)	-0.325 (0.375)	-0.485 (0.445)
gov-boss	0.474 (0.342)	-0.170 (0.395)	-0.456 (0.456)	0.194 (0.557)	-0.044 (0.690)
regular	-2.462*** (0.141)	-2.511*** (0.197)	-4.126*** (0.368)	-3.933*** (0.593)	-4.369*** (0.783)
low-educ	0.107*** (0.023)	0.047 (0.058)	0.036 (0.096)	0.154 (0.141)	0.358* (0.213)
medium-educ	-0.870*** (0.194)	-0.210 (0.200)	-0.061 (0.202)	-0.283 (0.235)	-0.603*** (0.232)
high-educ	-0.813** (0.386)	0.327 (0.532)	-0.153 (0.510)	0.063 (0.509)	0.354 (0.374)
cohort1	-0.125 (0.126)	-0.642** (0.292)	0.102 (0.502)	0.461 (0.602)	-0.439 (0.592)
cohort2	-0.164 (0.154)	-0.347 (0.436)	0.257 (0.805)	0.927 (0.836)	-1.004 (1.072)
cohort3	0.250 (0.231)	0.055 (0.204)	0.183 (0.317)	-0.055 (0.365)	-0.042 (0.413)
cohort4	0.592 (0.360)	0.533** (0.270)	-0.173 (0.319)	-0.150 (0.354)	0.321 (0.536)
cohort5	0.424 (0.397)	0.203 (0.302)	-0.261 (0.394)	-0.442 (0.440)	-0.284 (0.622)
cohort6	0.201 (0.485)	0.206 (0.405)	0.455 (0.535)	-0.099 (0.846)	1.955** (0.827)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.

Table 11: Staying probabilities within a 2-year transition period with respect to q25

	Unemployed	below25	25-50	50-75	above75
constant	3.821*** (0.105)	1.194*** (0.049)	-1.521*** (0.044)	-3.609*** (0.088)	-4.861*** (0.215)
age	0.023 (0.014)	0.057*** (0.011)	0.019* (0.011)	0.005 (0.017)	0.019 (0.029)
city	-0.591*** (0.123)	-0.257*** (0.084)	-0.176** (0.087)	-0.189 (0.131)	-0.149 (0.234)
gender	1.166*** (0.118)	1.069*** (0.082)	0.546*** (0.079)	0.512*** (0.130)	0.604*** (0.234)
marriage	-0.427*** (0.135)	-0.247*** (0.091)	-0.179** (0.083)	-0.241* (0.132)	-0.023 (0.248)
weekly-hours	-0.044*** (0.003)	-0.025*** (0.002)	-0.033*** (0.003)	-0.043*** (0.004)	-0.047*** (0.006)
own-boss	-0.470*** (0.174)	-0.494*** (0.141)	-0.178 (0.126)	-0.021 (0.177)	-0.162 (0.264)
gov-boss	-0.265 (0.271)	-0.002 (0.183)	-0.685*** (0.193)	-0.620*** (0.226)	-0.653* (0.352)
regular	-1.120*** (0.144)	-0.672*** (0.126)	-1.248*** (0.104)	-1.810*** (0.156)	-2.391*** (0.260)
low-educ	0.165*** (0.018)	0.202*** (0.025)	0.190*** (0.034)	0.243*** (0.068)	0.375*** (0.134)
medium-educ	-1.046*** (0.148)	-0.618*** (0.081)	-0.354*** (0.069)	-0.285*** (0.103)	-0.268** (0.135)
high-educ	-2.135*** (0.228)	-0.973*** (0.229)	-0.510** (0.226)	-0.438** (0.210)	-0.197 (0.203)
cohort1	-0.219 (0.138)	-0.360** (0.167)	-0.163 (0.181)	0.191 (0.276)	-0.709* (0.372)
cohort2	0.308* (0.168)	-0.622** (0.262)	0.087 (0.291)	0.940** (0.423)	-0.002 (0.612)
cohort3	-0.523** (0.239)	-0.009 (0.115)	-0.326*** (0.105)	-0.574*** (0.153)	-0.136 (0.192)
cohort4	-0.439 (0.367)	0.268** (0.131)	0.079 (0.109)	0.084 (0.177)	0.465 (0.298)
cohort5	-0.412 (0.413)	0.390** (0.166)	0.161 (0.136)	-0.111 (0.219)	0.276 (0.417)
cohort6	-0.746 (0.457)	0.399** (0.188)	0.129 (0.173)	0.234 (0.288)	0.297 (0.438)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.

Table 12: Staying probabilities within a 2-year transition period with respect to q50

	Unemployed	below25	25-50	50-75	above75
constant	4.751*** (0.142)	3.330*** (0.147)	1.218*** (0.036)	-1.351*** (0.034)	-3.611*** (0.098)
age	-0.016 (0.018)	0.032* (0.019)	0.021** (0.010)	-0.012 (0.009)	-0.010 (0.020)
city	-0.416*** (0.151)	-0.396** (0.155)	-0.126* (0.075)	-0.194*** (0.067)	-0.363** (0.155)
gender	1.233*** (0.137)	1.125*** (0.144)	0.542*** (0.065)	0.324*** (0.068)	0.439*** (0.152)
marriage	-0.576*** (0.152)	-0.484*** (0.160)	-0.207*** (0.071)	-0.272*** (0.068)	-0.180 (0.163)
weekly-hours	-0.035*** (0.003)	-0.030*** (0.004)	-0.023*** (0.002)	-0.026*** (0.002)	-0.030*** (0.004)
own-boss	-0.939*** (0.204)	-0.874*** (0.230)	-0.580*** (0.118)	0.117 (0.099)	0.023 (0.176)
gov-boss	-0.526* (0.275)	-0.751*** (0.273)	-0.513*** (0.138)	-0.590*** (0.115)	-0.909*** (0.253)
regular	-0.985*** (0.195)	-0.121 (0.221)	-0.272** (0.110)	-0.838*** (0.091)	-1.855*** (0.171)
low-educ	0.175*** (0.021)	0.299*** (0.043)	0.217*** (0.028)	0.325*** (0.034)	0.545*** (0.090)
medium-educ	-1.085*** (0.167)	-0.863*** (0.140)	-0.370*** (0.055)	-0.245*** (0.051)	-0.253*** (0.093)
high-educ	-2.349*** (0.234)	-1.871*** (0.270)	-0.890*** (0.153)	-1.047*** (0.116)	-0.497*** (0.149)
cohort1	-0.162 (0.181)	-0.196 (0.304)	-0.195 (0.168)	0.193 (0.155)	-0.298 (0.276)
cohort2	0.623*** (0.202)	-0.665 (0.459)	-0.151 (0.265)	0.688*** (0.227)	0.587 (0.430)
cohort3	-1.178*** (0.292)	0.154 (0.215)	-0.249*** (0.084)	-0.305*** (0.070)	-0.474*** (0.135)
cohort4	-1.083** (0.441)	0.029 (0.226)	0.100 (0.091)	-0.030 (0.086)	0.293 (0.211)
cohort5	-1.062** (0.495)	0.267 (0.286)	0.188 (0.116)	-0.061 (0.114)	0.165 (0.293)
cohort6	-1.381*** (0.528)	0.788** (0.401)	0.168 (0.143)	-0.018 (0.134)	0.380 (0.311)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.

Table 13: Staying probabilities within a 2-year transition period with respect to q75

	Unemployed	below25	25-50	50-75	above75
constant	7.537*** (2.125)	6.892** (2.707)	4.521*** (0.210)	1.710*** (0.035)	-1.425*** (0.039)
age	-0.028 (0.029)	-0.016 (0.039)	-0.006 (0.024)	0.013 (0.010)	-0.042*** (0.011)
city	-0.447* (0.243)	0.171 (0.301)	-0.119 (0.193)	-0.109 (0.076)	-0.186** (0.076)
gender	0.931*** (0.225)	0.751*** (0.288)	0.447*** (0.170)	0.421*** (0.077)	0.240*** (0.084)
marriage	-0.781*** (0.256)	-0.704** (0.333)	-0.160 (0.177)	-0.199*** (0.073)	-0.273*** (0.086)
weekly-hours	-0.039*** (0.005)	-0.032*** (0.007)	-0.022*** (0.005)	-0.018*** (0.002)	-0.016*** (0.002)
own-boss	-0.922*** (0.306)	-1.075*** (0.396)	-1.238*** (0.278)	-0.375*** (0.109)	0.077 (0.109)
gov-boss	-0.165 (0.420)	-0.035 (3.876)	-0.061 (0.394)	-0.122 (0.101)	-0.562*** (0.115)
regular	-0.071 (0.293)	0.612* (0.369)	0.084 (0.270)	-0.034 (0.109)	-0.900*** (0.106)
low-educ	0.230*** (0.038)	0.401*** (0.098)	0.228*** (0.077)	0.479*** (0.038)	0.731*** (0.048)
medium-educ	-1.457*** (0.304)	-1.023*** (0.324)	-0.330** (0.156)	-0.463*** (0.054)	-0.246*** (0.048)
high-educ	-2.970*** (0.368)	-3.618*** (0.455)	-1.432*** (0.322)	-1.202*** (0.090)	-0.811*** (0.076)
cohort1	-0.513 (0.314)	0.424 (0.969)	-0.049 (0.417)	-0.433*** (0.156)	-0.195 (0.154)
cohort2	0.638* (0.362)	-0.202 (0.927)	0.063 (0.614)	-0.188 (0.256)	0.629*** (0.237)
cohort3	-1.437*** (0.518)	0.100 (0.449)	-0.117 (0.207)	-0.240*** (0.073)	-0.215*** (0.068)
cohort4	-0.567 (0.783)	-0.378 (0.502)	-0.202 (0.213)	0.178* (0.092)	0.083 (0.110)
cohort5	-0.762 (0.842)	0.083 (0.692)	0.134 (0.300)	0.248** (0.115)	-0.001 (0.155)
cohort6	-1.056 (0.916)	-0.030 (1.678)	0.429 (0.428)	0.466*** (0.162)	0.170 (0.160)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.

9.3 Robustness check for the 2-year transition period

Table 14: Staying probabilities within a 2-year transition period with respect to the unemployment threshold while controlling for squared age

	Unemployed	below25	25-50	50-75	above75
constant	-0.031 (1.646)	-0.621 (1.970)	-4.070 (2.779)	-6.876* (4.139)	-13.346** (5.327)
age	0.040 (0.060)	-0.149* (0.079)	-0.123 (0.120)	-0.062 (0.170)	0.177 (0.214)
<i>age</i> ²	0.000 (0.001)	0.002*** (0.001)	0.002 (0.001)	0.001 (0.002)	-0.001 (0.002)
cohort1	-0.115 (0.137)	-0.248 (0.288)	0.390 (0.510)	0.589 (0.638)	-0.570 (0.633)
cohort2	-0.156 (0.157)	-0.041 (0.436)	0.449 (0.809)	1.032 (0.860)	-1.052 (1.045)
cohort3	0.245 (0.231)	0.271 (0.227)	0.330 (0.322)	0.019 (0.412)	-0.124 (0.425)
cohort4	0.567 (0.377)	0.392 (0.262)	-0.217 (0.316)	-0.175 (0.362)	0.392 (0.550)
cohort5	0.384 (0.436)	-0.282 (0.320)	-0.514 (0.391)	-0.594 (0.499)	-0.069 (0.696)
cohort6	0.171 (0.490)	-0.042 (0.418)	0.306 (0.515)	-0.180 (0.872)	1.995** (0.829)
city	-0.155 (0.139)	-0.314 (0.191)	0.167 (0.256)	-0.554** (0.277)	0.183 (0.469)
gender	0.881*** (0.135)	0.459** (0.184)	1.195*** (0.242)	0.969*** (0.322)	1.336*** (0.473)
marriage	-0.430*** (0.142)	-0.004 (0.196)	-0.611** (0.245)	-0.328 (0.298)	0.638 (0.549)
weekly-hours	-0.045*** (0.003)	-0.056*** (0.005)	-0.056*** (0.007)	-0.079*** (0.011)	-0.061*** (0.012)
own-boss	-0.254 (0.163)	-0.456** (0.227)	-1.250*** (0.312)	-0.320 (0.383)	-0.471 (0.454)
gov-boss	0.473 (0.343)	-0.168 (0.404)	-0.513 (0.458)	0.200 (0.566)	-0.086 (0.715)
regular	-2.463*** (0.141)	-2.535*** (0.198)	-4.121*** (0.367)	-3.939*** (0.602)	-4.364*** (0.716)
low-educ	0.108*** (0.023)	0.074 (0.060)	0.057 (0.096)	0.169 (0.148)	0.337 (0.213)
medium-educ	-0.874*** (0.194)	-0.300 (0.207)	-0.103 (0.202)	-0.306 (0.234)	-0.595** (0.231)
high-educ	-0.823** (0.386)	0.264 (0.535)	-0.177 (0.425)	0.051 (0.536)	0.378 (0.390)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.

Table 15: Staying probabilities within a 2-year transition period with respect to q25 while controlling for squared age

	Unemployed	below25	25-50	50-75	above75
constant	3.718** (1.460)	-0.936 (0.981)	-0.958 (1.031)	-0.477 (1.764)	0.756 (2.959)
age	-0.025 (0.058)	0.043 (0.042)	-0.043 (0.045)	-0.145* (0.075)	-0.256** (0.123)
age^2	0.000 (0.001)	0.000 (0.000)	0.001 (0.000)	0.002** (0.001)	0.003** (0.001)
cohort1	-0.168 (0.149)	-0.357** (0.169)	-0.132 (0.182)	0.302 (0.286)	-0.447 (0.370)
cohort2	0.311* (0.167)	-0.645** (0.270)	0.018 (0.296)	0.917** (0.435)	0.041 (0.599)
cohort3	-0.506** (0.240)	0.006 (0.122)	-0.289*** (0.107)	-0.471*** (0.160)	0.029 (0.209)
cohort4	-0.475 (0.364)	0.276** (0.132)	0.093 (0.109)	0.080 (0.177)	0.357 (0.283)
cohort5	-0.501 (0.415)	0.385** (0.167)	0.128 (0.136)	-0.267 (0.235)	-0.156 (0.438)
cohort6	-0.800* (0.454)	0.407** (0.187)	0.138 (0.175)	0.198 (0.302)	0.175 (0.446)
city	-0.585*** (0.123)	-0.256*** (0.083)	-0.174** (0.088)	-0.176 (0.129)	-0.101 (0.233)
gender	1.170*** (0.118)	1.070*** (0.083)	0.550*** (0.081)	0.525*** (0.131)	0.593** (0.233)
marriage	-0.413*** (0.136)	-0.243*** (0.091)	-0.167** (0.083)	-0.211 (0.133)	0.072 (0.251)
weekly-hours	-0.044*** (0.003)	-0.025*** (0.002)	-0.033*** (0.003)	-0.043*** (0.005)	-0.047*** (0.007)
own-boss	-0.472*** (0.174)	-0.495*** (0.141)	-0.178 (0.128)	-0.005 (0.176)	-0.181 (0.261)
gov-boss	-0.265 (0.271)	0.001 (0.184)	-0.695*** (0.195)	-0.622*** (0.226)	-0.590* (0.353)
regular	-1.117*** (0.144)	-0.673*** (0.127)	-1.247*** (0.105)	-1.803*** (0.156)	-2.397*** (0.261)
low-educ	0.168*** (0.018)	0.203*** (0.025)	0.195*** (0.034)	0.259*** (0.070)	0.421*** (0.137)
medium-educ	-1.066*** (0.148)	-0.621*** (0.081)	-0.364*** (0.069)	-0.307*** (0.105)	-0.295** (0.135)
high-educ	-2.164*** (0.231)	-0.974*** (0.232)	-0.516** (0.230)	-0.459** (0.211)	-0.227 (0.208)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.

Table 16: Staying probabilities within a 2-year transition period with respect to q50 while controlling for squared age

	Unemployed	below25	25-50	50-75	above75
constant	6.856*** (1.633)	2.124 (1.661)	1.036 (0.900)	2.890*** (0.869)	1.220 (1.912)
age	-0.073 (0.066)	0.025 (0.070)	-0.012 (0.042)	-0.193*** (0.039)	-0.204** (0.079)
age^2	0.001 (0.001)	0.000 (0.001)	0.000 (0.000)	0.002*** (0.000)	0.002** (0.001)
cohort1	-0.095 (0.196)	-0.197 (0.303)	-0.210 (0.171)	0.188 (0.150)	-0.157 (0.275)
cohort2	0.604*** (0.202)	-0.673 (0.469)	-0.245 (0.289)	0.405* (0.232)	0.532 (0.421)
cohort3	-1.126*** (0.296)	0.157 (0.226)	-0.232*** (0.087)	-0.210*** (0.075)	-0.373*** (0.143)
cohort4	-1.081** (0.439)	0.034 (0.225)	0.123 (0.096)	0.034 (0.087)	0.258 (0.203)
cohort5	-1.120** (0.492)	0.265 (0.288)	0.192* (0.116)	-0.131 (0.115)	-0.085 (0.308)
cohort6	-1.404*** (0.525)	0.793** (0.401)	0.191 (0.147)	0.036 (0.134)	0.326 (0.311)
city	-0.406*** (0.152)	-0.396** (0.158)	-0.126* (0.076)	-0.182*** (0.069)	-0.337** (0.155)
gender	1.241*** (0.137)	1.127*** (0.145)	0.543*** (0.067)	0.329*** (0.067)	0.432*** (0.153)
marriage	-0.556*** (0.153)	-0.482*** (0.162)	-0.201*** (0.071)	-0.233*** (0.071)	-0.115 (0.162)
weekly-hours	-0.035*** (0.003)	-0.030*** (0.004)	-0.023*** (0.002)	-0.026*** (0.002)	-0.030*** (0.004)
own-boss	-0.938*** (0.203)	-0.874*** (0.230)	-0.579*** (0.117)	0.137 (0.100)	0.015 (0.180)
gov-boss	-0.525* (0.276)	-0.751*** (0.269)	-0.517*** (0.139)	-0.596*** (0.115)	-0.885*** (0.252)
regular	-0.980*** (0.195)	-0.121 (0.221)	-0.272** (0.108)	-0.827*** (0.090)	-1.847*** (0.171)
low-educ	0.179*** (0.021)	0.300*** (0.043)	0.218*** (0.027)	0.342*** (0.034)	0.567*** (0.090)
medium-educ	-1.110*** (0.167)	-0.865*** (0.141)	-0.373*** (0.054)	-0.265*** (0.051)	-0.268*** (0.091)
high-educ	-2.383*** (0.236)	-1.875*** (0.267)	-0.889*** (0.148)	-1.075*** (0.116)	-0.508*** (0.149)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.

Table 17: Staying probabilities within a 2-year transition period with respect to q75 while controlling for squared age

	Unemployed	below25	25-50	50-75	above75
constant	11.364*** (2.736)	7.940** (3.959)	0.362 (1.945)	4.034*** (1.040)	4.107*** (1.025)
age	-0.148 (0.109)	-0.069 (0.151)	0.206** (0.087)	-0.128** (0.050)	-0.218*** (0.044)
<i>age</i> ²	0.001 (0.001)	0.001 (0.001)	-0.002** (0.001)	0.002*** (0.001)	0.002*** (0.000)
cohort1	-0.372 (0.336)	0.485 (1.055)	-0.103 (0.408)	-0.484*** (0.165)	-0.193 (0.151)
cohort2	0.550 (0.363)	-0.215 (0.925)	0.524 (0.671)	-0.501* (0.279)	0.369 (0.240)
cohort3	-1.254** (0.531)	0.159 (0.466)	-0.258 (0.215)	-0.172** (0.077)	-0.116 (0.073)
cohort4	-0.460 (0.781)	-0.384 (0.508)	-0.307 (0.221)	0.250** (0.097)	0.131 (0.108)
cohort5	-0.772 (0.827)	0.020 (0.738)	0.200 (0.304)	0.238** (0.117)	-0.108 (0.157)
cohort6	-1.004 (0.904)	-0.065 (1.362)	0.376 (0.520)	0.533*** (0.167)	0.204 (0.163)
city	-0.422* (0.244)	0.170 (0.299)	-0.136 (0.192)	-0.101 (0.076)	-0.171** (0.079)
gender	0.947*** (0.227)	0.754*** (0.290)	0.438*** (0.170)	0.425*** (0.076)	0.238*** (0.084)
marriage	-0.735*** (0.260)	-0.685** (0.348)	-0.221 (0.179)	-0.166** (0.074)	-0.224** (0.088)
weekly-hours	-0.039*** (0.005)	-0.032*** (0.007)	-0.022*** (0.005)	-0.018*** (0.002)	-0.016*** (0.002)
own-boss	-0.916*** (0.305)	-1.072*** (0.397)	-1.261*** (0.279)	-0.363*** (0.109)	0.068 (0.111)
gov-boss	-0.160 (0.421)	-0.143 (1.012)	-0.053 (0.397)	-0.124 (0.098)	-0.565*** (0.115)
regular	-0.073 (0.291)	0.607 (0.370)	0.088 (0.273)	-0.029 (0.112)	-0.892*** (0.106)
low-educ	0.236*** (0.037)	0.404*** (0.097)	0.215*** (0.077)	0.489*** (0.039)	0.738*** (0.050)
medium-educ	-1.508*** (0.301)	-1.033*** (0.321)	-0.303** (0.154)	-0.475*** (0.055)	-0.251*** (0.048)
high-educ	-3.033*** (0.365)	-3.637*** (0.455)	-1.436*** (0.319)	-1.220*** (0.090)	-0.815*** (0.079)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.

9.4 4-year transition period

Table 18: Staying probabilities within a 4-year transition period with respect to the unemployment threshold

	Unemployed	below25	25-50	50-75	above75
constant	2.248*** (0.106)	-2.516*** (0.109)	-5.247*** (0.280)	-7.539*** (0.526)	-7.902*** (0.763)
age	0.057*** (0.015)	0.045** (0.021)	0.029 (0.034)	0.008 (0.039)	0.051 (0.055)
city	-0.254 (0.165)	-0.448** (0.183)	-0.630** (0.298)	-0.457 (0.358)	-0.196 (0.432)
gender	0.977*** (0.150)	0.461*** (0.177)	0.470** (0.228)	1.258*** (0.362)	0.654 (0.427)
marriage	-0.394** (0.158)	-0.043 (0.181)	-0.282 (0.281)	0.411 (0.375)	0.095 (0.576)
weekly-hours	-0.039*** (0.003)	-0.048*** (0.005)	-0.065*** (0.008)	-0.087*** (0.011)	-0.075*** (0.016)
own-boss	-0.571*** (0.186)	-0.242 (0.223)	-0.436 (0.315)	-0.736* (0.406)	-0.266 (0.531)
gov-boss	0.631* (0.353)	-0.565 (0.414)	0.046 (0.536)	-0.382 (0.421)	0.038 (0.682)
regular	-2.727*** (0.164)	-2.176*** (0.188)	-3.348*** (0.367)	-3.689*** (0.569)	-3.714*** (0.778)
low-educ	1.267*** (0.169)	0.004 (0.207)	-0.249 (0.316)	0.484* (0.284)	0.336 (0.290)
medium-educ	-0.143 (0.187)	-0.536** (0.212)	0.023 (0.315)	-0.580* (0.312)	-0.318 (0.279)
high-educ	-1.093*** (0.252)	0.561 (0.342)	0.256 (0.549)	0.126 (0.397)	0.011 (0.388)
cohort1	-0.618*** (0.226)	-0.468 (0.295)	-0.111 (0.456)	0.019 (0.585)	-0.564 (0.711)
cohort2	-0.349 (0.361)	0.026 (0.475)	0.597 (0.718)	0.655 (0.864)	-0.812 (1.095)
cohort3	-0.235 (0.188)	0.047 (0.197)	-0.580** (0.265)	-0.519 (0.427)	0.411 (0.475)
cohort4	0.456* (0.256)	0.221 (0.278)	0.303 (0.419)	0.209 (0.519)	-0.282 (0.625)
cohort5	0.177 (0.270)	0.008 (0.321)	-0.237 (0.410)	-1.294** (0.591)	0.535 (0.741)
cohort6	0.629* (0.346)	0.225 (0.354)	0.088 (0.639)	0.989 (0.750)	0.772 (1.228)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.



Table 19: Staying probabilities within a 4-year transition period with respect to q25

	Unemployed	below25	25-50	50-75	above75
constant	3.741*** (0.119)	1.154*** (0.059)	-1.181*** (0.048)	-3.278*** (0.084)	-4.610*** (0.214)
age	0.038** (0.015)	0.064*** (0.012)	0.026** (0.012)	0.007 (0.018)	0.051* (0.029)
city	-0.654*** (0.135)	-0.339*** (0.096)	-0.185** (0.093)	-0.017 (0.135)	-0.470* (0.249)
gender	1.257*** (0.125)	0.936*** (0.091)	0.752*** (0.087)	0.657*** (0.134)	0.653*** (0.224)
marriage	-0.416*** (0.139)	-0.264*** (0.096)	-0.329*** (0.090)	-0.074 (0.137)	-0.134 (0.272)
weekly-hours	-0.036*** (0.003)	-0.025*** (0.003)	-0.030*** (0.003)	-0.046*** (0.004)	-0.051*** (0.007)
own-boss	-0.430** (0.182)	-0.347** (0.158)	-0.197 (0.140)	-0.072 (0.170)	0.199 (0.278)
gov-boss	-0.270 (0.258)	-0.083 (0.210)	-0.616*** (0.207)	-0.899*** (0.227)	-1.042*** (0.308)
regular	-1.048*** (0.162)	-0.208 (0.143)	-1.143*** (0.120)	-1.646*** (0.155)	-1.882*** (0.258)
low-educ	1.492*** (0.122)	0.806*** (0.101)	0.644*** (0.106)	0.702*** (0.113)	0.390** (0.158)
medium-educ	-0.160 (0.123)	-0.125 (0.105)	0.045 (0.107)	-0.098 (0.117)	-0.264* (0.151)
high-educ	-1.302*** (0.169)	-0.651*** (0.169)	-0.659*** (0.186)	-0.574*** (0.157)	-0.095 (0.194)
cohort1	-0.239 (0.226)	-0.183 (0.183)	-0.069 (0.164)	-0.190 (0.255)	-0.574 (0.367)
cohort2	0.063 (0.371)	-0.342 (0.293)	0.258 (0.274)	0.381 (0.407)	-0.288 (0.593)
cohort3	-0.352** (0.154)	-0.027 (0.117)	-0.455*** (0.108)	-0.423*** (0.161)	-0.534** (0.248)
cohort4	0.394* (0.213)	0.188 (0.153)	-0.009 (0.144)	0.320 (0.229)	0.442 (0.336)
cohort5	-0.118 (0.229)	0.255 (0.184)	0.128 (0.162)	-0.216 (0.278)	0.941** (0.419)
cohort6	0.313 (0.313)	0.169 (0.186)	0.208 (0.195)	0.188 (0.295)	0.073 (0.473)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.



Table 20: Staying probabilities within a 4-year transition period with respect to q50

	Unemployed	below25	25-50	50-75	above75
constant	4.391*** (0.142)	3.124*** (0.145)	1.211*** (0.043)	-1.180*** (0.038)	-3.294*** (0.102)
age	-0.005 (0.017)	0.061*** (0.019)	0.023** (0.012)	-0.004 (0.010)	-0.004 (0.021)
city	-0.529*** (0.155)	-0.426*** (0.155)	-0.206** (0.082)	-0.037 (0.076)	-0.458*** (0.154)
gender	1.202*** (0.145)	0.941*** (0.141)	0.602*** (0.074)	0.428*** (0.075)	0.453*** (0.160)
marriage	-0.662*** (0.158)	-0.588*** (0.151)	-0.283*** (0.075)	-0.176** (0.075)	-0.376** (0.181)
weekly-hours	-0.031*** (0.004)	-0.030*** (0.004)	-0.023*** (0.002)	-0.025*** (0.002)	-0.032*** (0.005)
own-boss	-0.677*** (0.205)	-1.122*** (0.251)	-0.619*** (0.135)	0.114 (0.108)	0.393** (0.189)
gov-boss	-0.769*** (0.260)	-0.948*** (0.293)	-0.499*** (0.161)	-0.613*** (0.125)	-1.139*** (0.242)
regular	-0.613*** (0.195)	0.082 (0.251)	-0.354*** (0.132)	-0.973*** (0.097)	-1.250*** (0.171)
low-educ	1.643*** (0.131)	1.150*** (0.128)	0.709*** (0.078)	0.799*** (0.067)	0.714*** (0.111)
medium-educ	-0.141 (0.113)	0.198 (0.126)	0.040 (0.075)	0.050 (0.065)	-0.208* (0.110)
high-educ	-1.472*** (0.146)	-1.318*** (0.182)	-0.719*** (0.126)	-0.819*** (0.098)	-0.476*** (0.135)
cohort1	0.208 (0.269)	-0.167 (0.296)	0.017 (0.168)	0.026 (0.139)	-0.282 (0.284)
cohort2	0.765* (0.438)	-0.661 (0.487)	0.486* (0.280)	0.315 (0.225)	0.467 (0.409)
cohort3	-0.761*** (0.179)	0.018 (0.194)	-0.235*** (0.089)	-0.388*** (0.083)	-0.737*** (0.160)
cohort4	-0.148 (0.239)	0.292 (0.237)	-0.138 (0.135)	0.037 (0.118)	0.195 (0.226)
cohort5	-0.256 (0.263)	0.392 (0.289)	-0.003 (0.156)	-0.147 (0.142)	0.567* (0.306)
cohort6	0.251 (0.352)	0.185 (0.288)	-0.068 (0.166)	0.216 (0.157)	-0.150 (0.330)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.



Table 21: Staying probabilities within a 4-year transition period with respect to q75

	Unemployed	below25	25-50	50-75	above75
constant	5.940*** (0.450)	5.217*** (0.706)	4.011*** (0.413)	1.326*** (0.036)	-1.420*** (0.047)
age	-0.003 (0.027)	0.016 (0.033)	0.061** (0.025)	0.002 (0.010)	-0.012 (0.013)
city	-0.413* (0.228)	-0.379 (0.316)	-0.165 (0.178)	-0.123 (0.076)	-0.118 (0.093)
gender	0.772*** (0.210)	1.077*** (0.253)	0.626*** (0.169)	0.349*** (0.078)	0.215** (0.096)
marriage	-0.933*** (0.226)	-0.611** (0.296)	-0.247 (0.162)	-0.118 (0.072)	-0.288*** (0.108)
weekly-hours	-0.039*** (0.005)	-0.020*** (0.007)	-0.024*** (0.005)	-0.022*** (0.002)	-0.019*** (0.003)
own-boss	-0.830** (0.331)	-1.524*** (0.413)	-1.359*** (0.281)	-0.436*** (0.113)	0.196 (0.129)
gov-boss	-0.102 (0.354)	-0.771 (0.508)	0.051 (0.361)	-0.340*** (0.102)	-0.640*** (0.125)
regular	-0.390 (0.323)	0.497 (0.425)	-0.179 (0.284)	-0.235** (0.113)	-0.946*** (0.118)
low-educ	2.148*** (0.246)	1.850*** (0.250)	0.923*** (0.146)	1.038*** (0.060)	0.920*** (0.063)
medium-educ	-0.081 (0.160)	0.047 (0.196)	0.221* (0.130)	-0.134*** (0.050)	-0.148** (0.060)
high-educ	-2.035*** (0.200)	-1.871*** (0.267)	-1.143*** (0.190)	-0.874*** (0.068)	-0.742*** (0.077)
cohort1	-0.625 (0.438)	0.292 (0.767)	-0.875*** (0.334)	-0.180 (0.143)	-0.472*** (0.166)
cohort2	0.165 (0.729)	-0.035 (0.826)	-0.820 (0.555)	0.081 (0.233)	0.098 (0.262)
cohort3	-1.318*** (0.282)	-0.456 (0.350)	0.019 (0.198)	-0.140* (0.079)	-0.409*** (0.091)
cohort4	0.582 (0.390)	0.220 (0.447)	0.285 (0.258)	0.047 (0.121)	0.192 (0.137)
cohort5	0.041 (0.398)	0.263 (0.523)	0.622** (0.305)	0.085 (0.130)	0.267 (0.179)
cohort6	1.217** (0.569)	-0.217 (0.542)	0.802** (0.369)	0.167 (0.158)	0.384** (0.184)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.

9.5 6-year transition period

Table 22: Staying probabilities within a 6-year transition period with respect to the unemployment threshold

	Unemployed	below25	25-50	50-75	above75
constant	2.103*** (0.122)	-2.214*** (0.146)	-4.400*** (0.230)	-6.999*** (0.694)	-11.171 (20.290)
age	0.054*** (0.017)	0.056** (0.026)	0.090*** (0.034)	-0.025 (0.043)	0.180 (0.377)
city	-0.195 (0.161)	-0.140 (0.234)	-0.842*** (0.323)	0.029 (0.321)	0.924 (3.168)
gender	0.638*** (0.160)	0.573** (0.233)	0.699*** (0.257)	1.214*** (0.364)	1.911 (7.422)
marriage	-0.321* (0.175)	0.038 (0.223)	-0.247 (0.284)	0.171 (0.342)	0.311 (3.623)
weekly-hours	-0.037*** (0.004)	-0.053*** (0.006)	-0.064*** (0.007)	-0.045*** (0.008)	-0.095 (0.223)
own-boss	-0.731*** (0.201)	-0.262 (0.294)	-0.268 (0.310)	-0.785** (0.332)	0.780 (1.741)
gov-boss	0.097 (0.407)	-0.016 (0.552)	-0.380 (0.526)	-0.216 (0.864)	1.672 (3.928)
regular	-2.379*** (0.197)	-2.515*** (0.254)	-2.901*** (0.318)	-4.456*** (0.666)	-6.165 (11.373)
low-educ	1.051*** (0.182)	0.324 (0.754)	-0.114 (0.452)	0.243 (0.246)	0.786 (0.548)
medium-educ	-0.384* (0.213)	-0.230 (0.768)	-0.638 (0.452)	-0.167 (0.338)	0.127 (1.228)
high-educ	-0.636** (0.273)	-0.064 (1.484)	0.782 (0.837)	-0.046 (0.447)	-0.884 (1.509)
cohort1	-0.390 (0.261)	-0.657* (0.367)	-0.987** (0.444)	0.698 (0.630)	-1.628 (4.303)
cohort2	0.058 (0.413)	0.015 (0.594)	-1.526* (0.790)	1.366 (0.923)	-3.103 (6.890)
cohort3	-0.146 (0.195)	-0.172 (0.226)	-0.744*** (0.272)	-0.279 (0.328)	0.421 (1.450)
cohort4	0.338 (0.280)	0.025 (0.393)	1.177** (0.487)	0.034 (0.636)	2.661 (4.933)
cohort5	-0.375 (0.305)	0.890** (0.440)	0.415 (0.479)	-2.025*** (0.685)	-0.353 (7.618)
cohort6	0.576 (0.381)	-0.041 (0.485)	1.724*** (0.609)	0.266 (0.786)	2.060 (5.963)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.



Table 23: Staying probabilities within a 6-year transition period with respect to q25

	Unemployed	below25	25-50	50-75	above75
constant	3.663*** (0.146)	1.425*** (0.096)	-0.886*** (0.055)	-2.889*** (0.086)	-4.495*** (0.221)
age	0.023 (0.018)	0.103*** (0.018)	0.038*** (0.015)	0.010 (0.019)	0.041 (0.041)
city	-0.374*** (0.145)	-0.268** (0.122)	-0.476*** (0.102)	-0.256* (0.141)	-0.272 (0.265)
gender	1.429*** (0.149)	1.182*** (0.119)	0.820*** (0.097)	0.587*** (0.142)	0.014 (0.293)
marriage	-0.351** (0.156)	-0.325*** (0.126)	-0.237** (0.101)	-0.144 (0.151)	-0.948*** (0.330)
weekly-hours	-0.035*** (0.003)	-0.028*** (0.004)	-0.036*** (0.003)	-0.034*** (0.004)	-0.049*** (0.009)
own-boss	-0.209 (0.198)	-0.464** (0.216)	-0.188 (0.154)	-0.128 (0.174)	0.166 (0.316)
gov-boss	-0.624** (0.298)	0.099 (0.237)	-1.007*** (0.233)	-0.993*** (0.267)	-0.740 (0.463)
regular	-0.567*** (0.181)	-0.557*** (0.203)	-0.858*** (0.136)	-1.563*** (0.162)	-1.935*** (0.312)
low-educ	1.680*** (0.144)	0.932*** (0.158)	0.663*** (0.137)	0.574*** (0.119)	0.485*** (0.178)
medium-educ	-0.214 (0.143)	-0.048 (0.164)	-0.065 (0.141)	-0.025 (0.127)	-0.356* (0.208)
high-educ	-1.436*** (0.213)	-0.854*** (0.279)	-0.569** (0.246)	-0.519*** (0.181)	-0.099 (0.230)
cohort1	0.009 (0.273)	-0.589** (0.251)	-0.364* (0.192)	-0.108 (0.252)	-0.432 (0.492)
cohort2	0.547 (0.457)	-1.420*** (0.397)	-0.121 (0.329)	0.568 (0.420)	0.086 (0.746)
cohort3	-0.513*** (0.166)	0.102 (0.140)	-0.458*** (0.117)	-0.637*** (0.156)	-0.346 (0.319)
cohort4	0.129 (0.252)	0.688*** (0.217)	0.441** (0.190)	0.497* (0.273)	0.315 (0.503)
cohort5	-0.222 (0.269)	0.620** (0.247)	-0.030 (0.190)	-0.562* (0.309)	-0.299 (0.839)
cohort6	0.111 (0.363)	0.659** (0.270)	0.593** (0.235)	0.302 (0.319)	0.736 (0.661)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.



Table 24: Staying probabilities within a 6-year transition period with respect to q50

	Unemployed	below25	25-50	50-75	above75
constant	4.387*** (0.178)	4.070*** (1.058)	1.192*** (0.055)	-1.109*** (0.044)	-3.231*** (0.118)
age	-0.006 (0.022)	0.074*** (0.028)	0.020 (0.015)	-0.003 (0.012)	0.017 (0.026)
city	-0.128 (0.162)	-0.315* (0.180)	-0.260*** (0.092)	-0.229*** (0.084)	-0.156 (0.182)
gender	1.179*** (0.163)	1.164*** (0.165)	0.590*** (0.088)	0.569*** (0.086)	0.119 (0.198)
marriage	-0.535*** (0.172)	-0.534*** (0.183)	-0.279*** (0.089)	-0.185** (0.085)	-0.596*** (0.212)
weekly-hours	-0.034*** (0.004)	-0.027*** (0.005)	-0.028*** (0.003)	-0.022*** (0.003)	-0.034*** (0.006)
own-boss	-0.513** (0.241)	-0.723** (0.314)	-0.524*** (0.151)	-0.047 (0.120)	0.202 (0.224)
gov-boss	-0.876*** (0.322)	-1.013*** (0.317)	-0.864*** (0.182)	-0.752*** (0.150)	-1.407*** (0.341)
regular	-0.504** (0.239)	0.360 (0.311)	-0.248 (0.152)	-0.848*** (0.113)	-1.312*** (0.209)
low-educ	1.747*** (0.145)	1.339*** (0.166)	0.791*** (0.099)	0.920*** (0.079)	0.707*** (0.119)
medium-educ	-0.112 (0.132)	0.226 (0.164)	-0.048 (0.101)	0.023 (0.083)	-0.378*** (0.139)
high-educ	-1.604*** (0.172)	-1.555*** (0.250)	-0.713*** (0.172)	-0.913*** (0.124)	-0.299* (0.157)
cohort1	0.204 (0.311)	-0.144 (0.386)	-0.056 (0.202)	0.155 (0.165)	-0.494 (0.327)
cohort2	1.046** (0.516)	-1.336** (0.617)	0.454 (0.333)	0.707*** (0.270)	0.096 (0.497)
cohort3	-0.927*** (0.181)	0.146 (0.207)	-0.146 (0.100)	-0.518*** (0.086)	-0.596*** (0.190)
cohort4	0.124 (0.281)	0.498 (0.324)	-0.140 (0.174)	0.076 (0.152)	0.111 (0.306)
cohort5	-0.520* (0.282)	0.287 (0.359)	0.011 (0.174)	-0.290* (0.174)	0.400 (0.395)
cohort6	0.135 (0.415)	0.572 (0.385)	-0.064 (0.217)	-0.071 (0.183)	0.543 (0.422)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.



Table 25: Staying probabilities within a 6-year transition period with respect to q75

	Unemployed	below25	25-50	50-75	above75
constant	6.023*** (0.734)	7.074*** (1.768)	3.547*** (0.365)	1.129*** (0.042)	-1.490*** (0.060)
age	-0.032 (0.030)	0.017 (0.044)	0.045 (0.031)	0.023* (0.012)	-0.009 (0.016)
city	-0.326 (0.242)	-0.380 (0.325)	-0.314* (0.183)	-0.143* (0.083)	-0.043 (0.109)
gender	1.043*** (0.215)	1.164*** (0.283)	0.555*** (0.177)	0.344*** (0.084)	0.191 (0.117)
marriage	-0.726*** (0.225)	-0.797** (0.342)	-0.213 (0.172)	-0.108 (0.085)	-0.494*** (0.128)
weekly-hours	-0.038*** (0.005)	-0.013 (0.008)	-0.028*** (0.005)	-0.021*** (0.002)	-0.024*** (0.004)
own-boss	-0.577* (0.346)	-1.202** (0.538)	-1.108*** (0.261)	-0.394*** (0.121)	0.250* (0.147)
gov-boss	-0.530 (0.366)	-0.983** (0.480)	0.345 (0.400)	-0.547*** (0.114)	-1.073*** (0.178)
regular	0.030 (0.324)	0.466 (0.549)	-0.043 (0.285)	-0.420*** (0.126)	-0.775*** (0.138)
low-educ	2.345*** (0.251)	1.731*** (0.276)	1.222*** (0.150)	1.123*** (0.065)	0.990*** (0.076)
medium-educ	-0.350** (0.159)	0.241 (0.229)	0.254* (0.136)	-0.179*** (0.057)	-0.212*** (0.077)
high-educ	-1.961*** (0.205)	-1.988*** (0.312)	-1.460*** (0.201)	-0.914*** (0.075)	-0.748*** (0.097)
cohort1	-0.410 (0.429)	0.349 (0.973)	-0.410 (0.395)	-0.402** (0.166)	-0.494** (0.209)
cohort2	1.090 (0.769)	0.111 (1.033)	-0.691 (0.617)	-0.022 (0.271)	0.058 (0.325)
cohort3	-1.395*** (0.269)	-0.489 (0.377)	0.148 (0.189)	-0.339*** (0.082)	-0.261** (0.109)
cohort4	0.177 (0.385)	0.176 (0.517)	0.265 (0.326)	0.265* (0.150)	0.159 (0.187)
cohort5	-0.027 (0.394)	-0.163 (0.638)	0.378 (0.324)	0.077 (0.159)	0.378 (0.237)
cohort6	0.627 (0.526)	0.097 (0.675)	0.355 (0.420)	0.481*** (0.183)	0.219 (0.252)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.

9.6 8-year transition period

Table 26: Staying probabilities within a 8-year transition period with respect to the unemployment threshold

	Unemployed	below25	25-50	50-75	above75
constant	1.243*** (0.145)	-2.722*** (0.216)	-4.708*** (0.367)	-7.280*** (0.734)	-121.161 (216.809)
age	0.058** (0.024)	0.054 (0.035)	0.023 (0.050)	0.045 (0.058)	2.441 (5.966)
city	-0.072 (0.196)	-0.365 (0.277)	0.036 (0.394)	0.314 (0.446)	-7.916 (31.741)
gender	0.501** (0.198)	0.603* (0.312)	0.722** (0.368)	1.855*** (0.550)	32.947 (72.291)
marriage	-0.368* (0.212)	-0.368 (0.281)	-0.581 (0.424)	0.006 (0.530)	15.179 (39.288)
weekly-hours	-0.039*** (0.005)	-0.041*** (0.009)	-0.047*** (0.011)	-0.073*** (0.014)	-0.530 (1.191)
own-boss	-0.189 (0.253)	-0.468 (0.404)	-0.574 (0.433)	-0.969* (0.570)	-6.651 (30.842)
gov-boss	0.710* (0.410)	-0.232 (1.059)	-1.496** (0.599)	-1.055* (0.586)	10.074 (44.771)
regular	-2.178*** (0.241)	-2.462*** (0.366)	-3.379*** (0.495)	-4.530*** (0.787)	-93.871 (159.049)
low-educ	1.261*** (0.209)	5.379*** (0.660)	2.366 (1.916)	1.021*** (0.375)	4.930 (19.433)
medium-educ	-0.245 (0.256)	4.552*** (0.687)	1.644 (1.938)	-0.122 (0.351)	-8.245 (27.887)
high-educ	-0.985*** (0.308)	-9.905*** (1.266)	-3.983 (3.833)	-0.870* (0.488)	3.346 (21.448)
cohort1	-0.388 (0.336)	-0.636 (0.477)	-0.201 (0.696)	-0.510 (0.786)	-28.438 (78.274)
cohort2	0.144 (0.568)	0.284 (0.781)	-0.032 (1.132)	-0.059 (1.222)	-31.719 (98.046)
cohort3	-0.244 (0.242)	0.084 (0.277)	0.089 (0.352)	-0.861* (0.506)	-3.924 (30.548)
cohort4	0.109 (0.387)	-0.377 (0.620)	0.147 (0.708)	1.822** (0.851)	34.764 (80.501)
cohort5	-0.048 (0.450)	0.989 (0.632)	-0.359 (0.809)	-1.417 (1.336)	11.023 (78.520)
cohort6	0.488 (0.417)	-0.282 (0.563)	0.416 (0.835)	1.084 (0.936)	18.325 (55.818)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.



Table 27: Staying probabilities within a 8-year transition period with respect to q25

	Unemployed	below25	25-50	50-75	above75
constant	3.091*** (0.180)	1.279*** (0.132)	-0.929*** (0.079)	-2.921*** (0.105)	-4.522*** (0.341)
age	0.012 (0.023)	0.093*** (0.022)	0.027 (0.020)	0.046* (0.024)	0.085* (0.049)
city	-0.448*** (0.169)	-0.067 (0.152)	-0.392*** (0.130)	-0.259 (0.174)	-0.466 (0.337)
gender	1.390*** (0.170)	1.386*** (0.162)	0.943*** (0.121)	0.675*** (0.171)	0.586 (0.357)
marriage	-0.260 (0.172)	-0.493*** (0.166)	-0.488*** (0.127)	-0.276 (0.186)	0.148 (0.431)
weekly-hours	-0.036*** (0.004)	-0.023*** (0.004)	-0.022*** (0.004)	-0.043*** (0.005)	-0.043*** (0.009)
own-boss	0.267 (0.234)	-0.769** (0.303)	-0.435** (0.194)	-0.276 (0.221)	-0.122 (0.405)
gov-boss	-0.193 (0.313)	0.143 (0.303)	-1.492*** (0.328)	-0.759** (0.330)	-1.057** (0.441)
regular	0.035 (0.221)	-0.792*** (0.274)	-0.928*** (0.184)	-1.906*** (0.215)	-2.016*** (0.355)
low-educ	1.877*** (0.152)	1.429 (1.112)	0.888* (0.479)	0.785*** (0.157)	0.644*** (0.204)
medium-educ	-0.155 (0.165)	0.690 (1.117)	-0.130 (0.488)	-0.076 (0.170)	-0.370 (0.245)
high-educ	-1.692*** (0.221)	-2.089 (2.221)	-0.729 (0.956)	-0.680*** (0.241)	-0.242 (0.259)
cohort1	0.160 (0.319)	-0.528* (0.309)	-0.219 (0.265)	-0.664** (0.329)	-0.751 (1.057)
cohort2	1.174** (0.566)	-0.681 (0.520)	0.292 (0.428)	-0.541 (0.526)	-0.335 (1.228)
cohort3	-0.645*** (0.181)	0.095 (0.188)	-0.457*** (0.147)	-0.552*** (0.204)	-0.284 (0.947)
cohort4	-0.274 (0.335)	0.206 (0.304)	0.193 (0.269)	0.894** (0.349)	1.613 (1.090)
cohort5	-0.061 (0.377)	0.657* (0.350)	-0.017 (0.264)	0.124 (0.476)	-0.755 (4.583)
cohort6	-0.294 (0.368)	0.311 (0.333)	0.268 (0.295)	0.799** (0.376)	0.528 (1.191)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.



Table 28: Staying probabilities within a 8-year transition period with respect q50

	Unemployed	below25	25-50	50-75	above75
constant	4.078*** (0.314)	2.995*** (0.284)	1.046*** (0.073)	-1.083*** (0.057)	-3.130*** (0.137)
age	-0.039 (0.028)	0.124*** (0.033)	0.030* (0.018)	0.009 (0.015)	0.014 (0.033)
city	-0.383** (0.185)	-0.245 (0.214)	-0.178 (0.112)	-0.143 (0.106)	-0.412** (0.209)
gender	0.922*** (0.183)	1.483*** (0.207)	0.781*** (0.107)	0.461*** (0.109)	0.479** (0.242)
marriage	-0.791*** (0.199)	-0.534** (0.237)	-0.455*** (0.106)	-0.184* (0.110)	-0.206 (0.279)
weekly-hours	-0.040*** (0.005)	-0.029*** (0.006)	-0.014*** (0.003)	-0.027*** (0.003)	-0.030*** (0.006)
own-boss	-0.103 (0.266)	-1.088*** (0.393)	-0.632*** (0.181)	-0.177 (0.150)	0.044 (0.279)
gov-boss	-0.619** (0.303)	-0.644* (0.386)	-1.213*** (0.234)	-0.747*** (0.180)	-1.113*** (0.348)
regular	0.257 (0.267)	-0.287 (0.371)	-0.217 (0.189)	-1.108*** (0.145)	-1.656*** (0.252)
low-educ	2.062*** (0.159)	1.429*** (0.252)	0.809*** (0.121)	1.068*** (0.107)	0.746*** (0.156)
medium-educ	-0.259* (0.150)	0.479* (0.252)	-0.013 (0.125)	0.146 (0.104)	-0.391** (0.172)
high-educ	-1.773*** (0.183)	-1.879*** (0.438)	-0.766*** (0.214)	-1.184*** (0.170)	-0.325* (0.196)
cohort1	0.601 (0.421)	-1.135** (0.448)	0.017 (0.253)	0.019 (0.204)	-0.572 (0.419)
cohort2	2.341*** (0.705)	-1.115 (0.767)	0.498 (0.434)	0.342 (0.341)	0.117 (0.599)
cohort3	-0.869*** (0.211)	0.178 (0.306)	-0.236* (0.129)	-0.414*** (0.109)	-0.736*** (0.241)
cohort4	-0.353 (0.407)	0.353 (0.453)	-0.012 (0.244)	0.179 (0.200)	0.414 (0.431)
cohort5	-0.977** (0.415)	1.409*** (0.501)	-0.139 (0.243)	-0.181 (0.253)	0.693 (0.595)
cohort6	-0.682 (0.442)	0.370 (0.484)	-0.067 (0.261)	0.114 (0.219)	0.143 (0.489)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.



Table 29: Staying probabilities within a 8-year transition period with respect to q75

	Unemployed	below25	25-50	50-75	above75
constant	6.818*** (2.478)	7.487*** (2.233)	3.550*** (0.623)	1.115*** (0.063)	-1.456*** (0.074)
age	-0.057 (0.037)	0.033 (0.050)	0.046 (0.032)	0.036** (0.015)	-0.014 (0.022)
city	-0.688*** (0.255)	-0.554 (0.437)	-0.133 (0.191)	-0.120 (0.100)	0.064 (0.142)
gender	0.670*** (0.233)	1.277*** (0.371)	0.657*** (0.189)	0.282*** (0.105)	0.189 (0.148)
marriage	-0.812*** (0.249)	-0.794* (0.417)	-0.210 (0.183)	-0.256** (0.101)	-0.463*** (0.156)
weekly-hours	-0.031*** (0.007)	-0.015 (0.011)	-0.021*** (0.005)	-0.026*** (0.003)	-0.027*** (0.004)
own-boss	-0.179 (0.346)	-1.752** (0.747)	-0.987*** (0.312)	-0.655*** (0.161)	0.171 (0.186)
gov-boss	0.105 (0.367)	-0.637 (0.667)	0.158 (0.424)	-0.665*** (0.143)	-1.039*** (0.205)
regular	0.769** (0.332)	0.480 (0.688)	0.077 (0.323)	-0.687*** (0.174)	-0.933*** (0.184)
low-educ	2.272*** (0.276)	1.607*** (0.317)	1.383*** (0.163)	1.226*** (0.080)	1.087*** (0.093)
medium-educ	-0.166 (0.175)	0.607* (0.320)	0.182 (0.148)	-0.194*** (0.070)	-0.328*** (0.097)
high-educ	-2.074*** (0.226)	-2.256*** (0.412)	-1.560*** (0.221)	-1.001*** (0.094)	-0.729*** (0.120)
cohort1	0.056 (0.537)	2.605 (2.955)	-0.332 (0.542)	-0.649*** (0.207)	-0.185 (0.270)
cohort2	2.104** (0.913)	3.210 (3.410)	-0.269 (1.523)	-0.111 (0.355)	0.340 (0.429)
cohort3	-1.330*** (0.302)	2.283 (2.830)	-0.190 (0.338)	-0.223** (0.108)	-0.335*** (0.129)
cohort4	0.254 (0.518)	-5.296 (5.474)	0.341 (0.518)	0.258 (0.206)	0.054 (0.249)
cohort5	-0.781 (0.511)	3.055 (2.866)	0.208 (0.479)	0.228 (0.226)	0.207 (0.358)
cohort6	-0.242 (0.548)	-5.742 (5.510)	0.308 (0.532)	0.558*** (0.216)	-0.021 (0.301)

¹ Standard errors are in parentheses, *, ** and *** denote statistical significance at 0.1, 0.5, and 0.01, respectively.

² Industry fixed effects and time fixed effects are included.