Female Employment in Germany from 1980 to 2010: Rising Part-Time Work, Demographics, and the Impact of Policy Reforms

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Preliminary - do not quote!

Abstract: This paper provides a comprehensive empirical analysis of changes in employment of West German women for the time period from 1980 to 2010 based on SIAB data. Our evidence shows a secular decline in full-time employment among women in West Germany which is compensated by an increase in part-time employment. The decline in full-time employment is particularly strong among mothers and it is associated with older mothers becoming less likely over time to return to full-time employment. We find a stronger decline (increase) in full-time employment (nonemployment) at higher age during the more recent decades. Part-time employment and nonemployment have become more persistent over time at older age. Changes in the age composition and changes in the employment history almost fully explain the long-run changes in full-time and part-time employment. Incidentally, our estimates suggest that all policy reforms since the mid 1980's have contributed further to a fall of full-time employment and a rise of nonemployment among mothers.

Keywords: Female Employment, Part-time, Demographics, Policy Reforms

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Contents

1 Introduction

Employment among females has generally been rising during the last decades in many European countries and part-time work has emerged to represent a significant share among the prime age female working population (OECD, 2010). Germany is not an exception and it has traditionally been characterized by relatively high share of part-time working women. In the last few decades, female employment in Germany has undergone significant changes (Blossfeld and Rohwer, 1997). Until the mid 1970s, there has been a considerable increase in the share of part-time working women, followed by a period with relatively stable part-time share and slowly increasing labor force participation rates.[1] Since the mid 2000s, however, women's part-time employment in Germany begins to accelerate with a much faster growth rate compared to the EU average and to countries with conventionally large part-time division of the labor market such as the Netherlands and the UK. From 2000 to 2010 (2015), for instance, part-time female employment as a share of total female employment has increased by 20.8% (25.1%) in Germany compared to an increase of 6.2% (5.5%) in the Netherlands and a decrease of 1.6% (4.9) in the UK.[2]

In Germany, there is concern that part-time employment is associated with a persistent reduction in labor supply among mothers (see e.g. Fitzenberger et al. (2016) and Paul (2016) as well as the literature cited in these papers). Part-time employment may in fact replace full-time employment and, therefore, be associated with lower hourly wages and less career progression (Gangl and Ziefle, 2009; Paul, 2016). However, part-time employment among mothers may serve as a stepping stone into the labor market to secure their human capital and to allow for a later return to full-time employment and for a continuation of female labor market careers (see discussion in (Fitzenberger et al., 2016)). In fact, policy reforms in parental leave legislation and child care provision in Germany since the 1970's have emphasized the compatibility between motherhood and having a career. Unpaid parental leave, which until the recent past was almost exclusively taken by females, was extended in a series of reforms until 1993 up to 36 months. Mothers from low-income households were entitled for income assistance while not working until their child reaches the age of 2. A reform in 2001 gave workers to right to reduce the

[1] Blossfeld and Rohwer (1997) relate the growth of women's part-time work after the World War II to the massive expansion of the administrative and service sector and to the decline in the supply of labor among young single women.

[2] Own calculations based on the OECD Employment Database.

hours of work on their full-time job. The reform in 2007 introduced paid parental leave for mothers for up to 12 months after the child was born. At the same time the reform abolished the lower means-test income assistance during the second year after birth (see Bergemann and Riphahn (2015)).

There exists a large multidisciplinary literature on the determinants underlying the high levels of female part-time work,[3] the consequences of working part-time for the individual women's career progression,[4] and future wages,[5] the determinants of mother's re-entry into the labor market,[6,7] and the role of social norms and beliefs towards traditional gender roles for labor supply behaviour and labor market outcomes.[8] The existing literature for West Germany quite unanimously shows that the increase in part-time work during the 1980s and 1990s has been strongly related to household formation, timing of child birth, and the division of work in the household (Blossfeld and Rohwer, 1997; Drobnič et al., 1999)), with part-time emerging as the most attractive re-employment option for married women with children of pre-school age, who had been employed full-time before child birth. In addition, the literature states that part-time growth during this time period has to a large extent been spurred by family-related institutional arrangements, such as parental leave regulations and availability of child care,[9] and by the negative work incentives generated by the joint taxation of married couples in Germany. Furthermore, Pfau-Effinger (1993) emphasizes the role of cultural values in explaining individual labor market behaviour and concludes that the increased share of part-time working women was essential for the adherence of the so called "male breadwinner marriage" model in the transition of West Germany to a service society.

This paper provides a comprehensive empirical analysis of changes in employment of West German women for the time period from 1980 to 2010 in the age range 25 to 59. Our econometric approach accounts for life-cycle and cohort effects, for motherhood regarding the timing of childbirth and the age of the first child as well as for the effects of education, occupation, and industry. In addition, we analyze the effect of labor market history. We

[3] A broad overview of theoretical explanations and empirical results on this topic for several European countries and the US is provided by Blossfeld and Hackim (1997).

[4] See e.g. Manning and Petrongolo (2008), Connolly and Gregory (2010).

[5] See e.g. Paul (2016) for Germany

[6] See among others Frodermann et al. (2013) for West Germany.

[7] A survey of the international economic literature on female labor supply is provided by Killingsworth and Heckman (1986).

[8] See e.g. Pfau-Effinger (1996), Fortin (2010), and Betrand et al. (2015).

[9] An overview of changes in the German family policy is provided by Furdas et al. (2017).

use the SIAB data, a large administrative panel data set, for which we carefully identify motherhood following the approach used in Schönberg and Ludsteck (2014). Our analysis focuses in particular on the rise in part-time work, the role of demographics, and the impact of policy reforms regarding parental leave legislation and child care provision. Because of data limitations, we restrict the analysis of part-time employment to part-time employment with long hours (more than 50% of standard full-time hours of work). Our analysis distinguishes full-time employment, part-time employment with long hours, and a residual third state, which we abbreviate with nonemployment.

Our study contributes to the existing literature by examining female employment patterns regarding four different aspects. First, we provide a comprehensive statistical analysis of female employment over a long time period based on individual employment history, while carefully controlling simultaneously for various time related variables, such as calendar time, age, cohort, age at birth of first child, year of child birth, and age of child. Second, we analyze whether and to what extent the increase of part-time work can be explained by a changing composition of females with regard to the aforementioned covariates considered. Using decomposition techniques based on re-weighting methods as proposed by DiNardo et al. (1996) and Hirano et al. (2003), we estimate time-specific counterfactual employment rates, which allows us to quantify the effect of compositional changes in a very flexible way. Different from previous analyses, we account for labor market history using the panel dimension of the data set. This is important since past research on female labor supply dynamics has shown that individual labor supply decisions are likely to exhibit a high degree of persistence due to either relevant individual characteristics (heterogeneity) or true state dependence (Heckman and MaCurdy, 1980; Heckman, 1981).[10] Third, we analyze changes in the age profile of the employment of females over time. In line with the existing literature,[11] we estimate how the employment of women changes after child birth and in the presence of a young child, which may be associated with a shift from full-time to part-time or a completely withdrawal from the labor market (Blossfeld and Rohwer, 1997). Our empirical analysis involves a comparison of relative age-related employment patterns that account for time and cohort effects as well as a large set of job-specific

[10]For instance, Heckman (1981) provides empirical evidence supporting the hypothesis of structural state dependence only for older women, bur not for women in their childbearing years. Prowse (2012) studies state dependencies on the extensive and on intensive margin of the labor supply of women and documents high own-state dependence for both full-time and part-time work.

[11]See among others (Connolly and Gregory, 2010; Fitzenberger and Wunderlich, 2004; Drobnič et al., 1999).

characteristics. Fourth, by estimating a comprehensive statistical model for employment outcomes, we can estimate the differences in the employment trends for non-mothers and mothers, while accounting for the birth year and the age of the first child. The model allows us to estimate the aggregate changes associated with various reforms of parental leave legislation and child care provision.

Our empirical results confirm various findings known in the literature and they provide a number of new - and often - surprising findings. We summarize here the most important new findings. First, we find a stronger decline (increase) in full-time employment (nonemployment) at higher age during the more recent decades. Second, changes in the age composition and changes in the employment history almost fully explain the long-run changes in full-time and part-time employment. Third, we find no long-term increase in part-time employment among non-mothers and an increase among mothers relative to non-mothers. Furthermore, full-time employment among non-mothers increases until 1993 and falls afterwards, and full-time employment among mothers falls even further. Fourth, there is no evidence that the reforms in parental leave and child care provision have increased employment altogether among mothers, and the 2007 reform stands out as showing a particularly negative employment effect. The latter findings should be viewed with caution because it is only based on employment outcomes up to three years after child birth.

The remainder of this paper is structured as follows. Section 2 describes and assesses the data used for our analysis. First descriptive evidence on employment trends of women is discussed in section 3. As the core of the paper, section 4 discusses the three parts of the further empirical analysis. Section 5 concludes. The appendix A comprises the detailed empirical results.

2 Data description

The empirical analysis in this paper is based on the Sample of Integrated Employment Biographies (SIAB) data.[12] The SIAB is a two percent random sample of the Integrated

[12]Our future work aims at implementing the underlying empirical strategy using the Biographical Data of Social Insurance Agencies in Germany (BASiD). This is a merged data set including information on administrative records from two social security agencies, the Federal Employment Agency and the German Pension Insurance. BASiD allows for a more precise childbearing information, especially with respect to timing of motherhood and the number of children.

Employment Biographies (IEB) that include all social security records from 1975 to 2010 for West Germany and from 1992 to 2010 for East Germany, respectively.[13] The data contain administrative daily spells reported by employers or the Federal Employment Agency for all individuals covered by social insurance contributions excluding self-employed workers, civil servants, and the military service. Information on employment forms with an exemption from social security contributions and income taxes (mini-jobs) is available from 1999 onwards.

An important advantage of our data is the reliable longitudinal information on employment and wages. The administrative nature of the data and the fact that employment and unemployment spells are not self-reported reduces the likelihood of measurement error and non-response bias in our outcome variables, problems with which survey data are mostly confronted. Further, the SIAB data allows us to construct in a very precise way the individual labor market history not only with respect to the employment status, but also regarding job-related characteristics such as industry structure and occupation.

The SIAB data have, however, three weaknesses for our study. First, there is no information on the household structure with respect to variables such as marriage or the partner's income or earnings. Therefore, it would not be possible to quantify the effect of household-related changes on changes in the female labor supply over time in our empirical analysis. Second, we do not observe the actual number of hours worked, only whether the individual is working full or part-time. Third, as the data do not include direct information on the children, we have to impute the timing of childbirth based on transfer payment spells of the mother. These caveats have to be kept in mind, when interpreting our results.

In SIAB, the distinction between full-time and part-time work is based on employment status records provided by the employer. For full-time employed (FT) workers, these records contain the individual's occupational status, including blue- and white-collar workers. For part-time workers, the employer information refers to whether the individual's working hours exceed a certain threshold or not (vom Berge et al., 2013). Further, from 1999 the data allows us to separate part-time workers exempted from income tax and social insurance contributions (*geringfügige Beschäftigung*) from part-time workers subject to social insurance contributions. According to this information, we differentiate between large part-time employment (PTL) spells and short part-time employment (PTS) spells. Our

[13]The data are provided as a SUF by the Research Data Center of the Institute for Employment Research in Nuremberg.

empirical analysis concentrates on PTL, as this was the most frequently used type of part-time employment in Germany in the last three decades (Hakim, 1997). PTS is counted to the residual category, which includes various inactivity spells, such as unemployment, participation in labor market training programs, vocational training, housekeeping, and non-employment.[14] In the following, we refer to this category as NE-PTS. Furthermore, outcome measures and past choices of labor market status are defined as calendar time-specific indicators of whether a woman belong to one out of the three mutually exclusive employment states: FT, PTL, or NE-PTS. In the descriptive and empirical analysis, we differentiate between three employment rates: PTL rate, FT rate, and NE-PTS rate, that represent the population fraction of women observed in the respective labor market state. Additionally, the PTL share is defined as the share of PTL working women conditional in employment.

One last point related to the used data deserves our attention. As already mentioned, the SIAB do not include a direct information on childbirth. Therefore, we follow Schönberg and Ludsteck (2014) and infer the timing of childbirth based on employer reports regarding the stated reason for spell ending. It should, however, be noted that this imputation procedure enables us to identify births from 1975 onwards and only for labor market attached mothers, i.e. women who interrupt their employment spell because of maternity leave. The left-censoring problem due to the stock sampling design of the data has two implications for our empirical analysis. First, it leads to an underrepresentation of mothers at the beginning of our observation period. The problem becomes less severe as time passes and younger cohorts of women flow into the sample. Second, it is possible that at the beginning of the observation period older cohorts of mothers are classified as women without children if they gave birth to a child before 1975.

Our sample includes West German women aged 25 and 59 during the period from 1980 to 2010. We exclude women with any work experience from East Germany as well as those who gave birth to a child before the age of 20. The empirical analysis is based on annual observations, where the information for all variables refers to June in the respective year. The sample size and an overview of summary statistics for selected calendar years can be

[14]Non-employment spells were generated within the data preparation process and serve the purpose of constructing a balanced panel data on a monthly base. These spells can be classified into two categories: i) spells with missing information before the first employment or unemployment spell recorded in the data; ii) spells with missing information after having observed some valid information related to social security contributions.

found in Table A1 in Appendix A.1.

3 Female employment in West Germany: 1980 – 2010

3.1 Aggregate time trends

Figure 1 presents the main employment trends of West German women over the last three decades. The four graphs refer to the four outcome variable of interest: PTL rate, FT rate, PTL share, and NE-PS rate. Since the mid 1980s, the relative share of women working in PTL increase continuously from about 12% in 1980 to about 16% in 2010. During the same time period, the FT rate reveals a downward trend, except for the years right after German re-unification. The expansion of part-time work becomes, however, more visible when we condition on employment. The graph in the lower left corner shows that among the working female population aged 25 to 59, part-time work has increased from an initial level of 24% to almost 36% in 2010. Alongside these overall trends, we observe that the FT rate and the NE-PTS rate show much stronger cyclical fluctuations in absolute values than the PTL rate. However, the evolution of the PTL share shows little cyclical fluctuations. Finally, NE-PTS shows no clear long-term trend.

Next, we consider the separate time changes in the employment patterns of women with respect to motherhood status and the age of first child. In Figure 1, the evolution of outcome measures for women without children in year t, is represented by the black dashed line and for mothers by the gray-coloured solid lines with the colour getting lighter the older the child.[15] Surprisingly, it turns out that the time trends in FT and NE-PTS basically represent the employment patterns of women without children. Note that we contrast the employment patterns of women with children against the employment patterns of women for whom we do not observe childbirth related information in the data.[16] We refer to this group of women as not-yet mothers because they can potentially

[15] Due to the sampling design of the data regarding birth identification (see section 2), we do observe disproportionably more mothers with older children at the end of the observation period relative to the early 1980s. This has implications for our research question at hand insofar as we can look at changes in employment rates among mothers with relatively older children solely during the last two decades.

[16] We can not be sure that the women observed to not have had children by a certain year in the data never had a child before the year of observation (see section 2). However, it is plausible that the trends we observe for women without children are not driven by those women for whom we do not observe that they have had a child.

have a child later or never. Moreover, not-yet mothers show even a slight decline in their PTL employment over time. In the presence of children, however, somewhat different employment patterns emerge. The following features of Figure 1 merit attention. First, the PTL rate for mothers with children in school age or older grows steadily over time, amounting to approximately 25% in the late 2000s (among the employed, this share reaches a value of over 50%). Second, while there are remarkable differences in the PTL rate with respect to the age of the child, such differences are considerably smaller for the FT rate and become relatively negligible at the end of the sample period. Third, mothers with small children (under the age of six) in the 1980s and in the 2000s show a two to five percentage points higher probability to work in PTL compared to FT and NE-PTS. Also, the FT rate for this group of mothers decreases rapidly from the 1980s until 1995, levels off between 1995 and 2005, and starts to increase from the mid 2000s onwards.

Table 1 depicts trends in female employment from a dynamic perspective based on a comparison of state-to-state transition rates for selected years.[17] Raw transition rates between year $t-5$ and t are presented in Panel A and between two consecutive years in Panel B, respectively. The descriptive results reveal a high degree of initial labor market state dependence (most pronounced for NE-PTS), which tents to become a bit stronger over time.[18] As to be expected, the observed persistence is even higher for the year-to-year transitions and always take values larger than 80%. With regard to labor market mobility, we observe different changes over time. For instance, the probability of moving from FT to PTL shows a strong increase over time, whereas transitions from PTL to FT become less likely and are almost negligible as indicated in Panel B. Furthermore, our results suggest that over the last decades moving directly from NE-PTS to full-time employment becomes less likely. Thus, altogether entry into FT employment apparently becomes less likely over time given that a women has been in one of the two other employment states.

3.2 Characteristics by observed labor market state

Before turning to the empirical analysis, we look at selected individual characteristics of labor market states in our sample and, in particular, how they change over time. Summary

[17] Note that these results represent a stylized picture of labor market mobility and serve the purpose of an aggregate descriptive analysis. This can not replace a multivariate analysis of changes in the determinants of transition rates over time. However, this is not the focus of this paper.

[18] Our measure of persistence corresponds to the observed probability of staying in any particular labor market state in the future conditional on occupying that particular state in the current period.

statistics with respect to age, education, motherhood, and labor market history including the occupation from the past are reported in Table 2. In the following, we focus on the most important changes that took place over time and between the different labor market states.

The descriptive results show that PTL working women are slightly above 40 years in the 1980s, but almost 45 years old in 2010. Investigating the age distribution more closely reveals that the observed increase in the average age is driven mainly by the growing share of middle-aged and elderly women (the share of PTL working women aged 45 and older has risen from 40% in 1980 to almost 58% in 2010). We observe the same age profile for women in NE-PTS, with the share of 55-59 aged growing somewhat faster compared to PTL, while there are almost no profound changes in the age distribution among full-time working women. Further, our summary statistics show that the share of both medium-skilled (with a vocational training degree) and high-skilled workers (with a Uni/college degree) in PTL increases over time, whereas the share of low-skilled (without a vocational training degree) falls strongly. The relative increase is strongest for the high-skilled. However, similar changes in educational attainment do not only occur for PTL but also for FT and NE-PTS.

As our sample includes childbirth information only from 1975 onwards and children as well mothers get older over time, it would be misleading to look at time-specific changes in the share of women with children compared to women without children by a particular labor market status. Therefore, we only compare the share of mothers within a year among the different labor market states. As to be expected, it is the case that the share of mothers is higher for PTL or NE-PTS compared to the share of mothers being full-time employed. This holds true for all selected years.

The descriptive results also show a growing share of former PTL workers among the currently PTL emloyed, which takes place at the expense of decreasing shares of workers that have been engaged in either FT or NE-PTS five years before.[19] This is, however, not true for women currently employed on a full-time basis. For this group, the proportion of those with PTL work experience five years in the past increases constantly over time, from about 3.9% in 1980 to almost 6.2% in 2010. Compared to this, the share of women with

[19]Here, the interpretation of the summary statistics with regard to the labor market history is different compared to that of the descriptive results on transition rates because of the changing population over which the percentage shares are calculated.

past FT experience among whose who are currently observed in NE-PTS is dramatically decreasing over time and is in 2010 almost half of the share observed for the early 1980s.

Also the distribution of the previous field of occupation among the currently employed workers underwent significant changes during the last three decades. As to be expected, we find a decline of manufacturing occupations and a strong increase of employment in health and social care occupations. This trend is more pronounced for PTL compared to FT working women.

4 Empirical Analysis

Our empirical analysis tries to shed light on the nature of the aggregate trends discussed in the previous section and the role of policy changes regarding parental leave legislation and child care provision. We put a particular focus on changes in transition rates between different labor market states. Our analysis proceeds in three steps: Section 4.1 decomposes the changes in the shares of women in the three labor market states over time. Section 4.2 analyzes the age profile in part-time work. Section 4.3 provides regression estimates of the changes over time by motherhood state and the age of the first child.

4.1 Explaining the increase of part-time work using decomposition techniques

In the following, we quantify the contribution of various individuals characteristics to recent aggregate changes in female labor supply. Our primary question of interest would be to construct a series of hypothetical employment rates that allows recovering the evolution of, for example PTL rate, over many years while holding certain sets of individuals characteristics constant over time. An example for such a hypothetical employment rate would be the PTL rate in 2000s if, for instance, age and education were distributed as in the 1980s. Our empirical analysis uses decomposition methods based on reweighting techniques as proposed by (DiNardo et al., 1996; Hirano et al., 2003), see Firpo et al. (2011) for a detailed description.

Empirical approach

Define in the following two time periods, t' and t, where t' denotes the base year, e.g. 1980, and $t = t' + 1, ..., T$ refers to all calendar years after the corresponding base year until the end of the observation period $T = 2010$. Our interest lies in explaining differences in the expected aggregate changes of the respective outcome measure that occur between the base year t' and the current year t. Further, let the dummy variable Y_τ^S be the observed individual outcome in $\tau = t', t$, i.e. it denotes whether individual i is in one of the three mutually exclusive states $S = \{FT, PTL, NE\text{-}PTS\}$. Likewise, we define two mutually exclusive dummy variables $D_{\tau,i}^S = \mathbb{1}[i \in \tau]$, indicating whether individual i with a certain set of individual characteristics X is observed in period t or t'.[20]

Adapting the notation of conditional distribution functions as in Firpo et al. (2011), the distribution of $Y_\tau^S \mid D_\tau^S$ can be obtained by integrating out over a set of observed characteristics, X:

$$F_{Y_\tau^S|D_\tau^S}(y) = \int F_{Y_\tau^S|X,D_\tau^S}(y \mid X = x) \cdot dF_{X|D_\tau^S}(x). \tag{1}$$

The identification problem in the decomposition analysis arises from the fact that data on (Y_τ^S, D_τ^S, X) allows us to identify only actual distributions, i.e. $F_{Y_t^S|D_t^S}$ and $F_{Y_{t'}^S|D_{t'}^S}$, but not the counterfactual of interest $F_{Y_t^S|D_{t'}^S}$, which represents the distribution of Y_t^S holding the distribution of X fixed as in the base year t'. However, it can be shown that under certain identification assumptions, counterfactual distributions can be identified from the observed data using re-weighting propensity score methods (DiNardo et al., 1996; Hirano et al., 2003; Firpo et al., 2011).[21] Thus, the hypothetical distribution of interest $Y_t^S \mid D_{t'}^S$ can be obtained by integrating out over the distribution of X in time period t' using a re-weighting function $W(X)$, such that

$$F_{Y_t^S|D_{t'}^S}(y) = \int F_{Y_t^S|X,D_t^S}(y \mid X = x) \cdot W(x) \cdot dF_{X|D_{t'}^S}(x), \tag{2}$$

[20] Note that even though we can observe a woman in adjacent years as long as she is between 25 and 59 years, her employment status will be different simply because her individual characteristics may change over time.

[21] Similar to the identification of average treatment effects from the treatment evaluation literature, we need to impose the following identifying assumptions: no selection on unobservables, i.e. D_τ^S and ε are independent conditional on X, common support, preventing X to be a perfect predictor of whether individual observation i belongs to t or t', and no general equilibrium effects. Firpo et al. (2011) provides a very comprehensive discussion on the equivalence of identifying assumptions from the treatment effect and inequality literature.

where $W(x) = \dfrac{dF_{X|D^S_{t'}}(x)}{dF_{X|D^S_t}(x)}$ are the inverse probability weights (IPW). Even though the weighting function is not observed, it can be consistently estimated from the observed data on $D_{t'}$ and X. The estimation procedure involves pooling the data from t and t', estimating a probit regression of $D_{t'}$ on X and using the propensity score $p_{t'}(x)$ – the estimated conditional probability that observation i belongs to t' instead of t – to calculate the estimated version of $W(X)$, i.e. $\hat{w}(x) = \frac{p_{t'}(x)}{1-p_{t'}(x)}$. Following Busso et al. (2009, 2014), we normalize the weights used for the empirical distribution in the sample of year t such that they sum up to one.

The estimation procedure described so far allows to quantify the impact of different sets of variables in the decomposition analysis. Changing the subset of variables in X considered allows to implement a sequential decomposition. Thus, we can construct hypothetical distributions by holding a certain set of covariates fixed as in the base year, while allowing another set of characteristics to be distributed as in the current year. This is very easily implemented here because the propensity score function can be obtained from probit regressions that condition in turn on different subsets of X. In the empirical analysis we distinguish between five different sets of covariates that we describe in the following. Note that all probit regressions contain an intercept and 34 year of age dummy variables for the age range 26 to 59. The reference category is the group of women aged 25.

The decomposition based on the smallest subset A includes only age dummy variables. The larger subset AE includes in addition dummy variables for the highest educational attainment. Next, we include motherhood-related information, subset AEM, that consists of two types of variables: i) mother dummy, which is zero for not-yet mothers and one for mothers;[22] ii) set of dummy variables indicating the age of the first child (for not-yet mothers these dummy variables take all the value zero). Due to the sampling design of the data (see Section 2), we can observe only mothers with relatively young children (0–5 years old) at the beginning of the observation period, leading to an overrepresentation of mothers with older children in later years. This means that the age distribution of the children in our sample is specific to the year of observation, which in turn means that the construction of counterfactual employment rates would not be feasible due to a violation of the common support assumption. We address this problem by treating

[22]Here, we do not distinguish between women with and without children in a static way. Instead, we define the motherhood dummy dynamically, where not-yet mothers refer to those who have a child later or never.

mothers with children older than the maximum age of the first child observed in the base year as if they were not-yet mothers, which is the information in the data we have in 1980 for mothers with children above age five and no child up to age five. In addition to age, education, and motherhood, subset $AEMH5$ includes past labor market states that are represented by two dummy variables indicating whether a woman has been full-time or part-time employed five years before the current year of observation (the labor market state NE-PTS serves as a reference category). Including such information in the probit regressions means that we can effectively quantify the impact of changes in the transition (hazard) rates on aggregate changes in the respective employment rate over time.[23] And finally, subset $AEMH5IOR$ include labor demand characteristics taken from the labor market status five years in the past. Using dummy variables, we account in a flexible way for industry structure, occupation, and region. Once more, as this information originates in the past, it is possible to relate past labor demand changes to current changes in labor supply.

Decomposition Results

Here, we present and discuss our results mainly using graphical illustrations. The decomposition results are presented in Figures 2 to 5 for PTL rate, FT rate, NE-PTS rate, and PTL share (PTL rate conditional on employment), respectively. To assess the robustness of our results with respect to the selected year in which the distribution of observed characteristics is held fixed, we perform the decomposition analysis based on different base years, i.e. $t' = \{1980, 1985, 1990, 1995\}$. In Figures 2 to 5, this is illustrated by the four graph panels, where the graph in the upper left corner corresponds to 1980, in the upper right corner to 1985, in the lower left corner to 1990, and in the lower right corner to 1995, respectively. In all graphs, the solid black line describes the evolution of the respective actual employment rate over time, whereas the dashed coloured lines represent hypothetical employment rates with respect to different subsets of observed characteristics. Note that for later base years we can account for mother for whom older children are observed. For base year 1980, as explained above, we account for children up to the age of five. For base year 1985, we account for children up to the age of ten - and so on. The comparison

[23] The main findings from the empirical results (see next section) regarding past labor market experience remain extremely robust when we model past labor market experience in a more flexible way by including, for instance, dummies for the labor market status in each of the five proceeding years or cumulated months of non-employment. We therefore opt for the more parsimonious way, which allows a direct interpretation referring to changes in the hazard rates from one point in time to another.

of the decomposition results for later calendar years allows to assess the sensitivity of the results to the omission of the information on older children in earlier years.

First, we discuss the results for the PTL rate in Figure 2. During the early 1980s, we do not observe any detectable changes in the actual rate over time and virtually zero compositional effects, which would become evident via differences between the evolution of the actual outcome and the evolution of the counterfactual composition-constant outcome. Compositional changes become evident with the increase of PTL during the 1990s and early 2000s. During this time period, the rise in PTL is to a large extent associated with changes in the distribution of individuals characteristics, with age contributing most to the composition effect. More specifically, if the age distribution of PTL working women were as in the early 1980s or 1990s, the currently observed PTL growth would be by almost 50% lower in recent years. Further, our results suggest that changes in educational attainment also contributed to the increase in PTL, however they become less important over the years and they have become almost negligible during the most recent time period. This result indicates that the education level of women in PTL has improved during the 1980s, but remain unaltered from then onwards. Surprisingly, the increase in PTL employment over time cannot be contributed to any significant changes in motherhood-related characteristics, thus suggesting that the proportion of mothers with small children has remained relatively stable during the last three decades. Moreover, our results indicate that compositional effects are to a very large proportion driven by changes in the labor market state five years ago (see section 3 above). Surprisingly, after accounting for employment history, the contribution of changes in industry and occupation (as proxies for labor demand effects) is negligible.[24] Contrasting the results for the different base years shows that the decompositions for the later time periods basically do not differ by the choice of base year. This robustness adds credibility to our findings.

Considering the decomposition results on FT and NE-PTS (Figures 3 and 4), we find similarities in the nature of composition effects, but also some differences compared to PTL. It turns out that demographic aging contributed more to the decrease in FT, while the slight increase in NE-PTS in the second half of the period can not be attributed to change in the age composition. Thus, the ageing of the female workforce is associated with an increase of PTL and a decline of FT from 1990 onwards. It does not have a strong effect

[24]Note that we can not exclude that there are occupation and industry specific labor demand effects. However, if they exist, they cancel each other at the aggregate level.

on NE-PTS. Furthermore, it turns out that changes in the labor market state five years ago seem much more important in explaining the downward trend in FT, compared to what we observe for NE-PTS. Apparently, the high persistence of labor market transition rates suggest that a major component of the changes we see are associated with women in younger starting to work less in FT employment and being observed more often in PTL or NE-PTS. This means that younger cohort work less in FT employment and more in PTL. The increase in NE-PTS may reflect the increase in educational attainment among the younger cohorts. These strong compositional changes are masked by the strong cyclical movements in the probabilities for the three employment states, especially for FT and NE-PTS.

Compositional effects also matter for the increase in part-time work among all working women. Results in Figure 5 suggest that changes in the age composition contribute to about one third to the overall increase in the PTL rate after the mid 1990's and nothing before the mid 1990's. The remaining part is to a very large extent attributed to changes in the past labor market history, which remains relatively stable except for an increase starting in the mid-1990s. The graph in the lower right corner illustrates that almost 80% of the increase in the PTL rate after 1995 can be explained by changes in individual characteristics, i.e. age and to a small extent motherhood, and past labor market history. However, our results suggest a slightly different conclusion with regard to motherhood at the end of the observation period. If age, education, and the share of women with children were distributed as in 1995, the PTL share would be lower until 2008, but then move in parallel to the increase in the actual PTL share after 2008, which is therefore not associated with composition changes regarding age, education, and motherhood.

4.2 Part-time work over the life-cycle

An important finding of our decomposition analysis is that changes in the age composition contributed strongly to observed time trends in female employment patterns, whereas changes in motherhood only seem to have a negligible effect. At the same time, the literature emphasizes that the changes in employment over the life-cycle, e.g. the growing importance of part-time work when women age, are associated with motherhood (Fitzen-

berger and Wunderlich, 2004; Fitzenberger et al., 2013, 2016).[25] To shed further light on this issue, we estimate the life-cycle employment profiles for different decades in our data while controlling for cohort effects. We investigate how the estimated age related employment differences differ, when we changing the set of further control variables. Our analysis is still descriptive in nature, thus providing a second decomposition analysis based on regression estimates.

Empirical Approach

Let $y_{i,t}$ be the indicator variable for the observed labor market status of individual i in calendar year t. We estimate the following regression equation:

$$y_{i,t} = x'_{i,t}\beta + w'_{i,t}\gamma + \sum_{\tau \in TPI} z'_{i,t,\tau} \cdot \alpha_\tau + u_{i,t}, \tag{3}$$

where $u_{i,t}$ is the error term and the covariates are as follows:

$x_{i,t}$ includes the intercept, separate calendar year dummies for the time period 1981 to 2010, and six cohort dummies for the decade of the birth year (the reference category involves the birth cohorts 1950 to 1959).

$z_{i,t,\tau}$ includes interaction terms between a third-order polynomial function in age centered at 25 and a time period dummy $pd = \mathbb{1}[\tau \in tpi]$, where $tpi = \{1980-1989, 1990-1999, 2000-2004, 2005-2010\}$.

$w_{i,t}$ includes different sets of characteristics[26] that we sequentially account for
(i) dummies for highest educational attainment;
(ii) motherhood dummy and nine dummies indicating the age of the first child as identified in our data;[27]
(iii) two indicator variables for labor market status five years (one year) in the past;
(iv) dummies for industry, occupation, and region as indicated in the past.

Changes in life-cycle employment patterns over time are represented by the third term in equation (3) involving the covariates $z_{i,t,\tau}$. The estimated coefficients on the interaction terms represent the relative outcome for a specific age group, e.g. for 35 year old relative

[25] Fitzenberger and Wunderlich (2004) provide a more comprehensive cohort analysis and a comparison of male and female employment patterns in Germany and the UK until the early 1990s.

[26] See the previous section for a detailed description of the covariates used.

[27] We group the information on the age of the child for older children, i.e. 4 to 6, 7 to 10, 11 to 16, 17 to 20, 21 to 25, and older than 26 years.

to 25 year old women, during a given time period after accounting for time and cohort effects. Our most restrictive specification excludes $w_{i,t}$, it does not include any of the covariates (i) to (iv). Then, we sequentially add the covariates under (i) to (iv). Thus, the second specification controls for (i), the third for (i) and (ii), and so forth. This way we estimate regression adjusted age differences to investigate whether and to what extent age related differences are driven by other covariates. Put differently, we investigate whether the age related differences reflect a composition effect (e.g. regarding motherhood).

Results

The empirical results are presented graphically in Figures 6 to 9 that correspond to our four outcome variables of interest: PTL rate, FT rate, NE-PTS rate, and PTL share (PTL among the working population). Our estimates of the age related outcome differences after conditioning on different sets of individual characteristics are displayed in grey-shaded bars for selected age groups – 30, 35, 40, 45 – for whom we contrast employment outcomes relative to 25 year old women.

The results indicate that PTL rate indeed increases over the life cycle when women age, while the FT rate falls. For instance, the increase of the PTL rate between age 25 and 35 amounts to 7 percentage points (ppoints) and the increase up to age 50 is about twice as large (these number refer to the first dark black bar in the graphs in Figure 6). These age related differences for PTL change little over time. In contrast, FT employment rates between 13 and 20 ppoints lower for women at age 35 or 40 relative to age 25 (Figure 7. These differences become larger over time and there is a particular increase between the 1980s and the 1990s. Focusing on changes in the estimated age differences over the four periods of time, reveal some interesting results. Figures 6 and 9 indicate relatively stable age profiles for the PTL rate and the PTL share. In contrast, the age differences in FT rate increase strongly from the 1980-1989 to the 1990-1999 period and decline slightly during the 2000s. This trend is especially pronounced for women older than 45.

The age related differences are much more heterogeneous for NE-PTS. Compared to 25 years old women, the NE-PTS reate is between 8 and 13 ppoints higher at age 35 and between 2 to 8 ppoints higher at age 40. These differences increase between the 1980's and 1990's and then fall slightly afterwards. The differences turn negative for 45 and 50 year old women during the 1980's but they are basically zero during the 1990's and the early 2000's. They increase further to about 3 to 4 ppoints in the late 2000's.

Now, we turn to the regression-adjusted age related differences shown in Figures 6 to 9. The regression-adjusted estimates accounting for the $w_{i,t}$ covariates (i) to (iv) are displayed sequentially by the bars in the graphs (the more covariates are controlled for, the lighter the colour of the bars). Our findings confirm some of the conclusions from the last section, but also show some new insights. Education plays almost no role for PTL, while there is an increase in the FT age differential for older women during the 2000s, when educational differences are taken into account. Further, as to be expected, the covariates related to motherhood - consider the contrast between AE and AEM in the graphs - typically explain a major part of the age-related differences in PTL and FT at ages 35 and 40, when mothers typically still have young children, but so at age 45 and 50, when children are typically older. This reflects the dip in FT employment in the 30's and the associated rise in part-time employment. However, the effect does not persist at later age. The motherhood impact becomes even stronger over time and we confirm the strong decline of FT employment at higher age from the 1990's onwards. Consistent with our results from the decomposition analysis, we find that age related differences can to a large extent be explained at a descriptive level by labor market history. Accounting for the fact that a woman has been engaged in FT or PTL work five years in the past explain nearly half of the raw age difference in the PTL rate and PTL share. This effect is not as much as pronounced for FT and sometimes works in the opposite direction. The regression-adjusted estimates for NE-PTS show not clear picture. The existing age-related differences are partly explained by motherhood but controlling for labor market history tends to increase the positive age-related differences form the 1990's onwards. At the same time, due to the high degree of persistence in labor market history, age differences almost fall to zero when we condition on the labor market status from the previous year. Thus, employment history five year ago has changed in a way which would be associated with higher NE-PTS rates at older age compared to age 25, but this is compensated by higher employment rates among older females in younger cohorts, i.e. the increase in part-time work and the persistence of doing so. However, this effect does not fully compensate the decline in FT employment at older age in the more recent decades.

4.3 Regression Analysis of Time Effects by Motherhood

Now, we turn towards an analysis of time trends by motherhood. Specifically, we examine the changes associated with various reform of parental leave legislation. To do so, we estimate the following regression for the four employment outcomes ($y =$) PTL rate, FT rate, PTL share, NE-PTS share for the observation period 1981 to 2010 and the age range 25 to 59:

$$(4) \qquad y_{it} = x'_{it}\alpha + \sum_{\tau=1981}^{2010} \beta_\tau \cdot dy_{i,\tau,t} + \sum_{a \in AI} \gamma_a \cdot md_{it} \cdot dac_{i,a,t} + \sum_{\tau=1981}^{2010} \delta_\tau \cdot md_{it} \cdot dy_{i,\tau,t}$$

$$+\eta_2 \cdot md_{it} \cdot byear_i^2 + \sum_{by \in RBY} \eta_{d,by} \cdot md_{it} \cdot I(byear_i \geq by) + u_{it} \ ,$$

where y_{it} is a dummy variable for individual i being in one of the four employment states (as above, the regression for PTL share is estimated based upon the sample of FT and PTL employees omitting those in NE-PTS) in year t. Regression (4) accounts for year effects ($dy_{i,\tau,t}$ is the dummy variable for year τ) as well as further covariates (x_{it}) for all females. x_{it} includes a third order polynomial in age and dummy variables for ten-year intervals for the birth cohorts (20: 20-29, 30: 30-49, ..., 70:70-79, 80:80-85).[28] In a specification accounting for labor market history, x_{it} includes dummy variables for the labour market outcome five years ago ($t-5$) as well as the industry and occupation of employment for those who were employed (FT or PTL) five years ago.

Regression (4) interacts the calendar time effects with a dummy for motherhood and it also accounts for the year of birth of the first child and the age of the first child. The motherhood dummy md_{it} is equal to one if the female had her first child not after year t and this was observed during the time period 1975 to 2010. $byear_i$ denotes the year of birth of the first child of female i and $dac_{i,a,t}$ are dummy variables for the age of the first child - both variables are only defined for mothers ($md_{it} = 1$).

Regression (4) fully interacts the mother dummy with year calendar time effects, such that δ_τ measures the year specific deviation of the time trend for mothers compared to non-mothers. Because labor force participation of mothers shows a strong association with the age of the child we account in flexible way for the age of the child by adding

[28] Note that one cannot estimate a linear age, time, and cohort effect at the same time, because, as is well known, there exists a linear relationship between the three variables ($cohort + age = calendar - year$). Implicitely, our specification sets the linear cohort effect to zero.

age dummy variables $dac_{i,a,t}$ which represents the age ranges given by the set $ACI = \{0, 1, 2, 3, 4-6, 7-10, 11-16, 17-20, 21-25, 26-30, \geq 30\}$. These dummy variables provide year specific estimates for the year of birth and the first three years of childhood. Later on, the effects are held constant for the indicated age intervals (e.g. the dummy variables $dac_{i,4-6,t}$ is equal to one, iff in year t the first child is between 4 and 6 years old.

The calendar year of birth of the first child may reflect the specific labor market conditions at child birth as well as the timing of policy reforms affecting fertility and labor market attachment of females. Regression (4) accounts for a quadratic term in the birth and further includes before-after dummy variables ($I(byear_i \geq by)$) for the birth years in the set $RBY = \{79, 86, 86, 88, 90, 92, 01, 07\}$, where $I(.)$ denotes the indicator function.[29] E.g. the birth year dummy $I(byear_i \geq 86)$ estimates the difference between child births before 1986 and child birth in 1986 or afterwards and, analogous to a regression discontinuity in time, we would interpret this as the reform effect implied by the reform in 1986. When a reform was implemented after January 1 in a specific year *by* (in some years the reform was implemented in May or July), we set the *by*-dummy to 0.5 in the year of the reform and to 1 afterwards. This is to account for the gradual effect on annual employment outcomes.

Next, we discuss the regression results. Tables A2 and A3 in the appendix comprise the coefficient estimates for the specification without labor market history (i.e. also without information on occupation and industry in the past) and with labor market history five years ago. Instead of discussing the detailed coefficient estimates reported in the tables, we summarize the findings by means of graphical evidence.

Figure 10 displays the estimated calendar year effects for non-mothers [the estimates for the coefficients β_τ in regression (4)]. To allow for an easy detection of significant year-to-year changes, Figure 11 displays the changes $\Delta\beta_\tau = \beta_\tau - \beta_{\tau-1}$ based on the same estimates as displyed in Figure 10. Starting with the estimates not accounting for employment history (the solid lines in the four graphs in the two figures), there is a strong cyclical component in employment outcomes (Figure 10). Employment rates are particularly high at the end of booms in the years 1993, 2001 and 2010 and particularly low during the years 1986, 1997, and 2005. Clearly, there is a delay in the female employment rates with

[29] Again note that one cannot estimate a linear age-of-child, time, and year-of-birth effect for mothers at the same time, because there is a linear relation between the three variables ($byear + age - of - child = calendar - year$). Implicitely, our specification sets the linear birth year effect to zero.

prolonged periods of falling employment after the end of a boom and delayed increases in employment with the start of a new boom.[30] The calendar effects show no long-run increase in employment rates of non-mothers (see graph for NE-PTS), a slight long-run increase in FT-employment and a slight decline in PTL-employment. Regarding the relative importance of PTL and FTL (PT-share), there is a strong decline in PTL relative to FT until the early 90's and a sharp recovover until 1997, mostly due to a decline in FT employment. Afterward the relative shares of PTL and FT did not change apart from cyclical movements. The PTL share typically falls until the end of a boom (referring to the years 93 and 01) and then increases gradually during a recession until the next boom starts (most noticeably during the 80's, the mid 90's, and the early/mid 00's). Turning to the year-by-year changes in Figure 11, there is evidence for some periods of persistent significant changes. For instance, employment rates grow significantly during the time period 1986 and 1993 and the PTL share grows significantly over that period. There are a few years with strong peaks in the year-by-year changes. The growth in FT employment is particularly strong in 1993 and in PTL in 1997. The increase in NE-PTS is particularly strong in the early 80's, the mid 90's and the mid 00's, mostly likely reflecting cyclical effects. There are no particularly noticeable effects in the aforementioned years of reforms possibly affecting the labor market attachment of females, say in the years 2001 or 2007. One may have expected a peak in PTL in 2001 because the reform in that 2001 made it easier to switch to part-time work for women working full-time and a peak in FT or PTL employment in 2007 because the introduction of paid maternity leave for all employed females increased the option value of employment. Accounting for labor market history five years ago in (grey lines in Figures 10 and 11) does not change the qualitative results. The results for the PTL rate are almost unaffected. The estimates for the FT rate (NE-PTS rate) lies fall (increase) slightly when controlling for history, slightly weakening the cycle in the estimates. Nevertheless, the cyclical pattern dominates even after accounting for the history.

Turning to the estimates for mothers, Figure 12 shows the estimated employment patterns by age of the first child. Compared to nonmothers, the FT employment rate drops by more than 50 percentage points (ppoints) during the first three years and then catches up to a persistent level of about minus 30 ppoints from seven years onwards. PTL is also reduced by 4 ppoints during the first two years and then fully recovers after four

[30]There is no discernable negative employment effect of the great recession 2008/09, which showed a stronger negative effect on male employment, see e.g. Hoffmann and Lemieux (2016).

years. From then onwards, there is a continuous slight decline. Correspondingly, the PTL share first increases and then decreases continuously after four years. The increase in NE-PTS peaks during the first four years and then falls to about 30 ppoints after seven years. It increases slightly in the long run. By and large, the results do not confirm a pervasive PTL mommy track after birth. Compared to nonmothers NE-PTS increases strongly and persistently, and PTL only plays a minor role for the return-to-job after having the first child. Compared to non-mothers, mothers either return full-time or they choose an employment career with long periods of non-employment or employment with short hours. The qualitative patterns remain unchanged when accounting for labor market history. Holding history constant there is a stronger move towards PTL, but this does not reduce the long-run increase in NE-PTS. The catching up of the FT rate is even weaker when accounting for the history.

The estimates displayed in Figure 13 address the question to what extent the employment patterns of mothers have changed over time relative to non-mothers. The results show a continuous significant increase in PTL of mothers over time compared to non-mothers. Thus, over time the importance of PTL has increased for mothers. Also FT employment is increasing continuously over time over time since 1993. The increase in employment since 1993 shows a growing labor force attachment of mothers compared to non-mothers and this increase is not restricted to PTL. Accounting for labor market history changes the results for FT employment. Given labor market history, FT employment falls by more than 6 ppoints between 1986 and 1993 - and never recovers. The long-run increase in PTL becomes slightly large for the time period from 1993 onwards. Correspondingly, the NE-PTS rate increases between 1986 and 1993 and only starts to fall gradually from 1997 onwards. Thus, the overall increase in FT employment among mothers is restricted to the fact that more females, who eventually have a child, start out working full-time. Given their labor market history, mothers actually become lesse likely to remain in or enter FT employment. This is an indication of growing churning processes in and out of FT employment among mothers who have become more attached to the labor market over time, especially since 1993.

Finally, we turn to the results on the effects of the birth-year of the child, see Figure 14. Even though the quadratic term in birth year is highly significant in all employment regressions, there is no noticeable effect in Figure 14. The graphs are dominated by the changes in the reform years. In response to the reform, we find a significant long-run

reduction of the FT employment rate of mothers relative to non-mothers. Up to the birth years 1997, this reduction was associated with an increase in the PTL rate. For births after 1997, the PTL rate declined continuously and we observe a strong decline due to the 2007 reform. Starting from the 1986 birth year onwards, all reforms resulted in a continuous increase in the NE-PTS rate among mothers. Controlling for labor market history, reduces both the negative effects of the reforms on FT employment and the positive effects on NE-PTS, especially after 2001. The qualitative patterns of the results remain unchanged.

Considering the evidence in Figures 13 and 14 together, there is no evidence for an increase of FT employment among mothers over time. The negative birth year effects associated with the reform years overcompensate any positive long-run time trends. The results for the PTL rate indicate that PTL has strongly gained importance among mothers over time. Overall, the most recent reform in 2007 and the time trend afterwards have been associated with a reduction of employment among mothers.

Summarizing, our findings suggest no long-run increase in PTL among non-mothers and an increase in PTL among mothers relative to non-mothers. FT employment among non-mothers increased until 1993 and fall afterwards. FT employment among mothers has even fallen further. There is strong evidence that future mothers increasingly start out their careers in FT employment. Given their employment history, it becomes less likely over time that mothers return to FT-employment after child birth and this is only partly compensated by an increase in PTL until the mid 90's. There is no evidence that the reforms have increased employment altogether among mothers, and the 2007 reform stands out as showing a particularly negative employment effect. Obviously, one should be cautious about the latter finding because it is only based on employment outcomes up to three years after child birth.

5 Conclusions

This paper provides a comprehensive empirical analysis of changes in employment of West German women for the time period from 1980 to 2010 in the age range 25 to 59. Our econometric approach accounts for life-cycle and cohort effects, for motherhood regarding the timing of childbirth and the age of the first child as well as for the effects of education, occupation, and industry. In addition, we analyze the effect of labor market history. We

use the SIAB data, a large administrative panel data set, for which we carefully identify motherhood following the approach used in Schönberg and Ludsteck (2014). Our analysis focuses in particular on the rise in part-time work, the role of demographics, and the impact of policy reforms.

Our empirical results confirm various findings known in the literature and they provide a number of new - and often - surprising findings. First, we confirm the familar findings that full-time employment falls and part-time employment rises over time as well as that full-time employment falls with age and part-time employment rises with age. Nonemployment first increases and then falls with age and there is no clear long-term trend. Whereas in the 1980's, nonemployment at age 50 is lower than at age 25, the decline in nonemployment at higher age decelerates and nonemployment remains higher at age 50 compared to age 25. This corresponds to a stronger age-related decline in full-time employment during the more recent decades. Finally, full-time employment and nonemployment show a much stronger cyclical pattern compared to part-time employment. Second, changes in the age composition and changes in the employment history almost fully explain the long-run changes in full-time and part-time employment. Other covariates only play a negligible role. Third, we find the familiar decline in employment after child birth and the partial recovery with rising part-time employment rate when the child ages. Over time, we find no long-run increase in part-time employment among non-mothers and an increase among mothers relative to non-mothers. Furthermore, full-time employment among non-mothers increases until 1993 and falls afterwards, and full-time employment among mothers falls even further. There is strong evidence that future mothers increasingly start out their careers in full-time employment. There is no evidence that the reforms in parental leave and child care provision increase employment altogether among mothers, and the 2007 reform stands out as showing a particularly negative employment effect. The latter findings should be viewed with caution because it is only based on employment outcomes up to three years after child birth.

Altogether our evidence shows a secular decline in full-time employment among women in West Germany which is compensated by an increase in part-time employment. The decline in full-time employment is particularly strong among mothers and it is associated with older mothers becoming less likely over time to return to full-time employment. Part-time employment and nonemployment have become more persistent over time at older age. Incidentally, our estimates suggest that all policy reforms since the mid 1980's

have contributed further to a fall of full-time employment and a rise of nonemployment among mothers.

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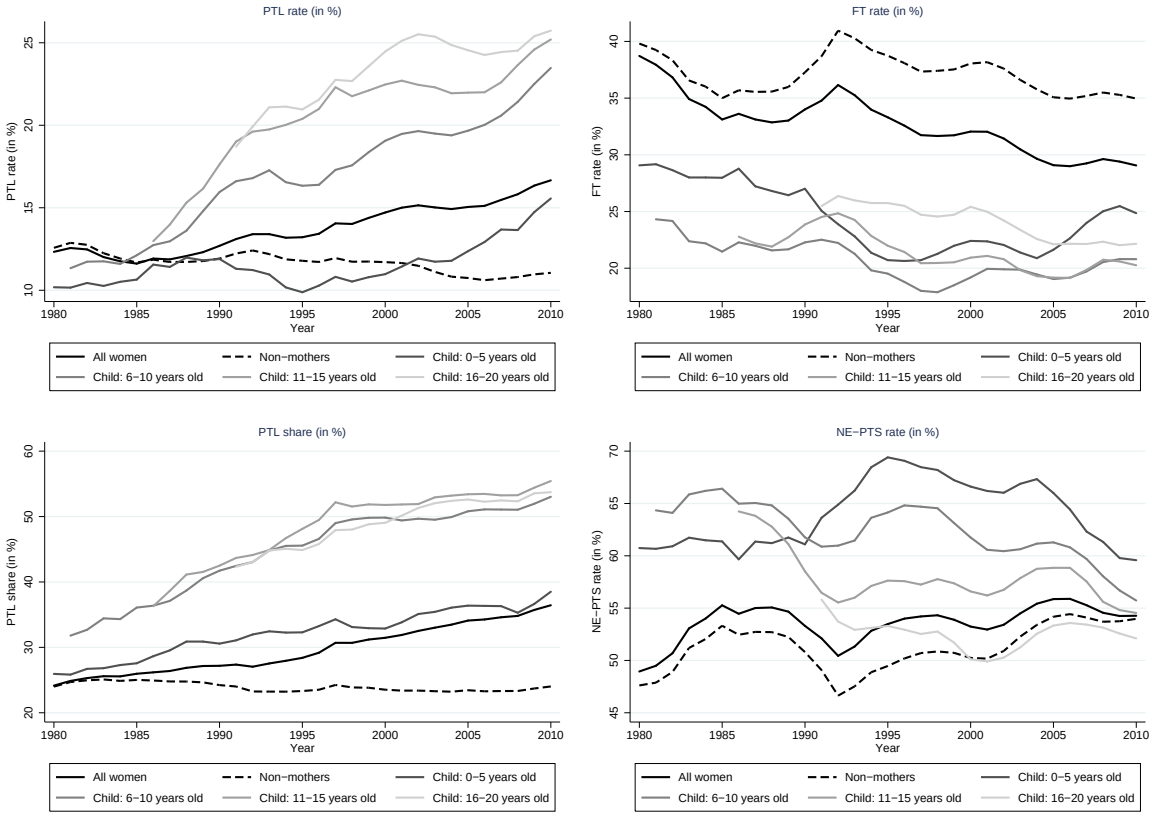
Figures and Tables

Figure 1: Female employment patterns: 1980–2010



Note: The graph shows the evolution of the four outcome measures over time: PTL rate, FT rate, PTL share and NE-PTS share (see main text for explanation). The solid black line refers to all women in our sample. The dashed line refers to women without children at time t. The gray-coloured lines refer to mothers with children in different ages. The sample include only women aged 25-59.

Table 1: Overview of labor market transition probabilities for selected years

		1980				1990				2000				2010			
		NE-PTS	FT	PTL	Obs.	NE-PTS	FT	PTL	Obs.	NE-PTS	FT	PTL	Obs.	NE-PTS	FT	PTL	Obs.
		Panel A															
State in t-5	NE-PTS	72.30	18.93	8.76	88,397	75.40	16.92	7.67	139,345	76.59	14.62	8.79	147,948	78.72	12.77	8.51	154,205
	FT	28.69	65.01	6.30	81,675	26.39	66.90	6.71	86,287	26.99	65.60	7.40	94,733	22.96	67.91	9.13	80,459
	PTL	25.55	16.03	58.42	17,534	21.06	14.48	64.46	23,490	22.85	13.24	63.91	31,879	21.22	12.90	65.88	37,869
		Panel B															
State in t-1	NE-PTS	88.74	7.61	3.65	91,611	89.87	6.68	3.44	135,010	91.05	5.60	3.35	146,739	91.98	4.50	3.52	146,979
	FT	11.11	86.32	2.57	74,510	10.19	87.63	2.12	84,367	9.97	87.72	2.32	88,750	10.15	86.75	3.10	81,340
	PTL	10.48	6.32	83.20	21,485	9.60	5.92	84.48	29,745	9.51	4.95	85.54	39.071	10.08	4.61	85.31	44,214

Note: The table shows state-to-state transition probabilities (in %) for selected years and for two time points in the past: $t-5$ in Panel A and $t-1$ in Panel B. The last column in each box of the table contains the number of observations over the respective initial state.

Table 2: Summary statistics for selected variables and years by labor market status

Variable	1980		1990		2000		2010	
	Mean	St.dev	Mean	St.dev	Mean	St.dev	Mean	St.dev
Labor market status: PTL								
Average age in years	42.35	(8.86)	42.87	(9.09)	43.51	(8.31)	45.10	(8.38)
25-29 years old	9.14	(28.82)	8.73	(28.23)	4.62	(20.99)	5.96	(23.68)
30-34 years old	12.29	(32.84)	13.51	(34.18)	10.76	(30.98)	7.32	(26.08)
35-39 years old	16.20	(36.84)	15.52	(36.21)	18.36	(38.71)	10.43	(30.56)
40-44 years old	21.73	(41.24)	15.89	(36.56)	20.84	(40.62)	19.19	(39.38)
45-49 years old	16.43	(37.06)	16.69	(37.29)	18.84	(39.10)	23.21	(42.22)
50-54 years old	13.50	(34.17)	19.11	(39.32)	15.31	(36.00)	20.29	(40.22)
55-59 years old	10.70	(30.92)	10.53	(30.69)	11.26	(31.61)	13.59	(34.27)
No voc. training degree	42.78	(49.48)	33.81	(47.31)	26.63	(44.20)	23.88	(42.64)
Voc. Training degree	50.87	(49.99)	60.89	(48.80)	67.69	(46.00)	69.09	(46.21)
Uni/college degree	2.38	(15.24)	2.70	(16.20)	3.92	(19.43)	5.11	(22.02)
Education unknown	3.97	(19.52)	2.59	(15.90)	1.75	(13.11)	1.91	(13.70)
At least one child	8.39	(27.73)	30.12	(45.88)	51.26	(49.98)	64.59	(47.83)
Employment history in $t-5$								
PTL	44.28	(49.67)	47.88	(49.96)	50.44	(49.99)	54.93	(49.76)
FT	22.24	(41.58)	18.32	(38.69)	17.36	(37.88)	16.18	(36.83)
NE-PTS	33.48	(47.19)	33.8	(47.30)	32.2	(46.73)	28.89	(45.32)
Manufacturing	9.92	(29.91)	7.00	(25.51)	4.70	(21.17)	3.86	(19.26)
Technicans	0.81	(8.97)	1.09	(10.39)	1.44	(11.92)	1.59	(12.53)
Merchants	11.83	(32.30)	12.5	(33.07)	12.75	(33.36)	12.09	(32.60)
Transport	3.41	(18.14)	3.08	(17.28)	2.32	(15.05)	2.21	(14.70)
Organization, adminstr., office	20.47	(40.35)	22.12	(41.51)	21.8	(41.29)	21.7	(41.22)
Health, social care, education	5.36	(22.53)	8.90	(28.61)	16.1	(36.75)	21.56	(41.12)
General services	12.78	(33.39)	10.05	(30.07)	7.27	(25.96)	6.28	(24.27)
Others	1.33	(11.46)	1.32	(11.45)	1.38	(11.68)	1.70	(12.93)
Missing or in NE-PTS	34.07	(47.39)	33.83	(47.31)	32.24	(46.74)	29	(45.38)
Nr. of observations	23,134		31,623		40,395		45,416	
Labor market status: FT								
Average age in years	40.34	(10.23)	38.85	(10.12)	39.94	(9.37)	41.68	(9.79)
25-29 years old	20.50	(40.37)	25.39	(43.52)	15.83	(36.50)	15.83	(36.50)
30-34 years old	14.10	(34.80)	15.99	(36.66)	18.54	(38.87)	13.49	(34.16)
35-39 years old	13.21	(33.86)	13.29	(33.94)	16.82	(37.41)	11.10	(31.41)

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Table 2 – <continued from previous page>

Variable	1980		1990		2000		2010	
	Mean	St.dev	Mean	St.dev	Mean	St.dev	Mean	St.dev
40-44 years old	16.18	(36.83)	12.57	(33.15)	15.39	(36.09)	16.08	(36.73)
45-49 years old	12.40	(32.96)	12.20	(32.73)	14.02	(34.72)	17.76	(38.22)
50-54 years old	12.14	(32.66)	13.19	(33.84)	11.48	(31.88)	15.29	(35.99)
55-59 years old	11.47	(31.87)	7.36	(26.12)	7.92	(26.99)	10.45	(30.59)
No voc. training degree	36.99	(48.28)	29.75	(45.72)	24.19	(42.82)	23.17	(42.20)
Voc. Training degree	57.93	(49.37)	65.31	(47.60)	69.51	(46.04)	67.74	(46.75)
Uni/college degree	2.22	(14.73)	3.22	(17.65)	4.90	(21.58)	6.70	(25.01)
Education unknown	2.86	(16.68)	1.72	(12.99)	1.41	(11.78)	2.39	(15.27)
At least one child	7.63	(26.55)	18.44	(38.78)	27.27	(44.54)	35.79	(47.94)
Employment history in $t-5$								
PTL	3.86	(19.28)	4.01	(19.63)	4.80	(21.37)	6.17	(24.05)
FT	73.09	(44.35)	68.14	(46.59)	70.62	(45.55)	68.97	(46.26)
NE-PTS	23.04	(42.11)	27.84	(44.82)	24.58	(43.07)	24.86	(43.22)
Manufacturing	15.88	(36.55)	12.32	(32.86)	9.17	(28.86)	7.08	(25.65)
Technicans	1.63	(12.67)	1.93	(13.76)	2.78	(16.43)	2.78	(16.44)
Merchants	11.12	31.44	11.31	31.67	11.79	(32.25)	10.83	31.07
Transport	2.34	15.12	2.16	14.53	2.56	(15.80)	2.79	16.46
Organization, adminstr., office	27.99	44.9	26.39	44.07	28.57	(45.17)	28.31	45.05
Health, social care, education	8.14	27.35	10.44	30.58	13.88	(34.58)	16.47	37.09
General services	7.07	25.62	5.70	23.18	4.50	(20.73)	3.82	19.17
Others	1.99	(13.96)	1.88	(13.57)	2.11	(14.40)	2.72	(16.28)
Missing or in NE-PTS	23.85	(42.62)	27.87	(44.84)	24.64	(43.09)	25.2	(43.41)
Nr. of observations	72,646		84,711		87,999		79,211	
Labor market status: NE-PTS								
Average age in years	37.23	(9.13)	38.80	(9.60)	41.46	(9.44)	43.84	(9.73)
25-29 years old	24.34	(42.91)	19.75	(39.81)	10.19	(30.26)	10.68	(30.89)
30-34 years old	21.44	(41.04)	20.84	(40.62)	17.32	(27.85)	10.43	(30.57)
35-39 years old	17.86	(38.30)	17.47	(37.97)	19.35	(39.50)	11.61	(32.03)
40-44 years old	15.72	(36.40)	12.88	(33.50)	16.1	(36.75)	16.59	(37.20)
45-49 years old	7.86	(26.82)	10.64	(30.83)	13.27	(33.93)	17.50	(38.00)
50-54 years old	6.18	(24.08)	10.54	(30.71)	11.28	(31.63)	16.34	(36.97)
55-59 years old	6.60	(24.82)	7.88	(26.95)	12.47	(33.04)	16.84	(37.42)
No voc. training degree	33.6	(47.24)	30.96	(46.23)	27.51	(44.66)	26.69	(44.23)
Voc. Training degree	48.6	(49.98)	51.99	(49.97)	55.06	(49.74)	53.30	(49.89)

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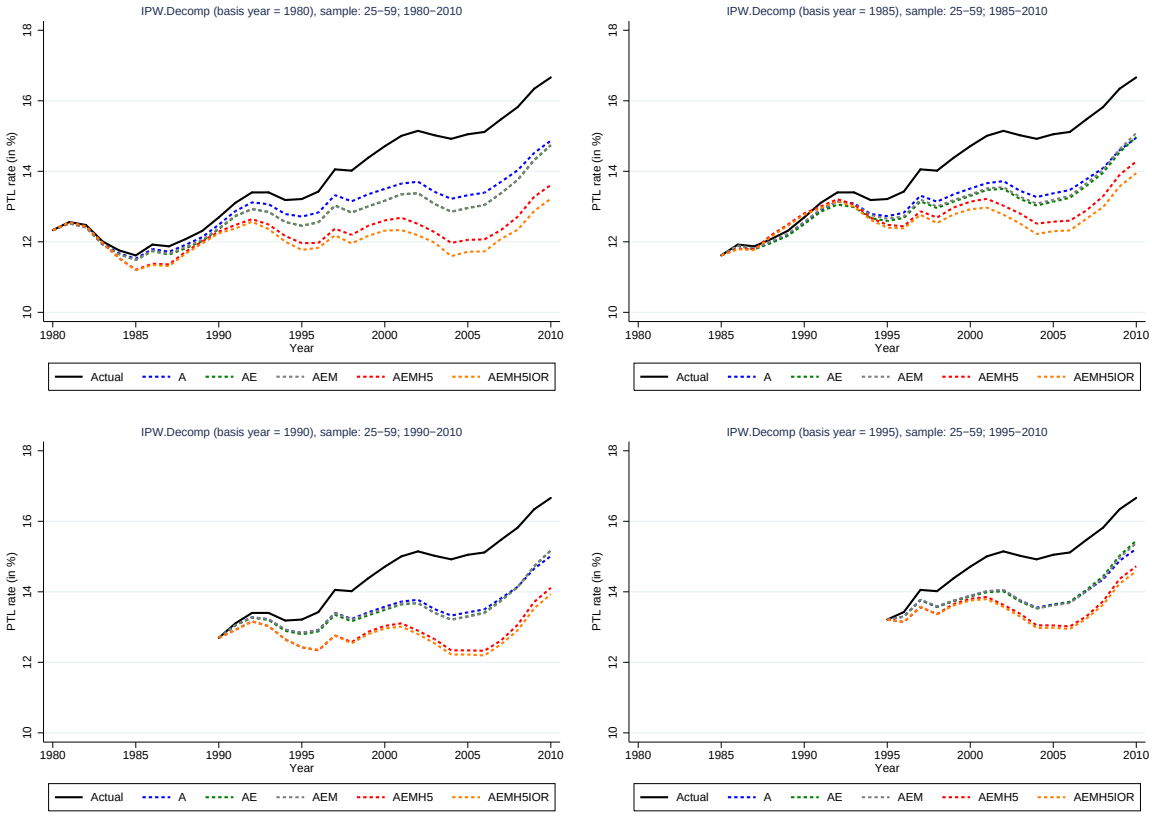
Table 2 – <continued from previous page>

Variable	1980		1990		2000		2010	
	Mean	St.dev	Mean	St.dev	Mean	St.dev	Mean	St.dev
Uni/college degree	4.09	(19.80)	5.26	(22.32)	5.79	(23.36)	6.25	(24.20)
Education unknown	13.71	(34.40)	11.79	(32.25)	11.64	(32.07)	13.76	(34.44)
At least one child	12.61	(33.20)	29.08	(45.42)	42.19	(44.54)	46.91	(49.90)
Employment history in $t-5$								
PTL	4.88	(21.54)	3.73	(18.94)	4.98	(21.76)	5.43	(5.43)
FT	25.52	(43.60)	17.15	(37.69)	17.5	(37.99)	12.49	(12.49)
NE-PTS	69.6	(45.99)	79.12	(40.64)	77.52	(41.74)	82.08	(82.08)
Manufacturing	5.75	(23.28)	3.75	(18.98)	2.67	(16.12)	1.46	(11.97)
Technicans	0.60	(7.70)	0.46	(6.66)	0.73	(8.48)	0.48	(6.94)
Merchants	5.21	(22.22)	3.70	(18.89)	3.85	(19.24)	2.96	(16.94)
Transport	1.01	(9.98)	0.64	(7.99)	0.86	(9.22)	0.78	(8.78)
Organization, adminstr., office	9.26	(28.99)	5.63	(23.05)	6.92	(25.38)	5.35	(22.50)
Health, social care, education	3.5	(18.38)	3.55	(18.51)	4.55	(20.84)	4.38	(20.47)
General services	3.91	(19.41)	2.49	(15.57)	2.06	(14.19)	1.61	(12.58)
Others	0.80	(8.93)	0.65	(8.01)	0.82	(9.02)	0.81	(8.99)
Missing or in NE-PTS	69.96	(45.85)	79.14	(40.62)	77.55	(41.73)	82.17	(38.28)
Nr. of observations	91,826		132,788		146,166		147,906	

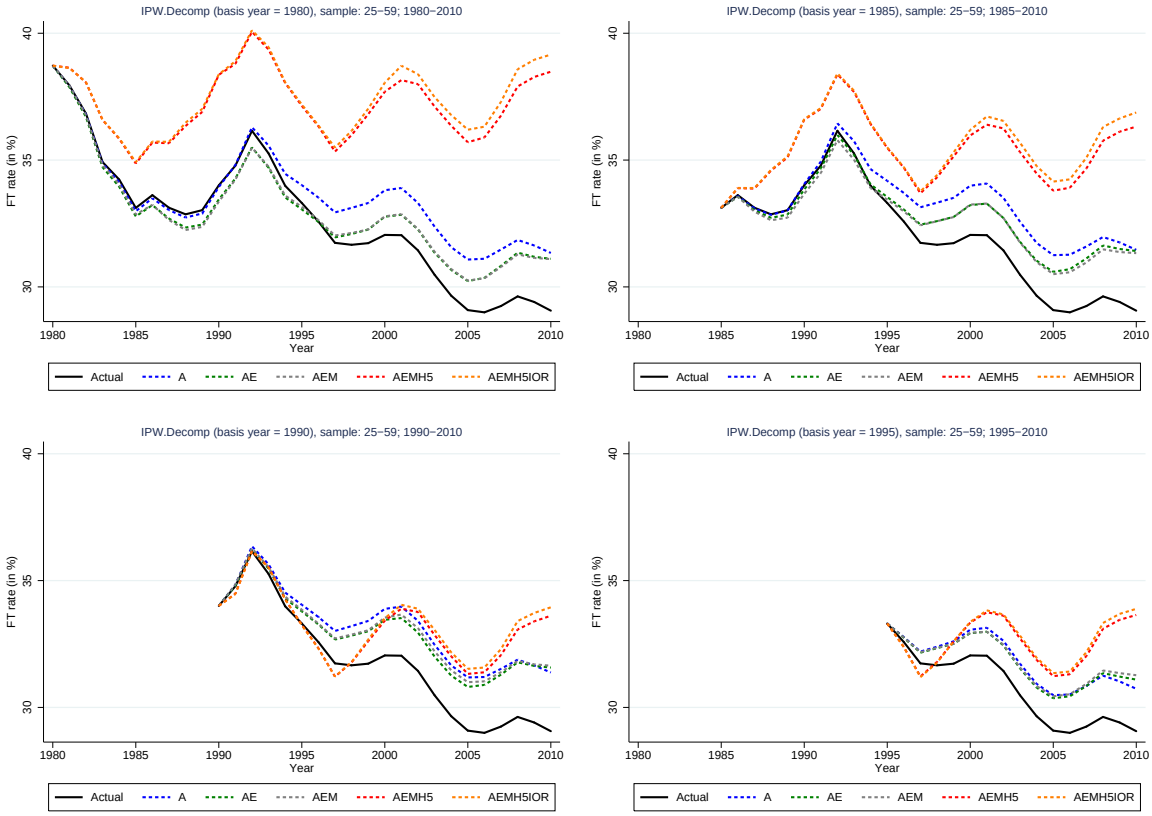
Note: If not otherwise stated, mean values in the table represent percentage shares.

Figure 2: Decomposition results for PTL rate



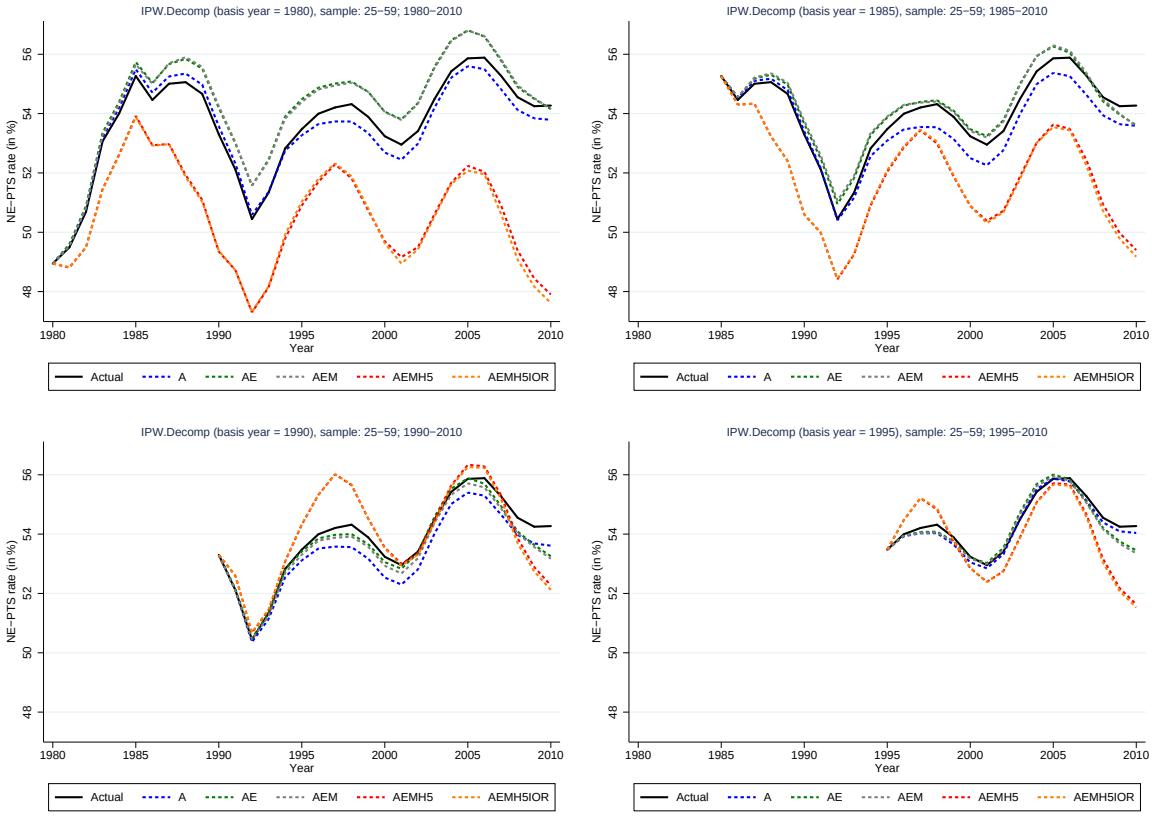
Note: The outcome measure is one for large part-time employment and zero otherwise. All dashed lines refer to the counterfactual outcome measure in year t conditional on fixing the composition of the population as in the respective basis year with respect to different sets of characteristics. A: Age; E: Education; M: Motherhood; H5: Employment history in $t-5$; IOR: Industry, Occupation, Region as in $t-5$.

Figure 3: Decomposition results for FT rate



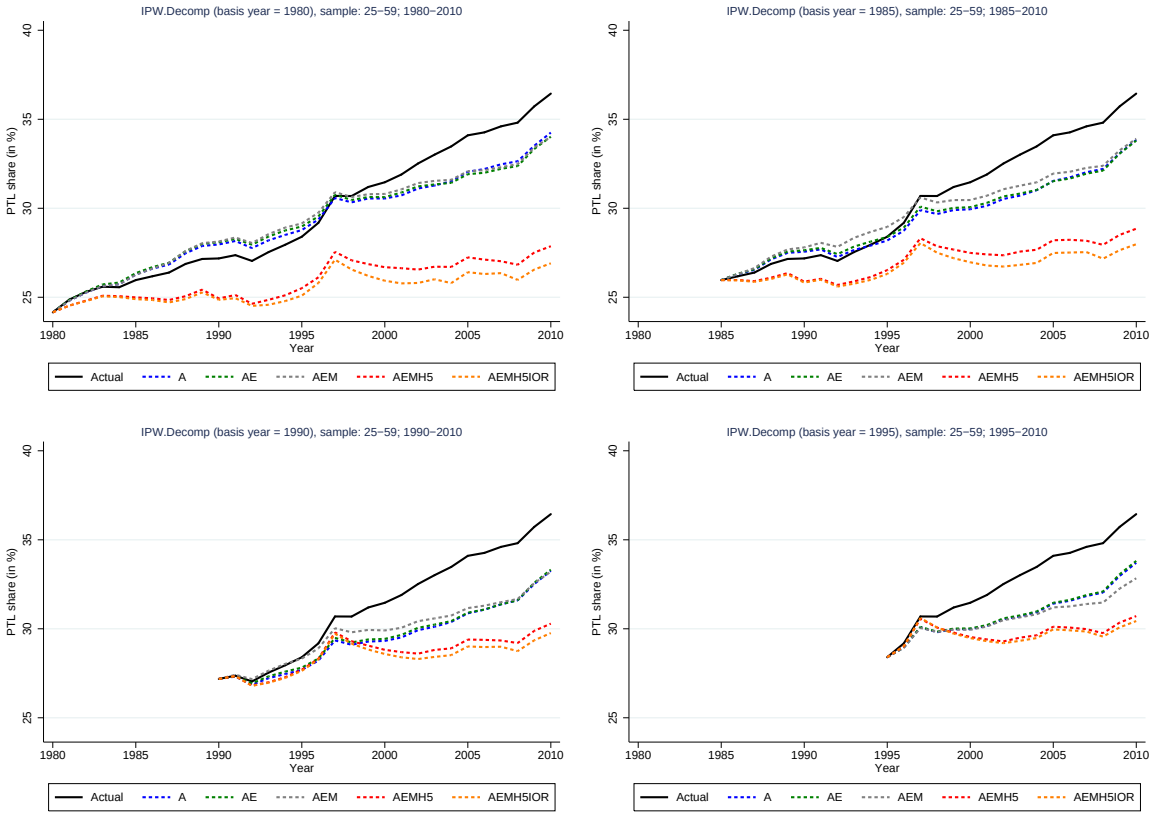
Note: The outcome measure is one for full-time employment and zero otherwise. All dashed lines refer to the counterfactual outcome measure in year t conditional on fixing the composition of the population as in the respective basis year with respect to different sets of characteristics. A: Age; E: Education; M: Motherhood; H5: Employment history in $t-5$; IOR: Industry, Occupation, Region as in $t-5$.

Figure 4: Decomposition results for NE-PTS rate



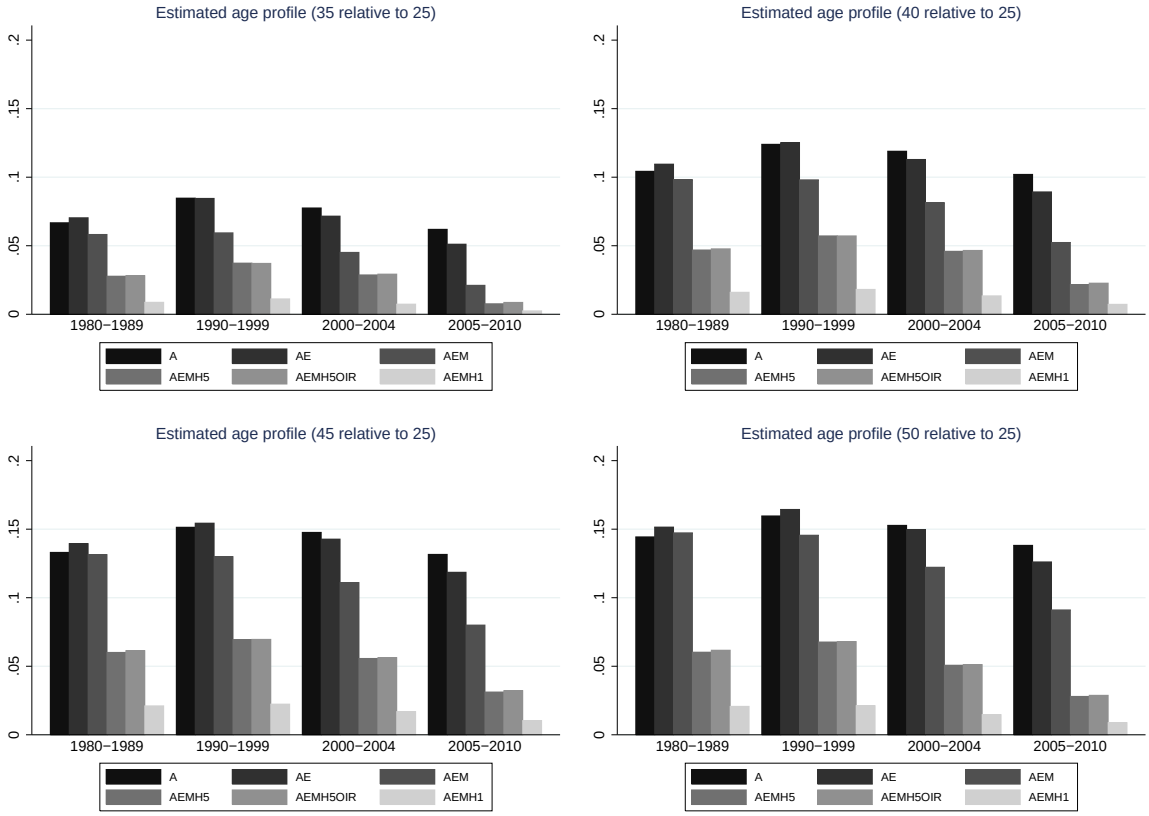
Note: The outcome measure is one for nonemployed or being marginally employed and zero otherwise. All dashed lines refer to the counterfactual outcome measure in year t conditional on fixing the composition of the population as in the respective basis year with respect to different sets of characteristics. A: Age; E: Education; M: Motherhood; H5: Employment history in $t-5$; IOR: Industry, Occupation, Region as in $t-5$.

Figure 5: Decomposition results for PTL share



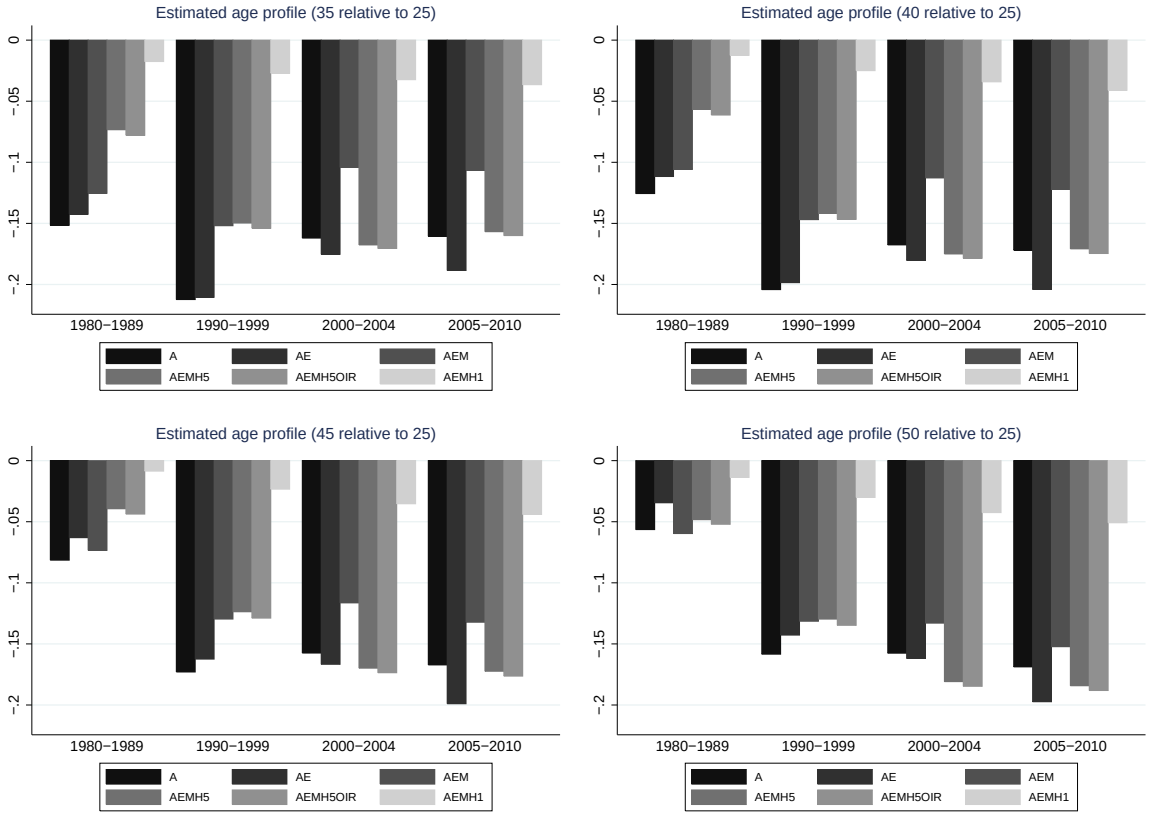
Note: The outcome measure is one for large part-time work conditional on employment and is zero for full-time work. All dashed lines refer to the counterfactual outcome measure in year t conditional on fixing the composition of the population as in the respective basis year with respect to different sets of characteristics. A: Age; E: Education; M: Motherhood; H5: Employment history in $t-5$; IOR: Industry, Occupation, Region as in $t-5$.

Figure 6: Estimated age related differences: PTL rate



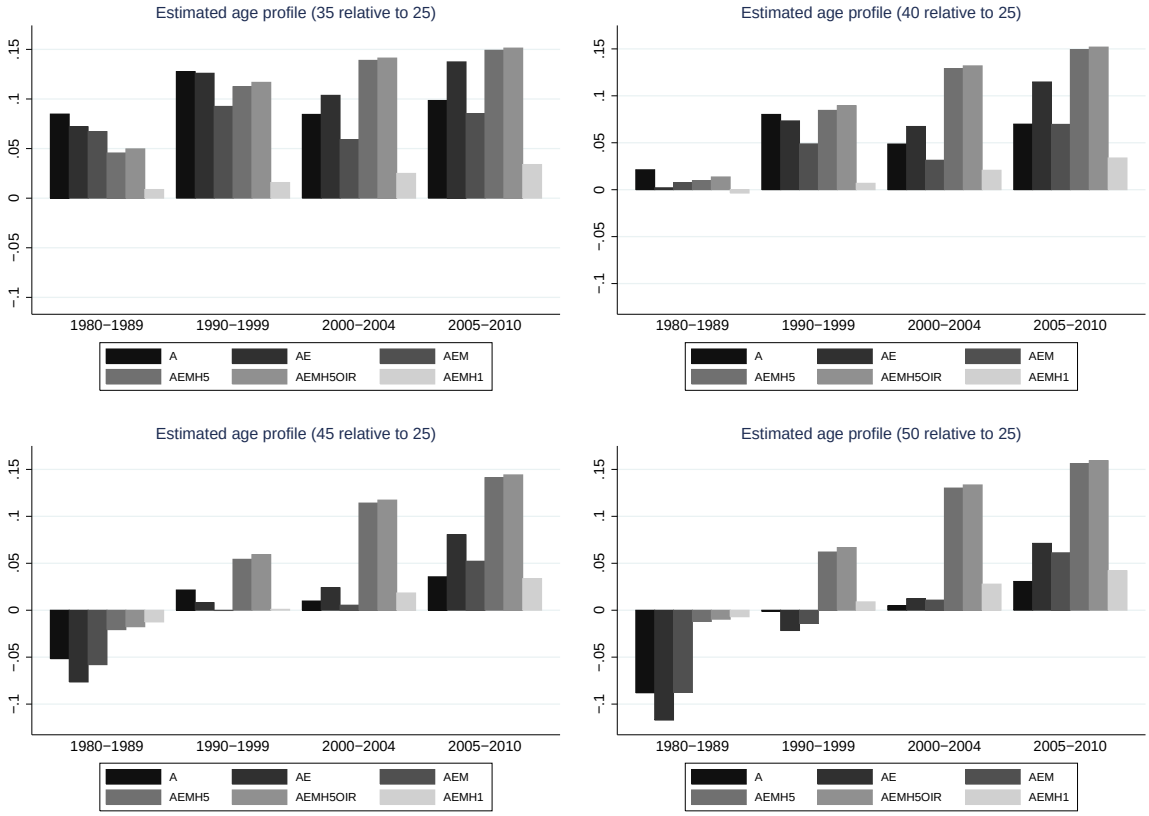
Note: The outcome measure is one for large part-time work and zero otherwise. The bars correspond to the estimated PTL rate of a specific age group relative to the PTL rate of women aged 25. The colours refer to relative employment rates estimated on the basis of different sets of characteristics. A: Age; E: Education; M: Motherhood; H5: Employment history in $t-5$; IOR: Industry, Occupation, Region as in $t-5$; H1: Employment history in $t-1$.

Figure 7: Estimated age related differences: FT rate



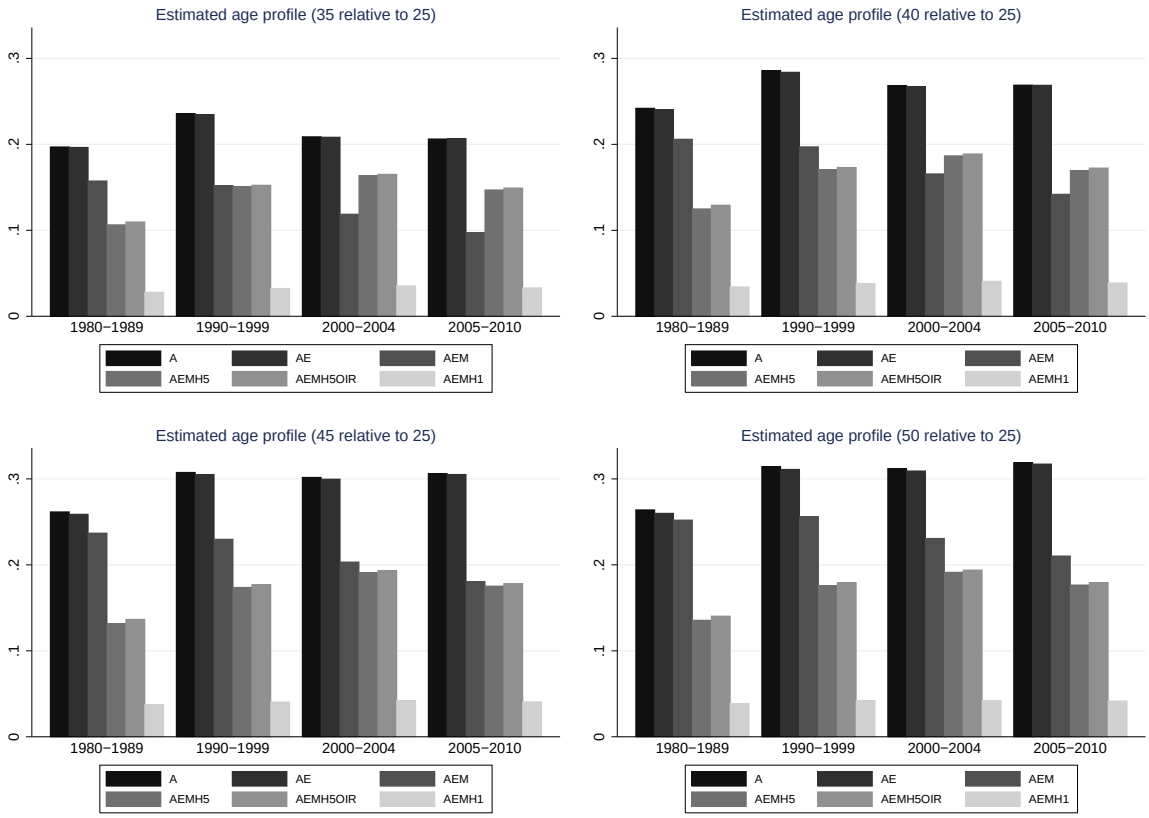
Note: The outcome measure is one for full-time work and zero otherwise. The bars correspond to the estimated FT rate of a specific age group relative to the FT rate of women aged 25. The colours refer to relative employment rates estimated on the basis of different sets of characteristics. A: Age; E: Education; M: Motherhood; H5: Employment history in $t-5$; IOR: Industry, Occupation, Region as in $t-5$; H1: Employment history in $t-1$.

Figure 8: Estimated age related differences: NE-PTS rate



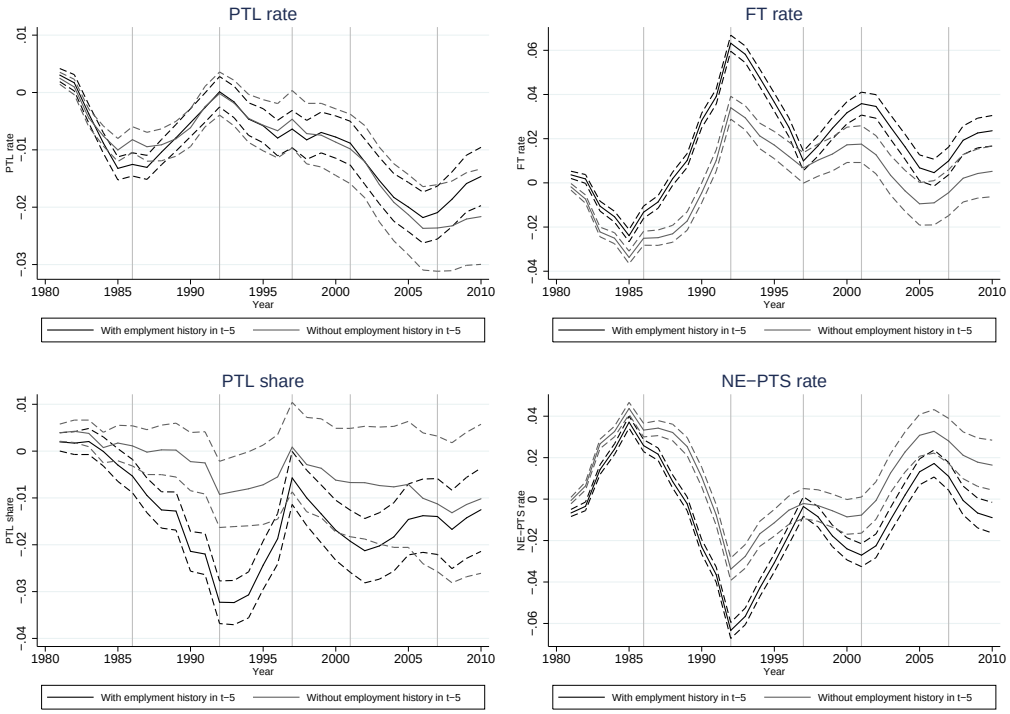
Note: The outcome measure is one for nonemployed or being marginally employed and zero otherwise. The bars correspond to the estimated NE-PTS rate of a specific age group relative to the NE-PTS rate of women aged 25. The colours refer to relative employment rates estimated on the basis of different sets of characteristics. A: Age; E: Education; M: Motherhood; H5: Employment history in $t-5$; IOR: Industry, Occupation, Region as in $t-5$; H1: Employment history in $t-1$.

Figure 9: Estimated age related differences: PTL share



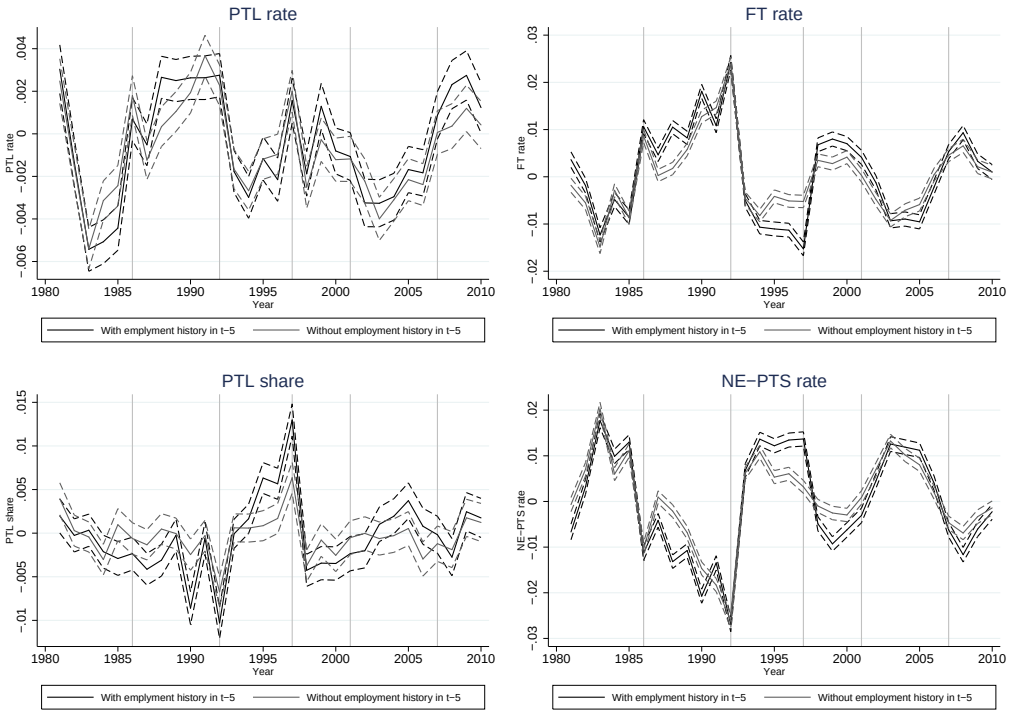
Note: The outcome measure is one for large part-time work conditional on employment and is zero for full-time work. The bars correspond to the estimated PTL share of a specific age group relative to the PTL share of women aged 25. The colours refer to relative employment rates estimated on the basis of different sets of characteristics. A: Age; E: Education; M: Motherhood; H5: Employment history in $t-5$; IOR: Industry, Occupation, Region as in $t-5$; H1: Employment history in $t-1$.

Figure 10: Regression Estimates of Calendar Year Effects for Employment Outcomes



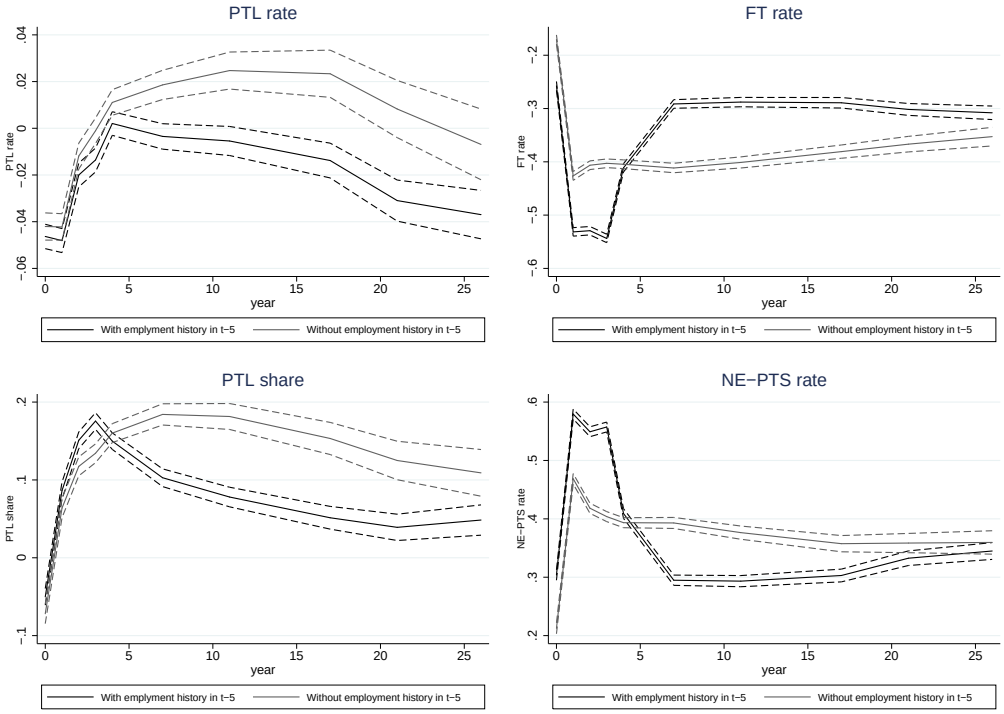
Note: These graphs shows the evolution of the estimated year dummies in the regressions (equation (4)) for the four employment outcomes over time: PTL rate, FT rate, PTL share and NE-PTS share (see main text for explanation). The solid lines refer to the regression estimates and the dashed lines refer to the 95% confidence intervals around. The black lines refer to the regression not controlling for employment history. The gray-coloured lines refer the regression controlling for employment history five years ago (in year $t-5$). The sample includes only women aged 25-59.

Figure 11: Regression Estimates of Annual Changes by Calendar Year



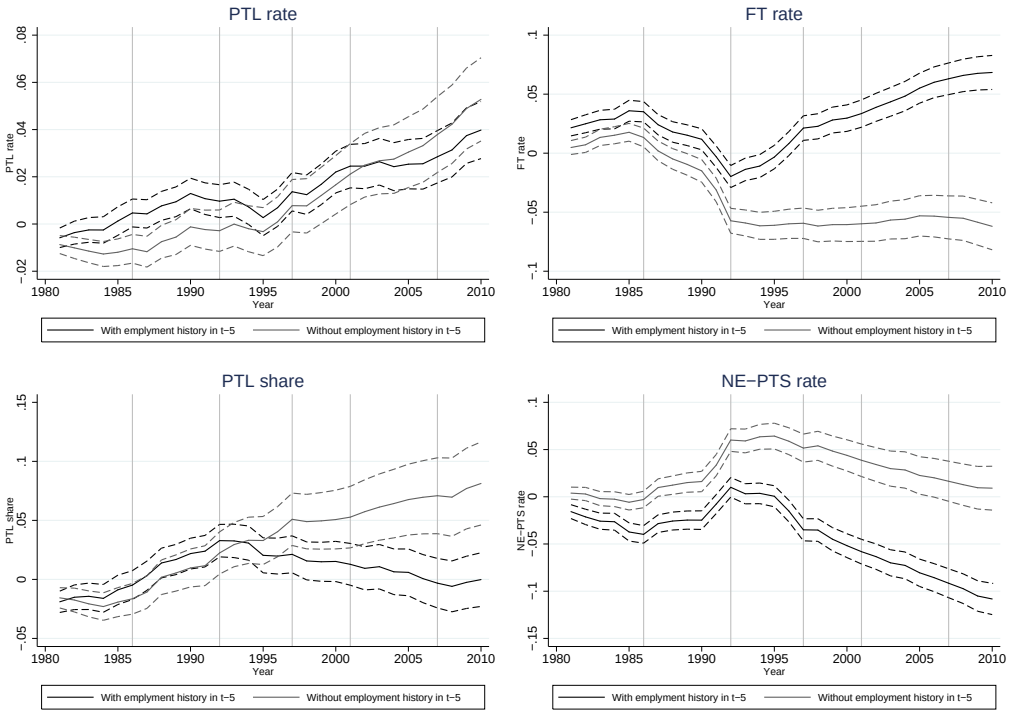
Note: These graphs shows the evolution of the annual change of the estimated year effects, i.e. the first differences of the numbers displayed in Figure 10, in the regressions (equation (4)) for the four employment outcomes (see main text for explanation). See Figure 10 for further explanations.

Figure 12: Regression Estimates of Employment Effects for Mothers by Time after First Birth



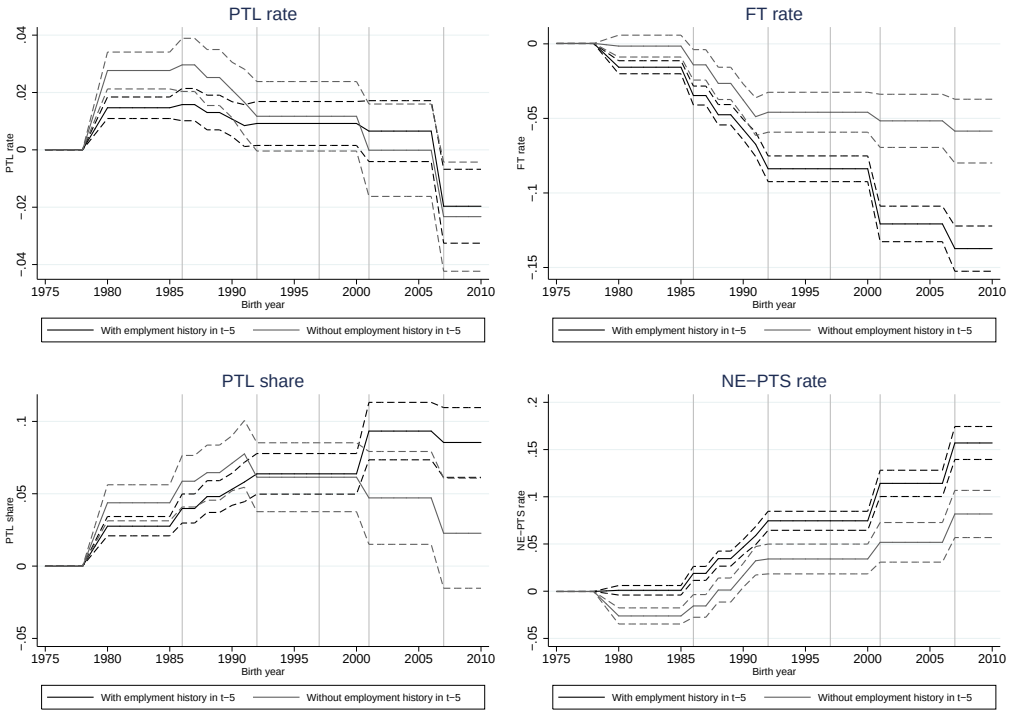
Note: These graphs shows the evolution of the estimated interaction effects between time since first birth for mothers in the regressions (equation (4)) for the four employment outcomes (see main text for explanation). See Figure 10 for further explanations.

Figure 13: Regression Estimates of Interaction Calendar Years with Motherhood



Note: These graphs shows the evolution of the estimated interaction effects between calendar year dummies and the motherhood dummy in the regressions (equation (4)) for the four employment outcomes (see main text for explanation). See Figure 10 for further explanations.

Figure 14: Regression Estimates of Interaction Birthyear of First Child with Motherhood



Note: These graphs shows the evolution of the estimated effect of the birth year of the first child for mothers in the regressions (equation (4)) for the four employment outcomes (see main text for explanation). The birth year effect combines the predicted values from a quadratic term in birth year and separate persistent reform dummies for the years 79, 86, 88, 89, 90, 92, 01, and 07. See Figure 10 for further explanations.

A Appendix

A.1 Summary statistics

Table A1: Summary statistics for selected years

Variable	1980		1990		2000		2010	
	Mean	St.dev	Mean	St.dev	Mean	St.dev	Mean	St.dev
Outcome measures								
PTL rate	12.33	(32.88)	12.69	(33.29)	14.71	(35.42)	16.66	(37.27)
FT rate	38.72	(48.71)	34.00	(47.37)	32.05	(46.67)	29.06	(45.41)
NE-PTS rate	48.95	(49.99)	53.30	(49.89)	53.24	(49.90)	54.27	(49.82)
PTL share	24.15	(42.80)	27.18	(44.49)	31.46	(46.44)	36.44	(48.13)
Age and highest level of education								
Mean age	39.07	(9.72)	39.33	(9.80)	41.28	(9.33)	43.42	(9.61)
25-29 years old	20.98	(40.71)	20.27	(40.20)	11.18	(31.51)	11.39	(31.77)
30-34 years old	17.47	(37.97)	18.27	(38.64)	16.75	(37.34)	10.80	(31.04)
35-39 years old	15.85	(36.52)	15.80	(36.47)	18.39	(38.74)	11.26	(31.62)
40-44 years old	16.64	(37.24)	13.16	(33.80)	16.57	(37.18)	16.88	(37.45)
45-49 years old	10.68	(30.88)	11.94	(32.42)	14.33	(35.04)	18.53	(38.85)
50-54 years old	9.39	(29.17)	12.53	(33.11)	11.94	(32.42)	16.70	(37.29)
55-59 years old	8.99	(28.60)	8.04	(27.19)	10.83	(31.08)	14.44	(35.15)
No voc. training degree	36.04	(48.01)	30.91	(46.21)	26.32	(44.03)	25.20	(43.42)
Voc. Training degree	52.49	(49.94)	57.65	(49.41)	61.55	(48.65)	60.13	(48.96)
Uni/college degree	3.15	(17.48)	4.24	(20.15)	5.23	(22.26)	6.19	(24.10)
Education unknown	8.31	(27.60)	7.20	(25.85)	6.90	(25.35)	8.48	(27.86)
Motherhood and age of the child								
At least one child	10.16	(30.22)	25.60	(43.64)	38.74	(48.72)	46.63	(49.89)
Giving birth to a child	1.60	(12.53)	1.55	(12.35)	1.23	(11.01)	0.92	(9.54)
Share of women with a child								
· · · 1-5 years old	8.60	(27.99)	7.96	(27.07)	7.41	(26.19)	5.70	(23.18)
· · · 6-10 years old			8.61	(28.05)	8.99	(28.60)	6.70	(25.01)
· · · 11-16 years old			7.48	(26.30)	7.79	(26.80)	7.71	(26.68)
· · · 16-20 years old					7.39	(26.16)	8.68	(28.16)
· · · older than 20 years					7.51	(26.36)	18.67	(38.97)
Employment history (t-5)								
PTL	9.35	(29.11)	9.43	(29.22)	11.61	(32.04)	13.90	(34.59)
FT	43.54	(49.58)	34.64	(47.58)	34.50	(47.54)	29.52	(45.61)

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Table A1 – <continued from previous page>

Variable	1980		1990		2000		2010	
	Mean	St.dev	Mean	St.dev	Mean	St.dev	Mean	St.dev
NE-PTS	47.12	(49.92)	55.93	(49.65)	53.89	(49.85)	56.58	(49.56)
Employment history (t-1)								
PTL	11.45	(31.84)	11.94	(32.43)	14.23	(34.94)	16.22	(36.87)
FT	39.72	(48.93)	33.87	(47.32)	32.32	(46.77)	29.85	(45.76)
NE-PTS	48.83	(49.97)	54.19	(49.82)	53.45	(49.88)	53.93	(49.85)
Industry								
Agricult., mining and quarrying	0.33	(5.75)	0.31	(5.54)	0.47	(6.83)	0.50	(7.09)
Production of plastic products	0.96	(9.74)	0.78	(8.80)	0.76	(8.70)	0.56	(7.44)
Chemical industry	1.06	(10.23)	0.90	(9.43)	0.76	(8.69)	0.71	(8.42)
Metal production	2.78	(16.44)	2.22	(14.74)	2.04	(14.14)	1.76	(13.18)
Automobiles, data processing	3.43	(18.21)	2.98	(17.00)	2.34	(15.11)	2.06	(14.21)
Consumer goods	7.26	(25.95)	4.94	(21.68)	4.48	(20.69)	3.39	(18.09)
Hospitality	1.32	(11.42)	1.28	(1.25)	2.01	(14.03)	2.18	(14.60)
Construction	1.32	(11.42)	1.13	(10.56)	1.37	(11.63)	1.11	(10.48)
Trade and commercial	11.36	(31.73)	9.71	(29.61)	12.15	(32.67)	10.90	(31.16)
Transport and communication	1.79	(13.25)	1.76	(13.16)	2.05	(14.17)	2.11	(14.36)
Credit, Insurance, rentals	6.05	(23.84)	6.58	(24.79)	10.61	(30.79)	11.55	(31.96)
Public and personal services	2.99	(17.04)	2.93	(16.86)	4.14	(19.92)	4.63	(21.00)
Education, social/health care	8.63	(18.09)	10.06	(30.08)	14.29	(34.99)	16.48	(37.10)
Public admin., social security	5.04	(21.87)	4.51	(20.74)	4.53	(20.80)	4.53	(20.79)
Missing or in NE-PTS	45.68	(49.81)	49.91	(50.00)	38.00	(48.54)	37.51	(48.42)
Occupation								
Manufacturing	9.68	(29.57)	6.96	(25.44)	5.69	(23.17)	4.42	(20.55)
Technicans	1.00	(9.95)	1.27	(11.20)	1.58	(12.47)	1.58	(12.47)
Merchants	8.36	(27.67)	7.80	(26.81)	10.05	(30.07)	9.35	(29.11)
Transport	2.14	(14.48)	2.03	(14.11)	2.65	(16.06)	2.69	(16.17)
Organization, adminstr., office	18.36	(38.72)	17.01	(37.58)	19.79	(39.84)	19.19	(39.38)
Health, social care, education	6.29	(24.28)	8.20	(27.44)	12.10	(32.61)	14.97	(35.68)
General services	7.06	(25.62)	5.46	(22.72)	7.56	(26.44)	7.33	(26.06)
Others	1.49	(12.11)	1.39	(11.73)	2.23	(14.75)	2.54	(15.74)
Missing or in NE-PTS	45.62	(49.81)	49.87	(50.00)	38.35	(48.62)	37.94	(48.52)

Note: Mean values refer to percentage shares, if not otherwise stated.

Table A2: Estimated coefficients for the regressions in Section 4.3 - I

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
age25	0.0037***	-0.0122***	0.0085***	0.0170***
	(0.0002)	(0.0003)	(0.0003)	(0.0004)
age252	0.0004***	0.0012***	-0.0016***	-0.0005***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
age253	-0.0000***	-0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
BIL1	-0.0088***	-0.0697***	0.0785***	0.0206***
	(0.0009)	(0.0013)	(0.0013)	(0.0018)
BIL3	-0.0309***	-0.1132***	0.1441***	0.0030
	(0.0015)	(0.0024)	(0.0026)	(0.0034)
BIL4	-0.0925***	-0.3152***	0.4078***	0.0556***
	(0.0011)	(0.0016)	(0.0018)	(0.0058)
coh20	0.0132**	0.1945***	-0.2076***	-0.0789***
	(0.0047)	(0.0064)	(0.0066)	(0.0088)
coh30	0.0219***	0.0683***	-0.0902***	0.0058
	(0.0032)	(0.0043)	(0.0045)	(0.0062)
coh40	0.0101***	0.0107***	-0.0208***	0.0240***
	(0.0019)	(0.0026)	(0.0028)	(0.0038)
coh60	0.0017	0.0242***	-0.0258***	-0.0092**
	(0.0017)	(0.0024)	(0.0026)	(0.0033)
coh70	0.0201***	0.0730***	-0.0930***	-0.0052
	(0.0028)	(0.0040)	(0.0042)	(0.0054)
coh80	0.0669***	0.1210***	-0.1879***	0.0445***
	(0.0040)	(0.0057)	(0.0059)	(0.0076)
dt1981	0.0025***	-0.0018*	-0.0007	0.0039***
	(0.0005)	(0.0008)	(0.0008)	(0.0009)
dt1982	0.0010	-0.0073***	0.0064***	0.0042***
	(0.0007)	(0.0010)	(0.0010)	(0.0012)
dt1983	-0.0044***	-0.0222***	0.0266***	0.0038**
	(0.0008)	(0.0011)	(0.0012)	(0.0015)
dt1984	-0.0076***	-0.0251***	0.0326***	0.0008
	(0.0009)	(0.0013)	(0.0013)	(0.0017)
dt1985	-0.0100***	-0.0337***	0.0438***	0.0017
	(0.0010)	(0.0014)	(0.0015)	(0.0019)
dt1986	-0.0082***	-0.0251***	0.0333***	0.0011

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Table A2 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0012)	(0.0016)	(0.0017)	(0.0022)
dt1987	-0.0095***	-0.0248***	0.0343***	-0.0002
	(0.0013)	(0.0018)	(0.0018)	(0.0024)
dt1988	-0.0091***	-0.0230***	0.0322***	0.0003
	(0.0014)	(0.0020)	(0.0020)	(0.0027)
dt1989	-0.0081***	-0.0173***	0.0253***	0.0002
	(0.0016)	(0.0021)	(0.0022)	(0.0029)
dt1990	-0.0061***	-0.0045*	0.0107***	-0.0022
	(0.0017)	(0.0023)	(0.0024)	(0.0032)
dt1991	-0.0025	0.0101***	-0.0077**	-0.0025
	(0.0018)	(0.0025)	(0.0026)	(0.0034)
dt1992	-0.0002	0.0340***	-0.0338***	-0.0092*
	(0.0019)	(0.0026)	(0.0028)	(0.0036)
dt1993	-0.0018	0.0295***	-0.0276***	-0.0086*
	(0.0020)	(0.0028)	(0.0029)	(0.0038)
dt1994	-0.0045*	0.0212***	-0.0167***	-0.0080*
	(0.0021)	(0.0029)	(0.0031)	(0.0040)
dt1995	-0.0057*	0.0171***	-0.0114***	-0.0072
	(0.0023)	(0.0031)	(0.0033)	(0.0043)
dt1996	-0.0067**	0.0120***	-0.0053	-0.0055
	(0.0024)	(0.0033)	(0.0035)	(0.0046)
dt1997	-0.0047	0.0068	-0.0021	0.0009
	(0.0026)	(0.0035)	(0.0037)	(0.0049)
dt1998	-0.0072**	0.0103**	-0.0031	-0.0029
	(0.0027)	(0.0037)	(0.0039)	(0.0051)
dt1999	-0.0074**	0.0131***	-0.0056	-0.0037
	(0.0028)	(0.0039)	(0.0041)	(0.0054)
dt2000	-0.0087**	0.0172***	-0.0086*	-0.0062
	(0.0030)	(0.0041)	(0.0043)	(0.0056)
dt2001	-0.0098**	0.0175***	-0.0077	-0.0067
	(0.0031)	(0.0042)	(0.0044)	(0.0059)
dt2002	-0.0121***	0.0127**	-0.0007	-0.0067
	(0.0032)	(0.0044)	(0.0046)	(0.0061)
dt2003	-0.0160***	0.0035	0.0126**	-0.0074
	(0.0033)	(0.0046)	(0.0048)	(0.0064)
dt2004	-0.0191***	-0.0036	0.0228***	-0.0076

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Table A2 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0034)	(0.0047)	(0.0049)	(0.0066)
dt2005	-0.0213***	-0.0095	0.0308***	-0.0071
	(0.0036)	(0.0049)	(0.0051)	(0.0069)
dt2006	-0.0237***	-0.0090	0.0327***	-0.0101
	(0.0037)	(0.0051)	(0.0054)	(0.0071)
dt2007	-0.0236***	-0.0044	0.0281***	-0.0113
	(0.0039)	(0.0053)	(0.0056)	(0.0074)
dt2008	-0.0233***	0.0021	0.0211***	-0.0132
	(0.0040)	(0.0055)	(0.0058)	(0.0076)
dt2009	-0.0221***	0.0042	0.0178**	-0.0114
	(0.0041)	(0.0057)	(0.0060)	(0.0079)
dt2010	-0.0216***	0.0052	0.0164**	-0.0102
	(0.0042)	(0.0058)	(0.0061)	(0.0081)
mdj1981	-0.0087***	0.0048	0.0039	-0.0156***
	(0.0019)	(0.0030)	(0.0032)	(0.0044)
mdj1982	-0.0101***	0.0071*	0.0030	-0.0174***
	(0.0023)	(0.0033)	(0.0036)	(0.0051)
mdj1983	-0.0115***	0.0134***	-0.0019	-0.0207***
	(0.0025)	(0.0035)	(0.0038)	(0.0056)
mdj1984	-0.0127***	0.0152***	-0.0025	-0.0230***
	(0.0027)	(0.0037)	(0.0040)	(0.0059)
mdj1985	-0.0119***	0.0177***	-0.0058	-0.0192**
	(0.0029)	(0.0038)	(0.0042)	(0.0063)
mdj1986	-0.0105***	0.0134***	-0.0029	-0.0164*
	(0.0031)	(0.0041)	(0.0044)	(0.0066)
mdj1987	-0.0117***	0.0019	0.0098*	-0.0107
	(0.0033)	(0.0043)	(0.0047)	(0.0071)
mdj1988	-0.0075*	-0.0049	0.0123*	0.0019
	(0.0036)	(0.0045)	(0.0050)	(0.0075)
mdj1989	-0.0055	-0.0095*	0.0150**	0.0055
	(0.0038)	(0.0047)	(0.0052)	(0.0078)
mdj1990	-0.0012	-0.0150**	0.0162**	0.0097
	(0.0040)	(0.0049)	(0.0055)	(0.0082)
mdj1991	-0.0024	-0.0312***	0.0335***	0.0116
	(0.0042)	(0.0051)	(0.0058)	(0.0086)
mdj1992	-0.0028	-0.0572***	0.0601***	0.0224*

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Table A2 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0045)	(0.0054)	(0.0061)	(0.0091)
mdj1993	-0.0000	-0.0591***	0.0591***	0.0295**
	(0.0047)	(0.0056)	(0.0064)	(0.0096)
mdj1994	-0.0020	-0.0615***	0.0635***	0.0331***
	(0.0050)	(0.0058)	(0.0067)	(0.0100)
mdj1995	-0.0032	-0.0611***	0.0643***	0.0330**
	(0.0052)	(0.0061)	(0.0070)	(0.0104)
mdj1996	0.0010	-0.0598***	0.0589***	0.0405***
	(0.0054)	(0.0063)	(0.0073)	(0.0108)
mdj1997	0.0078	-0.0593***	0.0516***	0.0509***
	(0.0057)	(0.0066)	(0.0076)	(0.0113)
mdj1998	0.0077	-0.0617***	0.0540***	0.0490***
	(0.0059)	(0.0068)	(0.0078)	(0.0118)
mdj1999	0.0121*	-0.0605***	0.0484***	0.0496***
	(0.0061)	(0.0071)	(0.0081)	(0.0122)
mdj2000	0.0166**	-0.0605***	0.0439***	0.0507***
	(0.0063)	(0.0073)	(0.0084)	(0.0127)
mdj2001	0.0211**	-0.0598***	0.0387***	0.0528***
	(0.0066)	(0.0076)	(0.0088)	(0.0133)
mdj2002	0.0249***	-0.0591***	0.0342***	0.0574***
	(0.0069)	(0.0079)	(0.0091)	(0.0138)
mdj2003	0.0268***	-0.0566***	0.0298**	0.0613***
	(0.0072)	(0.0082)	(0.0095)	(0.0143)
mdj2004	0.0275***	-0.0559***	0.0284**	0.0643***
	(0.0074)	(0.0084)	(0.0098)	(0.0148)
mdj2005	0.0305***	-0.0531***	0.0226*	0.0676***
	(0.0076)	(0.0087)	(0.0101)	(0.0153)
mdj2006	0.0332***	-0.0533***	0.0201	0.0696***
	(0.0079)	(0.0090)	(0.0104)	(0.0158)
mdj2007	0.0379***	-0.0544***	0.0165	0.0709***
	(0.0082)	(0.0093)	(0.0108)	(0.0164)
mdj2008	0.0422***	-0.0551***	0.0129	0.0697***
	(0.0085)	(0.0096)	(0.0112)	(0.0169)
mdj2009	0.0489***	-0.0585***	0.0096	0.0770***
	(0.0087)	(0.0099)	(0.0115)	(0.0174)
mdj2010	0.0528***	-0.0619***	0.0091	0.0813***

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Table A2 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0090)	(0.0102)	(0.0118)	(0.0179)
mdba0	-0.0420***	-0.1704***	0.2125***	-0.0719***
	(0.0030)	(0.0044)	(0.0048)	(0.0065)
mdba1	-0.0422***	-0.4264***	0.4686***	0.0639***
	(0.0029)	(0.0042)	(0.0045)	(0.0063)
mdba2	-0.0119***	-0.4063***	0.4182***	0.1174***
	(0.0028)	(0.0042)	(0.0044)	(0.0062)
mdba3	-0.0011	-0.4028***	0.4038***	0.1342***
	(0.0028)	(0.0041)	(0.0044)	(0.0061)
mdba4	0.0111***	-0.4045***	0.3935***	0.1601***
	(0.0028)	(0.0042)	(0.0044)	(0.0062)
mdba7	0.0186***	-0.4116***	0.3930***	0.1842***
	(0.0032)	(0.0045)	(0.0048)	(0.0070)
mdba11	0.0247***	-0.4011***	0.3764***	0.1815***
	(0.0040)	(0.0053)	(0.0058)	(0.0085)
mdba17	0.0234***	-0.3808***	0.3575***	0.1533***
	(0.0052)	(0.0064)	(0.0071)	(0.0105)
mdba21	0.0083	-0.3668***	0.3585***	0.1250***
	(0.0062)	(0.0074)	(0.0084)	(0.0126)
mdba26	-0.0069	-0.3527***	0.3596***	0.1091***
	(0.0077)	(0.0089)	(0.0102)	(0.0153)
mdba31	-0.0150	-0.3448***	0.3597***	0.1184***
	(0.0092)	(0.0103)	(0.0120)	(0.0183)
bjahr2	0.0000***	0.0000***	-0.0000***	-0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
mdbj1986	0.0020	-0.0126**	0.0106*	0.0149*
	(0.0036)	(0.0039)	(0.0046)	(0.0068)
mdbj1988	-0.0044	-0.0124**	0.0168***	0.0059
	(0.0040)	(0.0043)	(0.0051)	(0.0077)
mdbj1992	-0.0049	0.0030	0.0019	-0.0161*
	(0.0039)	(0.0041)	(0.0050)	(0.0080)
mdbj2001	-0.0118***	-0.0058	0.0176***	-0.0143*
	(0.0031)	(0.0035)	(0.0041)	(0.0066)
mdbj2007	-0.0232***	-0.0069	0.0300***	-0.0244***
	(0.0033)	(0.0043)	(0.0046)	(0.0072)
mdbj1979	0.0277***	-0.0018	-0.0258***	0.0438***

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Table A2 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0033)	(0.0037)	(0.0044)	(0.0064)
mdbj1990	-0.0087	-0.0223***	0.0310***	0.0130
	(0.0047)	(0.0049)	(0.0060)	(0.0095)
cons	0.0409***	0.3897***	0.5695***	0.0831***
	(0.0012)	(0.0019)	(0.0019)	(0.0023)
N	7842143	7842143	7842143	3634919
Cluster size	420784	420784	420784	339448

Note: See section 4.3 equation (4) for further details. Clustered standard errors in parentheses. Regressions without labor market history.

Table A3: Estimated coefficients for the regressions in Section 4.3 - II

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
age25	0.0026***	-0.0160***	0.0134***	0.0211***
	(0.0002)	(0.0002)	(0.0003)	(0.0003)
age252	0.0002***	0.0014***	-0.0016***	-0.0010***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
age253	-0.0000***	-0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
BIL1	-0.0061***	-0.0271***	0.0332***	0.0036***
	(0.0005)	(0.0007)	(0.0008)	(0.0010)
BIL3	-0.0179***	-0.0198***	0.0377***	-0.0334***
	(0.0009)	(0.0015)	(0.0016)	(0.0020)
BIL4	-0.0533***	-0.1497***	0.2030***	0.0184***
	(0.0007)	(0.0010)	(0.0011)	(0.0031)
coh20	0.0144***	0.1206***	-0.1350***	-0.0507***
	(0.0028)	(0.0038)	(0.0041)	(0.0047)
coh30	0.0130***	0.0531***	-0.0661***	-0.0085**
	(0.0018)	(0.0024)	(0.0026)	(0.0032)
coh40	0.0039***	0.0209***	-0.0249***	-0.0020
	(0.0011)	(0.0015)	(0.0016)	(0.0020)
coh60	0.0014	0.0084***	-0.0098***	-0.0015
	(0.0010)	(0.0014)	(0.0015)	(0.0018)
coh70	0.0125***	0.0550***	-0.0675***	-0.0129***
	(0.0017)	(0.0024)	(0.0026)	(0.0030)
coh80	0.0455***	0.1464***	-0.1919***	-0.0188***
	(0.0025)	(0.0037)	(0.0039)	(0.0045)
dt1981	0.0030***	0.0036***	-0.0067***	0.0020*
	(0.0006)	(0.0008)	(0.0009)	(0.0010)
dt1982	0.0017*	0.0018	-0.0035**	0.0017
	(0.0007)	(0.0010)	(0.0011)	(0.0012)
dt1983	-0.0037***	-0.0105***	0.0143***	0.0021
	(0.0008)	(0.0011)	(0.0012)	(0.0014)
dt1984	-0.0088***	-0.0153***	0.0241***	-0.0001
	(0.0009)	(0.0013)	(0.0013)	(0.0016)
dt1985	-0.0132***	-0.0239***	0.0371***	-0.0030
	(0.0010)	(0.0014)	(0.0015)	(0.0018)
dt1986	-0.0125***	-0.0133***	0.0258***	-0.0053**

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Table A3 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0010)	(0.0014)	(0.0015)	(0.0018)
dt1987	-0.0131***	-0.0086***	0.0217***	-0.0095***
	(0.0011)	(0.0015)	(0.0015)	(0.0019)
dt1988	-0.0104***	0.0019	0.0085***	-0.0126***
	(0.0011)	(0.0015)	(0.0016)	(0.0020)
dt1989	-0.0079***	0.0101***	-0.0022	-0.0128***
	(0.0012)	(0.0016)	(0.0017)	(0.0021)
dt1990	-0.0053***	0.0283***	-0.0230***	-0.0214***
	(0.0012)	(0.0017)	(0.0018)	(0.0022)
dt1991	-0.0026*	0.0391***	-0.0364***	-0.0220***
	(0.0013)	(0.0018)	(0.0019)	(0.0022)
dt1992	0.0001	0.0632***	-0.0634***	-0.0323***
	(0.0014)	(0.0019)	(0.0020)	(0.0023)
dt1993	-0.0016	0.0582***	-0.0566***	-0.0323***
	(0.0014)	(0.0019)	(0.0020)	(0.0024)
dt1994	-0.0046**	0.0475***	-0.0429***	-0.0307***
	(0.0014)	(0.0020)	(0.0021)	(0.0025)
dt1995	-0.0058***	0.0365***	-0.0307***	-0.0244***
	(0.0015)	(0.0021)	(0.0022)	(0.0026)
dt1996	-0.0079***	0.0252***	-0.0173***	-0.0187***
	(0.0016)	(0.0022)	(0.0023)	(0.0028)
dt1997	-0.0064***	0.0099***	-0.0036	-0.0057*
	(0.0017)	(0.0023)	(0.0024)	(0.0029)
dt1998	-0.0083***	0.0167***	-0.0085***	-0.0100***
	(0.0017)	(0.0024)	(0.0025)	(0.0030)
dt1999	-0.0070***	0.0247***	-0.0178***	-0.0134***
	(0.0018)	(0.0025)	(0.0026)	(0.0032)
dt2000	-0.0078***	0.0317***	-0.0240***	-0.0169***
	(0.0019)	(0.0026)	(0.0027)	(0.0033)
dt2001	-0.0088***	0.0359***	-0.0270***	-0.0192***
	(0.0019)	(0.0026)	(0.0028)	(0.0034)
dt2002	-0.0121***	0.0346***	-0.0225***	-0.0213***
	(0.0020)	(0.0027)	(0.0029)	(0.0035)
dt2003	-0.0153***	0.0253***	-0.0099***	-0.0203***
	(0.0021)	(0.0028)	(0.0030)	(0.0036)
dt2004	-0.0183***	0.0163***	0.0020	-0.0183***

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Table A3 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0021)	(0.0029)	(0.0031)	(0.0037)
dt2005	-0.0200***	0.0068*	0.0132***	-0.0146***
	(0.0022)	(0.0030)	(0.0032)	(0.0039)
dt2006	-0.0218***	0.0046	0.0172***	-0.0138***
	(0.0023)	(0.0031)	(0.0033)	(0.0040)
dt2007	-0.0209***	0.0099**	0.0110**	-0.0140***
	(0.0024)	(0.0032)	(0.0034)	(0.0041)
dt2008	-0.0186***	0.0193***	-0.0007	-0.0167***
	(0.0024)	(0.0033)	(0.0035)	(0.0043)
dt2009	-0.0159***	0.0226***	-0.0067	-0.0143**
	(0.0025)	(0.0034)	(0.0037)	(0.0044)
dt2010	-0.0146***	0.0236***	-0.0090*	-0.0125**
	(0.0026)	(0.0035)	(0.0038)	(0.0045)
mdj1981	-0.0058**	0.0215***	-0.0157***	-0.0190***
	(0.0021)	(0.0035)	(0.0037)	(0.0046)
mdj1982	-0.0036	0.0249***	-0.0213***	-0.0151**
	(0.0025)	(0.0039)	(0.0041)	(0.0053)
mdj1983	-0.0025	0.0283***	-0.0258***	-0.0143*
	(0.0027)	(0.0041)	(0.0044)	(0.0057)
mdj1984	-0.0025	0.0289***	-0.0264***	-0.0161**
	(0.0029)	(0.0042)	(0.0045)	(0.0060)
mdj1985	0.0013	0.0360***	-0.0372***	-0.0088
	(0.0031)	(0.0045)	(0.0049)	(0.0063)
mdj1986	0.0047	0.0351***	-0.0398***	-0.0048
	(0.0030)	(0.0044)	(0.0047)	(0.0062)
mdj1987	0.0043	0.0241***	-0.0284***	0.0032
	(0.0031)	(0.0044)	(0.0048)	(0.0063)
mdj1988	0.0077*	0.0180***	-0.0257***	0.0139*
	(0.0031)	(0.0044)	(0.0048)	(0.0064)
mdj1989	0.0094**	0.0152***	-0.0247***	0.0169**
	(0.0032)	(0.0045)	(0.0049)	(0.0065)
mdj1990	0.0129***	0.0118**	-0.0247***	0.0219***
	(0.0033)	(0.0046)	(0.0050)	(0.0066)
mdj1991	0.0107**	-0.0030	-0.0077	0.0239***
	(0.0034)	(0.0046)	(0.0051)	(0.0068)
mdj1992	0.0097**	-0.0197***	0.0101	0.0329***

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Table A3 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0035)	(0.0048)	(0.0053)	(0.0070)
mdj1993	0.0105**	-0.0137**	0.0032	0.0326***
	(0.0037)	(0.0049)	(0.0054)	(0.0072)
mdj1994	0.0073	-0.0109*	0.0036	0.0308***
	(0.0038)	(0.0050)	(0.0056)	(0.0074)
mdj1995	0.0027	-0.0033	0.0006	0.0204**
	(0.0039)	(0.0051)	(0.0057)	(0.0076)
mdj1996	0.0069	0.0082	-0.0151**	0.0198*
	(0.0040)	(0.0052)	(0.0058)	(0.0078)
mdj1997	0.0137***	0.0213***	-0.0350***	0.0213**
	(0.0042)	(0.0053)	(0.0060)	(0.0080)
mdj1998	0.0124**	0.0228***	-0.0352***	0.0157
	(0.0043)	(0.0054)	(0.0061)	(0.0082)
mdj1999	0.0168***	0.0281***	-0.0449***	0.0150
	(0.0044)	(0.0056)	(0.0063)	(0.0084)
mdj2000	0.0220***	0.0297***	-0.0517***	0.0152
	(0.0045)	(0.0057)	(0.0064)	(0.0087)
mdj2001	0.0245***	0.0336***	-0.0581***	0.0128
	(0.0047)	(0.0059)	(0.0067)	(0.0090)
mdj2002	0.0245***	0.0388***	-0.0634***	0.0094
	(0.0049)	(0.0061)	(0.0069)	(0.0093)
mdj2003	0.0264***	0.0435***	-0.0699***	0.0108
	(0.0050)	(0.0062)	(0.0071)	(0.0096)
mdj2004	0.0243***	0.0483***	-0.0726***	0.0065
	(0.0052)	(0.0064)	(0.0072)	(0.0099)
mdj2005	0.0254***	0.0551***	-0.0805***	0.0060
	(0.0053)	(0.0065)	(0.0074)	(0.0101)
mdj2006	0.0255***	0.0601***	-0.0856***	0.0007
	(0.0055)	(0.0066)	(0.0076)	(0.0104)
mdj2007	0.0285***	0.0630***	-0.0915***	-0.0032
	(0.0057)	(0.0068)	(0.0078)	(0.0107)
mdj2008	0.0314***	0.0659***	-0.0973***	-0.0059
	(0.0058)	(0.0070)	(0.0080)	(0.0110)
mdj2009	0.0374***	0.0676***	-0.1051***	-0.0025
	(0.0060)	(0.0072)	(0.0082)	(0.0113)
mdj2010	0.0398***	0.0684***	-0.1082***	-0.0002

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Table A3 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0062)	(0.0074)	(0.0084)	(0.0116)
mdba0	-0.0463***	-0.2574***	0.3038***	-0.0502***
	(0.0027)	(0.0042)	(0.0045)	(0.0054)
mdba1	-0.0481***	-0.5314***	0.5795***	0.0864***
	(0.0026)	(0.0041)	(0.0043)	(0.0055)
mdba2	-0.0200***	-0.5292***	0.5492***	0.1510***
	(0.0026)	(0.0040)	(0.0043)	(0.0054)
mdba3	-0.0136***	-0.5438***	0.5574***	0.1757***
	(0.0026)	(0.0040)	(0.0043)	(0.0054)
mdba4	0.0021	-0.4112***	0.4092***	0.1498***
	(0.0026)	(0.0040)	(0.0042)	(0.0054)
mdba7	-0.0035	-0.2914***	0.2949***	0.1028***
	(0.0028)	(0.0041)	(0.0045)	(0.0058)
mdba11	-0.0054	-0.2879***	0.2933***	0.0780***
	(0.0032)	(0.0045)	(0.0049)	(0.0064)
mdba17	-0.0138***	-0.2892***	0.3030***	0.0514***
	(0.0038)	(0.0050)	(0.0056)	(0.0074)
mdba21	-0.0309***	-0.3017***	0.3326***	0.0391***
	(0.0045)	(0.0057)	(0.0064)	(0.0086)
mdba26	-0.0370***	-0.3080***	0.3449***	0.0485***
	(0.0053)	(0.0065)	(0.0073)	(0.0099)
mdba31	-0.0401***	-0.3049***	0.3450***	0.0621***
	(0.0063)	(0.0074)	(0.0085)	(0.0117)
bjahr2	0.0000***	0.0000***	-0.0000***	-0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
mdbj1986	0.0011	-0.0190***	0.0179***	0.0122**
	(0.0022)	(0.0024)	(0.0028)	(0.0038)
mdbj1988	-0.0028	-0.0129***	0.0156***	0.0082
	(0.0024)	(0.0027)	(0.0031)	(0.0043)
mdbj1992	0.0007	-0.0164***	0.0157***	0.0056
	(0.0025)	(0.0027)	(0.0032)	(0.0047)
mdbj2001	-0.0027	-0.0370***	0.0396***	0.0295***
	(0.0024)	(0.0027)	(0.0031)	(0.0047)
mdbj2007	-0.0262***	-0.0166***	0.0428***	-0.0079
	(0.0030)	(0.0042)	(0.0045)	(0.0060)
mdbj1979	0.0147***	-0.0159***	0.0012	0.0276***

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Table A3 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0019)	(0.0022)	(0.0026)	(0.0034)
mdbj1990	-0.0046	-0.0198***	0.0244***	0.0101
	(0.0029)	(0.0031)	(0.0038)	(0.0055)
fworked20	-0.0633***	0.3009***	-0.2376***	-0.2589***
	(0.0109)	(0.0158)	(0.0152)	(0.0173)
fworked39	0.4729***	-0.2022***	-0.2707***	0.4189***
	(0.0110)	(0.0158)	(0.0152)	(0.0174)
fmocc2	-0.0127*	-0.0163	0.0290**	-0.0054
	(0.0063)	(0.0102)	(0.0099)	(0.0088)
fmocc3	-0.0106	0.0491	-0.0386	-0.0361
	(0.0136)	(0.0258)	(0.0241)	(0.0196)
fmocc4	0.0026	0.0816***	-0.0842***	-0.0251*
	(0.0078)	(0.0127)	(0.0118)	(0.0102)
fmocc5	-0.0088	0.0760***	-0.0672***	-0.0339***
	(0.0058)	(0.0092)	(0.0087)	(0.0079)
fmocc6	-0.0018	0.0775***	-0.0757***	-0.0243**
	(0.0060)	(0.0095)	(0.0090)	(0.0081)
fmocc7	-0.0146	0.0566***	-0.0420**	-0.0388**
	(0.0088)	(0.0163)	(0.0156)	(0.0119)
fmocc8	-0.0089	0.0668***	-0.0579***	-0.0313***
	(0.0060)	(0.0099)	(0.0094)	(0.0082)
fmocc9	-0.0167**	0.0508***	-0.0342***	-0.0308***
	(0.0059)	(0.0099)	(0.0094)	(0.0082)
fmocc10	-0.0020	0.0594***	-0.0574***	-0.0243**
	(0.0057)	(0.0090)	(0.0086)	(0.0078)
fmocc11	-0.0118*	0.0781***	-0.0663***	-0.0406***
	(0.0057)	(0.0092)	(0.0087)	(0.0079)
fmocc12	-0.0012	0.0305***	-0.0293***	-0.0093
	(0.0055)	(0.0086)	(0.0083)	(0.0076)
fmocc13	-0.0081	0.0668***	-0.0587***	-0.0234**
	(0.0055)	(0.0087)	(0.0082)	(0.0076)
fmocc14	-0.0281	0.0036	0.0245	-0.0164
	(0.0151)	(0.0234)	(0.0234)	(0.0191)
fmocc15	-0.0096	0.0680***	-0.0584***	-0.0276**
	(0.0079)	(0.0136)	(0.0132)	(0.0103)
fmocc16	0.0009	-0.0059	0.0050	-0.0135

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Table A3 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0123)	(0.0212)	(0.0204)	(0.0171)
fmocc17	-0.0083	0.0351*	-0.0268	-0.0236*
	(0.0082)	(0.0146)	(0.0140)	(0.0115)
fmocc18	-0.0001	0.0676***	-0.0675***	-0.0215**
	(0.0056)	(0.0087)	(0.0083)	(0.0077)
fmocc19	-0.0136*	0.0318**	-0.0182	-0.0261**
	(0.0061)	(0.0100)	(0.0097)	(0.0084)
fmocc20	-0.0215	0.1004***	-0.0788***	-0.0595***
	(0.0124)	(0.0232)	(0.0216)	(0.0167)
fmocc21	-0.0084	0.0862***	-0.0779***	-0.0304***
	(0.0066)	(0.0107)	(0.0101)	(0.0088)
fmocc22	0.0021	0.0798***	-0.0818***	-0.0168*
	(0.0055)	(0.0086)	(0.0082)	(0.0075)
fmocc23	0.0175***	0.0412***	-0.0588***	0.0156*
	(0.0052)	(0.0082)	(0.0078)	(0.0073)
fmocc24	0.0331***	0.0939***	-0.1271***	0.0101
	(0.0054)	(0.0085)	(0.0080)	(0.0075)
fmocc25	0.0004	0.0671***	-0.0675***	-0.0130
	(0.0054)	(0.0084)	(0.0081)	(0.0075)
fmocc26	0.0049	0.0967***	-0.1016***	-0.0208**
	(0.0051)	(0.0081)	(0.0077)	(0.0072)
fmocc27	0.0028	0.0430***	-0.0458***	-0.0147
	(0.0068)	(0.0100)	(0.0096)	(0.0088)
fmocc28	-0.0008	0.0682***	-0.0675***	-0.0228**
	(0.0060)	(0.0095)	(0.0090)	(0.0081)
fmocc29	-0.0104	0.0371***	-0.0267***	-0.0058
	(0.0053)	(0.0083)	(0.0079)	(0.0074)
fmocc30	-0.0123*	0.0448***	-0.0326***	-0.0033
	(0.0054)	(0.0083)	(0.0079)	(0.0074)
fmocc31	0.0177***	0.0183*	-0.0360***	0.0216**
	(0.0053)	(0.0082)	(0.0079)	(0.0073)
fwzw2	0.0057	0.0502***	-0.0559***	-0.0003
	(0.0073)	(0.0135)	(0.0126)	(0.0110)
fwzw3	0.0027	0.0750***	-0.0777***	-0.0100
	(0.0069)	(0.0128)	(0.0119)	(0.0105)
fwzw4	0.0079	0.0918***	-0.0997***	-0.0031

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Table A3 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0068)	(0.0127)	(0.0117)	(0.0104)
fwzw5	0.0032	0.0828***	-0.0860***	-0.0079
	(0.0066)	(0.0124)	(0.0114)	(0.0102)
fwzw6	0.0050	0.0820***	-0.0870***	-0.0052
	(0.0066)	(0.0123)	(0.0114)	(0.0102)
fwzw7	0.0017	0.0613***	-0.0630***	-0.0061
	(0.0066)	(0.0123)	(0.0114)	(0.0102)
fwzw8	-0.0152*	0.0191	-0.0040	-0.0176
	(0.0067)	(0.0125)	(0.0117)	(0.0104)
fwzw9	-0.0048	0.0490***	-0.0442***	-0.0112
	(0.0068)	(0.0126)	(0.0117)	(0.0104)
fwzw10	0.0148*	0.0343**	-0.0491***	0.0226*
	(0.0065)	(0.0122)	(0.0113)	(0.0101)
fwzw11	0.0171*	0.0245*	-0.0416***	0.0219*
	(0.0068)	(0.0125)	(0.0116)	(0.0103)
fwzw12	0.0039	0.0447***	-0.0486***	0.0071
	(0.0065)	(0.0122)	(0.0113)	(0.0101)
fwzw13	0.0160*	0.0479***	-0.0639***	0.0079
	(0.0066)	(0.0123)	(0.0114)	(0.0102)
fwzw14	0.0532***	0.0651***	-0.1183***	0.0332**
	(0.0066)	(0.0123)	(0.0114)	(0.0102)
fwzw15	0.0627***	0.0662***	-0.1289***	0.0419***
	(0.0066)	(0.0123)	(0.0113)	(0.0102)
fbl2	0.0307**	0.0777***	-0.1084***	0.0023
	(0.0104)	(0.0152)	(0.0146)	(0.0161)
fbl3	0.0250*	0.0936***	-0.1185***	-0.0089
	(0.0104)	(0.0153)	(0.0146)	(0.0161)
fbl4	0.0352***	0.0754***	-0.1106***	0.0070
	(0.0103)	(0.0151)	(0.0145)	(0.0160)
fbl5	0.0335**	0.0794***	-0.1129***	0.0036
	(0.0108)	(0.0156)	(0.0149)	(0.0164)
fbl6	0.0223*	0.0822***	-0.1045***	-0.0064
	(0.0103)	(0.0151)	(0.0144)	(0.0160)
fbl7	0.0356***	0.0837***	-0.1193***	0.0045
	(0.0103)	(0.0152)	(0.0145)	(0.0161)
fbl8	0.0361***	0.0752***	-0.1113***	0.0072

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Table A3 – <continued from previous page>

Variable	PTL rate	FT rate	NE-PTS rate	PTL share
	(0.0104)	(0.0152)	(0.0146)	(0.0161)
fbl9	0.0327**	0.0889***	-0.1216***	0.0004
	(0.0103)	(0.0151)	(0.0145)	(0.0160)
fbl10	0.0358***	0.0802***	-0.1160***	0.0073
	(0.0103)	(0.0151)	(0.0145)	(0.0160)
fbl11	0.0187	0.0893***	-0.1080***	-0.0134
	(0.0106)	(0.0156)	(0.0149)	(0.0163)
fbl12	0.0200	0.1166***	-0.1365***	-0.0241
	(0.0104)	(0.0152)	(0.0146)	(0.0161)
cons	0.0369***	0.2050***	0.7581***	0.2212***
	(0.0010)	(0.0015)	(0.0016)	(0.0019)
N	7842143	7842143	7842143	3634919
Cluster size	420784	420784	420784	339448

Note: See section 4.3 equation (4) for further details. Clustered standard errors in parentheses. Regressions with labor market history (including industry, occupation, and state indicators).