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The creation and resolution of working hour discrepancies over the life course

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The creation and resolution of working hour discrepancies over the life course

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Abstract

Studies on labor supply have increasingly taken account of not only the actual working hours, but also of working hour preferences as well as the discrepancy between them. However, longitudinal research on this topic remains scarce. This paper contributes to the analysis of working hour discrepancies by exploring how hours mismatch emerges and resolves with special consideration of the household context. We use a rich longitudinal data set, the German Socio-economic panel (GSOEP), for a discrete duration analysis applying a fixed effects-logit estimator. With special consideration of the household context, the findings suggest that female underemployment is strongly related to household responsibilities impeding the mismatch resolution. On the contrary, the creation of female overemployment is linked to higher qualification and job autonomy. In those positions working hour discrepancies also turn out to be persistent. Male hour constraints can be associated to job positions in a similar way. Nevertheless, the results also show that household responsibilities are less important for both male under- and overemployed.

Zusammenfassung

Das Arbeitsangebot wird zunehmend nicht nur unter dem Aspekt der tatsächlichen Arbeitszeit, sondern auch hinsichtlich der gewünschten Arbeitszeit und deren Diskrepanz untersucht. Jedoch berücksichtigen nur wenige Studien dieses Thema im Längsschnitt. Dieses Papier trägt zur Analyse von Arbeitszeitdiskrepanzen bei, indem deren Entwicklung, das heißt, deren Entstehung und Lösung beleuchtet wird. Das deutsche Sozio-oekonomische Panel dient als Datengrundlage, um dieser Forschungsfrage mit einer diskreten Verweildaurananlyse unter Verwendung eines Logit-Schätzers, der für individuenspezifische fixe Effekte kontrolliert, nachzugehen. Unter besonderer Berücksichtigung des Haushaltskontextes deuten die Ergebnisse darauf hin, dass Unterbeschäftigung von Frauen stark mit Tätigkeiten im Haushalt korreliert, die die Lösung der Diskrepanz verhindern. Im Gegensatz dazu ist die Entstehung weiblicher Überbeschäftigung mit höheren Bildungsabschlüssen und größerer beruflicher Autonomie verknüpft. In diesen Positionen ist die Überschäftigung auch persistent. Arbeitszeitdiskrepanzen von Männern können auf ähnliche Weise mit beruflichen Positionen erklärt werden. Jedoch sind für die Unter- und Überbeschäftigung von Männern Aufgaben innerhalb des Haushalts und der Familie weniger bedeutend.

JEL classification: J21, J22, C23, C41

Keywords: Working hour preferences, working hour discrepancies, household context, life course, Germany

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1 Introduction

Discrepancies between preferred and actual working hours are a common phenomenon in industrialized countries (Holst/Schupp, 1994; Reynolds, 2003; Stier/Lewin-Epstein, 2003; Reynolds, 2004; Ehing, 2014; Seifert et al., 2016; Wanger/Weber, 2016). Empirical studies show that a mismatch between working hour wishes and actual hours does not only deteriorate life, health or work satisfaction, but a realization of the discrepancies can also strengthen the employment potential which is especially important in aging societies (Grözinger/Matiaske/Tobsch, 2008; Ehing, 2014; Matiaske et al., 2017). Hence, policies, such as currently implemented in the German labor market, encourage reconciling work and family life by subsidizing parents who reduce their working hours but stay in the labor force. The underlying study seeks to further inform these debates by providing evidence on the dynamics of hours mismatch, i.e., creation and resolution, in a household context.

If discrepancies of preferred and actual working hours are widespread, who are those with a desire for reducing or increasing their labor supply? Several studies for different countries agree that the family context is one key determinant in addition to job and firm characteristics (Fagan, 2001; Merz, 2002; Reynolds, 2003; Drago/Tseng/Wooden, 2005; Pollmann-Schult, 2009; Wanger, 2011; Ehing, 2014). Especially children are a determinant for working hour discrepancies for both women and men. The empirical findings suggest that mothers are less likely to be underemployed while fathers do not prefer an hour reduction (Pollmann-Schult, 2009; Ehing, 2014). Gender disparities also show up concerning the presence of a partner. Single women tend to be under- rather than overemployed, but men without a partner have a lower probability for wanting an increase in labor supply. These findings emphasize that men and women are differently affected by time and monetary constraints imposed on the household. Apart from the family background higher levels of education and income determine overemployment (Reynolds, 2003; Pollmann-Schult, 2009), but underemployment is characterized by medium levels of education and low incomes (Ehing, 2014).

While explaining the presence of working hour discrepancies, these studies examine working hour discrepancies from a cross-sectional point of view, i.e., they neglect the development of working hour discrepancies over time. Reynolds/Aletraris (2006) and Reynolds/Aletraris (2010) analyze the creation and resolution mechanism of an hour mismatch using Australian and US data respectively. Reynolds/Aletraris (2006) emphasize that both a change in preferred and/or actual hours contribute to creating and solving over- or underemployment, but preferred hours are of higher importance. Furthermore, both studies find that a mismatch of preferred and actual hours persists over time, especially the desire for fewer hours is hard to implement.

We contribute to the existing literature on working hour discrepancies by exploiting rich panel data for a longitudinal life course approach, which also allows a detailed view on the household and its employment situation. To be more concrete, we examine how different individual and household characteristics contribute to the creation and resolution of working hour discrepancies over time. We analyze the German labor market as an interesting example of a country where the traditional employment pattern is still wide spread providing potential for working hour discrepancies (Wanger, 2011, 2015; Lietzmann/Wenzig, 2017) and where the topic of working time flexibility is discussed intensely. Although the employ-

ment rate has almost become equal among men and women, the number of hours worked differs substantially between gender. Women are characterized by a high share of part-time while the male majority is full-time employed. Almost half of those part-time employed women express a wish for an increase of their working hours (Wanger, 2011). Hence, the mismatch of preferred and actual working hours proves to be relevant for Germany.

Furthermore, the German Socio-economic Panel (GSOEP) allows to examine working hour wishes and actual hours from a longitudinal perspective. Its time horizon of now 30 years enables to observe individuals over a long timespan including different life or career stages. Hence, the GSOEP is a suitable data base in order to examine working hour discrepancies over the life course. Seifert et al. (2016) analyze working hour discrepancies in a descriptive analysis for the German labor market with data from the GSOEP. The authors conclude that an increase in working hours can be implemented faster and to a larger extent than a reduction. Furthermore, Knaus/Otterbach (2016) evaluate the resolution of a working hour discrepancy especially for job movers with data from the GSOEP. They find that job movers are more likely to solve a mismatch in the desired direction, but their probability to end up in the opposite type of mismatch is also higher. Besides, there are significant differences in the adjustment of working hour preferences and actual hours between job movers and stayers.

We first analyze the stock of hour mismatches in dependence from personal, job-related and household characteristics in a descriptive way. By definition, the stock results from flow into and out of mismatch. Therefore, secondly, we evaluate the creation and resolution of working hour discrepancies over time in a multivariate context by exploiting the panel structure of the GSOEP. It allows not only to control for unobserved individual characteristics and cohort effects, but also enables to examine the individual adaption of working hour preferences and actual hours over a long time period.

The descriptive findings suggest that underemployed women differ substantially from female overemployed in household duties, motherhood, education and job positions. Underemployment is to a larger extent associated with the presence of children and the care for them whereas overemployed women are on average better educated and more often show up in higher job positions. A similar pattern considering education and job characteristics can also be found for men while overemployment is to a larger extent related to fatherhood and partnership. Especially the activity of the partner is an additional attribute of male overemployment.

The main results focus on the dynamics of working hour discrepancies, i.e., creation and resolution. It turns out that female underemployment origins from the mismatch persistence in the presence of child care provided by the mother herself, the lack of institutional child care and lower job autonomy. Furthermore, both the creation and resolution mechanisms have an impact on the high stock of female overemployed with university degree or higher job autonomy. Male hour constraints can be associated to job positions in a similar way while household responsibilities play an inferior role. The findings for female underemployment highlight the importance of traditional role models for the German labor market.

The paper proceeds as follows: Section 2 deals with theoretical considerations and relevant previous findings. Section 3 includes a description of the data and of the estimation strategy as well as the descriptive analysis. The regression results can be found in section 4. The last section concludes.

2 Theoretical Considerations

Standard labor supply theory suggests that individuals are free to chose their working hours according to their preferences. Deviating from neoclassical considerations, market imperfections are important. While economists highlight the existence of market imperfections, sociologists emphasize the role of changing preferences for justifying working hour discrepancies (Clarkberg/Moen, 2001; Reynolds/Aletraris, 2006). A common feature, however, is that both approaches suggest that individuals are differently affected by a mismatch of preferred and actual working hours dependent on their life stage including, e.g. the formation of the household, marriage, and the education of children. Thus, working hour discrepancies should not only be examined from the individual's persepective, but enclose the broader household context. The following subsections discuss the most relevant aspects within the household that theoretically influence the creation and resolution of working hour discrepancies.

Familiy composition Longitudinal research on the development of working hour discrepancies over time is scarce. However, a change in the life situation affects preferred hours (Campbell/van Wanrooy, 2013). Events in an individual's life like moving in with a partner, marriage, the arrival and departure of children or the care for family members are examples for altering working hour preferences. Discrepancies are likely to be created if an adjustment of the actual number of hours is hard to implement.

Social role models are an important factor for explaining traditional employment patterns that imply a full-time working man whose partner supplies a reduced amount of hours and has the main responsibility for the household. The majority of German women states the reason for their part-time employment to be family duties while the most important factor for men is that a full-time job cannot be found (Wanger, 2015). Although the employment rate of women has risen over the last decades, a major point is that working women are more strongly confronted with the conflict of reconciling housework and their job than men (e.g. Hochschild/Machung, 1989) providing potential for working hour discrepancies. However, men also face expectations in terms of male breadwinning which is considered to be crucial for compensating potential female income losses or for the masculine identity (Potuchek, 1997; Stone, 2007). Hence, normative and time or monetary interdependencies within the household can cause both women and men not to supply the amount of hours they actually want to provide.

As women are more likely to suffer from the conflict of being simultaneously the ideal homemaker and worker, mothers should be even more affected by working time discrepancies than childless women. Suppose a full-time employed mother carries out the bulk of the domestic work including the care for children. If her children are younger, she is more willing to reduce her working hours, and thus, an hour constraint should evolve with a lower probability. However, when children grow older, working preferences rise again resulting in a higher (lower) probability of getting under- (over-)employed.

Apart from varying preferences due to changed life situations, resignation or settling can also be of importance in consideration of the resolution of hour discrepancies. It describes the circumstance individuals develop a preference for the working hours they can get (Reynolds/Aletraris, 2006; Campbell/van Wanrooy, 2013). Underemployed women might be more willing to adapt to their lower actual hours which helps solving the discrepancy.

Fathers face different social expectations. Although gender roles have been changing, traditional employment patterns persist (Wanger, 2015). Men are supposed to financially support their families (Potuchek, 1997; Stone, 2007) whereas a preference for an hour reduction might be interpreted as a lack of job commitment (Fagan, 2001). Hence, fathers should be more likely to end up in overemployment compared to underemployment. On the other hand, solving a preference for more hours should be easier and thus, overemployment of fathers be characterized by a higher persistence.

Career stages Furthermore, besides family duties and role models, market imperfections like asymmetric information can explain why actual working hours diverge from the preferred amount of hours. As long working hours serve as a signal of productivity to the employer, employees offer working hours that exceed their preferences (Sousa-Poza/Ziegler, 2003). Long working hours are especially important when individuals suffer from financial insecurity or the lack of job alternatives which forces them to accept job conditions they would otherwise reject (Stewart/Swaffield, 1997). However, the argument of insecurity also matters for accepting and remaining in jobs if preferences exceed actual hours. This argumentation particularly holds during early life stages when employees still have to prove themselves or pursue a promotion and have less financial resources. Therefore, employees should be more likely to create and less likely to solve a working hour discrepancy in earlier phases compared to later stages.

Job characteristics The divergence of working hour wishes and actual hours can also be expected to differ with respect to the individual occupational position. The normative signalling power of long working hours is especially high in professional and managerial positions characterized by non-standard tasks the results of which are hard to assess (Landers/Rebitzer/Taylor, 1996). Thus, overemployment should more likely emerge in such positions compared to lower-rank jobs. We expect that this effect is more pronounced for women than for men as they are confronted with the norm of female responsibility for the household. A reinforcing impact stems from the finding that professional women are also more likely to have a partner in a professional occupation which lowers the possibility to get spousal support in the context of the dominance of the male career (Stone, 2007; Cha, 2010). However, the resolution of overemployment should be easier with rising levels of human capital and a better chance to change the employer which is also represented by the labor market situation as these characteristics improve one's bargaining position (Reynolds/Aletraris, 2010).

Male underemployment is not supposed to occur in high-rank occupations. However, women with a higher educational degree can be concerned by underemployment if they accept job offers that enable them to reconcile work and family, but that do not fit their qualification. Thus, the creation probability of female underemployment is expected to be higher in the presence of a university degree while the resolution should be more difficult.

Wages are of further importance in this context. We argue that low-income earners have a higher preference for an extension of their working hours resulting in a higher probability to become and remain overemployed while underemployment is less likely to emerge and persist. Higher wages allow to afford an hour reduction and hence, individuals do not tend to end up in overemployment. This argumentation is furthermore in line with the concept of a backward bending labor supply curve that states the dominance of the income effect

over the substitution effect for high incomes (Shank, 1986; Prasch, 2000).

Partner's characteristics Interdependencies between the individual and the partner's occupational decisions are expected to be of further importance. Reynolds (2014) finds that working hour preferences of couples often diverge and that women more often adjust their actual hours according to their own preferences while men also consider their partner wishes. We do not evaluate preferences that couples have for each other, but focus on time and monetary constraints imposed by the partner's job, but also the (lack of) support in the household is examined. The partner's time spent on household work versus his/her hours supplied on the labor market determines the individual's preferred and actual working hours. Again, these effects depend on social norms that define the working time arrangement of couples. Social role models can reinforce the separate spheres arrangement, as long working hours of the husband can crowd out women from the labor market while female working hours do not affect the husband's extensive margin (Cha, 2010). To a less extreme extent, it is clear that the intensive margin can also be affected by the wish to reduce working hours if the partner overworks. Apart from the time constraint, the lack of income provided by a non-working partner increases the financial pressure on the individual who cannot afford to lower labor supply. Hence, partnership has an overall ambiguous effect, and it is not sufficient to examine the working decision of the partner, but also his/her occupational position including financial means. Bargaining theories explain how couples decide on the division of labor within the household (Evertsson/Nermo, 2007; Bünning, 2015). Financial resources have a positive impact on the individual's bargaining power which relieves him/her from household duties and increases his/her part of paid work. Hence, with a lower level of income provided by the partner, male underemployment should emerge with a lower probability in comparison with overemployment. For jobs of higher prestige of the partner, underemployment is expected to occur with a higher probability in comparison with overemployment. We expect a similar effect for women. However, the effect should be more pronounced for jobs of higher prestige of the partner where women serve as an additional earner, i.e., it makes female underemployment more likely to be created. In contrast to underemployment, overemployment should be more persistent for lower rank jobs of the partner as individuals cannot afford an hour reduction.

3 Empirical Analysis

3.1 Data, variables and estimation strategy

Data To evaluate working hour discrepancies and their dynamics over time, panel data giving information on preferred and actual working hours is needed. The GSOEP as an annual repeated survey of German households fulfills both criteria of a longitudinal approach and of the variable requirement[1]. Conducted since 1984, the GSOEP firstly only covered West-German households. After the German reunification also former East-German households were included. This survey is designed to cover both economic and sociological questions

[1] For a detailed description of the GSOEP see, e.g. Wagner/Frick/Schupp (2007) or Göbel et al. (2008).

such as the current life situation, employment, income and health but also attitudes and different concepts of satisfaction. Besides, it has the great advantage that not only individual data is a hand, but also information on other household members like partners and children. This condition allows to approach the topic of labor supply from a comprehensive household context.

Dependent variable Currently employed respondents are asked the following questions about their preferred and actual working hours: "If you could choose your own work hours, taking into account that your income would change according to the number of hours, how many hours would you want to work per week?" and "How many hours do you generally work per week, including any overtime?". The wording of these questions turns out to be meaningful, e.g. filtering the question on working hour preferences influences the amount of hours the respondent indicates (Campbell/van Wanrooy, 2013; Holst/Bringmann, 2016). Stating a preference on working hours might furthermore be complex as individuals evaluate different background circumstances like the household income, household duties and child care simultaneously. Hence, Campbell/van Wanrooy (2013) emphasize to consider preferences not as pre-determined and stable values that depict 'true preferences'.
We define a working hour discrepancy as the difference of desired and actual hours, $mism_{i,t}$, exceeding 2.5 hours in absolute values such that underemployed respondents have a positive and overemployed employees a negative mismatch[2]. The threshold of 2.5 is in line with previous studies, e.g. Knaus/Otterbach (2016). Furthermore, the robustness checks where the bandwidth of the mismatch interval is changed do not show huge differences to the baseline estimates. The dependent variable of interest is a dummy indicating the creation and resolution of a working hour mismatch, $mism\_cre_{i,t}$ and $mism\_res_{i,t}$ respectively:

$$mism\_cre_{i,t} = \begin{cases} 1 \text{ if } mism_{i,t} \geq |2.5| \text{ and } mism_{i,t-1} < |2.5|. \\ 0 \text{ else} \end{cases}$$

and

$$mism\_res_{i,t} = \begin{cases} 1 \text{ if } mism_{i,t} < |2.5| \text{ and } mism_{i,t-1} \geq |2.5|. \\ 0 \text{ else} \end{cases}$$

Estimation strategy As the focus of the analysis lies on the emergence and resolution of a working hour mismatch, the original panel data set has to be transformed into spell data. That means for those individuals for whom a mismatch evolves, preferred and actual hours have to coincide at the first period of the spell ($mism\_cre_{i,1} = 0$). For the resolution of a discrepancy, preferred and actual hours diverge at the beginning of the spell ($mism\_res_{i,1} = 0$). Getting non-employed is not considered as a resolution mechanism.
Left-censored observations are kept in the basic sample. Right-censored spells cannot be taken into account due to the estimation strategy allowing only for spells that change their dependent variable at least once. All individuals older than 16 years of the survey years from 1985 until 2015 are included. The waves of 1984 and 1996 have to be omitted as

[2] The indices denote the individual (i) and the time dimension (t).

they do not contain information on working hour wishes. Extreme values of more than 80 hours per week of actual and preferred working hours, as well as discrepancies exceeding a difference of 70 hours are dropped. Individuals can also have multiple spells.
Duration analysis allows to analyze the resolution of a working hour discrepancy in dependence from various factors. As annual panel data is at hand, we conduct a discrete analysis where the dependent variable $mism\_cre_{i,t}$ or $mism\_res_{i,t}$ is a binary indicator for creating or solving the mismatch. In order to take unobserved heterogeneity into account, the fixed-effects or conditional logit estimator (Chamberlain, 1984; Wooldridge, 2010) is used. Like the fixed effects estimator, the conditional logit estimator differences out time-constant variables including unobserved characteristics. Considering the role of social norms for the division of labor within the household, this property of the estimator is valuable as it is difficult to find a suitable proxy for the normative aspect. In the context of cohort effects social values are as well important. As attitudes, especially concerning the working time arrangement of men and women, have likely changed between the different cohorts included in the data set, the elimination of such factors is important for getting unbiased estimates.
The probability for a positive outcome of $mism\_cre_{i,t}$ or $mism\_res_{i,t}$ is

$$P(mism\_cre_{i,t} = 1|X_1, ...X_T, c_i) = \Lambda(X_t\beta + c_i) = \frac{e^{X_t\beta+c_i}}{1+e^{X_t\beta+c_i}}$$
and
$$P(mism\_res_{i,t} = 1|X_1, ...X_T, c_i) = \Lambda(X_t\beta + c_i) = \frac{e^{X_t\beta+c_i}}{1+e^{X_t\beta+c_i}}$$

where $\Lambda(\cdot)$ denotes the logistic distribution, X a matrix of regressors and c_i individual-specific, time-constant factors. The contribution of an observation to the likelihood function depends on whether $mism\_cre_{i,t}$ or $mism\_res_{i,t}$ changes it outcome at least once, e.g. with only two observational periods $T = 2$, the probability for $mism\_cre_{i,2} = 1$ ($mism\_res_{i,2} = 1$) conditional on $mism\_cre_{i,1} + mism\_cre_{i,2} = 1$ ($mism\_res_{i,1} + mism\_res_{i,2} = 1$) becomes

$$P(mism\_cre_{i,2} = 1|X_1, X_2, c_i, mism\_cre_{i,1} + mism\_cre_{i,2} = 1) = \Lambda((X_2 - X_1)\beta)$$
and
$$P(mism\_res_{i,2} = 1|X_1, X_2, c_i, mism\_res_{i,1} + mism\_res_{i,2} = 1) = \Lambda((X_2 - X_1)\beta)$$

which is independent from c_i[3]. Instead of providing marginal effects in the regression analysis, odds ratios (OR) are indicated as they do not require plugging in a value for the unobserved component c_i, i.e., the odds ratio gives the multiplicative value for the odds if the explanatory variable increases by one unit[4].

Explanatory variables The explanatory variables of interest include different characteristics considering the individual him-/herself and the household he/she lives in.
Firstly, we define a variable on the career stages depicting important steps in an individual's working life as they are the learning phase, the beginning of the working career, the establishment in the job, a middle phase and the years before and after retirement. Those life stage variables are successively generated as follows. The learning phase is created

[3] The elimination of c_i depends on a mathematical transformation that is based on conditioning on the sum of the dependent variable.

[4] The odds is defined as $\frac{p}{1-p} = e^{X\beta+c}$ where p is the probability for the dependent variable to be one. Hence, OR is the exponentiated coefficient of interest.

upon the question if the respondent is currently receiving education or training (vocational and further training or university) up to an age of 36 years. Once the learning phase has passed, individuals change to the three years-lasting stage of the career start which always refers on the highest level of education achieved. Hence, for persons with a vocational degree who decide to go to college, the career start will be postponed to the period after university. By the same token, breaks of unemployment after the learning phase are not taken into account. The phase of establishment in the working life lasts for five years after the stage of the career start. It is followed by the middle stage that is divided into two parts at the age of 45. Finally, the phase before retirement is defined upon the age and it includes individuals of 56 years and older. Workers older than 65 years are captured in the retirement phase and considered separately, as working beyond the statutory retirement age is supposed to be characterized by special conditions such as financial needs or high motivation. As respondents can enter the survey at each life stage, there are cases where phases cannot be determined successively starting from the learning phase. For those cases, the weighted median age for each survey year of the persons from the already successively determined career start stage is used. According to the achieved educational level, the median age assigns life stage membership. Using the generated variable of career phases provides a deeper insight into the individual's life course than simply exploiting the age.

Furthermore, children are supposed to affect the creation and resolution of working hour discrepancies. We do not only include a categorial variable representing the children's age, but also the daily hours of child care provided by the mother/father her-/himself and a measure of institutional child care depicting whether the youngest child is in part- or full-time care or not institutionally cared for. In addition, the daily hours of housekeeping describe the hours spent for unpaid work. The daily hours for child care and housekeeping might cause an endogeneity problem as these variables can be determined simultaneously with the dependent variable. To solve this problem we instrument those variables with their first lag meaning that we insert linear predictions of the first stage regression in the second stage.

In order to depict the occupational position, we use different measures like education, the autonomy within the job[5] and the gross wage. The latter is a generated variable based on the gross monthly individual income divided by the agreed working hours per month. Overtime and overtime allowances are considered in this calculation[6].

The partner's characteristics are represented by his/her employment status, the occupational autonomy within the job and the daily hours spent on child care and housekeeping. The partner's hours spent on child care and housekeeping are like the individual hours instrumented by their first lags.

Apart from these characteristics, other aspects of the firm side, the labor market and considering the duration spent (un)constrained are included as control variables. A dummy for changing the job within or to another firm and the number of employees depict the firm side. A measure of labor market tightness, i.e., the number of vacancies divided by the number of unemployed, created upon the job classification system controls for the occupation-

[5] This is a generated variable which is strongly correlated to the classification of occupations (KldB) and the Treiman Prestige Scale (Treiman, 1976).

[6] The agreed working hours per month are generated by multiplying the weekly hours with the factor 4.348. Overtime allowances are considered with a factor of 1.25.

specific labour market situation. These numbers are taken from the official statistics of the Federal Employment Agency on a two-, three- and five-digit occupational level according to the classification system KldB88 and KldB10. Furthermore, tenure and experience in full- or part-time work and in unemployment are included because the employment history is expected to have a strong impact on the current working conditions. The duration spent (un-)constrained is depicted by two variables. The first one measures the point in time until the mismatch occurs or is solved while the first and second period as well as the periods exceeding the fifth are grouped due to the small number of observations with long duration. The other variable depicts the number of spells in which the mismatch is created or is left. Again, more than two or three spells are grouped in categories. Besides, a regional dummy for East and West Germany as well as a quadratic time trend are included.

3.2 Descriptive analysis

Before analyzing how working hour discrepancies evolve and get solved in a multivariate context, the analysis will turn to a descriptive determination of the characteristics individuals concerned by a mismatch have. Table 1 displays how these characteristics are distributed within the different mismatch types. The reference for explaining these different numbers is always the state of being unconstrained (columns 1 and 4), i.e., the descriptive analysis wants to find different patterns between the unconstrained and the under- or overemployed. The first lines show that women are in equal shares unconstrained or overemployed. Most men are overemployed while the numbers also demonstrate that women are more often underemployed compared to men. Besides, women have similar working hour wishes independent from being unconstrained, under- or overemployed. For those experiencing mismatch, the absolute difference between preferred and actual hours amounts to about 11 weekly hours which is comparable to the male hour discrepancy. However, underemployed men have a weekly working hour wish of about 43 hours while for the overemployed it amounts to only 37 hours.
The occurrence of mismatch can be further examined looking at covariates. We consider working hour discrepancies from several aspects already mentioned in the theoretical part: personal characteristics considering the household, education and the job, but also the partner's characteristics.

Table 1: Distribution of individual and partner's characteristics over mismatch types

	Women			Men		
Variables	1 Uncon-strained	2 Under-employed	3 Over-employed	4 Uncon-strained	5 Under-employed	6 Over-employed
N	41,265	17,559	41,248	48,099	10,941	60,952
%	41.24	17.55	41.22	40.09	9.12	50.80
Mismatch characteristics						
Preferred working hours $Mean$	30.18	30.51	30.48	39.52	43.14	37.22
Actual working hours $Mean$	30.43	19.79	40.74	39.76	31.65	47.99
Difference between preferred and actual hours $Mean$	-0.25	10.73	-10.26	-0.24	11.49	-10.77
Personal characteristics						
Career stage %						
Learning stage	11.96	9.65	10.62	13.30	19.60	8.41
Career start	7.99	7.13	9.93	7.75	10.00	7.25

Establishing	9.69	9.20	12.17	10.50	11.66	11.69
Middle phase up to 45 years	30.81	38.09	29.36	29.62	27.80	31.79
Middle phase up to 55 years	26.01	26.79	26.95	23.97	19.43	27.01
Pre-retirement	12.43	8.47	10.55	13.16	9.86	13.13
Retirement	1.11	0.66	0.43	1.70	1.65	0.71
Children %						
No children	71.61	55.38	76.24	69.87	69.86	65.94
Children le6	11.63	17.72	9.25	16.95	18.57	19.03
Children 7-10	7.62	11.92	6.22	6.37	5.37	7.12
Children 11-15	9.15	14.98	8.29	6.81	6.21	7.91
Child care facility %						
No facility	24.31	27.44	23.48	40.44	48.15	40.52
Part-time facility	57.75	55.98	52.42	46.96	38.57	46.45
Full-time facility	17.94	16.58	24.10	12.61	13.28	13.03
Daily hours for child care $Mean$	4.68	5.65	4.05	1.67	2.07	1.41
Daily hours for housekeeping $Mean$	2.06	2.45	1.70	0.65	0.82	0.61
Education and job %						
No vocational degree	23.58	20.15	15.30	21.59	26.47	12.55
Vocational training	59.48	64.01	57.47	61.00	56.49	59.63
University degree	16.94	15.84	27.23	17.41	17.04	27.81
Occupational autonomy %						
Apprenticeship	6.44	2.43	5.33	7.24	6.94	3.56
Low autonomy ($= 1$)	18.16	23.90	9.13	18.53	24.39	10.25
2	25.07	34.27	19.10	29.54	29.00	23.50
3	38.70	32.66	42.09	22.81	23.79	22.35
4	9.87	6.04	21.01	18.41	13.92	32.97
High autonomy ($= 5$)	1.76	0.69	3.34	3.47	1.96	7.37
Gross wage %						
$\leq$ 1st percentile	11.96	15.62	10.36	8.77	14.15	5.95
$\leq$ median	52.81	59.30	43.46	33.08	40.84	30.71
$\leq$ 9th percentile	30.58	20.41	38.36	47.24	35.64	44.74
> 9th percentile	4.65	4.67	7.81	10.91	9.38	18.60
Partner						
Partner%						
No partner	31.42	31.00	31.83	29.40	34.68	22.86
Inactive, currently in education	10.82	8.88	9.52	24.84	24.61	24.16
Active	57.76	60.12	58.65	45.76	40.71	52.98
Occupational autonomy %						
Low autonomy ($= 1$)	13.85	14.91	10.08	21.40	19.89	12.40
2	25.69	27.25	23.30	25.77	26.49	23.67
3	24.71	24.65	25.08	38.25	39.11	43.57
4	29.14	28.09	33.96	12.47	13.04	17.33
High autonomy ($= 5$)	6.61	5.10	7.58	2.11	1.46	3.03
Daily hours for child care $Mean$	1.59	1.58	1.77	6.34	6.78	6.49
Daily hours for housekeeping $Mean$	0.78	0.70	0.88	3.04	3.00	2.88

Data Source: GSOEP v32.1, 1985-2015.

Table 1 gives an overview of the life phase distribution. The majority is assigned to the middle stages independent from over- or underemployment and gender. Nevertheless, female underemployment turns out to concentrate in the middle phase up to 45 years (column 2), and overemployment is relatively independent from the career stages in reference to the unconstrained case (columns 1 and 3). Besides, the share of men in the underemployed subsamples belonging to the learning and establishing phase is relatively high and comparably low for the later middle stage (column 5). On the contrary, male overemployment more often shows up during the middle stages and less often during the learning stage (column 6).

These figures could be related to other factors like the presence of children. In the majority of the households there live no children (55 to 76 %), with the highest share in the

subsample of overemployed women (column 3). Underemployed women have on average more children compared to both unconstrained and overemployed, above all young children. Overemployed men have on average slightly more children than unconstrained men, but the differences are not pronounced as in the female sample. Moreover, underemployed spend more time on child care or housekeeping which hints at time constraints. Their children are furthermore to a smaller share institutionally cared for.

Table 1 shows that most employees have a vocational degree. Overemployment is more strongly characterized by workers with a university degree for both women and men. Furthermore, male underemployment is related to the lack of a degree. The occupational autonomy provides a similar pattern. While the majority is assigned to have a middle level of autonomy, overemployment is more an issue for employees with higher autonomy and underemployment for those with a lower level. However, with regard to high autonomy women are underrepresented in comparison with men. The distribution of the gross wage, which is categorized into percentiles in order to depict low- and high-income earners, is in line with the distribution provided by the educational degree and the occupational autonomy.

The presence of a partner and the employment status do not strongly differ between the female unconstrained and the women having a mismatch. For males, the share of singles is higher (lower) for the underemployed (overemployed) compared to the unconstrained. Male under- and overemployed also differ in the share of those having an active partner. More than half of the overemployed have an active partner which is clearly higher than the amount for the underemployed. Concerning the occupational autonomy of the partner, by contrast, there is variation among the women. A high autonomy of the partner is positively correlated with the female wish for a reduction which is similar to the case of male overemployment (even though on a lower level). Finally, the mean of daily hours spent on household tasks by the partner is lower for women than for men suggesting that women get less support by their partner. However, the differences among constrained and unconstrained are not as remarkable as for the individual child care and housekeeping hours.

To conclude, these descriptive results hint at gender differences but also at disparities between the over- and underemployed. Female underemployment shows a strong link to motherhood, household work and lower-ranked jobs while overemployed women provide the opposite pattern. Men tend to be underemployed in earlier stages and overemployed during their middle phases. They do show large disparities concerning fatherhood, but underemployed men dedicate more time to household duties. Like in the female case, male overemployment is correlated with higher job positions and wages. Besides, the descriptive evidence suggests that women's working constraints do not depend on the presence and employment status of a partner. However, the share of male underemployed is higher among singles and lower for those with an active partner. Higher positions of the partner are more widespread among female and male overemployed.

These descriptive findings can be associated with the creation of a working hour discrepancy or with constrained individuals suffering from difficulties in solving an hour mismatch. I.e., we ask for the explaining power of the flows into and out of mismatch. By controlling for individual and time fixed effects, the next chapter focusses on this issue using a multivariate approach. We first address creation and resolution of hour discrepancies and subsequently connect them to the stock results.

4 Estimation results

Tables 2 and 3 depict the estimation results for becoming and leaving over- and underemployed conditioned on gender. We also estimate a single fully interacted model that includes both under- and overemployed to identify statistically significant differences between both groups. These are indicated by an italic odds ratio in Tables 2 and 3.
The main effects of interest stem from personal characteristics like the career stage and determinants depicting the presence and care for children, as well as from the job characteristics of the individual him-/herself or of the partner. We will address these variable categories in turn.

4.1 Creation of a working hour discrepancy

Personal characteristics The odds ratios of the career stages show that the creation of a mismatch is less likely during the learning stage and at later career stages compared to the middle stage. When starting or establishing in their careers, for women the odds of an overemployment creation are higher than in the middle stage, e.g. 1.8 times higher during establishing. Men show a different pattern. Their odds are smaller at very early and late career stages compared to the middle phase, but not very pronounced during establishing. The creation of underemployment follows a similar hump-shaped form in dependence from the career stages. However, the effect is less precisely measured which could be explained by the lower sample size. Furthermore, the odds ratios of becoming underemployed are less diverse between gender. Hence, the expectation that the occurrence of working hour discrepancies is more likely during earlier life stages can only be supported for the creation of female overemployment.
The odds ratios of having children show huge disparities between becoming under- and overemployed. Mothers are more likely to become underemployed, but the odds ratio for getting overemployed in the presence of young children is smaller than one. This effect cannot be observed for fathers who are less likely to become underemployed. In contrast, the creation of male overemployment is not strongly affected by children and their age. Thus, the expectation how underemployment evolves for parents can be supported. However, the theoretical argumentation of section 2 for the creation of overemployment of parents does not match the regression results.
In the context of these findings, the availability of child care might play a role. Interestingly, parents whose children are not institutionally cared for or in part-time care have a lower probability for creating a working hour discrepancy than those whose children are cared for during the whole day. A possible reason is selectivity leading parents with a lower work commitment or for whom child care costs are too high to care for their children on their own. Unfortunately, an exogenous measure for institutional child care is not available for the long time horizon since 1985. The German Federal Statistical Office provides data on institutional child care from the year 2006 onwards such that a rate for children who are institutionally cared for can be calculated for each federal state. This measure is included in a robustness check in subsection 4.4. Besides, the findings show that individual child care and housekeeping duties impede the creation of overemployment, in particular for women. Furthermore, women differ significantly in the odds ratio of becoming under- or

overemployed for increasing hours of individual child care.

Education and job characteristics Considering the individual educational and occupational characteristics, it becomes obvious that reaching a higher level of education or of occupational autonomy leads to a higher probability for becoming overemployed. For women with a university degree the odds are about 1.5 times higher than for those without any degree. The male creation of overemployment is to a lesser extent characterized by a higher educational degree or autonomy status (apart from the highest autonomy level). This gender difference hints at a more pronounced tradeoff between household tasks and working hours for professional women than for professional men, in line with the findings of Cha (2010).
The emergence of underemployment is more likely for female academics, but quite independent from the occupational autonomy. In contrast, the odds of getting underemployed are significantly lower for men in higher positions than in jobs of lower autonomy.
Turning to the effect of the gross wage shows that the creation of underemployment increases with higher wage levels. This pattern can especially be observed for women for whom the difference between under- and overemployed is furthermore statistically significant. Male overemployment, on the contrary, emerges less likely for high-wage earners. Hence, financial constraints encourage individuals to adjust their actual hours to their wishes in case of underemployment or to provide more hours than preferred.
To sum up, academic women are more concerned by a working hour mismatch than men which can be also seen in a higher probability of getting constrained for high occupational positions. This result supports the hypothesis that working hour discrepancies are more a problem for academic women than for men trying to reconcile their private with their working lives. Moreover, financial constraints act in the expected way.

Partner characteristics Further variables of interest concern the presence of a partner and his/her working conditions. The odds ratios for having an (in)active partner compared to being single are not statistically significantly different from one. For men it is less likely to become overemployed and more likely to become underemployed. Besides, for both men and women, with a higher autonomy of the partner the odds for the creation of overemployment decrease. This effect supports the expectation and suggests that financial constraints are one determinant for intra-household labor supply. However, empirical evidence for the hypotheses concerning the emergence of underemployment related to the partner's job autonomy can only be found for men whose partner has a lower autonomy. The effect also shows to significantly differ from the overemployed. Especially the creation of female underemployment proves to counteract the hypothesis.
The odds ratios of the partner's daily hours of housekeeping and child care are not statistically significantly different from one.

Firm characteristics, labor market and duration The odds ratios of the other included regressors are shown at the bottom of Table 2. A job change decreases the odds for getting constrained in comparison with stayers. Firm size does not provide a clear pattern in terms of the number of employees. With a higher labour market tightness, i.e., vacancies relative to the number of unemployed, the creation of overemployment becomes less likely. Besides, the work experience plays a significant role. Full-time experience decreases the

Table 2: Creation of a discrepancy

	Underemployed				Overemployed			
	Women		Men		Women		Men	
Personal characteristics								
Career stages(Ref. Middle stage up to 45 years)								
Learning stage	0.4589	(-1.51)	0.8473	(-0.34)	0.8131	(-0.72)	0.6768*	(-1.87)
Career start	0.5872	(-1.42)	1.0266	(0.06)	1.4261	(1.54)	0.6401***	(-2.76)
Establishing	1.1067	(0.35)	1.2491	(0.65)	1.7712***	(3.03)	1.0010	(0.01)
Middle stage up to 55 years	1.0965	(0.44)	*1.2399*	(0.64)	0.8553	(-1.00)	*0.7534***	(-2.55)
Pre-retirement	1.2008	(0.51)	1.1086	(0.16)	0.9430	(-0.25)	0.8142	(-1.23)
Retirement	0.4998	(-0.96)	0.0452	(-0.98)	0.3892	(-1.55)	0.3254**	(-2.47)
Children (Ref. No children)								
Children le6	1.2898	(0.62)	0.7258	(-0.57)	0.8148	(-0.73)	1.0336	(0.16)
Children le10	1.1446	(0.38)	0.3609*	(-1.93)	1.2913	(0.98)	1.0426	(0.21)
Children le15	1.1309	(0.43)	0.7313	(-0.62)	0.8944	(-0.52)	1.0473	(0.28)
Daily hours for child care	*0.9677*	(-0.91)	1.0980	(0.73)	*0.8553****	(-3.98)	1.0774	(1.29)
Institutional child care (Ref. Full-time)								
No facility	0.5386**	(-2.07)	0.6571	(-0.92)	0.9751	(-0.11)	0.9161	(-0.59)
Part-time facility	0.7516	(-1.28)	0.9212	(-0.20)	0.9568	(-0.29)	0.9315	(-0.57)
Daily hours for housekeeping	*0.9953*	(-0.06)	1.0280	(0.15)	*0.8015****	(-3.43)	0.8034**	(-2.47)
Education and job characteristics								
Educational degree (Ref. No degree)								
Vocational degree	1.6573	(0.96)	1.0001	(0.00)	1.1876	(0.65)	1.2048	(0.98)
University degree	*3.9203***	(2.35)	0.3605	(-1.53)	*1.5700*	(0.91)	0.9954	(-0.01)
Occupational autonomy (Ref. Middle=3)								
Apprenticeship	0.3479**	(-2.29)	1.0688	(0.17)	0.4712***	(-2.82)	0.5416***	(-2.70)
Low=1	*1.3821**	(1.66)	1.0138	(0.06)	*0.6440***	(-2.54)	0.9115	(-0.81)
2	*1.1091*	(0.75)	1.1548	(0.66)	*0.9001*	(-1.18)	0.8749	(-1.50)
4	1.3624	(1.27)	*0.6912**	(-1.68)	1.3247**	(2.36)	*1.2026***	(1.97)
High=5	1.3551	(0.30)	*0.6430*	(-0.81)	1.1899	(0.63)	*1.6392****	(3.10)
Wage (Ref. $\leq$ 1st percentile)								
$\leq$ Median	*1.7589****	(3.90)	0.9907	(-0.04)	*0.9218*	(-0.66)	0.9818	(-0.15)
$\leq$ 9th percentile	*1.7584****	(2.88)	*1.3798*	(1.22)	*0.9189*	(-0.60)	*0.8411*	(-1.30)
$>$ 9th percentile	*5.3945****	(5.59)	*2.2092***	(2.54)	*0.9806*	(-0.10)	*0.7906*	(-1.45)
Partner								
Partner (Ref. No partner)								
Inactive partner	0.6102	(-1.35)	1.2184	(0.47)	0.7987	(-0.86)	0.8684	(-0.81)
Active partner	0.7534	(-0.94)	1.3525	(0.82)	0.8573	(-0.79)	0.8273	(-1.29)
Occupational autonomy (Ref. Middle=3)								
Low=1	0.9603	(-0.17)	0.7292	(-0.92)	1.2889	(1.45)	1.0801	(0.59)
2	1.1279	(0.65)	*0.5954***	(-2.20)	1.1695	(1.18)	*0.9561*	(-0.48)
4	0.8425	(-0.85)	0.5994	(-1.25)	1.0506	(0.40)	0.8687	(-1.10)
High=5	0.7117	(-0.87)	0.8412	(-0.18)	0.7082	(-1.49)	0.6752	(-1.46)
Daily hours for housekeeping	1.1303	(0.80)	1.0121	(0.12)	1.1207	(0.96)	1.0121	(0.30)
Daily hours for child care	0.9425	(-0.54)	1.0588	(1.49)	1.0514	(0.77)	1.0047	(0.28)
Firm characteristics								
Job change	*0.4112****	(-7.48)	0.9899	(-0.07)	*0.5782****	(-7.14)	0.8609**	(-2.12)
Firm size (Ref. No employees)								
Up to 19 employees	0.4473**	(-2.22)	1.4182	(0.57)	0.7403	(-1.29)	1.1188	(0.68)
20 to 200 employees	*0.4281***	(-2.24)	1.6080	(0.74)	*0.7410*	(-1.18)	0.9016	(-0.55)
More than 200 employees	*0.3870***	(-2.47)	1.9534	(0.99)	*0.7574*	(-1.10)	0.6913*	(-1.92)
Labor market								
Labor market tightness	1.0243	(0.22)	1.0258	(0.16)	0.9278	(-0.60)	0.9685	(-0.39)
Tenure	0.9773	(-0.95)	*1.1239****	(2.86)	1.0174	(1.10)	*0.9888*	(-1.31)
Full-time experience	1.1059	(0.79)	*0.6640****	(-2.78)	1.1188**	(2.07)	*0.8527***	(-2.32)
Part-time experience	*1.3431***	(2.29)	*1.2371*	(1.18)	*0.9929*	(-0.13)	*0.7620****	(-3.84)
Unemployment experience	0.6837	(-1.34)	0.8695	(-0.45)	0.7450	(-1.64)	0.4304***	(-5.41)
Duration								
Period (Ref. 1st and 2nd period)								
3rd period	6.3961***	(16.54)	7.0866***	(13.31)	5.2431***	(23.59)	5.2729***	(31.45)
4th period	12.3261***	(13.68)	12.8279***	(10.89)	9.6584***	(19.49)	7.7257***	(24.46)
5th period	18.1743***	(10.31)	23.0557***	(10.32)	15.2056***	(15.10)	11.1601***	(19.93)
Spell (Ref. 1st spell)								
2nd spell	*0.0514****	(-12.61)	*0.0370****	(-10.30)	*0.0929****	(-18.23)	*0.1283****	(-23.82)
3rd spell					0.0139***	(-16.64)	0.0209***	(-23.44)
N	6,375		4,372		13,912		20,095	
n	1,654		1,166		3,470		4,781	

Fixed effects-logit estimates. Exponentiated coefficients. Quadratic trend and a dummy for East Germany included.

t-values in parentheses. Standard errors are bootstrapped with 1000 replications. * p<0.10, ** p<0.05, *** p<0.010.

$Period$ measures the point in time until the mismatch occurs (the first and second period are grouped).

$Spell$ indicates how many discrepancies have already been created (more than 2 or 3 spells, respectively, are grouped).

Data Source: GSOEP v32.1, 1985-2015.

probability for men to become constrained while part-time experience positively affects the creation of underemployment for both men and women. Further interesting results concern the lifecourse dimension. For those with multiple spells, i.e., those who have already solved a mismatch, the emergence of another discrepancy is considerably less likely.

4.2 Resolution of a working hour discrepancy

Besides the creation of hours mismatch, the life-course-oriented setting further allows analyzing the factors influencing how an existing mismatch can be solved. Thus, in the following we analyze the impact of the variables introduced above on the transition from a mismatch- to a non-mismatch-state.

Personal characteristics Table 3 includes the odds ratios of all relevant regressors. Beginning again with the impact of the career stages, the resolution of male overemployment seems to be less life stage-dependent than for women. While the odds ratios for men are more or less close to one and not statistically significant, women have a higher probability for quitting overemployment in earlier life stages than during the middle phase. Recapitulating that also the creation of overemployment is more likely during these stages, women turn out to be more prone to switches into and out of mismatch in the early phases. This finding does not correspond to expectations that here, the resolution of discrepancies is harder to be achieved. However, it demonstrates that persistence of mismatch is most problematic in the middle of the working life.
The pattern of the female underemployed is similar from the career start onwards, but the odds ratios are smaller and not significant (also due to the lower sample size). Male underemployed have a lower probability for solving their mismatch during earlier stages. Hence, underemployment represents a substantial problem for men in their early career, with those affected facing severe constraints.
The impact of children on the resolution of working hour discrepancies provides some interesting insights. Female underemployment had been found to be more likely to emerge in the presence of young children and if a discrepancy exists it is more difficult to solve. However, when the special needs of young children drop, underemployed mothers are more likely to become unconstrained. The adjustment of preferred hours might also play a role in this context if mothers adapt their wishes to the amount they can get. Hence, the expectation is supported by these findings. In contrast, children make the resolution of overemployment (and less significantly also of underemployment) more likely for men. This result for the resolution of male overemployment contradicts the expectation of male breadwinning. However, the puzzle about the higher share of overemployed fathers will be solved by another argument presented in subsection 4.3.
For the resolution of male underemployment, the odds ratios of institutional child care are smaller than one meaning that full-time care helps solving an underemployment discrepancy. The effect is a bit weaker for women. Furthermore, housekeeping prevents women from solving a discrepancy of both under- and overemployment.

Education and job characteristics Concerning the educational characteristics, we find a less clear pattern than for the mismatch creation mechanism. However, the resolution is less likely for underemployed in low prestige jobs and overemployed in high prestige

Table 3: Resolution of a discrepancy

	Underemployed				Overemployed			
	Women		Men		Women		Men	
Personal characteristics								
Career stages (Ref. Middle stage up to 45 years)								
Learning stage	*0.2682***	(-2.24)	0.3451**	(-2.09)	*1.5893*	(1.28)	1.1334	(0.54)
Career start	0.9928	(-0.02)	0.5808	(-1.36)	1.5803*	(1.84)	1.1288	(0.68)
Establishing	1.2591	(0.78)	*1.0075*	(0.02)	2.2085***	(4.16)	*1.0183*	(0.14)
Middle stage up to 55 years	0.8177	(-0.93)	0.9620	(-0.15)	0.9302	(-0.50)	0.8849	(-1.01)
Pre-retirement	1.0248	(0.07)	0.7582	(-0.59)	1.0171	(0.08)	0.9356	(-0.37)
Retirement	2.9618	(0.97)	0.2221	(-1.15)	1.8223	(0.96)	1.4881	(0.97)
Children (Ref. No children)								
Children le6	0.7680	(-0.67)	1.8151	(1.33)	1.3440	(0.91)	1.5708**	(2.06)
Children le10	1.1457	(0.39)	1.9906	(1.47)	1.1163	(0.40)	1.7140**	(2.50)
Children le15	1.1379	(0.44)	1.8110	(1.39)	1.2130	(0.85)	1.1135	(0.62)
Daily hours for child care	0.9569	(-1.16)	1.0787	(0.75)	0.9194**	(-2.19)	1.0554	(0.75)
Institutional child care (Ref. Full-time)								
No facility	0.5369**	(-2.02)	0.6528	(-1.19)	0.8284	(-0.81)	0.9680	(-0.21)
Part-time facility	0.9880	(-0.06)	0.6940	(-1.14)	0.8130	(-1.25)	0.9845	(-0.12)
Daily hours for housekeeping	0.8556*	(-1.95)	0.7926	(-1.24)	0.8104***	(-3.33)	0.9229	(-0.86)
Education and job characteristics								
Educational degree (Ref. No degree)								
Vocational degree	0.7816	(-0.64)	1.5709	(1.31)	1.1141	(0.34)	1.0134	(0.07)
University degree	1.3736	(0.64)	1.2868	(0.37)	1.1318	(0.22)	0.6105	(-1.06)
Occupational autonomy (Ref. Middle=3)								
Apprenticeship	*1.5067*	(1.33)	1.3592	(0.85)	*0.4852***	(-2.22)	1.2895	(0.93)
Low=1	*0.6743***	(-2.12)	0.8138	(-0.84)	*1.2080*	(1.11)	1.1897	(1.33)
2	*0.9327*	(-0.56)	0.9984	(-0.01)	*1.1081*	(1.10)	1.1009	(0.99)
4	0.9118	(-0.43)	*1.3630*	(1.44)	0.7254**	(-2.47)	*0.8690*	(-1.51)
High=5	0.9357	(-0.05)	2.2338	(1.51)	1.3599	(1.05)	0.8107	(-1.19)
Wage (Ref. $\leq$ 1st percentile)								
$\leq$ Median	*0.8909*	(-0.84)	1.1945	(0.81)	*1.5435****	(3.30)	1.3312*	(1.78)
$\leq$ 9th percentile	*0.7793*	(-1.46)	1.3566	(1.21)	*1.6894****	(3.46)	1.6588***	(2.90)
$>$ 9th percentile	*0.3220****	(-4.63)	*1.0208*	(0.06)	*1.9796****	(3.31)	*1.6369***	(2.56)
Partner								
Partner (Ref. No partner)								
Inactive partner	1.9545*	(1.75)	1.4215	(1.00)	0.7337	(-1.19)	0.8411	(-0.89)
Active partner	2.1635**	(2.39)	*1.1825*	(0.54)	0.9983	(-0.01)	*0.6847***	(-2.31)
Occupational autonomy (Ref. Middle=3)								
Low=1	1.4076	(1.32)	0.9140	(-0.30)	0.6902**	(-2.05)	1.0030	(0.02)
2	0.9647	(-0.18)	1.0128	(0.06)	0.8914	(-0.82)	1.1756*	(1.78)
4	0.8197	(-0.93)	*0.4163***	(-2.50)	0.8417	(-1.31)	*1.2372*	(1.64)
High=5	0.7416	(-0.72)	*0.2811*	(-1.30)	0.9139	(-0.37)	*1.5269*	(1.58)
Daily hours for housekeeping	0.8579	(-0.88)	0.9017	(-1.33)	0.9748	(-0.22)	0.9482	(-1.40)
Daily hours for child care	0.9654	(-0.32)	0.9611	(-1.00)	1.0703	(1.07)	0.9832	(-0.99)
Firm characteristics								
Job change	0.8181*	(-1.76)	*0.6772****	(-3.09)	0.8692*	(-1.72)	*1.1302*	(1.62)
Firm size (Ref. None)								
Up to 19	1.0099	(0.03)	1.3592	(0.92)	0.8491	(-0.71)	1.0872	(0.47)
20 to 200	1.0431	(0.12)	1.1468	(0.38)	0.8863	(-0.51)	1.0700	(0.34)
More than 200	1.0280	(0.08)	1.4306	(0.95)	0.9824	(-0.07)	1.1196	(0.55)
Labor market								
Labor market tightness	*1.6052****	(2.78)	*1.4999**	(1.91)	*0.9709*	(-0.35)	*0.9887*	(-0.18)
Tenure	0.9941	(-0.23)	*0.9946*	(-0.22)	0.9930	(-0.52)	*1.0136*	(1.28)
Full-time experience	1.3086**	(2.18)	0.5025***	(-4.08)	1.1160	(1.37)	0.7310***	(-3.86)
Part-time experience	*1.2375**	(1.93)	0.6551***	(-2.69)	*1.1959***	(2.31)	0.8327**	(-2.24)
Unemployment experience	0.6146*	(-1.65)	0.2992***	(-3.73)	0.6055*	(-1.69)	0.3456***	(-6.10)
Duration								
Period (Ref. 1st and 2nd period)								
3rd period	*8.4703****	(18.15)	*9.6724****	(13.26)	*4.4987****	(21.90)	*4.7091****	(30.47)
4th period	*17.1007****	(14.18)	*33.3052****	(10.55)	*6.9903****	(18.98)	*6.5654****	(24.35)
5th period	*22.4733****	(10.72)	*94.5594****	(8.14)	*8.5806****	(14.99)	*8.8056****	(20.94)
Spell (Ref. 1st spell)								
2nd spell	0.0614***	(-10.90)	*0.0642****	(-8.39)	0.0834***	(-17.34)	*0.0958****	(-23.83)
3rd spell					0.0108***	(-15.75)	0.0118***	(-22.08)
N	6,533		4,649		14,083		21,461	
n	1,901		1,495		3,122		4,335	

Fixed effects-logit estimates. Exponentiated coefficients. Quadratic trend and a dummy for East Germany included.

t-values in parentheses. Standard errors are bootstrapped with 1000 replications. * p<0.10, ** p<0.05, *** p<0.010.

$Period$ measures the point in time until the mismatch is solved (the first and second period are grouped).

$Spell$ indicates how many discrepancies have already been solved (more than 2 or 3 spells, respectively, are grouped).

Data Source: GSOEP v32.1, 1985-2015.

jobs. These effects also turn out to statistically significantly differ between under- and overemployed. While in the former case a lack of flexibility and low negotiation power are plausible reasons, overemployment in high autonomy jobs is likely to persist due to peer pressure and weakly delimited workload. The resolution of overemployment is furthermore more probable at the upper part of the wage distribution indicating that low-income earners cannot afford an hour reduction.

Partner characteristics Now we turn to the role of the partner's characteristics for mismatch resolution. Having a partner represents a constraint in solving overemployment. For leaving underemployment, the presence of a partner is rather neutral, or even advantageous in case of female underemployed. The closer look at the partner's occupational autonomy shows that a lower level prevents women from leaving overemployment. Women might provide additional income if their partner has a lower rank job such that financial constraints impede the mismatch resolution. Higher occupational autonomy of the partner decreases the chances to leave underemployment, especially for men. These effects also significantly differ between the under- and overemployed. A trade-off between the partners' careers might prove relevant here. Hence, the empirical findings correspond to the theoretical argumentation of section 2.
The partner's support for household duties has no statistically significant impact on the resolution. Here, the own efforts play the more important role.

Labor market and mismatch duration The further regressors are listed at the bottom of Table 3. Quite interestingly, apart from male overemployed the odds for a mismatch resolution of job movers are smaller compared to the stayers. This finding is not in line with Knaus/Otterbach (2016) who find that job movers have a higher probability for the mismatch resolution. However, the authors furthermore show that the probability to end up in the other type of mismatch is also higher. Firm size does not have a statistically significant influence on the resolution. The odds for leaving underemployment are remarkably higher if labour market tightness rises, especially for women. Furthermore, multiple spells prevent constrained individuals from solving a discrepancy. Interestingly, while the reemergence of a mismatch is less likely, once an additional spell occurred, it is hard to end. Furthermore, the longer the mismatch already lasted, the more likely is its resolution. This duration effect is considerably stronger for under- than for overemployment.

4.3 Summary of results

Now we recapitulate how these multivariate findings go together with the descriptive results of subsection 3.2. I.e., how can the stock of working hour discrepancies be explained by the creation and resolution dynamics?

Female underemployment The descriptive findings suggest that female underemployment is linked to motherhood, household duties and jobs with lower autonomy where wages are on average lower. Concerning the career stages, female underemployment often occurs during the early middle stage.
However, in the multivariate conditional logit estimations, neither the odds ratio of the middle stage for the creation nor for the resolution does significantly differ from one, regardless

of the chosen base category. Hence, there must be reasons explaining female underemployment other than the career stage itself. Children and household duties are possible explanations based on the descriptive findings. Housekeeping and the care for children do not significantly foster the creation of female underemployment. However, individual child care and the lack of institutional child care as well as housekeeping duties prevent underemployed mothers from becoming unconstrained.
Besides, the descriptive findings for underemployed women seem to be quite independent from the presence and the employment status of the partner which is also confirmed in the multivariate context. Hence, female underemployment can to a large extent be associated with a low outflow rate in the presence of family responsibilities.

Female overemployment Overemployed women demonstrate a quite different pattern. They have less children, work in higher-rank jobs and are better educated. Their partner also tends to have a job of higher autonomy. Moreover, female overemployment shows only slight differences in comparison to unconstrained women with regard to their career stages.
The last result is also supported by findings of the regression where women not only demonstrate a high odds for becoming constrained but also for leaving overemployment during the early career stages. Furthermore, young children do not encourage the emergence of overemployment, and also the resolution is not significantly influenced. However, the odds for the creation of female overemployment are significantly higher among academics and in jobs of higher autonomy. Although the resolution seems not to depend on the educational degree, it is less likely for higher-rank jobs. Neither the creation nor the resolution mechanism can explain the higher share of women whose partner has a high autonomy level. Hence, we conclude that individual job characteristics, i.e., the job autonomy, is the main driving force for explaining the development of female overemployment.

Male underemployment Male underemployed turned out to be strongly represented in the earliest career stage. Furthermore, they have on average more often no vocational degree and work in jobs of low autonomy. There is also a higher share of singles and a lower proportion of those with an active partner while children do not provide a different pattern in comparison to unconstrained men.
These descriptive findings can partly be explained by the in- and outflow rates, e.g. the concentration of underemployed men during the learning stage is to a large extent owed to lower odds for leaving underemployment at this stage compared to the middle phase. Underemployed fathers turn out only to slightly differ from unconstrained fathers which can be explained by low inflow and high outflow rates. However, the most interesting aspect of male underemployment is education and the occupational autonomy. It has a high share among those without a degree and in low-rank jobs. Changing the base category of the educational variable to having a vocational degree reveals that the odds for the resolution of underemployment in case of no degree are significantly smaller. A similar argumentation holds for the job autonomy. The partner variables do not significantly contribute to the emergence or resolution of underemployment such that the lack of an educational degree and the job autonomy mainly contribute to the evolution of male underemployment.

Male overemployment Similar to women, male under- and overemployed differ systemati-

cally from each other. Male overemployment shows a lower share during the learning stage and a higher one during the later middle stage. Besides, there is descriptive evidence that young children and partnership, especially living with an active partner, are linked with male overemployment. Additionally, overemployment turned out to be spread among high-level jobs and educational degrees.

The first descriptive finding concerning the career stages can be explained by a lower inflow rate, but also the odds for the late middle stage are smaller compared to the early middle phase. As the odds ratios for the mismatch resolution are not statistically significantly different from one, other aspects must characterize this finding.

Both higher odds for the creation and lower odds for solving the discrepancy contribute to the high share of overemployed in high autonomy jobs. The educational degree has less explanatory power.

Furthermore, the resolution of overemployment is significantly more likely among fathers while the odds ratio for a mismatch creation is close to one and not significant. It seems that the descriptive finding is mostly driven by monetary incentives as individual child care does not prevent fathers from becoming unconstrained. This result would hint at the male breadwinner role. Quite interestingly, the share of fathers is the lowest under low-wage earners who are the most concerned by becoming and remaining overemployed. Hence, a pure financial constraint of fathers in terms of the individual wage cannot be found[7]. However, overemployed fathers have a higher share among those with a higher job autonomy which fosters the creation and inhibits the resolution of overemployment. Thus, the presence of children cannot directly explain the higher share of overemployed fathers and the job characteristics are the most important in determining male overemployment.

4.4 Robustness

As a robustness check, a logistic regression, that does not control for unobserved heterogeneity, is estimated (see Tables 4 and 5). As the logistic regression also includes spells that are right-censored, i.e., individuals whose outcome does not change over time, the sample size is higher than in the previous regressions. Especially concerning the career stages and the children's age there are some differences to the fixed effects-logit estimates which hints at an endogeneity problem for these variables. However, the differences of the variables considering the duration, $period$ and $spell$, are the most striking. The logit estimates of $period$ ($spell$) turn out to be smaller (greater) than in the fixed effects-logit estimation. Unlike to ordinary least squares estimation, the bias of logit estimates caused by unobserved heterogeneity cannot only be explained by (i) the correlation of the endogenous regressor with the residual and the correlation of the dependent variable with the residual, but also by (ii) the residual's variance (Mood, 2010). Even if (i) can be neglected, the coefficient will be downward biased due to (ii). Starting with the case of mismatch creation, the residual may contain individual characteristics like having a strong tendency for being constrained caused by health and satisfaction issues or workplace conditions. Then this "mismatch type" will have a positive correlation with the creation of a discrepancy (i.e.,

[7] The selection of middle- to high-income earners into fatherhood has been discussed by, e.g. Koslowski (2011).

a high fixed effect). Besides, it will be negatively correlated with $period$, i.e., the mismatch occurs to an earlier point in time, and positively with $spell$, i.e., the number of spells increases for "mismatch types". Hence, the first part of the bias (i) can be explained by an overall negative bias for the coefficient of $period$ and an upward bias for the coefficient of $spell$ in case of logit estimation that does not account for unobserved heterogeneity. An analogous argumentation holds for the resolution of a discrepancy. Thus, applying a logit estimation is not sufficient in the given analysis. Furthermore, a Hausman test suggests preference for the fixed effects-logit estimator as opposed to logit estimation for both creating and solving over- or underemployment.

A second specification varies in the bandwidth of the mismatch interval. In the baseline specification the mismatch size is set to $|2.5|$ hours or more which is a suitable difference in order to account for both full- and part-time and marginally employed. Firstly, the specification for a smaller discrepancy of $|1.5|$ hours or more instead of $|2.5|$ hours shows no strong differences to the baseline estimation. Increasing the bandwidth to $|3.5|$ hours or more also leads to similar results. The signs and significance of the coefficients remain stable. The odds ratios of the underemployed male subsamples turn out to differ the most which can result from limited within variation and small sample size.

Furthermore, we test a specification that drops left-censored spells additionally to the right-censored ones. Dropping the left-censored spells slightly changes the size of the significant results of subsections 4.1 and 4.2. The same holds for dropping observations before the German reunification in 1990 and observations with very small or long durations between subsequent interviews[8].

Additionally, the daily hours spent on care for relatives is added as further regressor which is only available since 2001. Like the hours spent on child care and housekeeping, it is instrumented by its first lag. Care duties have no statistically significant impact on the creation of a working hour discrepancy, but they inhibit the resolution of female underemployment, i.e., an increase in care duties by one hour per day lowers the odds for a resolution by 0.7. Finally, the share of children under the age of three years who are institutionally cared for is added as regressor instead of the individual care and the variable of institutional care provided by the GSOEP. As this variable of the German Federal Statistical Office is given from 2006 onwards, the sample size is considerably smaller. The findings show that a rise in the proportion of institutional child care prevents the creation of working hour discrepancies. However, the findings also suggest that the resolution becomes less likely for a higher share of children who are institutionally cared for.

5 Conclusion

This paper contributes to the existing literature on working hour discrepancies in examining the mismatch of preferred and actual hours from a longitudinal approach, i.e., stressing how discrepancies emerge and resolve over time. Particularly, the definition of career stages gives the analysis a life-course orientation that has been predominantly neglected in the research of working hour discrepancies. Furthermore, the data structure allows to observe

[8] German households are normally questioned in spring. However, some interviews take place earlier or later resulting in shorter or longer periods between two interviews. In the robustness check we drop the lower and upper five percent concerning the duration between two subsequent interviews.

individuals over a long time horizon of 30 years, representing an advantage over existing studies that only conduct a two-wave comparison. Hence, individuals can be in a constant flux of creating and solving working hour discrepancies.

The findings suggest the career stages can partly explain the occurrence of hour discrepancies by the creation and resolution in a multivariate context. Household responsibilities and the educational degree as well as the job autonomy are the main determinants for becoming constrained and leaving this state. Concretely, female underemployment is characterized by frictions caused by household duties while the creation and persistence of female overemployment is more related to a higher job autonomy. Male working hour constraints prove to show a similar pattern concerning the occupational autonomy. Household responsibilities play an inferior role for both male under- and overemployment.

Reynolds/Aletraris (2006) and Reynolds/Aletraris (2010) additionally try to find out more about the adaption of preferred and/or actual working hours. However, these studies do not take into account unobserved heterogeneity that might especially occur if social norms are important. Hence, the presented study benefits also from a full panel structure in controlling for attitudes, norms and cohort effects that influence the working behaviour.

In order to understand the creation and resolution of working hour constraints in detail, future research may focus on how hour wishes and actual hours adjust over the life course. The life course perspective is especially fruitful in the context of different assumptions made by economists and sociologists on the adaption of preferences and actual hours. Economic theory rather highlights the role of varying actual hours adapting according to individual preferences while sociologists also emphasize the possibility of changing preferences. Additionally, knowledge on which of the adjustment mechanisms prevails can give further advice for strengthening the employment potential.

Moreover, the findings suggest that traditional role models still prevail. Apart from social norms, this finding might stem from regulations on the German tax and health insurance system that foster traditional employment patterns for married couples. Policies that encourage an equal employment pattern as well as increasing the supply of institutional full-time child care may help overcoming the share of under- or overemployment. However, as also the job characteristics showed to play an important role in both the creation and resolution of working hour discrepancies, more flexible working-time arrangements can prove relevant here. This applies both to the amount of hours, which is still often subject to a strict full-time part-time divide, and the timing that sets conditions for working hour preferences.

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A Tables

Table 4: Creation of a discrepancy

	Underemployed				Overemployed			
	Women		Men		Women		Men	
Personal characteristics								
Career stages (Ref. Middle stage up to 45 years)								
Learning stage	1.6011***	(3.61)	1.3567**	(2.42)	1.0710	(0.80)	0.9961	(-0.06)
Career start	1.0942	(0.75)	0.8296	(-1.36)	1.1448*	(1.81)	0.9255	(-1.10)
Establishing	1.1513	(1.44)	1.0450	(0.39)	1.1571**	(2.33)	1.0940*	(1.66)
Middle stage up to 55 years	1.0657	(0.87)	0.9767	(-0.22)	0.9410	(-1.11)	0.9618	(-0.79)
Pre-retirement	0.6500***	(-3.77)	0.7458*	(-1.73)	0.7500***	(-3.73)	0.8293**	(-2.49)
Retirement	0.6916	(-1.40)	0.6460	(-1.40)	0.5418***	(-2.61)	0.3709***	(-5.97)
Children (Ref. No children)								
Children le6	1.3442*	(1.72)	1.0429	(0.17)	1.3915**	(2.20)	1.0951	(0.73)
Children le10	1.2778	(1.62)	0.8152	(-0.83)	1.3018**	(2.02)	1.0590	(0.50)
Children le15	1.1060	(0.82)	0.9391	(-0.29)	1.0632	(0.60)	1.0496	(0.49)
Daily hours for child care	1.0114	(0.61)	0.8608**	(-1.97)	0.9394***	(-3.16)	0.9359*	(-1.73)
Institutional child care (Ref. Full-time)								
No facility	0.7383*	(-1.95)	0.8301	(-0.93)	0.7724**	(-2.08)	0.8413*	(-1.82)
Part-time facility	1.0430	(0.38)	1.1032	(0.54)	1.0020	(0.02)	0.9962	(-0.04)
Daily hours for housekeeping	1.2032***	(3.98)	1.4908***	(3.64)	0.7961***	(-5.72)	0.8830**	(-2.01)
Education and job characteristics								
Educational degree (Ref. No degree)								
Vocational degree	1.1774**	(2.30)	0.9690	(-0.36)	1.1645***	(2.95)	1.0743*	(1.84)
University degree	1.2525**	(2.18)	0.8756	(-1.04)	1.1269*	(1.81)	1.0185	(0.35)
Occupational autonomy (Ref. Middle=3)								
Apprenticeship	0.4489***	(-4.38)	0.5909***	(-2.72)	0.7847**	(-2.12)	0.6439***	(-4.05)
Low=1	1.3500***	(3.49)	1.1777*	(1.65)	0.7697***	(-3.91)	0.8117***	(-3.83)
2	1.2375***	(3.23)	0.9700	(-0.35)	0.9336	(-1.47)	0.9476	(-1.23)
4	0.9324	(-0.61)	0.7157***	(-2.98)	1.3186***	(4.41)	1.3412***	(6.36)
High=5	0.7348	(-1.13)	0.6749*	(-1.85)	1.1333	(1.14)	1.6376***	(7.07)
Wage (Ref. $\leq$ 1st percentile)								
$\leq$ Median	1.0583	(0.62)	0.9866	(-0.09)	0.9518	(-0.65)	1.0352	(0.42)
$\leq$ 9th percentile	1.0178	(0.16)	1.1923	(1.14)	0.9650	(-0.44)	0.9981	(-0.02)
$>$ 9th percentile	1.6855***	(3.27)	1.5651**	(2.37)	1.1540	(1.32)	1.0780	(0.80)
Partner								
Partner (Ref. No partner)								
Inactive partner	0.7362*	(-1.76)	1.1312	(0.63)	0.9512	(-0.37)	0.9663	(-0.37)
Active partner	0.8286*	(-1.73)	1.1484	(1.05)	1.0782	(0.98)	1.0464	(0.75)
Occupational autonomy (Ref. Middle=3)								
Low=1	1.0980	(0.92)	0.9577	(-0.32)	1.1484*	(1.70)	0.8757**	(-2.17)
2	1.0473	(0.53)	0.8342	(-1.53)	1.1406**	(2.08)	0.9260	(-1.49)
4	0.9695	(-0.35)	0.8884	(-0.76)	1.0761	(1.19)	0.9794	(-0.34)
High=5	0.7291**	(-2.17)	0.6991	(-0.94)	0.9374	(-0.72)	0.8891	(-0.93)
Daily hours for housekeeping	1.0610	(0.66)	0.9974	(-0.06)	1.0267	(0.39)	0.9843	(-0.73)
Daily hours for child care	0.9875	(-0.25)	1.0329	(1.61)	1.0406	(1.04)	1.0199*	(1.93)
Firm characteristics								
Job change	0.5394***	(-7.18)	0.9013	(-1.07)	0.6748***	(-6.41)	0.9542	(-0.89)
Firm size (Ref. None)								
Up to 19	0.5934***	(-3.96)	0.9108	(-0.53)	0.7427***	(-2.88)	0.8670*	(-1.78)
20 to 200	0.5001***	(-5.12)	0.8731	(-0.77)	0.8311*	(-1.78)	0.7921***	(-2.81)
More than 200	0.5176***	(-4.96)	0.8222	(-1.17)	0.7745**	(-2.50)	0.7117***	(-4.29)
Labor market								
Labor market tightness	0.9422	(-1.08)	1.0410	(0.41)	0.9786	(-0.64)	0.9950	(-0.15)
Tenure	0.9716***	(-7.07)	1.0007	(0.15)	0.9951*	(-1.95)	0.9945***	(-2.93)
Full-time experience	0.9996	(-0.09)	0.9833***	(-2.63)	1.0100***	(3.23)	1.0022	(0.74)
Part-time experience	1.0334***	(7.09)	1.0374***	(2.60)	1.0028	(0.69)	0.9738***	(-2.82)
Unemployment experience	1.0406***	(2.82)	1.0355*	(1.94)	1.0084	(0.69)	0.9787*	(-1.80)
Duration								
Period (Ref. 1st and 2nd period)								

3rd period	2.3946***	(12.51)	2.8046***	(12.89)	2.3843***	(18.77)	2.4105***	(22.04)
4th period	1.8429***	(6.42)	2.0043***	(5.78)	2.0061***	(10.59)	1.8307***	(10.16)
5th period	1.2011*	(1.92)	1.3051**	(2.18)	1.2550***	(3.04)	1.3299***	(5.03)
Spell (Ref. 1st spell)								
2nd spell	1.4520***	(5.37)	1.9511***	(8.01)	1.1799***	(3.87)	1.0153	(0.43)
3rd spell					1.3618***	(4.21)	1.0974*	(1.77)
N	17,092		16,227		23,003		29,112	
n	8,100		8,304		8,770		9,880	

Logit estimates. Exponentiated coefficients. Quadratic trend and a dummy for East Germany included.

t-values in parentheses. Standard errors are bootstrapped with 1000 replications. * p<0.10, ** p<0.05, *** p<0.010.

$Period$ measures the point in time until the mismatch occurs (the first and second period are grouped).

$Spell$ indicates how many discrepancies have already been created (more than 2 or 3 spells, respectively, are grouped).

Data Source: GSOEP v32.1, 1985-2015.

Table 5: Resolution of a discrepancy

	Underemployed				Overemployed			
	Women		Men		Women		Men	
Personal characteristics								
Career stages (Ref. Middle stage up to 45 years)								
Learning stage	0.9114	(-0.84)	0.8798	(-1.08)	1.1680*	(1.67)	1.1878**	(2.28)
Career start	1.0380	(0.32)	0.9259	(-0.65)	0.9715	(-0.38)	1.0857	(1.09)
Establishing	1.1080	(1.08)	1.0904	(0.90)	1.0411	(0.63)	1.0763	(1.28)
Middle stage up to 55 years	1.0027	(0.04)	0.8051**	(-2.21)	1.1149**	(2.09)	0.9617	(-0.77)
Pre-retirement	1.1369	(1.16)	0.7242**	(-2.23)	1.1587*	(1.96)	0.9909	(-0.12)
Retirement	1.5090*	(1.93)	0.5403**	(-2.32)	1.9683***	(3.11)	1.6789***	(3.40)
Children (Ref. No children)								
Children le6	1.5047**	(2.35)	1.3610	(1.20)	1.3614**	(2.22)	1.3243**	(2.22)
Children le10	1.2550	(1.46)	1.4557	(1.53)	1.1073	(0.83)	1.2636**	(2.00)
Children le15	1.0245	(0.20)	1.0984	(0.52)	1.0504	(0.47)	0.9842	(-0.15)
Daily hours for child care	0.9624*	(-1.91)	0.9644	(-0.51)	0.9929	(-0.36)	0.9733	(-0.63)
Institutional child care (Ref. Full-time)								
No facility	0.6068***	(-3.42)	0.9160	(-0.52)	0.8496	(-1.26)	0.9175	(-0.83)
Part-time facility	0.9598	(-0.39)	0.9889	(-0.07)	0.9924	(-0.08)	1.0420	(0.46)
Daily hours for housekeeping	0.8820***	(-2.81)	0.8272*	(-1.65)	0.9827	(-0.39)	1.0007	(0.01)
Education and job characteristics								
Educational degree (Ref. No degree)								
Vocational degree	0.9451	(-0.87)	1.1797**	(2.21)	0.9457	(-1.03)	0.8962**	(-2.39)
University degree	0.8677	(-1.47)	1.0437	(0.39)	0.9072	(-1.29)	0.8358***	(-2.87)
Occupational autonomy (Ref. Middle=3)								
Apprenticeship	1.4836**	(2.35)	1.7959***	(3.33)	0.8150	(-1.53)	1.1958	(1.28)
Low=1	0.7776***	(-3.23)	1.0543	(0.59)	1.2338***	(3.04)	1.3075***	(5.14)
2	0.8280***	(-2.98)	1.0892	(1.07)	1.1355**	(2.58)	1.2267***	(4.88)
4	1.1131	(1.02)	1.3080***	(2.71)	0.7258***	(-5.28)	0.8304***	(-3.97)
High=5	1.3726	(1.23)	1.5070**	(2.32)	0.8294*	(-1.69)	0.8511**	(-2.02)
Wage (Ref. $\leq$ 1st percentile)								
$\leq$ Median	1.0791	(0.96)	1.4120***	(2.78)	1.3260***	(3.73)	1.4023***	(3.26)
$\leq$ 9th percentile	1.0597	(0.59)	1.4374***	(2.68)	1.2666***	(2.78)	1.5461***	(4.11)
$>$ 9th percentile	0.5656***	(-3.80)	1.0958	(0.58)	1.4270***	(3.17)	1.5156***	(3.67)
Partner								
Partner (Ref. No partner)								
Inactive partner	1.2110	(0.99)	1.1750	(0.88)	1.2515*	(1.68)	0.9639	(-0.39)
Active partner	1.2625**	(2.02)	1.0002	(0.00)	1.1313	(1.56)	0.8505**	(-2.51)
Occupational autonomy (Ref. Middle=3)								
Low=1	1.0899	(0.84)	1.1015	(0.74)	1.0678	(0.83)	1.1789***	(2.76)
2	1.0275	(0.33)	1.1032	(0.95)	1.0488	(0.75)	1.0921	(1.63)
4	1.0150	(0.18)	0.9868	(-0.11)	0.9829	(-0.29)	1.0438	(0.69)
High=5	1.0628	(0.44)	1.1177	(0.34)	1.0418	(0.42)	1.2112	(1.59)
Daily hours for housekeeping	1.0060	(0.06)	0.9562	(-1.04)	0.8785*	(-1.84)	0.9722	(-1.25)
Daily hours for child care	1.0402	(0.90)	0.9718	(-1.41)	1.0273	(0.88)	0.9940	(-0.55)

Firm characteristics								
Job change	0.9875	(-0.18)	0.7999***	(-2.63)	0.9688	(-0.54)	1.0745	(1.36)
Firm size (Ref. None)								
Up to 19	0.9196	(-0.72)	1.0384	(0.24)	0.8645	(-1.55)	0.7817***	(-2.85)
20 to 200	0.9901	(-0.08)	1.0965	(0.57)	0.8617	(-1.53)	0.7523***	(-3.21)
More than 200	0.9477	(-0.45)	1.0689	(0.43)	0.7753***	(-2.70)	0.7624***	(-3.22)
Labor market								
Labor market tightness	1.1058*	(1.85)	1.1198	(1.51)	0.9883	(-0.28)	0.9987	(-0.03)
Tenure	0.9972	(-0.78)	1.0008	(0.22)	0.9990	(-0.44)	1.0051***	(2.66)
Full-time experience	1.0154***	(3.94)	1.0138**	(2.45)	0.9998	(-0.05)	1.0052*	(1.69)
Part-time experience	1.0133***	(2.78)	1.0055	(0.43)	1.0213***	(5.69)	1.0021	(0.25)
Unemployment experience	0.9071***	(-5.33)	0.9686*	(-1.76)	0.9876	(-0.80)	0.9991	(-0.06)
Duration								
Period (Ref. 1st and 2nd period)								
3rd period	2.9332***	(16.25)	2.8514***	(11.66)	1.9375***	(14.17)	2.1135***	(19.24)
4th period	2.2433***	(7.70)	2.7727***	(7.41)	1.6528***	(7.99)	1.6303***	(9.77)
5th period	1.4316***	(3.12)	1.8769***	(3.95)	1.0180	(0.28)	1.1006*	(1.91)
Spell (Ref. 1st spell)								
2nd spell	1.0853	(1.24)	1.1496*	(1.95)	1.1891***	(3.98)	1.1986***	(5.03)
3rd spell					1.2350**	(2.53)	1.3337***	(4.74)
N	11,753		7,639		25,818		37,019	
n	5,252		3,723		8,556		10,953	

Logit estimates. Exponentiated coefficients. Quadratic trend and a dummy for East Germany included.

t-values in parentheses. Standard errors are bootstrapped with 1000 replications. * p<0.10, ** p<0.05, *** p<0.010.

$Period$ measures the point in time until the mismatch is solved (the first and second period are grouped).

$Spell$ indicates how many discrepancies have already been solved (more than 2 or 3 spells, respectively, are grouped).

Data Source: GSOEP v32.1, 1985-2015.

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