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Second job holding in Germany — a persistent feature?

Philipp Lentge[a]

Abstract: This paper investigates the persistence and determinants of second job holding in Germany, especially marginal second jobs, following a legislative change allowing extensive dispensation of marginal second jobs from taxes and social security contributions. I document an upward trend in second job holding driven in particular by women. Moreover I find strong evidence for the persistence of second job holding using a dynamic panel model. Further, I identify significant gender differences in the decision to moonlight, where especially women in the lower part of the earnings distribution and women with few years of tenure are most likely to take up a second job.

JEL-Classification: J22; J28

Keywords: second job, marginal second job, multiple job holding

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1 Introduction

Second job holding, also referred to as moonlighting, is a notable labour market feature and is the topic of numerous studies documenting substantial numbers of the work force engaging in more than one job in most industrialized countries (recent studies include Auray *et al.*, 2021, and Choe *et al.*, 2017).

Standing out among other Western countries is Germany, where examining German data over the recent almost two decades suggests an unseen upward swing in second job holding, more than doubling in numbers and being the exception in comparison to other European countries (Klinger and Weber, 2020). This unique trend started after a change in the German legislation allowed for extensive dispensation of marginal employment, including marginal second jobs, from taxes and social security contributions starting in 2003. Figure 1 illustrates this strong increase and shows that in 2019 more than 2.5 million employees in Germany held at least one additional job, translating into about 9% of the employed with at least one job subject to social security. As noted by Klinger and Weber (2020) evidence for the German labour market is scarce and somewhat outdated (Heineck, 2009, and Schmidt and Voss, 2014)[1], regarding the increase of second job holding over the last 15 years.

Turning to the existing literature, in general the reasons for holding multiple jobs can be characterized by two main motives. The so-called hours constraint (or earnings constraint) motive applies to workers being unable to supply their desired number of hours in a first job, which leads them to taking up an additional job to optimize their individual labor supply (e.g. Shishko and Rostker, 1976; Conway and Kimmel, 1998). Early research found that specifically workers' earnings on the first job determined the propensity to moonlight and concluded that people foremost take up additional jobs to increase living standards and meet financial needs (e.g. Hamel, 1967; Guthrie, 1969), as for example labor market institutions constrained the hours in their primary occupation (Perlman, 1966). Furthermore, Boheim and Taylor (2004) showed that higher income

[1] The study by Heineck (2009) uses SOEP data up to the year 2005 and Schmidt and Voss (2014) use SOEP data up to 2011.

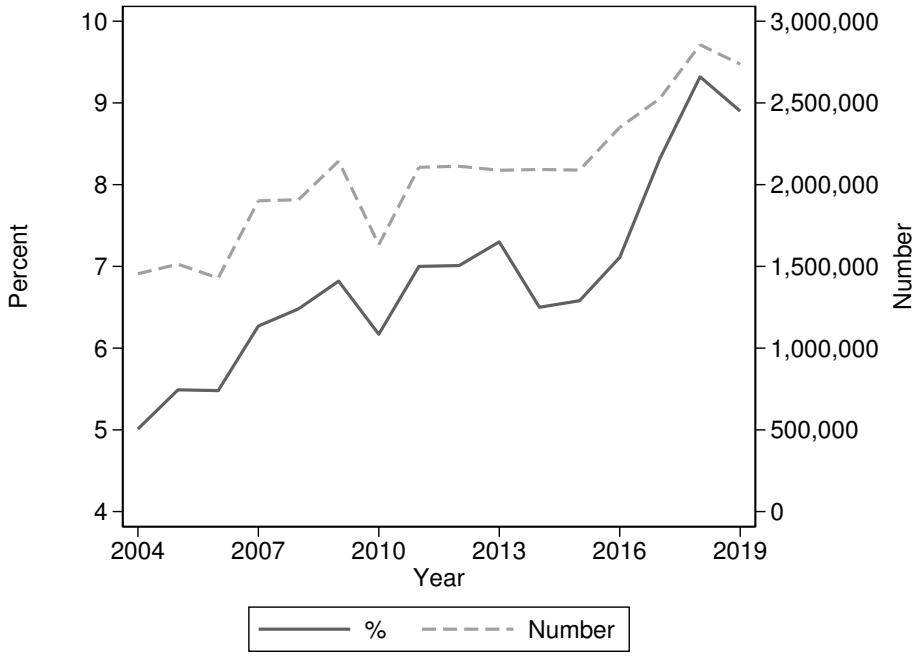

Figure 1: Share and number of employed having a second job (SOEP 2004-2019; weighted using sample weights)

levels in the first job decreased the propensity to take up a second job and also found that second jobs are not only temporary labor supply adjustments but rather persist over time.

Alternatively, the heterogeneous jobs (or portfolio) motive accounts for workers who do not face an hours constraint on their first job, but choose to work a second job for reasons beyond earnings. Workers may increase their utility from different aspects of the second job then just income alone, since there exist complementarities with the first job, e.g. the professor who also works as a consultant or a mother who holds two jobs to meet time-allocation needs (Heineck, 2009). Moreover workers may aim at diversifying their tasks to increase satisfaction by engaging in more pleasant or prestigious second jobs (Conway and Kimmel, 1998, and Renna, 2006) or invest in human capital (Averett, 2001). Empirical work supporting the portfolio motive includes Panos *et al.* (2014) showing that the acquired skills from the second job increase the probability of finding a new job or Pouliakas (2017) finding high-skilled moonlighters upgrading their skills. Auray *et al.* (2021) find that second job holding is rising with individuals' education and interpret their results as evidence for a comparative advantage of educated workers in second job

holding. Allen (1998) (for the US) and Boheim and Taylor (2004) (for the UK) obtain that constrained workers are actually less likely to hold an additional job than unconstrained workers, thus suggesting that heterogeneous job motives are more important than the hours constraint. Other studies exploring the determinants of multiple job holding include Kimmel and Conway (2001), Wu *et al.* (2009) and Dickey *et al.* (2011).

Investigating economic conditions and moonlighting, Amuedo-Dorantes and Kimmel (2009) find for the US that multiple job holding of men is largely acyclic, while female multiple job holding switched to being procyclical in the early 2000s. Similarly, Hirsch *et al.* (2017) document that multiple job holding is largely acyclic and negligible in mitigating earnings volatility over the business cycle. Moreover it is rather unresponsive to unemployment or employment growth changes within markets over time.

Against this backdrop, this paper contributes to the existing literature as follows. Firstly, using recent panel data for Germany I document developments in second job holding since the legislative change in 2003 with a focus on marginal second jobs and how these vary especially between men and women. Secondly, I show empirically that second job holding is a persistent feature of workers' biographies in Germany. Thirdly, I investigate the individual determinants of taking up a second job—either a marginal or non-marginal one—and whether there are marked differences among specific groups of workers.

The remainder of this paper is organised as follows. Section 2 describes my data and provides descriptive findings on the prevalence and extent of second job holding in Germany. Section 3 explains the econometric approach based on a dynamic multinomial logit random effects model. Section 4 presents and discusses my estimation results, and Section 5 concludes.

2 Data and descriptive findings

Within the German labour market there is the distinction into two different types of employment: regular jobs subject to income tax and social security contributions, and marginal jobs (called mini-jobs), which are exempt from income taxes and the employee

share of social security contributions (health, long-term care, unemployment, and pension) leading to 'gross is net' pay for those jobs. From 1999 to 2003 the social security exemption for marginal employment additional to the main job had been abolished and when holding a second job, these earnings were added to the main job earnings and were thus subject to income tax and social security contributions. The law governing marginal employment was changed with the Hartz II reforms, effective April 1, 2003, and introduced a marginal earnings threshold of 400 Euros and removed the limit of 15 hours per week for marginal employment and allowed workers in a regular main job to hold an additional marginal second job free of tax and social security contributions. As a result of legislative changes in the area of marginal employment, the monthly earnings limit for marginal employment was raised from 400 to 450 Euros as of January 1, 2013. At the same time, these mini-jobs became subject to compulsory insurance in the statutory pension insurance, but the option to be exempt was created. Thus, second job holding in Germany can be divided into holding a marginal (400/450 Euros per months up to 2013/from 2013 onwards) or non-marginal second job (exceeding 400/450 Euros per month). Therefore, I use the earnings information on second jobs in my data to define these second jobs according to these thresholds, meaning into marginal and non-marginal second jobs.

My data come from the German Socio-Economic Panel (SOEP henceforth) for the years 2003[2] to 2019 (Goebel *et al.*, 2018). This survey is nationally representative and provides detailed information on individuals and households on an annual basis. The same individuals are re-interviewed each year, and if they leave their original households to form new households all adult members of these new households are also interviewed. I include only employees that have a primary job, which is subject to social security contributions, meaning this income must exceed 400 (450) Euros per month for the years up to 2013 (after 2012). Furthermore the sample is restricted to workers aged 18 to 65 who are full- or part-time employed on the first job. I exclude self-employed[3], apprentices, interns, and partial retirees.

[2] I only include observations for the year 2003 with the interview time being later than April 1st, since from that time on the legislative change was in effect.

[3] I exclude self-employed in the main job as they have more flexibility of choosing their working hours and other aspects of their job.

Table 1: Variable means by second job status

	Main job only		Marginal 2nd		Non-marginal 2nd	
Main job characteristics	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**
Main job monthly gross income in €	3,332.59	2,209.68	3,258.94	1,889.72	4,309.28	2,445.93
Decile of first job gross income (1/0):						
Up to 1st decile	0.025	0.166	0.030	0.251	0.023	0.169
1st to 2nd decile	0.044	0.152	0.043	0.175	0.040	0.119
2nd to 3rd decile	0.077	0.141	0.065	0.156	0.048	0.116
3rd to 4th decile	0.092	0.108	0.092	0.111	0.041	0.116
4th to 5th decile	0.109	0.099	0.115	0.085	0.069	0.083
5th to 6th decile	0.115	0.090	0.138	0.065	0.083	0.077
6th to 7th decile	0.125	0.084	0.128	0.062	0.118	0.075
7th to 8th decile	0.131	0.073	0.136	0.046	0.112	0.089
8th to 9th decile	0.141	0.056	0.138	0.034	0.165	0.092
Above 9th decile	0.141	0.031	0.117	0.015	0.301	0.064
Tenure (1/0)						
Less than 2 years	0.155	0.177	0.156	0.249	0.134	0.196
2-5 years	0.167	0.185	0.175	0.217	0.158	0.208
5-10 years	0.178	0.185	0.179	0.204	0.183	0.210
More than 10 years	0.500	0.453	0.489	0.330	0.525	0.387
Full-time (1/0)	0.950	0.527	0.891	0.385	0.842	0.413
Temporary contract (1/0)	0.193	0.201	0.185	0.200	0.205	0.233
Public service sector (1/0)	0.225	0.357	0.331	0.357	0.400	0.452
Worker characteristics						
Family status (1/0)						
Single and no children	0.184	0.188	0.198	0.226	0.134	0.188
Partner and no children	0.366	0.409	0.331	0.337	0.356	0.402
Partner and children	0.433	0.318	0.457	0.323	0.494	0.319
Single and children	0.017	0.085	0.014	0.114	0.016	0.091
Preferred working hours first job (1/0)						
More hours	0.261	0.257	0.323	0.396	0.361	0.347
Less hours	0.292	0.319	0.282	0.254	0.294	0.294
Same hours	0.447	0.424	0.395	0.350	0.345	0.358
Employment status partner (1/0)						
No working partner	0.517	0.526	0.511	0.608	0.526	0.604
Full time	0.194	0.446	0.175	0.368	0.147	0.376
Part time	0.239	0.020	0.232	0.017	0.282	0.016
Other	0.051	0.008	0.082	0.008	0.045	0.005
Age (1/0)						
18-25 years old	0.046	0.049	0.044	0.048	0.018	0.013
26-35 years old	0.187	0.178	0.200	0.180	0.119	0.155
36-45 years old	0.301	0.303	0.316	0.302	0.330	0.305
46-55 years old	0.308	0.324	0.316	0.354	0.334	0.377
Older than 55 years	0.157	0.146	0.125	0.116	0.199	0.150
Skill level (1/0)						
Low skill	0.074	0.072	0.074	0.073	0.029	0.038
Medium skill	0.660	0.649	0.628	0.682	0.480	0.457
High skill	0.266	0.279	0.298	0.245	0.490	0.505
Lives in East Germany (1/0)	0.216	0.247	0.136	0.154	0.142	0.197
Migration Background (1/0)						
No migration background	0.815	0.838	0.806	0.824	0.891	0.862
Direct migration background	0.139	0.117	0.146	0.130	0.076	0.091
Indirect migration background	0.046	0.045	0.048	0.046	0.033	0.047
Number of Individuals	13,984	13,809	1,535	1,916	595	367
Number of Observations	60,654	57,994	3,209	4,036	1,258	639

Notes: SOEP 2003-2019; unbalanced panel, unweighted.

Table 1 tabulates the variable means for the estimating sample by second job status. The final sample comprises 127,790 observations (49% Women). The SOEP data include information on workers' personal and job characteristics. Moreover, the SOEP includes information on the household and family context of interviewed persons allowing me to include this information in later investigations. Workers characteristics comprise, *inter alia*, their sex, age, information on educational attainment, family status, employment status of partner, migration background, and whether the person lives in East or West Germany. Characteristics of the main job include workers' earnings, job tenure, temporary (as opposed to permanent) contract, working hours, whether the job is in the public service sector, occupation, industry sector, and firm size. For my further analysis I will make use of monthly income deciles (derived from monthly earnings across all observations by year) to allow for non-monotone income effects in latter models, as well as for descriptive evidence for different income groups. For workers' preferences regarding working hours, I can generate an appropriate indicator. SOEP-interviewees are asked: 'If you could choose your own working hours, taking into account that your income would change according to the number of hours: How many hours would you want to work?'[4]. Comparing this number of desired working hours with actual hours worked, gives me an indicator for the working hours preference of a worker.[5]

As is visible from Table 1, there are substantial differences between men's and women's characteristics and their second job status. Firstly, there are marked differences in monthly gross income by job status and gender. Men's income in the main, respectively only job, is in all cases higher than their female counterpart's. Comparing the incomes of workers with regard to what type of second job they hold, it shows that workers with a marginal second job tend to have lower incomes in their first job than those having a non-marginal second job. Note further that female marginal second job holders are disproportionally found in the lower main job income deciles compared to the other two outcomes, with almost 60% being in the lowest four deciles. Among male non-marginal second job holders, top earners

[4] This question is asked directly after questions relating to the first (main) job.

[5] Information on desired working hours is not available for 2019. Therefore latter estimations include data from 2003 to 2018.

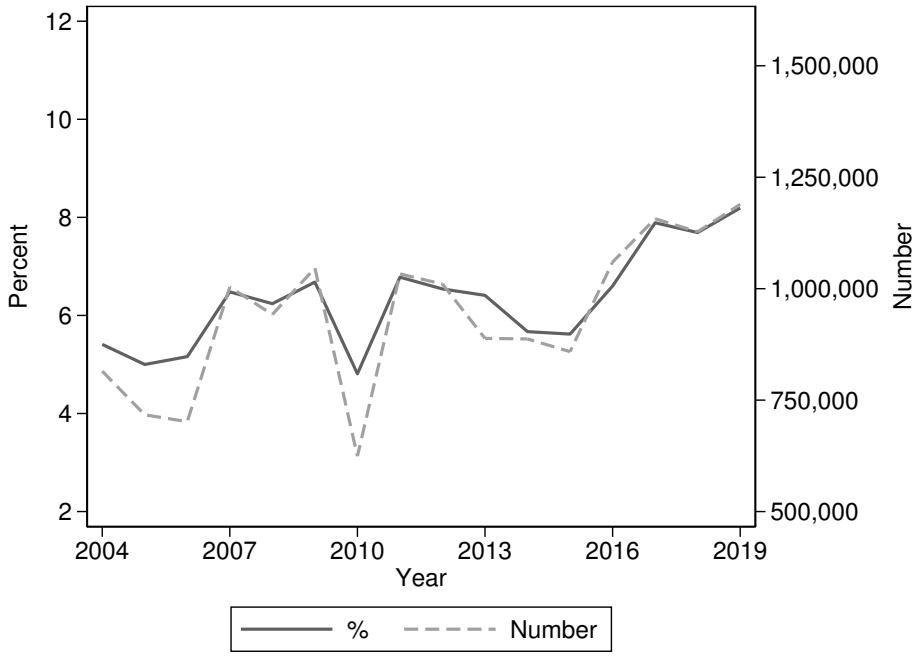

Figure 2: Male share and number of employed having a second job (SOEP 2004-2019; weighted using sample weights)

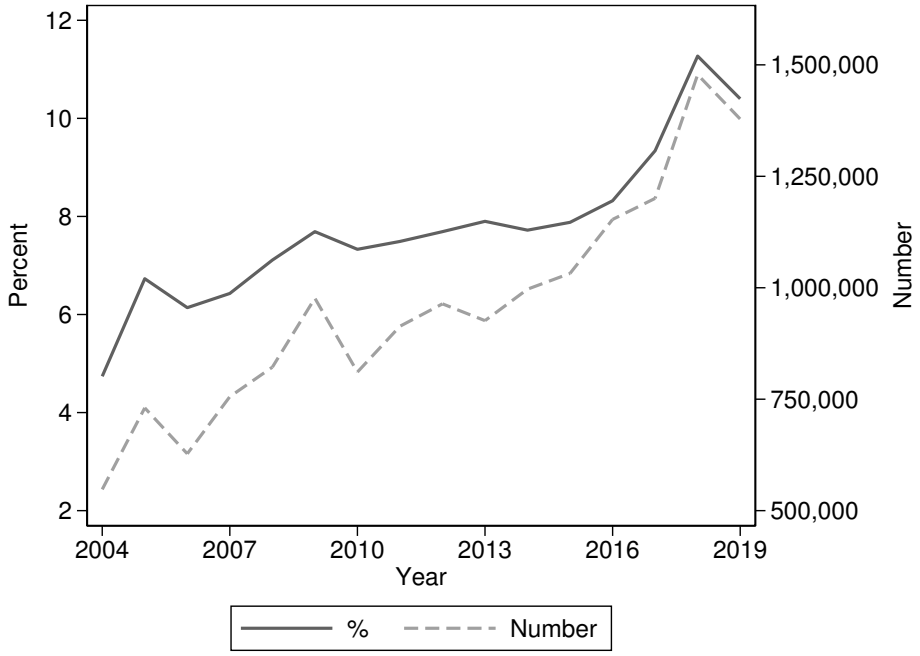

Figure 3: Female share and number of employed having a second job (SOEP 2004-2019; weighted using sample weights)

make up the largest group with almost 50% being in the top two deciles. Moreover, female as well as male moonlighters work less often full time than employees with only one job.

Turning to workers' personal characteristics, we see from Table 1 that the proportion of single mothers is higher for second job holders, whereas among male marginal second job holders the proportion of men with partner and children is highest. About one third of second job holders prefers more hours in their main job, which could be an indication of the hours constraint. The distribution of skill levels is quite similar for workers with only one job and marginal second job holders, whereas among non-marginal second job holders the share of low skilled is smallest. Apart from that, we can see that the share of second job holders is smaller in Eastern Germany.

In the following, using these data and the provided sample weights, I will descriptively investigate trends and heterogeneities in second job holding for Germany for the years 2004[6] to 2019 for various subgroups. Note that I will mainly focus on marginal second jobs in this descriptive analysis, since for those jobs legislative changes were introduced.

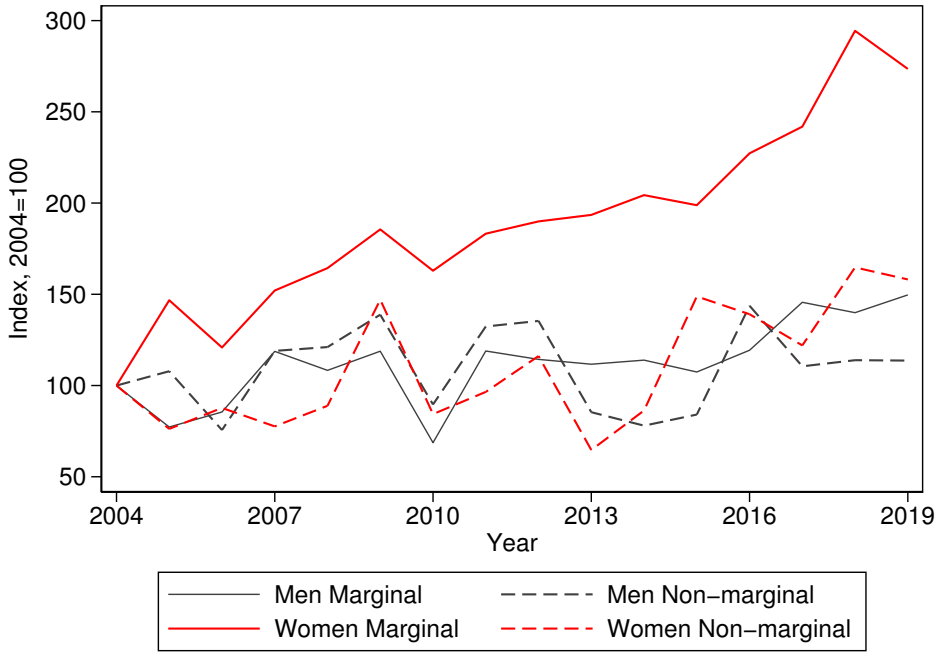

Figure 4: Development of second job types for men and women (SOEP 2004-2019; weighted using sample weights)

[6] I start with the year 2004 as I am comparing absolute yearly numbers and for the year 2003 that number would be very small, due to the legislative change in April 2003 and only a small number of SOEP interviews for the year 2003 after April of this year.

Having seen the strong overall increase in second jobs in Germany, Figures 2 and 3 show these developments separately for men and women. Men exhibited in 2004 initially a higher number of moonlighters than women in absolute and relative terms, but have been subsequently overtaken by women. From 2004 to 2019, the share of women holding more than one job rose from around 4 to more than 10 percent, whereby the absolute number almost tripled. The increase in the share of moonlighting men was moderate from about 6 to about 8 percent, since the legislation on mini-jobs changed. The number of men holding a second job increased during this period by about half a million. In addition to that, there is a visible dip in male second job holding for the year 2010, the time of the financial crisis and sharp drop of economic growth in Germany.

Table 2: Number of second job holders by second job type

	Men		**Women**	
Year	2004	2019	2004	2019
Marginal second job	635,000	950,000	445,000	1,215,000
Non-marginal second job	210,000	240,000	105,000	165,000

Notes: SOEP 2004-2019; weighted using sample weights.

However, as pointed out before, there are two different types of second jobs in Germany; marginal and non-marginal ones. Figure 4 illustrates the development of these different second job types by gender. It stands out, that in particular marginal second jobs of women have increased. This increase is almost threefold and by far the strongest one during the considered time period. Whereas women's non-marginal second job numbers have increased by about 50 percent, we can see that men's non-marginal second job holding remained about the same, with some ups and downs during these years. Table 2 gives an indication of the magnitude of moonlighting workers, and further shows that marginal second jobs substantially outnumber non-marginal ones. Taking into account the increased female participation rate and also the strong German economic performance for the second part of my observation period, these descriptive findings nevertheless appear very plausible in connecting these increases to the legislative changes. It also shows that non-marginal second employment is rather unaffected.

Next, I will take a closer look at those marginal second job holders and who they

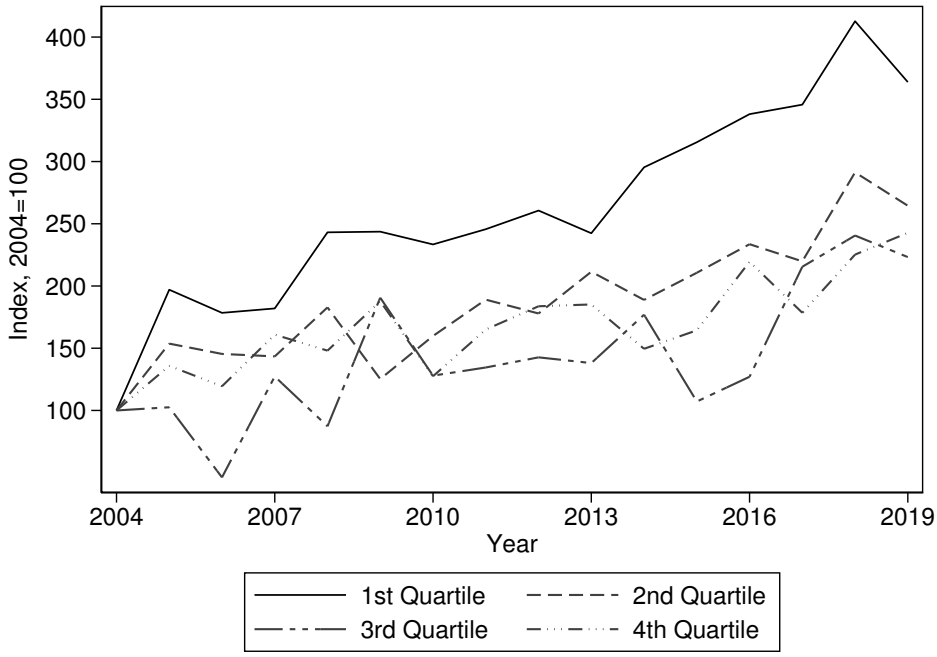

Figure 5: Development of marginal second job holding by monthly income quartiles for women (SOEP 2004-2019; weighted using sample weights)

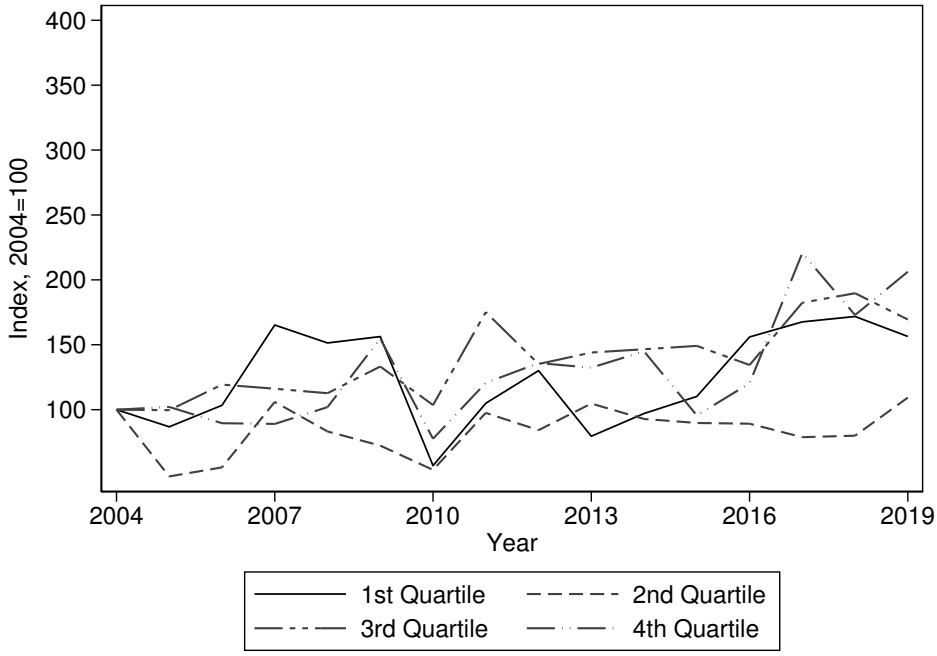

Figure 6: Development of marginal second job holding by monthly income quartiles for men (SOEP 2004-2019; weighted using sample weights)

are. Figure 5 shows the development of marginal second job holding of women divided into monthly first job income quartiles of the whole distribution (including both men and women). The number of marginal second jobs is trending upwards for all income quartiles, but is largest for the lowest income quartile by a large margin. In 2019 there are three and a half times as many female marginal second job holders in the lowest income quartile than were in 2004. For the second quartile the number increased by more than 150%, while it also doubled for female top earners. On the contrary, the numbers of male marginal second job holders (Figure 6) are quite similar for all income quartiles but the second quartile, where second job holding even seems to decline over the years.

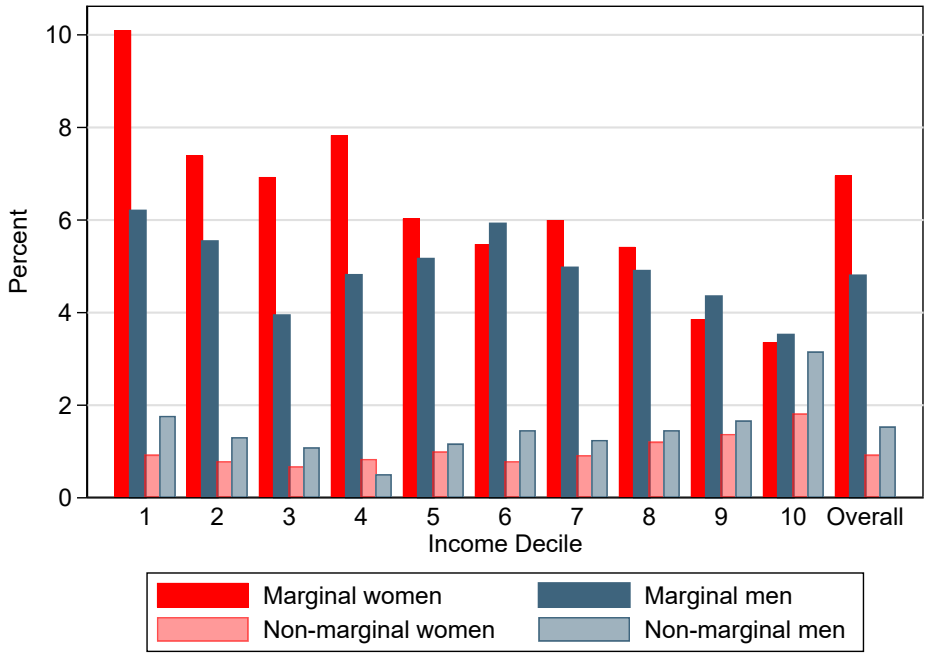

Figure 7: Share of second job holders by type and income decile (SOEP 2003-2019; weighted using sample weights)

This impression is also borne out in Figure 7 that shows the shares of marginal and non-marginal second holders for income deciles by gender. The lower income deciles of women have the highest share of marginal second job holders with every tenth women in this group moonlighting, while this share is decreasing when moving up the income distribution. Within the lower half of the income distribution, the share of women in marginal second jobs is always higher than for men. About 6% of male workers in the first income decile also engage in a marginal second job, with another peak for the sixth decile.

Overall, I can see that the incidence to hold a marginal second job (mostly) decreases along the income distribution no matter the gender of the worker. As seen before, non-marginal second job holding plays a minor role with shares between 1 or 2 percent, with the exception being the top decile for men, where it is almost on par with marginal second job holding.

In addition to differences in second job holding for specific income groups, I look at the development of marginal second jobs for specific skill levels of workers. I distinguish high-skilled workers with an academic education, medium-skilled workers with a vocational training, and low-skilled workers with neither. Figure 8 displays that marginal second jobs of women of all skill levels more than doubled over the considered time span; showing a very similar upward trend. By contrast, we can see in Figure 9 that especially low skilled men increased their engagement in marginal second jobs. For the medium skilled (the largest skill group) there is almost no change noticeable across the years, while for the high skilled it rose by about 50 percent.

Table 3: Share of marginal second job holders by family status for women and men

	Income decile										
Family status of women	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Overall**
Single	10.32	9.43	8.7	9.91	7.31	6.36	8.16	4.29	4.33	7.55	7.89
Partner	9.96	6.47	5.6	7.04	5.04	4.68	4.35	6.49	3.78	1.21	6.13
Partner and children	10.02	6.79	6.05	5.29	5.97	5.8	5.24	4.33	3.54	3.3	6.85
Single with children	10.77	8.97	10.52	11.69	6.5	5.74	6.23	7.16	1.9	2.7	8.93
Family status of men											
Single	7.01	6.15	4.69	5.25	5.61	7.45	4.91	4.14	4.6	2.53	5.24
Partner	6.97	4.74	3.06	3.8	4.17	5.49	4.85	4.1	4.02	3.31	4.26
Partner and children	4.61	6.08	4.12	5.68	5.85	5.11	5.26	6.52	4.65	4.11	5.18
Single with children	0.88	1.94	2.96	2.23	6.23	7.62	2.09	0.24	3.49	7.99	3.12

Notes: SOEP 2003-2019; weighted using sample weights.

In order to take further advantage of the strength of the SOEP data, I will look at the composition of marginal second job holders with regard to their family status (Table 3). As already seen, the share of women with a marginal second job is higher than those of men no matter the family status. Single mothers and single women show the highest shares of marginal second job holders with 9 respectively 8% among them. This fact is

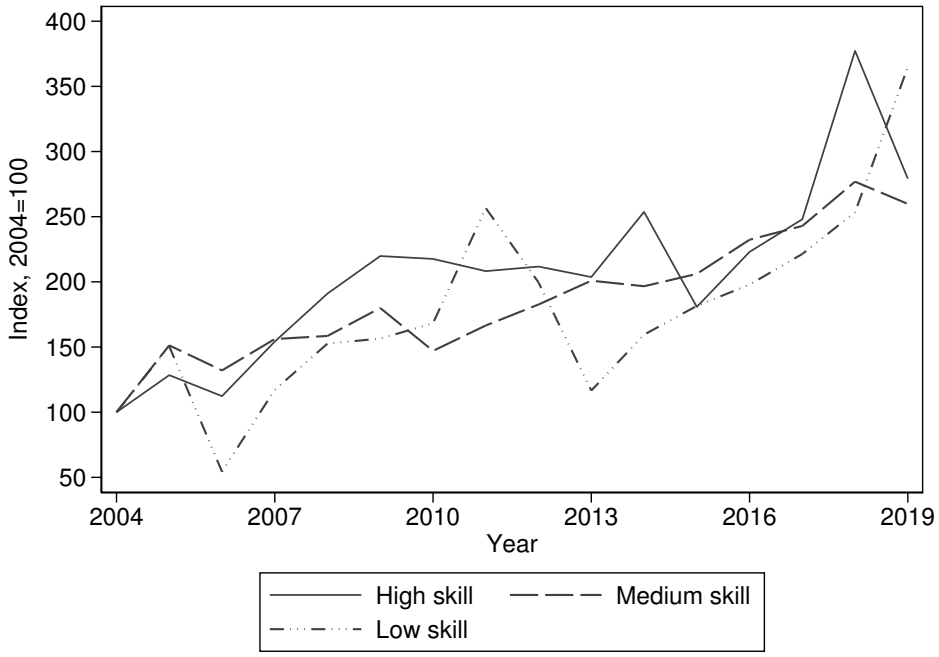

Figure 8: Development of marginal second job holding by skill level for women (SOEP 2004-2019; weighted using sample weights)

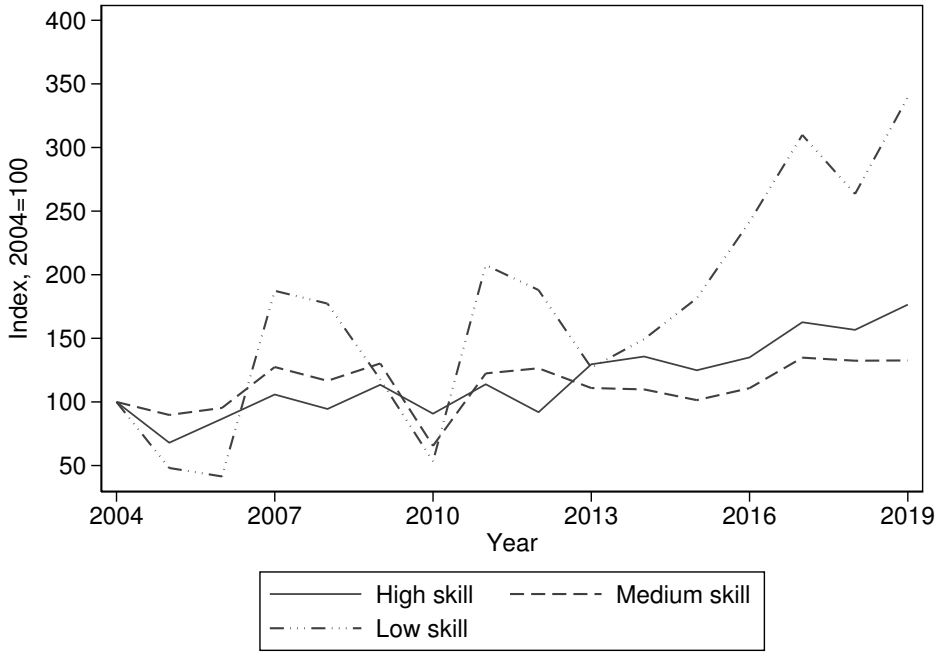

Figure 9: Development of marginal second job holding by skill level for men (SOEP 2004-2019; weighted using sample weights)

even exacerbated when considering the lower income deciles. Further, we see that workers having children with a partner present a higher share of marginal second job holders than those without children. Taking a closer look at the different income deciles shows that the share of marginal moonlighters follows a downward trend while income rises across all groups.[7] All of these findings let me conclude so far, that when workers' conditions are below average or less than ideal, regarding e.g. income or household composition, marginal second jobs are particularly prevalent.

Table 4: Hours worked per week by job combination

	Only main job	**Marginal second job**	**Non-marginal second job**	**Overall**
Men				
Hours main job	42.9	41.8	43.2	42.9
Hours in second job	—	5.4	8	6.1
Women				
Hours main job	35	32	33	35
Hours in second job	—	5.5	8.5	5.9

Notes: SOEP 2003-2019; unweighted.

In addition, I want to make use of the data to show the allocation of working hours between the main and the second job. Firstly, Table 4 tabulates the mean hours worked per week and job combination. Those who have a marginal second job work on average fewer hours in their main job than those without a second mini-job, which provides some suggestive evidence for the hours constraint motive of moonlighting for this group. Here, women with a marginal second job work 3 hours less on average in their first job than women with only one job. Regardless of gender, workers with a marginal second job allocate on average 5.5 working hours per week to this second job. Men work more hours in their main jobs than women and seem to reduce these hours by not as much as women when holding an additional mini-job. Non-marginal second job holders work on average more hours in the main job than those with a marginal second job, whereas male non-marginal second job holders seem to be workers with higher working hours across the

[7] Single fathers are the exception, but are only very few in numbers in the data

board compared to the other types. This lends some evidence to the fact that particularly men with higher paying (more hours intensive) main jobs hold additional jobs with higher additional earnings opportunities.

As one of the main questions of this paper is the persistence of second job holding, I look at the transition matrix for second job holding. Looking at Table 5 the data seem to confirm this persistence. About 60% of workers that had a marginal second job in one year also had one in the next year. Also, about 54% of non-marginal second jobbers also had one in the next year. Apart from that, very few workers (about 3%) start any type of second job from year to year. Furthermore, it rarely occurs that workers switch from a marginal to a non-marginal second job in the next year. On the other hand, the opposite holds true for about 20% of non-marginal second jobbers. If we were to look at gender differences, all these numbers are somewhat larger for women than men.

Table 5: Transitions between main job and second job combination types

	Period t		
	Only main job	Marginal second job	Non-marginal second job
Period t-1			
Only main job	97.25	2.27	0.48
Marginal second job	35.85	59.01	5.14
Non-marginal second job	27.22	19.06	53.72
Total	92.51	5.91	1.57

Notes: SOEP 2003-2019; unweighted data; 162,577 observations from 33,747 individuals; figures indicate row percentages.

In summary so far, my descriptive findings show a strong increase in marginal second jobs in Germany. They further document significant differences in marginal second job holding across different socio-economic worker groups, where especially low income and low skill workers hold a marginal second job. What is more, there is descriptive evidence for a considerable persistence of second job holding. In a next step, I will run regressions to quantify the contribution of specific characteristics to the persistence and take-up of a second job.

3 Econometric Approach

In a first step, I investigate in a binary response model I investigate which characteristics are correlated with starting a marginal second job. I focus on marginal second jobs only, because no meaningful regression analysis is feasible for non-marginal second jobs due to the very low number of people starting a non-marginal second job in my sample. Moreover, the legislative change only affected marginal second jobs. Since taking up such a marginal second job is rare, I choose a complementary log-log model, which is asymmetrical and thus suitable for modelling such rare events.

In a next step, my econometric approach to study persistence rests on a dynamic random-effects logit model. I translate the decision to hold a second job into a multinomial logit setting to distinguish between types of second jobs and explore the factors driving a worker's decision to have either a main job, the main and a marginal second job, or a main and a non-marginal second job. Using a dynamic specification accounts for the state dependence of workers, modeled as a $t-1$ lag in my outcome variable.

In such a model, identifying true state dependence rests on the assumption of no correlation between unobserved heterogeneity and the outcome variable. Another issue is the initial condition problem stemming from the correlation between the relevant unobserved factors and the initial observation y_{i0}. The initial period y_{i0} in my data regarding second jobs might not (and likely does not) correspond to the beginning of the stochastic process leading to the second job engagement. Therefore, the approach of the model I am using is based on the simple solution to the initial condition problem by Wooldridge (2005) and the extension by Rabe-Hesketh and Skrondal (2013) and means that I include the initial value of the response variable and of other time-varying explanatory variables, as well as within-unit averages of the time-varying explanatory variables.

Following this, my model has the following specification:

$$y_{it} = \gamma \mathbf{Z}_{it} + \rho y_{it-1} + c_i + u_{it} \tag{1}$$

The outcome variable y_{it} expresses the chances of holding a particular job type combination for worker i at time t.[8] $\mathbf{Z}_{it}$ is a set of time-varying explanatory variables considered strictly exogenous, conditional on the unit-specific unobserved effect c_i. ρ captures the coefficient for the y_{it-1} and thus true state dependence, while u_{it} is an error term.

As Rabe-Hesketh and Skrondal (2013) note, the unit-specific unobserved effect c_i can be written as:

$$c_i = \alpha_0 + \alpha_1 y_{i0} + \overline{\mathbf{Z}}_i \alpha_2 + \mathbf{Z}_{i0} \alpha_3 + a_i \tag{2}$$

where $\mathbf{Z}_{i0}$ and y_{i0} represent the initial values of the time-varying explanatory variables and of the response variable, respectively.[9] $\overline{\mathbf{Z}}_i$ comprises the within-unit averages of the explanatory variables where the averages are based on all periods. Lastly, a_i is a unit-specific time-constant error term, normally distributed with mean 0 and variance σ_a^2. If the assumption holds, that unobserved heterogeneity is captured by c_i, then the lagged value of the response variable can be interpreted as true state dependence, meaning as the effect of holding a second job in one period on the second job status in a subsequent time period.

As covariates I add the following groups of variables: (i) main job characteristics including groups of dummies for income deciles, tenure, full-time hours, a temporary contract, public-service sector, as well as dummies for occupation, sector, and firm size; (ii) worker characteristics capturing family status, hours preferences, educational attainment (distinguishing high-skilled workers with an academic education, medium-skilled workers with a vocational training, and low-skilled workers with neither), employment status of the partner, age, migration background, and residence in East Germany. I employ dummies for the wage deciles as an explanatory variable to allow for non-monotone income effects suggested by the descriptive analysis in Section 2. I further control for working time arrangements (full- vs part-time) to disentangle both effects.

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8 Note that $t = 0$ indicates the initial period.

9 They also show that this can be safely implemented in case of an unbalanced panel.

4 Estimation Results

First, I show the results for characteristics which correlate with workers to take up a marginal second job (Table 6).[10] Therefore I use a complementary log-log model to investigate the workers that take up a marginal second job in period t after working only their main job in $t-1$ and note in passing that my findings remain robust when using a standard logit model.

At first, I discuss female workers. Having controlled for other influences like family status or working full-time, the probability of starting a marginal second job is by far the highest in the lowest income and lowest tenure group. Compared to the top 10% of high-earners, the lowest income decile workers are 2 percentage points more likely to hold a marginal second job. This translates into an about one third increase in the average probability to have a marginal second job and thus by no means a small effect as the overall average marginal second job rate form women is around 6% in the sample. The same effect size can be seen for women with less than 2 years of tenure compared to women with tenure of 10 years and more. Furthermore income growth has an impact, since moving up in the income distribution shrinks the probability of a marginal second job slowly but steadily, as staying longer with an employer does as well. This is consistent with the results of Klinger and Weber (2020) that document a similar pattern and conclude no evidence for the heterogeneous/ portfolio motive of moonlighting, since financial needs seem to dominate.

Other things being equal, full-timers and women with a partner are less likely to take up a marginal second job. The fact, that a woman wants to work more hours instead of the same number of hours in the main job increases the probability to take up a marginal second job by 1.4 percentage points, and further points at a possible hours, respectively earnings, constraint motive for the second job. Age plays a minor role for women to look for a marginal second job, as I can only see that women over the age of 55 are marginally less likely to do so. Living in East Germany reduces the average probability to engage in a marginal second job by 25% or 1.3 percentage points, which is highly likely due to a

[10] See Appendix A.1 showing coefficients and standard errors.

Table 6: Complementary log-log model for holding a marginal second job after only main job in period t-1; marginal effects

	Women	**Men**
Main job characteristics		
Main job monthly gross income		
up to 1st decile	0.019***	0.008
1st to 2nd decile	0.014***	0.013**
2nd to 3rd decile	0.014***	0.008**
3rd to 4th decile	0.012**	0.009**
4th to 5th decile	0.011**	0.012***
5th to 6th decile	0.009*	0.009***
6th to 7th decile	0.004	0.006**
7th to 8th decile	0.006	0.007***
8th to 9th decile	0.004	0.002
above 9th decile (reference)	—	—
Tenure		
less than 2 years	0.022***	-0.001
2-5 years	0.011***	-0.001
5-10 years	0.008***	-0.003
more than 10 years (reference)	—	—
Full-time (1/0)	-0.006***	-0.007**
Fixed-term contract (1/0)	0.003	0.002
Public service sector (1/0)	0.002	0.006**
Personal characteristics		
Family status		
Single and no children (reference)	—	—
Partner and no children	-0.007***	0.001
Partner and children	-0.004	0.002
Single and children	0.001	0.002
Preferred working hours first job		
More hours	0.014***	0.006***
Same hours (reference)	—	—
Less hours	0.002	0.001
Employment status partner		
Full time (reference)	—	—
Not working	0.008***	0.001
Part time	0.01	0.002
Other	0.022**	0.011***
Age		
18-25 years old	0.004	0.014**
26-35 years old	0.009***	0.013***
36-45 years old	0.007*	0.008***
46-55 years old	0.009***	0.005***
older than 55 years (reference)	—	—
Skill level		
Low skill	-0.006*	-0.006**
Medium skill (reference)	—	—
High skill	-0.007***	-0.002
Lives in East Germany (1/0)	-0.013***	-0.010***
Migration Background		
No migration background (reference)	—	—
Direct migration background	0.004	-0.001
Indirect migration background	-0.005	-0.004
	44,476 obs./ 10,679 persons	48,086 obs./ 11,045 persons

Notes: SOEP 2003-2018. Standard errors clustered at the person level (* p<0.05, ** p<0.01, *** p<0.001). Controls included for industry sectors, occupation, firm size and years.

higher share of full-time working women than in Western Germany.

Table 6 shows that men in the middle of the income distribution are most likely to start a second job, e.g. men in the fifth income decile have a 1.2 percentage points or 35% higher probability to have a marginal second job than top male earners. Moreover, men working in the public service sector have a 15% higher average probability to engage in a marginal second job compared to those in the private sector. This might be explained by hours and job security in the public sector job. I also find that the desire to work more hours, as well as being in prime working age, increases the chances to engage in an additional mini-job. As was the case for women, living in East Germany reduces the probability to moonlight.

In summary, I conclude that in particular a less than ideal first main job environment (income, tenure, part-time) of women appears to be a good indicator of taking up an additional mini-job.[11] For men the same can be said for average income levels and working in the public-service sector. On the one hand, the hours constraint motive or probably better earnings constraint motive gets support by the fact that workers with a preference to work more hours show a higher probability to look for an additional marginal job, where gross pay is net pay. On the other hand, the portfolio motive is hardly confirmed, as the probability to hold a second job does not rise significantly towards the top of the wage distribution.

Next, in Table 7 I present the marginal effects of the dynamic multinomial logit model with random effects for different second job status types of German workers.[12] The main variables of interest are the lagged second job states. Once controlled for the initial condition and net of the role of unobserved heterogeneity, these coefficients indicate the presence of significant genuine state dependence.[13]

Holding only the main job in $t-1$ serves as the reference category, such that the

[11] This is in line with the findings of Schmidt and Voss (2014) for the period up to 2010.

[12] The sum of the marginal effects for the alternatives: marginal second job and non-marginal second job, yield the respective marginal effect of the alternative: only the main job.

[13] See Appendix A.2 showing coefficients and standard errors.

reported marginal effects must be interpreted relative to this group. I observe a genuine state dependence for second job holders, where the state dependence is even more pronounced for women: having a marginal second job in year $t-1$ increases the probability of holding a marginal second job in year t by about 17 percentage points or 200% for women and 11 percentage points for men (keeping in mind that the average probability of holding a marginal second job is about 6% for women and 4.4% for men across my sample). The effect of having a non-marginal second job in $t-1$ on having a marginal one the year after is almost equal in size and also highly significant. Having a marginal second job or, respectively, a non-marginal second job in $t-1$ also increases the probability to hold a non-marginal second job in t by 3, or 5 percentage points respectively. The same pattern can be found for men, but the effect of state dependence regarding marginal second jobs is only about two thirds of the effect size of women. These findings strongly support the argument that second job holding is no temporary but a persistent feature, in particular for German female workers with marginal second jobs.

Note that in this dynamic setting, genuine state dependence becomes the single largest (and most significant) contributor to the probability for holding some type of second job. Nevertheless, I want to comment on the impact of other variables as well, which are unfortunately not estimated very precisely due to the small number of observations for this outcome. Firstly regarding marginal second jobs, the probability to have a marginal second job is highest for the lower income deciles for women as well as men. For women, tenure of less than 2 years increases the probability of a marginal second job compared to longer tenured workers, while the desire for more working hours in the first job is associated with a higher probability to have a marginal second job, as expected. Moreover low skilled women show an 11 percentage points higher probability to hold a marginal second job than medium skilled women, while high skilled females are also more prone to hold a marginal second jobs than medium skilled ones. Meanwhile low skilled men are less likely to hold a second job than men with vocational training. Apart from that, living in East Germany reduces the probability for men to hold a marginal second job by almost 5 percentage points. Therefore, I can conclude that for my sample of German workers

Table 7: Dynamic Multinomial logit model with random effects for second job states; marginal effects

	Women		Men	
	Marginal	***Non-marginal***	***Marginal***	***Non-marginal***
State dependence t-1				
Only main job (reference)	—	—	—	—
Marginal second job	0.172***	0.032***	0.112***	0.030***
Non-marginal second job	0.165***	0.047**	0.108***	0.041***
Main job characteristics				
Main job monthly gross income				
Up to 1st decile	0.016	0.004	0.028*	0.013
1st to 2nd decile	0.010	0.002	0.014	0.015*
2nd to 3rd decile	0.007	0.001	0.009	0.010
3rd to 4th decile	0.007	0.002	0.011	-0.001
4th to 5th decile	0.004	0.000	0.016**	0.006
5th to 6th decile	-0.001	-0.001	0.009	0.001
6th to 7th decile	-0.006	-0.001	0.004	0.002
7th to 8th decile	0.001	-0.001	0.005	0.003
8th to 9th decile	-0.005	0.003	0.006	0.000
Above 9th decile (reference)	—	—	—	—
Tenure				
Less than 2 years	0.014**	0.001	-0.005	-0.001
2-5 years	0.004	-0.001	-0.002	-0.002
5-10 years	0.001	0.001	-0.005	0.002
More than 10 years (reference)	—	—	—	—
Full-time (1/0)	-0.010**	-0.005**	-0.008	0.000
Temporary contract (1/0)	0.002	-0.001	-0.002	0.003
Public service sector (1/0)	0.001	0.001	0.007	0.004
Worker characteristics				
Family status				
Single and no children (reference)	—	—	—	—
Partner and no children	-0.010	-0.001	-0.002	0.000
Partner and children	-0.007	-0.003	0.000	-0.004
Single and children	-0.003	-0.001	-0.007	0.010***
Preferred working hours first job				
More hours	0.008**	-0.001	0.002	0.002
Same hours (reference)	—	—	—	—
Less hours	0.001	0.002	-0.001	0.000
Employment status partner				
No working partner (reference)	—	—	—	—
Full time	-0.008*	-0.001	-0.006	0.000
Part time	-0.006	0.000	0.001	-0.001
Other	0.003	0.006	0.007	-0.003
Age				
18-25 years old	0.014	-0.006	0.013	0.007
26-35 years old	0.008	-0.004	0.005	-0.003
36-45 years old	0.000	-0.001	0.000	0.005
46-55 years old	0.003	0.000	0.003	0.002
Older than 55 years (reference)	—	—	—	—
Skill level				
Low skill	0.112	-0.005	-0.023	-0.012***
Medium skill (reference)	—	—	—	—
High skill	0.033	0.015	-0.007	0.016
Lives in East Germany (1/0)	0.003	-0.020**	-0.046***	-0.005
Migration Background				
No migration background (reference)	—	—	—	—
Direct migration background	0.004	0.000	0.006	-0.004*
Indirect migration background	0.001	-0.001	0.000	-0.007**
	41,103 observation/8,974 persons		43,329 observation/8,965 persons	

Notes: SOEP 2003-2018. Standard errors clustered at the person level (* p<0.05, ** p<0.01, *** p<0.001). Controls included for industry sectors, occupation, firm size and years. Coefficients for the initial condition, and the initial value and the within-unit averages of time-varying explanatory variables are not shown in the table.

second job holding is persistent and even more so marginal second job holding and that especially for women in lower income groups, with low skills, and less job security (low tenure) the odds to have a marginal second job are highest. Descriptively, we had already seen that these groups showed the strongest increase in numbers across my sample period.

Overall, these estimations let me conclude that the probability of taking up a marginal second job depends a lot on individual and job characteristics — but once a worker is in, she is in, meaning that state dependence is very large for second job holders in Germany.

5 Conclusions

This study analyzes true state dependence in second job holding of German workers as well as the development of second job holding in Germany using panel data from the SOEP after the legislative change in 2003. This change allowed extensive dispensation of marginal second jobs from taxes and social security contributions. To that end, I analyzed the trends in second job holding overall and divided into the different types of second jobs.

Descriptively, I saw that women are more prone to hold second jobs and that the strong increase in numbers was mainly driven by marginal second jobs also known as mini-jobs. I further observed that the pronounced increase in marginal second jobs was largest in relative terms for low income women. Also, the data showed that non-marginal second job holders are a minority and seem to be unaffected by the legislative change as expected.

Using this panel data and taking into account the initial conditions problem, I estimate a dynamic multinomial logit model with random effects. I find that there is true state dependence in second job holding, especially for marginal second employment. This state dependence is even more pronounced for women than for men. Moreover, I find in panel estimations that low income, low tenure, part-time, and hours constrained women have a higher probability to take up a marginal second job. In short, my results show that gender differences in second job holding exist and that women in particular responded to the legislative change, which allowed for tax and social security contribution exempt second jobs.

Klinger and Weber (2020) argue that individual factors explain the increase over time

only to a very small extent and the tax exemption of marginal second jobs sets wrong incentives. I tend to follow their interpretation regarding wrong incentives of marginal second jobs and would see some further disadvantages. First, mini-jobbers themselves are losing out on certain social security benefits for their work in marginal second jobs, e.g. unemployment insurance or pension. This can be critical, as we have seen that especially low income groups tend to take up these jobs. Moreover, marginal second jobs set the incentive to stay below a certain threshold in earnings, although the individual might be able to work more. Secondly, it is unclear whether the tax exemption is desirable from a social point of view since the state forgoes tax revenue, as well as social insurance contributions. Even if the benefit of additional earnings capacities for low income workers is desired, the question remains, why there is the necessity for tax free second employment of well to do earners.

I expect the upward trend in marginal second jobs to go on, since the earnings limit for marginal employment has been recently increased from 450 to 520 euros per month. This could be used in future research to test how workers react in allocating their hours and how this continues to shape second job holding in Germany.

A Appendix

Table A.1: Complementary log-log model for holding a marginal second job after only main job in period t-1

	Women	**Men**
Main job characteristics		
Main job monthly gross income		
up to 1st decile	0.82***	0.50
	(0.31)	(0.31)
1st to 2nd decile	0.67**	0.70***
	(0.30)	(0.25)
2nd to 3rd decile	0.68**	0.48**
	(0.30)	(0.22)
3rd to 4th decile	0.58*	0.53***
	(0.30)	(0.20)
4th to 5th decile	0.56*	0.69***
	(0.30)	(0.19)
5th to 6th decile	0.45	0.56***
	(0.30)	(0.18)
6th to 7th decile	0.21	0.38**
	(0.30)	(0.18)
7th to 8th decile	0.32	0.42***
	(0.31)	(0.16)
8th to 9th decile	0.25	0.16
	(0.31)	(0.15)
above 9th decile (reference)	—	—
Tenure		
less than 2 years	0.78***	-0.064
	(0.10)	(0.13)
2-5 years	0.46***	-0.041
	(0.093)	(0.11)
5-10 years	0.35***	-0.14
	(0.092)	(0.10)
more than 10 years (reference)	—	—
Full-time (1/0)	-0.25***	-0.34**
	(0.095)	(0.15)
Fixed-term contract (1/0)	0.11	0.083
	(0.10)	(0.15)
Public service sector (1/0)	0.079	0.29**
	(0.084)	(0.11)
Industry		
Agriculture (reference)	—	—
Energy	-0.63	-0.098
	(0.57)	(0.55)
Minig	0	-0.68
	(.)	(1.05)
Manufacturing	-0.52	0.27
	(0.36)	(0.38)
Construction	-0.24	-0.032
	(0.41)	(0.40)
Trade	-0.55	0.30
	(0.35)	(0.39)
Transport	-0.47	0.27
	(0.39)	(0.40)
Bank, Insurance	-0.39	0.53
	(0.39)	(0.43)
Services	-0.34	0.57
	(0.35)	(0.38)
Other	-0.10	0.20
	(0.40)	(0.53)

Table A.1 continued: Complementary log-log model for holding a marginal second job after only main job in period t-1

	Women	Men
Occupation		
Untrained worker (reference)	—	—
Semi-Trained worker	-0.43**	0.11
	(0.18)	(0.28)
Trained worker	-0.49**	-0.0077
	(0.24)	(0.28)
Foreman, group leader	-0.53	0.28
	(0.59)	(0.33)
Foreman	-0.16	-0.31
	(0.77)	(0.45)
Industry or factory foreman	-0.49	-0.21
	(1.03)	(0.46)
Salaried employee, unskilled without training	-0.20	0.34
	(0.17)	(0.32)
Salaried employee, unskilled with training	-0.46***	0.11
	(0.17)	(0.30)
Salaried employee, skilled	-0.49***	0.058
	(0.17)	(0.28)
Salaried employee, highly skilled or managerial duties	-0.15	0.12
	(0.20)	(0.30)
Salaried employee with extensive managerial duties	-0.25	0.70**
	(0.41)	(0.34)
Civil servant, lower level	0	0.011
	(.)	(0.61)
Civil servant, middle level	-0.49	-0.35
	(0.33)	(0.37)
Civil servant, upper level	-0.81***	0.089
	(0.28)	(0.34)
Civil servant, executive level	-0.72**	0.72**
	(0.37)	(0.36)
Firmsize		
less than 20 employees (reference)	—	—
20 to 199 employees	-0.29***	-0.15
	(0.084)	(0.12)
200 and more employees	-0.27***	-0.24**
	(0.082)	(0.12)
Worker characteristics		
Family status		
Single and no children (reference)	—	—
Partner and no children	-0.28***	0.043
	(0.10)	(0.13)
Partner and children	-0.13	0.11
	(0.11)	(0.12)
Single and children	0.033	0.082
	(0.11)	(0.30)
Preferred working hours first job		
More hours	0.51***	0.31***
	(0.073)	(0.088)
Same hours (reference)	—	—
Less hours	0.087	0.049
	(0.082)	(0.088)
Employment status partner		
Full time (reference)	—	—
Not working	0.32***	0.033
	(0.084)	(0.12)
Part time	0.37*	0.13
	(0.21)	(0.12)
Other	0.70***	0.51***
	(0.26)	(0.16)

Table A.1 continued: Complementary log-log model for holding a marginal second job after only main job in period t-1

	Women	**Men**
Age		
18-25 years old	0.20	0.78***
	(0.19)	(0.25)
26-35 years old	0.37***	0.73***
	(0.14)	(0.15)
36-45 years old	0.28**	0.50***
	(0.13)	(0.15)
46-55 years old	0.36***	0.32**
	(0.12)	(0.13)
older than 55 years (reference)	—	—
Skill level		
Low skill	-0.23*	-0.36**
	(0.13)	(0.17)
Medium skill (reference)	—	—
High skill	-0.27***	-0.089
	(0.10)	(0.12)
Lives in East Germany (1/0)	-0.59***	-0.70***
	(0.094)	(0.12)
Migration Background		
No migration background (reference)	—	—
Direct migration background	0.15	-0.062
	(0.097)	(0.13)
Indirect migration background	-0.20	-0.26
	(0.17)	(0.18)
Year		
2004 (reference)	—	—
2005	0.37	0.81**
	(0.32)	(0.38)
2006	0.31	0.63
	(0.32)	(0.40)
2007	0.45	1.09***
	(0.32)	(0.39)
2008	0.54*	0.83**
	(0.32)	(0.39)
2009	0.72**	0.82**
	(0.32)	(0.39)
2010	0.30	0.54
	(0.33)	(0.41)
2011	0.71**	1.15***
	(0.33)	(0.39)
2012	0.69**	0.85**
	(0.32)	(0.39)
2013	0.81***	0.81**
	(0.31)	(0.39)
2014	0.83***	0.88**
	(0.31)	(0.39)
2015	0.59*	0.92**
	(0.31)	(0.39)
2016	0.54*	1.06***
	(0.31)	(0.39)
2017	1.05***	1.62***
	(0.31)	(0.38)
2018	0.88***	1.19***
	(0.32)	(0.39)

Notes: SOEP 2003-2018. Standard errors in parentheses (* p<0.05, ** p<0.01, *** p<0.001).

Table A.2: Dynamic Multinomial logit model with random effects for second job states

	Women		**Men**	
	Marginal	***Non-marginal***	***Marginal***	***Non-marginal***
State dependence t-1				
Only main job (reference)	—	—	—	—
Marginal second job	2.706***	3.017***	2.506***	2.258***
	(0.123)	(0.235)	(0.135)	(0.238)
Non-marginal second job	2.672***	3.496***	2.477***	2.640***
	(0.251)	(0.445)	(0.209)	(0.299)
Main job characteristics				
Main job monthly gross income				
up to 1st decile	0.495	0.774	1.114**	1.326*
	(0.427)	(0.933)	(0.483)	(0.709)
1st to 2nd decile	0.317	0.425	0.693*	1.348**
	(0.412)	(0.835)	(0.402)	(0.599)
2nd to 3rd decile	0.233	0.173	0.461	0.979*
	(0.401)	(0.806)	(0.356)	(0.561)
3rd to 4th decile	0.239	0.415	0.464	0.0109
	(0.392)	(0.742)	(0.325)	(0.593)
4th to 5th decile	0.119	0.0997	0.684**	0.681
	(0.384)	(0.735)	(0.308)	(0.476)
5th to 6th decile	-0.0385	-0.242	0.424	0.173
	(0.371)	(0.671)	(0.296)	(0.446)
6th to 7th decile	-0.238	-0.277	0.200	0.255
	(0.357)	(0.692)	(0.275)	(0.396)
7th to 8th decile	0.0419	-0.236	0.256	0.321
	(0.353)	(0.611)	(0.260)	(0.336)
8th to 9th decile	-0.150	0.428	0.252	-0.00547
	(0.314)	(0.581)	(0.218)	(0.278)
above 9th decile (reference)	—	—	—	—
Tenure				
less than 2 years	0.389**	0.168	-0.233	-0.204
	(0.175)	(0.401)	(0.218)	(0.372)
2-5 years	0.155	-0.155	-0.0754	-0.168
	(0.151)	(0.338)	(0.189)	(0.359)
5-10 years	0.0514	0.204	-0.220	0.0839
	(0.126)	(0.316)	(0.151)	(0.283)
more than 10 years (reference)	—	—	—	—
Full-time (1/0)	-0.340**	-0.892***	-0.363	-0.784**
	(0.152)	(0.329)	(0.261)	(0.379)
Fixed-term contract (1/0)	0.0577	-0.111	-0.0467	0.283
	(0.143)	(0.343)	(0.183)	(0.293)
Public service sector (1/0)	0.0403	0.240	0.326*	0.423
	(0.173)	(0.399)	(0.196)	(0.331)
Occupation				
Untrained worker (reference)	—	—	—	—
Trained worker	-0.0863	0.525	-0.128	-0.612
	(0.171)	(0.526)	(0.248)	(0.376)
Foreman, highly trained, managerial duties	0.0726	0.397	0.176	-0.234
	(0.231)	(0.621)	(0.297)	(0.460)

Table A.2 continued: Dynamic Multinomial logit model with random effects for second job states

	Women		**Men**	
	Marginal	***Non-marginal***	***Marginal***	***Non-marginal***
Industry				
Agriculture, energy, mining	0.783	-20.27***	0.555	-0.362
	(0.749)	(1.285)	(0.574)	(0.741)
Manufacturing	0.260	0.985	1.042**	0.0554
	(0.374)	(0.815)	(0.468)	(0.689)
Construction	0.424	5.105***	0.584	-0.0617
	(0.517)	(1.309)	(0.521)	(0.777)
Services	0.162	0.622	0.758*	-0.536
	(0.366)	(0.716)	(0.452)	(0.705)
Firmsize				
less than 20 employees (reference)	—	—	—	—
20 to 199 employees	0.144	-0.554	0.212	0.0874
	(0.161)	(0.424)	(0.219)	(0.347)
200 and more employees	0.0377	-0.599	0.0891	0.0359
	(0.169)	(0.476)	(0.260)	(0.360)
Worker characteristics				
Family status				
Single and no children (reference)	—	—	—	—
Partner and no children	-0.315	-0.235	-0.0709	-0.0454
	(0.192)	(0.357)	(0.230)	(0.360)
Partner and children	-0.233	-0.574	-0.0261	-0.447
	(0.218)	(0.455)	(0.233)	(0.362)
Single and children	-0.0965	-0.205	-0.398	-1.343**
	(0.220)	(0.525)	(0.514)	(0.559)
Preferred working hours first job				
More hours	0.234**	-0.187	0.103	0.175
	(0.0928)	(0.219)	(0.111)	(0.172)
Same hours (reference)	—	—	—	—
Less hours	0.0528	0.323	-0.0573	-0.0220
	(0.103)	(0.220)	(0.106)	(0.175)
Employment status partner				
Not working (reference)	—	—	—	—
Full time	-0.246*	-0.259	-0.278	-0.0513
	(0.142)	(0.283)	(0.175)	(0.273)
Part time	-0.183	-0.0581	0.0481	-0.0693
	(0.281)	(0.630)	(0.151)	(0.210)
Other	0.107	0.736	0.234	-0.246
	(0.401)	(1.204)	(0.193)	(0.290)
Age				
18-25 years old	0.366	-1.415	0.550	0.756
	(0.432)	(1.396)	(0.505)	(1.226)
26-35 years old	0.215	-0.671	0.190	-0.315
	(0.300)	(0.708)	(0.335)	(0.549)
36-45 years old	-0.0219	-0.172	0.0587	0.501
	(0.224)	(0.541)	(0.246)	(0.402)
46-55 years old	0.0935	0.0897	0.150	0.287
	(0.160)	(0.394)	(0.184)	(0.262)
older than 55 years (reference)	—	—	—	—

Table A.2 continued: Dynamic Multinomial logit model with random effects for second job states

	Women		**Men**	
	Marginal	***Non-marginal***	***Marginal***	***Non-marginal***
Skill level				
Low skill	2.183**	-1.211	-1.291	-2.836**
	(0.992)	(1.842)	(1.115)	(1.327)
Medium skill (reference)	—	—	—	—
High skill	1.008	1.965*	-0.159	1.279*
	(0.800)	(1.021)	(0.608)	(0.736)
Lives in East Germany (1/0)	0.0166	-3.525***	-2.365***	-0.899
	(0.694)	(0.965)	(0.854)	(0.667)
Migration Background				
No migration background (reference)	—	—	—	—
Direct migration background	0.145	0.0931	0.214	-0.435
	(0.129)	(0.338)	(0.163)	(0.309)
Indirect migration background	0.0434	-0.165	-0.0838	-0.919**
	(0.190)	(0.500)	(0.246)	(0.466)
Year				
2004 (reference)	—	—	—	—
2005	0.330	-0.177	0.430	0.310
	(0.267)	(0.506)	(0.269)	(0.367)
2006	0.140	-0.364	0.152	0.297
	(0.278)	(0.553)	(0.303)	(0.437)
2007	0.193	-0.676	0.440	0.657
	(0.280)	(0.556)	(0.297)	(0.416)
2008	0.318	-0.192	0.255	0.548
	(0.282)	(0.531)	(0.306)	(0.431)
2009	0.494*	-0.158	0.310	0.582
	(0.283)	(0.559)	(0.300)	(0.447)
2010	0.209	-0.449	0.00409	0.440
	(0.283)	(0.539)	(0.307)	(0.439)
2011	0.337	-0.893	0.524*	0.881**
	(0.290)	(0.579)	(0.312)	(0.424)
2012	0.350	-1.146**	0.349	0.608
	(0.287)	(0.569)	(0.306)	(0.452)
2013	0.615**	-1.215**	0.334	0.217
	(0.279)	(0.575)	(0.301)	(0.469)
2014	0.524*	-0.883	0.277	0.231
	(0.278)	(0.548)	(0.306)	(0.439)
2015	0.381	-0.705	0.276	0.312
	(0.283)	(0.549)	(0.315)	(0.471)
2016	0.410	-0.673	0.463	0.409
	(0.281)	(0.561)	(0.316)	(0.464)
2017	0.720**	-0.317	0.802**	0.559
	(0.284)	(0.541)	(0.315)	(0.470)
2018	0.779***	-0.444	0.787**	0.839*
	(0.282)	(0.554)	(0.316)	(0.482)
Initial conditions t=0				
Second job status				
Only main job (reference)	—	—	—	—
Marginal second job	2.205***	1.011***	3.163***	2.736***
	(0.165)	(0.333)	(0.197)	(0.308)
Non-marginal second job	1.521***	4.667***	2.063***	5.156***
	(0.324)	(0.668)	(0.273)	(0.452)

Table A.2 continued: Dynamic Multinomial logit model with random effects for second job states

	Women		Men	
	Marginal	***Non-marginal***	***Marginal***	***Non-marginal***
Initial conditions t=0				
Main job characteristics				
Main job monthly gross income				
up to 1st decile	-0.385	0.353	-0.758	-0.952
	(0.549)	(1.194)	(0.541)	(0.791)
1st to 2nd decile	-0.00606	0.631	0.358	-0.408
	(0.534)	(1.142)	(0.428)	(0.665)
2nd to 3rd decile	-0.252	0.530	-0.442	-0.836
	(0.526)	(1.125)	(0.409)	(0.604)
3rd to 4th decile	-0.513	0.411	-0.183	-1.434**
	(0.525)	(1.127)	(0.383)	(0.626)
4th to 5th decile	-0.281	0.557	-0.288	-0.939*
	(0.524)	(1.106)	(0.367)	(0.541)
5th to 6th decile	-0.828	0.589	-0.595*	-1.297**
	(0.517)	(1.095)	(0.352)	(0.543)
6th to 7th decile	-0.679	0.205	-0.531	-0.442
	(0.506)	(1.060)	(0.329)	(0.450)
7th to 8th decile	-0.593	0.477	-0.222	-0.387
	(0.505)	(1.044)	(0.306)	(0.403)
8th to 9th decile	-0.481	0.512	-0.117	0.145
	(0.497)	(1.053)	(0.283)	(0.340)
above 9th decile (reference)	—	—	—	—
Tenure				
less than 2 years	-0.290	0.343	0.0331	0.342
	(0.213)	(0.538)	(0.253)	(0.410)
2-5 years	0.107	0.172	0.244	0.441
	(0.200)	(0.487)	(0.234)	(0.395)
5-10 years	-0.0865	0.180	-0.0829	-0.235
	(0.177)	(0.421)	(0.201)	(0.343)
more than 10 years (reference)	—	—	—	—
Full-time (1/0)	0.234	0.582	0.170	0.625
	(0.162)	(0.360)	(0.298)	(0.454)
Fixed-term contract (1/0)	-0.0856	-0.559**	-0.185	0.215
	(0.107)	(0.272)	(0.133)	(0.207)
Public service sector (1/0)	-0.0671	0.0368	0.217	0.481
	(0.179)	(0.422)	(0.274)	(0.373)
Occupation				
Untrained worker (reference)	—	—	—	—
Trained worker	-0.0633	0.599	-0.188	-0.0109
	(0.193)	(0.432)	(0.337)	(0.571)
Foreman, highly trained, managerial duties	-0.217	0.355	-0.105	-0.437
	(0.270)	(0.569)	(0.403)	(0.673)
Industry				
Agriculture, energy, mining	0.321	1.997	0.473	-0.895
	(0.605)	(1.445)	(0.527)	(0.757)
Manufacturing	0.673**	-0.530	0.0433	-0.551
	(0.286)	(0.711)	(0.277)	(0.438)
Construction	1.873***	2.421**	-0.291	-0.766
	(0.596)	(1.089)	(0.446)	(0.586)
Services	0.306	-0.662	-0.117	-0.589*
Firmsize	(0.219)	(0.439)	(0.255)	(0.353)
less than 20 employees (reference)	—	—	—	—
20 to 199 employees	-0.0300	0.302	0.0912	0.0366
	(0.177)	(0.409)	(0.246)	(0.400)
200 and more employees	-0.00904	0.145	0.0932	0.302
	(0.186)	(0.421)	(0.262)	(0.423)

Table A.2 continued: Dynamic Multinomial logit model with random effects for second job states

	Women		**Men**	
	Marginal	***Non-marginal***	***Marginal***	***Non-marginal***
Initial conditions t=0				
Worker characteristics				
Family status				
Single and no children (reference)	—	—	—	—
Partner and no children	0.0762	-0.465	-0.348	-0.198
	(0.217)	(0.476)	(0.251)	(0.411)
Partner and children	0.326	-0.144	0.124	0.244
	(0.232)	(0.519)	(0.247)	(0.394)
Single and children	0.360	0.184	-0.285	-0.907
	(0.235)	(0.503)	(0.527)	(1.035)
Preferred working hours first job				
More hours	-0.0608	-0.144	-0.157	0.00172
	(0.117)	(0.269)	(0.146)	(0.223)
Same hours (reference)	—	—	—	—
Less hours	0.205*	0.0398	0.0812	0.0442
	(0.124)	(0.281)	(0.151)	(0.255)
Employment status partner				
Not working (reference)	—	—	—	—
Full time	-0.0307	0.0136	0.288	-0.344
	(0.149)	(0.331)	(0.225)	(0.326)
Part time	0.456	-0.187	0.217	-0.377
	(0.391)	(0.963)	(0.197)	(0.314)
Other	-0.0153	0.886	0.830***	-0.775*
	(0.648)	(1.488)	(0.275)	(0.466)
Age				
18-25 years old	0.520	1.359	0.850	-0.138
	(0.515)	(1.148)	(0.621)	(1.038)
26-35 years old	0.414	1.091	0.627	0.103
	(0.425)	(0.950)	(0.487)	(0.750)
36-45 years old	0.229	0.883	0.236	-0.0910
	(0.360)	(0.752)	(0.404)	(0.611)
46-55 years old	0.0248	0.550	-0.225	-0.186
	(0.283)	(0.580)	(0.293)	(0.435)
older than 55 years (reference)	—	—	—	—
Skill level				
Low skill	0.490	-0.971	-1.754*	-2.532*
	(0.742)	(1.294)	(0.924)	(1.521)
Medium skill (reference)	—	—	—	—
High skill	0.168	-1.487	-1.182*	-0.457
	(0.693)	(1.058)	(0.612)	(1.140)
Lives in East Germany (1/0)	0.170	0.00771	-0.156	-0.640
	(0.484)	(0.800)	(0.543)	(0.710)
Migration Background				
No migration background (reference)	—	—	—	—
Direct migration background	0.0124	0.00527	0.0286	0.0461
	(0.471)	(0.604)	(0.553)	(0.513)
Indirect migration background	0.0302	0.00293	0.0108	0.00974
	(0.285)	(0.0258)	(0.347)	(0.0946)

Table A.2 continued: Dynamic Multinomial logit model with random effects for second job states

	Women		Men	
	Marginal	***Non-marginal***	***Marginal***	***Non-marginal***
Average of time-varying variables				
Main job characteristics				
Main job monthly gross income				
up to 1st decile	0.0896	-1.111	-1.239	-1.832
	(0.726)	(1.628)	(0.955)	(1.553)
1st to 2nd decile	-0.284	-0.996	-0.396	-2.256*
	(0.695)	(1.509)	(0.739)	(1.255)
2nd to 3rd decile	0.0417	-0.458	0.106	-1.030
	(0.684)	(1.443)	(0.673)	(1.094)
3rd to 4th decile	0.218	-0.470	0.111	-0.269
	(0.686)	(1.449)	(0.621)	(1.063)
4th to 5th decile	-0.130	0.00495	0.0188	-0.491
	(0.674)	(1.394)	(0.570)	(0.888)
5th to 6th decile	0.526	0.442	0.548	-0.336
	(0.670)	(1.359)	(0.557)	(0.834)
6th to 7th decile	1.142*	-0.0461	0.356	-0.0248
	(0.629)	(1.358)	(0.515)	(0.736)
7th to 8th decile	-0.0579	0.558	0.263	-0.915
	(0.629)	(1.199)	(0.478)	(0.656)
8th to 9th decile	0.632	0.238	-0.382	-1.074*
	(0.612)	(1.307)	(0.430)	(0.593)
above 9th decile	—	—	—	—
Tenure				
less than 2 years	0.437	0.485	0.221	0.0917
	(0.336)	(0.842)	(0.411)	(0.687)
2-5 years	0.380	1.147	-0.398	0.683
	(0.308)	(0.703)	(0.391)	(0.680)
5-10 years	0.454	0.127	0.289	-0.108
	(0.291)	(0.676)	(0.358)	(0.653)
more than 10 years	—	—	—	—
Full-time (1/0)	-0.155	0.110	-0.548	-1.014
	(0.269)	(0.571)	(0.472)	(0.724)
Fixed-term contract (1/0)	0.0200	0.622	-0.00153	0.317
	(0.268)	(0.678)	(0.301)	(0.488)
Public service sector (1/0)	-0.0417	-0.401	-0.0389	-0.393
	(0.281)	(0.714)	(0.373)	(0.550)
Occupation				
Untrained worker	3.488	2.557	-2.067	9.094
	(5.385)	(6.934)	(4.033)	(7.771)
Trained worker	3.402	1.214	-1.847	10.32
	(5.370)	(6.903)	(4.000)	(7.749)
Foreman, highly trained, managerial duties	3.732	2.612	-2.074	10.72
	(5.380)	(6.949)	(4.006)	(7.727)
Industry				
Agriculture, energy, mining	-1.179	-1.178	-1.187	2.447
	(1.144)	(2.636)	(1.013)	(1.623)
Manufacturing	-0.955	-0.842	-0.0508	1.383
	(0.655)	(1.637)	(0.775)	(1.443)
Construction	-1.640*	-21.96***	0.338	1.923
	(0.975)	(3.248)	(0.888)	(1.574)
Services	-0.244	0.345	0.631	2.638*
	(0.607)	(1.357)	(0.757)	(1.433)

Table A.2 continued: Dynamic Multinomial logit model with random effects for second job states

	Women		Men	
	Marginal	***Non-marginal***	***Marginal***	***Non-marginal***
Average of time-varying variables				
Main job characteristics				
Firmsize				
less than 20 employees	0.239	-0.120	0.618	0.750
	(0.297)	(0.724)	(0.423)	(0.632)
20 to 199 employees	0.0149	-0.413	0.0537	0.375
	(0.247)	(0.538)	(0.287)	(0.468)
200 and more employees	—	—	—	—
Worker characteristics				
Family status				
Single and no children	0.362	-0.453	-0.575	-3.337**
	(0.379)	(0.834)	(0.913)	(1.517)
Partner and no children	0.510	0.792	-0.299	-2.836*
	(0.410)	(0.849)	(0.954)	(1.550)
Partner and children	0.169	0.964	-0.764	-2.678*
	(0.389)	(0.819)	(0.956)	(1.574)
Single and children	—	—	—	—
Preferred working hours first job				
More hours	-0.223	0.130	-0.916*	-1.285*
	(0.452)	(0.983)	(0.495)	(0.712)
Same hours	-1.120**	-1.640*	-1.434***	-1.311*
	(0.456)	(0.978)	(0.492)	(0.702)
Less hours	-0.967**	-0.762	-1.510***	-1.893***
	(0.438)	(0.942)	(0.481)	(0.685)
Employment status partner				
Not working	-0.637	2.857	0.251	-1.196
	(1.049)	(2.816)	(0.447)	(0.728)
Full time	-0.742	2.317	0.430	-0.932
	(1.049)	(2.838)	(0.495)	(0.770)
Part time	-0.549	1.849	0.133	-1.015
	(1.133)	(3.187)	(0.469)	(0.725)
Other	—	—	—	—
Age				
18-25 years old	-0.808	0.0453	-0.798	-1.082
	(0.767)	(2.087)	(0.915)	(2.051)
26-35 years old	-0.0866	0.0280	-0.349	0.0407
	(0.547)	(1.319)	(0.629)	(1.028)
36-45 years old	0.136	0.0271	-0.0443	-0.626
	(0.429)	(0.946)	(0.496)	(0.790)
46-55 years old	0.288	0.212	-0.0424	-0.837
	(0.327)	(0.704)	(0.370)	(0.609)
older than 55 years	—	—	—	—
Skill level				
Low skill	-1.638	1.737	1.500	6.284***
	(1.220)	(2.313)	(1.370)	(1.578)
Medium skill	1.414	0.487	-1.178	1.052
	(1.142)	(1.576)	(0.952)	(1.556)
High skill	—	—	—	—
Lives in East Germany (1/0)	-0.658	3.220***	1.976**	1.230
	(0.929)	(1.129)	(0.942)	(1.202)

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