

The German Mini-Job reform: Intended and unintended consequences for low-earning workers

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Abstract

This paper provides an empirical analysis of the effects of a welfare-to-work policy on earnings and employment prospects of targeted workers. I exploit the expansion of tax exemptions and subsidies to low-earning employment introduced by the German Mini-Job Reform in 2003, which aimed to decrease unemployment by promoting work of disadvantaged workers. The literature has focused on its effects on employment. This paper explores unintended effects of the policy instead, such as the change in wages for targeted workers and the transitions to better employment after transiting through a tax advantaged job. I use data from the German Socio-Economic Panel for 2000-2007. I compare target groups (women, single parents, young and secondary workers) to non-target groups, and similar workers according to a matching strategy. The findings suggest that low-earning workers reduce the hours worked while net hourly wages do not increase despite the lower tax burden. On the other hand, inactive and unemployed people improve their chances to transit to employment with higher earnings by taking a transitory low-earning job. Hence, while the German in-work benefits do not appear successful as an antipoverty policy, they seem to help jobless people to smoothly transit to better paid employment. The incentives appear effective for promoting employment of women and young workers. Low educated workers and single parents suffer instead a reduction in earnings.

JEL Classification: H22, H23, J2, J38, I38

Keywords: in-work benefit, tax shifting, stepping-stones

1 Introduction

Welfare-to-work programs have become particularly widespread in developed countries in the last decades. They are intended to help economically poor people while encouraging labor participation and self-sufficiency by providing benefits conditional on employment. One such a program is the Mini-Job Reform which took place in Germany in April 1, 2003. The explicit objectives discussed in the legislation are to (1) reduce unemployment, (2) increase competitiveness, and (3) stimulate both labor supply and demand. Exemptions and subsidies of social security contributions (SSC) and income tax paid by workers were expanded in the low-earning segment of the labor market, yielding a considerable expansion of the so-called *mini* and *midi* jobs. These types of employment are defined by a maximum amount of gross monthly earnings (€400 in the mini-jobs and €800 in the midi-jobs), and they are characterized by a lower tax burden.

The existing literature about the reform has focused on its effect on labor supply and employment, as affecting these variables is one of the main objectives of the policy. On the contrary, potential issues such as higher in-work poverty and increase in labor precariousness have been extensively debated in the media and the public discourse, but have received less attention in the academic research.¹ This paper aims at providing empirical evidence regarding these side-effects of the expansion of mini and midi-jobs.

The first question this paper addresses is whether the promotion of low-earning jobs by tax incentives results in improved earnings for workers in the bottom of the distribution, being effective then as an anti-poverty policy. Mechanically, since these workers pay lower taxes after the reform, their take-home wage should improve. However, as predicted by the theory of tax incidence, the lower tax burden is shared by employers and employees depending on the relative elasticities of supply and substitution between workers in low-earning and high-earning employment. Thus, the theoretical prediction regarding the effect on net earnings is ambiguous, and remains an empirical question.

A second question tackled by this paper is whether tax incentives for mini and midi-jobs improve employment prospects of targeted workers. This should be the case if they represent a way for inactive and unemployed workers to accumulate human capital or signal their skills and motivation. If after a spell in these jobs workers have higher chances to transit to employment with higher earnings, mini or midi-jobs constitute a *stepping-stone*. On the contrary, working for reduced hours or low hourly wages may exert a negative signal regarding productivity or motivation. Hence mini or midi-jobs might potentially represent a *dead-end*. Which of these two forces prevail remains an empirical question as well.

The main contribution of this paper is to provide empirical evidence in response to these questions. I use survey data from the German Socio-Economic Panel (SOEP) for 2000-2007 and I estimate fixed effects models to assess the effect of taking up a mini or midi-job on earnings, wages and transition probabilities. I exploit the change in incentives for labor supply and demand induced by

¹The article “The dark side of Germany’s job miracle” (Reuters, 2012) is particularly insightful: “Economists say it was Schroeder’s intention to bring about a rapid expansion of these sectors (mini-jobs and temporary employment) in order to get the poorly-qualified and long-term unemployed back into the workforce. Critics say Germany’s reforms came at a high price as they firmly entrenched the low-wage sector and depressed wages, leading to a two-tier labor market. New categories of low-income, government-subsidized jobs - [...] were created to help those with bad job prospects eventually become reintegrated into the regular labor market, but surveys show that for most people, they lead nowhere. [...] “Regular full-time jobs are being split up into mini-jobs,” said Holger Bonin of the Mannheim-based ZEW think tank. And there is little to stop employers paying “mini-jobbers” low hourly wages given they know the government will top them up and there is no legal minimum wage”.

the Mini-Job Reform, and compare across groups in a differences-in-differences (DiD) setting to address selection into tax-advantaged jobs.

First, I compare groups typically targeted by similar welfare-to-work policies (e.g. the Earned Income Tax Credit in the US) to non-targeted groups. The findings suggest that after the reform earnings, employment and job stability improves for young people and, to a lesser extent, for women. On the other hand, earnings of single parents do not improve, as an increase in hours worked is offset by a decrease in hourly wages. For low-educated individuals, earnings even decrease after the reform.

I use a second approach comparing workers in tax-advantaged jobs to those in non-tax advantaged jobs with similar observable characteristics. Similar workers are defined by using matching on pre-treatment characteristics. The results suggest that mini and midi-jobbers experience a reduction in net earnings mainly due to a decrease in hours worked. The net hourly wage does not significantly change despite these workers having a lower tax burden. This is consistent with firms benefiting from lower taxes more than workers, and raises doubts about the effectiveness of such an institutional design as an antipoverty instrument. On the other hand, estimates for people out of employment before the reform suggest that low-earning jobs can lead to better future employment possibilities when they are held temporarily.

Related literature

Welfare-to-work policies have attracted a lot of attention in the literature since the introduction of the Earned Income Tax Credit (EITC) in the US in mid 1970's. A big bulk of studies has focused on the effects on participation and employment, exploiting changes in the generosity across time and states and variation in benefits by demographic characteristics. The findings suggest a positive effect on labor participation (mitigated at the family level) and a negative and rather small effect on hours worked, consistent with a theoretical framework of labor supply decision (e.g. Eissa and Liebman 1996, Meyer and Rosenbaum 2001, Eissa and Hoynes 2004). The Working Families Tax Credit (WFTC) in UK has a design similar to the EITC, and the research has shown comparable results (see Blundell 2006 and Blundell, Duncan, McCrae, and Meghir 2000). The German mini-job design differs from these tax credits in two main ways: (1) the earnings test for eligibility are at the individual and not the family level, and (2) generosity does not vary with demographic characteristics. These features challenge the analysis of the causal effects of the German Mini-Job Reform.

The effects of welfare-to-work policies have been tested through a few random experiments. One example is the Self Sufficiency Program (SSP) in Canada. Conducted between 1992 and 1995, the experiment consisted in offering a temporary earnings' supplement to a random sample of welfare recipients, conditional on the beneficiaries holding a full-time job. Michalopoulos, Robins, and Card (2005), Robins, Michalopoulos, and Foley (2008), Michalopoulos, Tattrie, Miller, Robins, Morris, Gyarmati, Redcross, Foley, and Ford (2002) find large effects of the policy in employment and earnings, lower welfare receipt, higher family income and lower poverty during the implementation time. The effects vanish shortly after the exhaustion of the benefit. The German mini-job design differs from the SSP as there is no restrictions in hours worked or full-time requirement. As a matter of fact, the vast majority of mini-jobs is part-time employment. Furthermore, the tax benefits in Germany are permanent, favoring a persistence in the effects.

Recently, few studies have addressed the effect of tax credits on wages, more related to the question in this paper. Leigh (2010) exploits variation in the EITC state supplements, finding that the generosity of the tax credit is positively associated with lower hourly wages of unskilled workers.

Similarly, exploiting the expansion of the federal EITC in the middle of the 90s, Rothstein (2010) finds that the wage of single mothers, entitled to higher benefits, has a slower growth rate compared to single women without children. The proposed mechanism behind findings in both studies is an outwards movement in labor supply that shifts the benefit from workers to employers. A similar result but different explanation is provided by Azmat (2014) for the WFTC in UK. The WFTC, differently from the EITC and its predecessor Families Tax Credit, is liquidated in the wage package, giving more information to the employer regarding eligibility and amount received. This salience of the tax benefit for the employer amplifies the shifting of the tax benefit from workers to employers. This paper contributes to this literature by showing that a big part of the German tax benefits for low-earning workers are shifted to the employers, which is consistent with the findings for other in-work benefits and with the fact that the mini-job design has a high salience for employers. Furthermore, I provide evidence of effects on transition probabilities after holding a tax advantaged job, a question for which there is very scarce evidence in the context of in-work benefits.

The German mini-job reform, which does not provide benefits in function of the family structure and applies homogenously nationwide, is particularly challenging for impact evaluation due to the lack of a natural counterfactual. The literature on the effects of the reform on labor market outcomes (e.g. the surveys of Akyol, Neugart, and Pichler 2013, Jacobi and Kluve 2007, and Eichhorst and Zimmermann 2007) has pointed out this limitation. The reduced form branch relies on difference-in-difference (DID) techniques and propensity score matching to address this problem.

Fertig and Kluve (2006) analyze the impact of the reform on the labor structure by estimating a fixed effects model with administrative data provided by the IAB (the German Employment Agency). They find that the share of atypical employment increases as a consequence of the reform. Caliendo and Wrohlich (2010), using the SOEP, exploit the variation in the months of the interview to analyze the impact of the reform in the probability of having a marginal or secondary job. They define as treatment group people interviewed between April and October 2003, and control between January and March. With the cross section in the same dates for 2002, they perform a DID to control for seasonal variation. They find that the reform increases the propensity of single men who hold secondary jobs, while they do not find an effect on the share of marginal employment.

Another strand of studies uses structural estimations of labor supply and ex-ante micro-simulations of the reform to infer potential effects on participation and employment composition (Bargain, Caliendo, Haan, and Orsini 2010 and Steiner and Wrohlich 2005). The simulations predict a moderate positive effect on labor participation, coming mostly from an inflow of secondary workers, and a negative effect on hours, a standard result of the neoclassical labor supply model. Encouraging results regarding the effects on the speed of the matching process are reported by Fahr and Sunde (2009), who structurally estimate the matching function using administrative data on job seekers and vacancies by occupation for 2000-2006. Overall, the literature on the Mini-Job Reform has focused on the changes induced in labor market participation and employment. This paper instead focuses on the consequences on earnings and employment prospects of targeted workers, outcomes for which there is no evidence to the best of my knowledge. The strategy I apply is in line with the techniques used in the existing reduced-form literature.

Related to the question addressed by this paper, there is evidence about the potential of marginal employment in Germany to serve as stepping-stone. However, the analysis is limited to the pre-reform period and to workers already in the social security registers. Caliendo, Kunn, and Uhlendorff (2012) use a sample of unemployed workers from the IAB data for 2001-2004 and analyze the effect of taking up a mini-job on the unemployment duration and the ex-post job matching quality. They exploit the existence of a disregard level of €165 a month for unemployment benefit claim.

They find that holding a mini-job increases the outflow probability of the long-term unemployed and towards more stable jobs. They also document a high correlation between the sector and firm of mini-jobs and subsequent employment, suggesting human capital accumulation. Freier and Steiner (2008) focus on unemployed men, using quarterly administrative data from the Employment Panel of the Federal Employment Agency (EP-FEA) for 1999-2003. Using propensity score matching on recent employment history and duration of the unemployment spell, they find no effect on the probability of regular employment, but a reduction in the likelihood of re-entering unemployment and a slight improvement in earnings. In this paper I analyze instead the changes in the transition probabilities after the reform. Differently from these studies, I use survey data which, despite the smaller sample size, allows to include inactive people in the analysis, an important group given the activation purpose of the in-work benefits.

The question regarding the potential of welfare-to-work policies as stepping-stones or dead-ends is related to the relationship between in-work benefits and human capital accumulation (Blundell, Costa Dias, Meghir, and Shaw 2013 for the WFTC and Riddell and Riddell 2012 for the SSP). The literature documents that higher labor participation induced by tax benefits may increase human capital through on-the-job training. However, since jobs taken are mostly part-time, human capital accumulation is not as high as in full-time employment. There might also be a negative effect if the incentives to enter the labor market promote withdrawal from formal education.

The rest of the paper is organized as follows. In Section 2 I discuss the details of the institutional background and some relevant facts. Section 3 explains the theoretical background behind the empirical investigation. I describe the data in Section 4 and the empirical strategy in Section 5. Section 6 presents the results using the strategy of comparison across targeted and non-targeted groups, and Section 7 the findings by applying the matching strategy. Robustness checks and discussion of the results are included in Section 8, and Section 9 concludes.

2 Institutional Background and Some Facts

The Mini-Job Reform was part of a wider set of policies, the so-called “Hartz reform”, which were gradually implemented between 2003 and 2005. The main goal was to increase labor market participation, by providing incentives to both the labor supply and demand. In this paper I focus on the second set of policies (Hartz II or Mini-Job Reform), introduced in April 2003. Before the reform, mini-jobs existed already in Germany. However, they had been restricted to employment with a maximum of 15 hours a week and a gross monthly wage of €325 or less, provided it was the only source of income for the worker. Mini-jobbers were exempted from SSC and income tax, while the employer paid 22% tax on gross wages. Earnings from several mini-jobs were added up and the resulting amount was subject to SSC. Above the threshold, regular SSC (21% for both workers and employers) plus income tax kicked in.

The reform consisted in the extension of the wage limit to €400 and the elimination of the hour limit. Employers’ SSC were raised to 25%. In addition a phase out category (midi-job) was introduced for monthly gross wage between €400 and €800, where the SSC increase linearly for the worker while it is the normal rate for the employer, and income tax applies normally. Secondary jobs were allowed to qualify as mini or midi-jobs if complying with the earnings’ limits, benefiting from a lower tax burden. The change in the definition of mini-jobs led to an expansion from approximately 4 million in 2003 to more than 7 million in 2007 according to official statistics. Adding up midi-jobs, they are 8.5 million or 25% of total private employment.

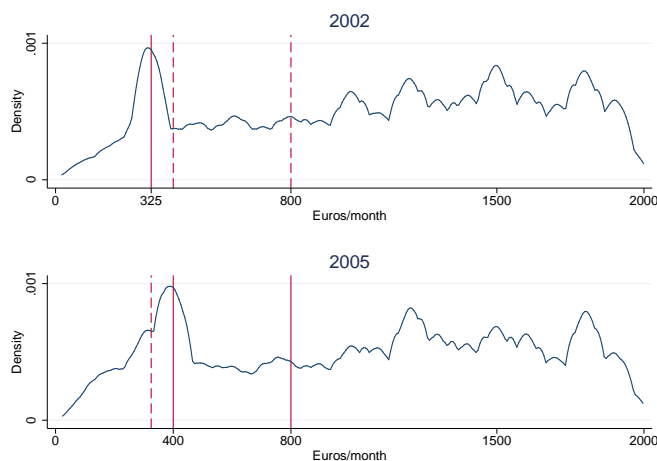
While workers in midi-jobs are entitled to the same benefits as the rest of employees in Germany,

mini-jobbers have health insurance, paid holidays and other benefits such as maternity leave, but they do not have pension entitlements. Regarding income taxation, the amount coming from mini-jobs is exempted on an individual basis.² Finally, mini-jobbers earning up to €165 are also entitled to unemployment insurance and social assistance.

Using survey data from the G-SOEP (to be detailed later), the pre and post-reform aggregate labor market numbers provide a mixed picture regarding its potential effects, as shown in table (A1) in the Appendix. While both participation and unemployment increased between 2002 and 2005, average hours per worker remained constant and monthly after-tax earnings increased. The number of mini-jobs increased from 2.7 million in 2002 (9% of total employment excluding self-employed and civil servants), to almost 5.5 million in 2005 (17%). Together with the midi-jobs, they constitute 8.3 million or 26% of the private wage-earners (see figures (A1) and (A2) in the Appendix).³

The earnings distribution is shaped by the institutional design. There is a considerable amount of bunching around the upper limit of monthly gross earnings defining mini-job, as shown in figure (1). Moreover, the location of the bunching shifts from €325 before 2003 to €400 after. There is not a comparable amount of bunching for the €800 defining midi-jobs. Figure (2) shows there is not a similar change in the components of earnings, i.e. hours and hourly wage. Mini, midi-jobs and the rest of employment differ in terms of the distribution of this variables, as shown in figure (A3) in the Appendix. However, after the reform the institutional design does not impose limits with this respect, only in terms of monthly earnings. Overall, this suggests that the presence tax exemptions in mini-jobs represents a strong incentive for workers to search for jobs and firms to create employment with earnings up to €400 a month, adjusting hours or hourly wage in a not trivial way.

Figure 1: Distribution of gross monthly earnings in main job



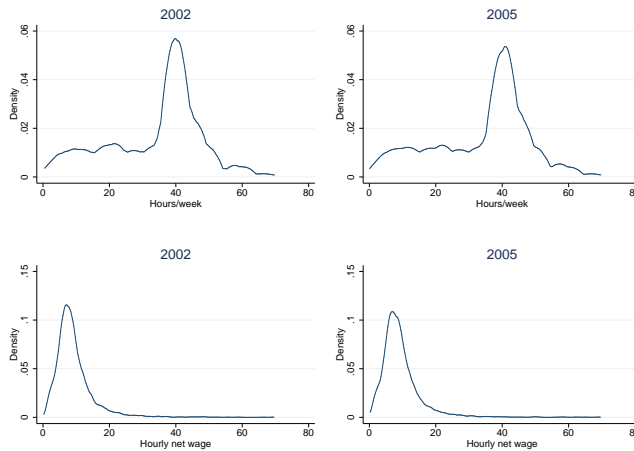
Note: Earnings below the median.

German labor market comprises what has been referred in the literature as regular and atypical

²The individual base of the tax benefit entailed by the mini-jobs is different from the tax credits in the US and UK, in which the benefit is computed on the family income declaration. The joint declaration for couples in the Germany income tax is important though because it generates strong disincentive for secondary earners to work above the €400 monthly level, above which the higher family tax rate applies.

³These numbers are not exactly the same as in official statistics due to the survey nature of the data and that I use definitions of mini and midi-jobs. However, they capture the important facts such as the jump in the number of mini-jobs and the share of total private employment.

Figure 2: Distribution of weekly working hours and hourly net earnings in all occupations



Note: Hours below the feasible amount of 70 a week. Hourly earnings excluding top 1 percentile.

employment (see for eg. Eichhorst and Tobsch 2013, Keller and Seifert 2012). Regular employment is defined as a combination of the following characteristics: full-time, high payment, permanent employment contract, and complete integration into social security system. On the other hand, atypical employment is characterized by any of the following features: part-time, mini-jobs and midi-jobs, temporary and agency employment. In this paper, I will consider a particular type of atypical employment, the mini and midi-jobs, referred as marginal employment in the literature. The share of employment in this category makes it particularly interesting: 25% within the private sector, compared to 10% temporary workers. The rest of the employment will be referred as “regular” employment in the rest of the paper, even though some forms of atypical employment are also included in it (temporary work with earnings above €800 a month for example).

Table (1) shows the composition of the working age population in Germany in 2005, after the reform, as well as average hours and earnings of each employment type. Mini-jobs are comparable to regular part-time employment in average hours (14 and 13 a week respectively), though the dispersion is much higher (the standard deviation is 12 compared to 5.7 for regular part-time jobs). However, average hourly earnings of regular part-timers double mini-jobbers’ (19 and 10 respectively). For midi-jobs, average hours worked, 26, are below the full-time workers’, 41, while double those of part-timers. The dispersion is higher as well (13.9, 9.5 and 6.7 of standard deviation respectively). The hourly net earnings are comparable to full-time workers in terms of mean (8 and 9) while they are more disperse (the standard deviation is 16.4 and 4.2 respectively). Finally, 2% of the working age population holds a mini or midi-job as a secondary employment. This group resembles full-time workers, except for a higher hourly earnings for those whose second job is a midi-job.

Mini and midi-jobs in 2004-2007 absorb two thirds of the people who were inactive or unemployed before the reform (table (A2) in the Appendix), while only the remaining one third goes directly to regular employment. Tables (2) and (3) show the observed probability of transition between states for before the reform (2001/2002) and after (2004/2005) respectively. Outflow from mini-jobs to better-paid employment decreases (33% to 21%), while the persistence in mini-jobs increases (48% to 63%). Mini-jobs display a considerable persistence (45%), being the outflows to better-paid employment 28%. On the other hand, the outflows from full-time employment to inactivity and unemployment decrease slightly (2.6% to 2%). The flow from regular part-timers to mini-jobs

Table 1: Composition of working age population (17-65) in Germany, 2005.

| | Prop. (%) | Hours/ week | Hr. wage | Month. gross earn. |
|----------------------|-----------|---------------|---------------|--------------------|
| Inactive | 15.1 | | | |
| Studying | 3.4 | | | |
| Unemployed | 5.0 | | | |
| Irregularly employed | 2.4 | | | |
| Part-time | 6.7 | 13 (5.68) | 19 (21.20) | 1,640 (1114.38) |
| Full-time | 49.1 | 41 (9.50) | 9 (4.16) | 2,634 (1564.93) |
| Mini-job (main) | 10.4 | 14 (12.00) | 10 (25.59) | 267 (161.51) |
| Mini-job (secondary) | 1.9 | 40 (13.97) | 9 (6.59) | 2,456 (1214.64) |
| Midi-job (main) | 5.8 | 26 (13.86) | 8 (16.41) | 626 (166.63) |
| Midi-job (secondary) | 0.3 | 36 (16.96) | 15 (12.38) | 3,123 (1101.77) |
| Total | 100.0 | 34 (15.21) | 10 (11.94) | 2,021 (1625.73) |

Note: Hours worked, hourly net earnings and monthly gross earnings are reported only for those who have a positive declaration.

decreases (9.4% to 8.4%), not giving signs of precarization of part-time workers.

To sum up, mini and midi-jobs have particular characteristics in terms of hours and hourly earnings compared to regular employment both part-time and full-time. The flows into and out of them suggest that they are a cushion between unemployment and inactivity and regular employment.

Table 2: Transition table: Probability (%) of going from state in row to state in column. 2001/2002

| 2001/2002 | Inactive not stud. | Studying | Unempl. | Irregular employm. | Working PT | Working FT | Mini-Job (main) | Total |
|--------------------|--------------------|----------|---------|--------------------|------------|------------|-----------------|-------|
| Inactive not stud. | 87.86 | 0.71 | 1.83 | 1.42 | 3.75 | 1.46 | 2.96 | 100 |
| Studying | 4.9 | 48.4 | 3.62 | 6.18 | 10.02 | 17.27 | 9.59 | 100 |
| Unemployed | 19.42 | 1.94 | 57.28 | 2.27 | 7.77 | 7.77 | 3.56 | 100 |
| Irregular employm. | 23.62 | 19.93 | 6.64 | 17.71 | 9.59 | 10.7 | 11.81 | 100 |
| Working PT | 8.75 | 1.28 | 4.91 | 2.85 | 38.51 | 34.31 | 9.4 | 100 |
| Working FT | 1.3 | 0.37 | 1.32 | 0.47 | 6.85 | 88.66 | 1.02 | 100 |
| Mini-Job (main) | 6.86 | 2.67 | 1.63 | 8.14 | 20.7 | 12.09 | 47.91 | 100 |
| Total | 18.16 | 2.66 | 4.37 | 1.91 | 10.46 | 56.87 | 5.57 | 100 |

Table 3: Transition table: Probability of going from state in row to state in column. 2004/2005

| 2004/2005 | Inactive not stud. | Studying | Unempl. | Irregular employm. | Working PT | Working FT | Mini-Job (main) | Mini-Job (secondary) | Midi-Job (main) | Midi-Job (secondary) | Total |
|----------------------|--------------------|----------|---------|--------------------|------------|------------|-----------------|----------------------|-----------------|----------------------|-------|
| Inactive not stud. | 86.08 | 0.91 | 2.94 | 2.58 | 1.47 | 0.96 | 3.95 | 0.15 | 0.91 | 0.05 | 100 |
| Studying | 4.04 | 54.83 | 2.46 | 5.1 | 3.69 | 3.87 | 18.1 | 0.35 | 7.56 | 0 | 100 |
| Unemployed | 21.77 | 1.09 | 55.99 | 2.49 | 4.67 | 3.42 | 7.47 | 0.47 | 2.64 | 0 | 100 |
| Irregular employm. | 23.28 | 17.24 | 8.62 | 18.53 | 3.45 | 3.45 | 17.67 | 0 | 7.76 | 0 | 100 |
| Working PT | 13.46 | 1.89 | 6.42 | 3.14 | 34.21 | 27.3 | 8.43 | 0.63 | 4.28 | 0.25 | 100 |
| Working FT | 0.9 | 0.07 | 1.08 | 0.18 | 4.74 | 89.54 | 0.61 | 1.41 | 1.23 | 0.24 | 100 |
| Mini-Job (main) | 5.17 | 2.04 | 2.59 | 6.5 | 4.78 | 4.08 | 63.48 | 1.25 | 10.03 | 0.08 | 100 |
| Mini-Job (secondary) | 1.01 | 0 | 0 | 0.67 | 3.7 | 40.07 | 4.38 | 43.77 | 1.35 | 5.05 | 100 |
| Midi-Job (main) | 2.09 | 2.21 | 3.84 | 2.56 | 9.3 | 18.14 | 15.47 | 0.81 | 45.12 | 0.47 | 100 |
| Midi-Job (secondary) | 2.08 | 0 | 0 | 0 | 2.08 | 39.58 | 2.08 | 22.92 | 0 | 31.25 | 100 |
| Total | 16.17 | 3.29 | 4.77 | 2.1 | 6.19 | 49.67 | 9.93 | 2.02 | 5.45 | 0.4 | 100 |

3 Theoretical Approach

In this section, I discuss the theoretical mechanisms underlying the variation in earnings and employment prospects of workers after to the Mini-Job Reform. For simplicity, let's think in a static partial equilibrium model of the labor market, segmented in a low-earnings' sector, which in the case of interest comprises mini and midi-jobs, and a high-earnings' sector or regular employment.⁴ The Mini-Job Reform implies a reduction on the tax (SSC and income tax) paid by workers in the low-earnings' sector and a consequent decrease in the tax wedge on equilibrium.⁵ Without any movement in supply or demand (left panel), two effects are in place as shown in the left panel in figure (3): (i) the labor cost paid by firms W falls to W' , and (ii) the take-home or net wage of workers w increases to w' . The variation depends on the sensitivity of demand and supply.

However, the modification in the tax wedge in the low-earnings' sector induces responses by agents. On the demand side, firms might create more low-paid jobs because now is less expensive, or substitute more costly regular employment with low-earnings' workers. This would imply a shift outwards in the demand for low-earnings' workers and, depending on the substitution with regular employment, a shift in the demand in this sector. The result is an upward pressure on wages and employment level in the low-earnings' sector.

On the other hand, supply of workers is also expected to respond. The left panel of figure (4) shows the labor supply decision by an individual with an homogeneous labor tax. The upper indifference curve determines the hours worked by an agent who decides to supply labor, while the lower one represents an agent who does not participate in the labor market. The tax reduction represents an increase in the take-home wage and a steeper budget line as shown in the right panel.⁶ This change induces some people not participating in the labor market to work a positive amount of hours. However, some agents reduce hours worked to profit from the lower taxes paid by mini and midi-jobbers. Labor supply shifts outwards in the low-earnings' sector, and inwards in the sector of regular employment. This induces a downwards pressure of wages in the first sector, and upwards in the second, and the opposite with respect to the amount of labor.

The right panel in figure (3) shows the effect of the shift outwards in the labor supply, while ignoring the movements in demand.⁷ In this case, there will be downwards pressures on the take-home wage of the workers in the low-earnings' sector even if they are paying lower taxes. The final direction and magnitude of the variations in labor cost, take-home wage and employment in the low-earnings' sector and regular employment depends on the sensitivity of supply and demand for labor, as well as on the relative magnitudes of the shifts in the curves.

In the formal framework of the theory of tax incidence (Fullerton and Metcalf 2002), let's assume an economy with competitive markets and a single final good produced using labor from two sectors $j = \{1, 2\}$. The Mini-Job Reform implies a reduction in the tax wedge for the sector of low-paid workers, $j = 1$. Let τ_1 be the tax rate paid by employers and employees in mini and midi-jobs, while τ_2 applies for regular employment, such that $\tau_1 < \tau_2$.

⁴The implicit assumption is that there are two well defined types of labor, each traded in a different sector of the labor market (for example, high skilled and unskilled). Even if in practice there is not a clear cut between low and high-earnings' capacity workers, the simplification is useful for understanding the basic effects.

⁵I mostly abstract from the fact that the tax rate on mini and midi-jobbers, and within the latter group, is heterogeneous, but I simply consider a sector with lower taxes than the other.

⁶I do not consider that the change in the tax rate for single and married people is different due to the joint income taxation of couples.

⁷This is analogous to the case of dominant effect on labor supply, reasonable in the case of in-work benefits, in which the main objective is to increase participation.

Figure 3: Partial equilibrium in the labor market of the low-earnings' sector

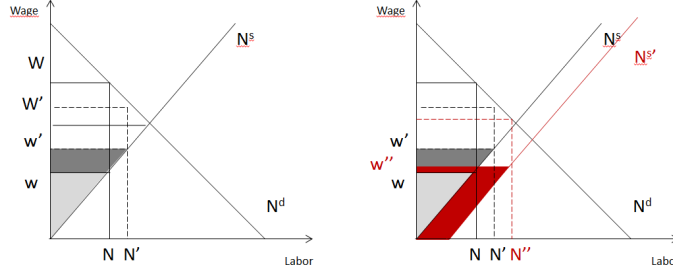
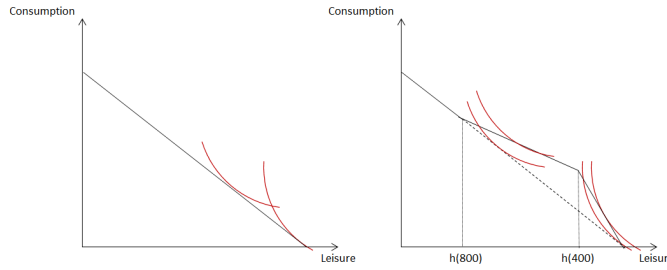


Figure 4: Labor supply decision



The net or take-home wage received by workers is $w_j = W_j(1 - \tau_j)$, where W_j is the labor cost for the firm. The tax wedge τ_j , independent of the statutory incidence (who pays the tax), generates a difference between the net wage and the labor cost. It is possible to define an implicit subsidy s derived from the difference between τ_1 and τ_2 : $(1 + s) \equiv (1 - \tau_1)/(1 - \tau_2)$. Using this definition, log-linearizing the equation for net wage in sector 1 and totally differentiating (note $d\tau_2/(1 - \tau_2) = 0$ because there is no change in taxes in sector 2):

$$\hat{W}_1 = \hat{w}_1 - \hat{s} \quad (1)$$

where $\hat{W}_1 \equiv dW_1/W_1$, $\hat{w}_1 \equiv dw_1/w_1$, $\hat{s} \equiv ds/(1 + s)$ represent percentage changes of the labor cost, net wage and implicit subsidy respectively. Similar derivations yield:

$$\hat{W}_2 = \hat{w}_2 \quad (2)$$

Assume a constant returns to scale production function $X = F(N_1, N_2)$, where X is the single consumption good produced using labor N_j from sectors $j = \{1, 2\}$. Totally differentiating X and expressing the percentage change of X in terms of percentage changes in the labor inputs:

$$\hat{X} = \frac{F_1 N_1}{X} \hat{N}_1 + \frac{F_2 N_2}{X} \hat{N}_2 \quad (3)$$

where $F_j \equiv \partial F(N_1, N_2)/\partial N_j$. Under perfect competition, the problem of the firm maximizing benefits yields $W_j = F_j$ for $j = \{1, 2\}$. Let $\theta \equiv (W_1 N_1)/X$ be the share of product corresponding to workers in sector 1, and $(1 - \theta) \equiv (W_2 N_2)/X$ the analogous for sector 2:

$$\hat{X} = \theta \hat{N}_1 + (1 - \theta) \hat{N}_2 \quad (4)$$

The elasticity of substitution is defined as:

$$\begin{aligned} \sigma &= \frac{d(N_1/N_2)/(N_1/N_2)}{d(W_2/W_1)/(W_2/W_1)} \\ &= \frac{\hat{N}_1 - \hat{N}_2}{\hat{W}_2 - \hat{W}_1} \end{aligned} \quad (5)$$

Hence:

$$\hat{N}_1 - \hat{N}_2 = \sigma(\hat{W}_2 - \hat{W}_1) \quad (6)$$

The labor supply is derived from the individual's static problem, in which we assume a quasi-linear utility over a numeraire consumption good c and hours of work N^s :⁸

$$\begin{aligned} \max_{c, N^s} c - \alpha \frac{1}{\gamma} N^{s(1+\frac{1}{\gamma})} \\ \text{s.t. } c = wN^s \end{aligned} \quad (7)$$

where α denotes the disutility from labor, and γ is the constant elasticity of labor supply. Note that the individual makes the labor supply decision depending on w , which varies according the sector where he supplies labor. For simplicity, I assume each agent supplies labor in a different sector. The first order conditions with respect to labor yield: $N^s = \frac{1}{\alpha} w^\gamma$. Log-linearizing and using $\hat{\alpha} = 0$ (it is a parameter) yields:

$$\hat{N}^s = \gamma \hat{w} \quad (8)$$

where $\gamma = \hat{N}^s / \hat{w}$ is the labor supply elasticity with respect to net wage, typically assumed not negative. Deriving the labor supply for sector 1 and 2 in terms of the constant elasticity and the respective net wages yields:

$$\begin{aligned} \hat{N}_1 &= \gamma \hat{w}_1 = \gamma(\hat{W}_1 + \hat{s}) \\ \hat{N}_2 &= \gamma \hat{w}_2 = \gamma(\hat{W}_2) \end{aligned} \quad (9)$$

Plugging equation (9) in (5) and deriving the difference in the growth rates of the net wage with respect to the implicit subsidy:

$$\frac{\hat{w}_1 - \hat{w}_2}{\hat{s}} = \frac{\sigma}{\gamma + \sigma} \quad (10)$$

Assuming γ is positive, the right hand side of the expression can be either negative or positive depending on the sign and the size of σ relatively to γ . For the case in which labor from both sectors are substitutes in production ($\sigma > 0$), the net wage in sector 1 is expected to grow by more when the subsidy increases, and the magnitude of the variation is increasing in σ and decreasing in γ . If $\sigma < 0$, then the direction of the change is ambiguous. Similarly, the relative growth rate of the amount of labor in both sectors when the subsidy increases is:

$$\frac{\hat{N}_1 - \hat{N}_2}{\hat{s}} = \frac{\sigma + \gamma}{\sigma \gamma} \quad (11)$$

The amount of labor in the sector which receives the subsidy is also expected to increase by more when $\sigma > 0$, and is ambiguous if $\sigma < 0$. Using this expression, it is possible to derive the relative growth in the gross wages:

$$\frac{\hat{W}_1 - \hat{W}_2}{\hat{s}} = -\frac{\gamma}{\gamma + \sigma} \quad (12)$$

where the right hand side is negative for $\sigma > 0$. Differently from net earnings, the cost paid by firms is expected to fall in the subsidized sector relative to the other when the subsidy increases, reflecting the employer appropriates part of the tax benefit. If $\sigma < 0$ the change is ambiguous.

Within this simplified static framework, it is clear that the effect of reducing the tax rate in the low-earnings' sector on labor cost, wages and employment depends on the sign and the size of the elasticity of substitution and of labor supply. Who is appropriating the tax reduction, the worker or the firm, is an empirical question. Independently of the mechanism, if the tax reduction implies an increase in the workers' take-home wage, the policy is effective as an antipoverty instrument. If, on the contrary, the implicit subsidy allows the firm to reduce the labor cost without improving workers' net earnings, then it is not possible to conclude that workers are better off.

Now I shift attention to the inactive and unemployed workers. As shown in figure (4), they face

⁸This formulation of the problem is fairly standard in the public finance literature.

higher incentives to participate in the labor market due to a higher take-home wage implied by the lower tax burden. Let's think in three periods in a very simplified scheme, $t = \{0, 1, 2\}$. In $t = 0$, all workers are unemployed or inactive. Let's assume all workers start with the same reservation wage and they hence accept the first offer they get.⁹ Abstracting from labor demand determination, let's assume that the offers include mini or midi-jobs and regular employment. While from the former it is feasible to transit to regular employment, the latter is an absorbing state. Regular employment is more costly for firms (higher tax wedge), hence the probability of receiving such an offer is lower than a mini or midi-job.

In $t = 1$, a randomly selected group obtains an offer for a mini or midi-job, with probability $\alpha_{MJ} = 1$. The remaining workers face a lower probability $\alpha_E < 1$ of receiving an offer of regular employment and $(1 - \alpha_E)$ of not receiving any offer. If they remain unemployed or inactive, in $t = 2$ they face the same lottery. Hence, the probability of obtaining a regular employment for this group which do not get a mini or midi-job offer in $t = 1$ is:

$$\alpha_E^{NM} = \alpha_E + (1 - \alpha_E)\alpha_E = \alpha_E(2 - \alpha_E) \quad (13)$$

The workers that enter mini or midi-jobs might develop higher labor market attachment through better access to information, working habits or possibilities of promotion, than the unemployed or inactive. On the other hand, they bear costs such as less time for searching for a regular employment, or stigma or bad signal about their productivity or motivation (Moffitt 1983), which may reduce their possibility to transit into regular employment. These factors determine the probability of transiting to regular employment in $t = 2$, denoted α_E^M . The relevant comparison is then between this probability and expression (13). If $\alpha_E^M \geq \alpha_E^{NM}$, then mini or midi-jobs are “stepping-stones”, and they are “dead-ends” otherwise. Again, the relative size of these probabilities remains an empirical question.

The implicit assumption in this analysis is that agents prefer regular employment to mini and midi-jobs. As discussed earlier, mini and midi-jobs are not exclusively defined by the amount of hours worked, in this sense a regular employment can entail the same amount of effort with a better hourly wage. Overall, regular jobs by definition imply higher earnings, and the implicit assumption is that workers prefer to earn more. If holding a mini or midi-job improves the future possibilities of transition to regular employment for workers, then there is some evidence that a policy promoting these type of jobs might help workers to improve their employment prospects. In the next sections, I provide some evidence regarding these empirical questions.

4 Data and Descriptives

The data used in this paper is the German Socio-Economic Panel (SOEP), a yearly survey covering a wide set of socio-economic and demographic characteristics at the individual and household level, on a representative sample of German population. It has a panel structure and responds to a stratified sampling. I use the balanced panel for 2000-2007.¹⁰

Table (4) shows the main characteristics of mini and midi-jobbers compared to the rest of workers

⁹This is a simplification useful for the analysis. If all unemployed and inactive workers are homogenous ex-ante, the reservation wage is the same and offers below it would not be taken. Hence, all offers are above the reservation wage and are taken by the worker.

¹⁰The weights provided by the survey are used throughout the analysis, which adjust for the different probabilities of selection and for the probability of attrition.

and jobless population according to their labor situation in 2004-2007.¹¹ Some demographic groups are over-represented among mini and midi-jobbers compared to both workers in regular employment and jobless population: women, single (without a partner), workers who are not head of households, low educated. They are also concentrated in poorer households and with more children. Mini and midi-jobbers have a larger share of previously welfare-state dependent workers, i.e. receiving unemployment insurance or assistance or other public transfers, compared to workers in regular employment, though lower if compared to the group with no employment. Workers starting their first job are more concentrated in mini and midi-jobs.

Considering the recent labor history (2000-2002), mini and midi-jobbers have a longer experience in part-time employment, and shorter in full-time jobs than jobless and rest of working population. They have been unemployed for more time than other workers, though shorter than jobless population. Working hours and gross monthly earnings are in between those of jobless population and rest of the workers, while the hourly net wage is the lowest and the rate of job change the highest among mini and midi-jobbers. The gap between mini and midi-jobbers and regular workers in labor market outcomes increases after the reform.

Given their particular characteristics, mini and midi-jobbers are not a random sample of the population. The probability of taking a mini-job depends on pre-treatment characteristics (see table (B1) in the Appendix). The resulting selection bias needs to be addressed to approximate the causal effect of taking up a mini or midi-job.

Exploiting the panel structure of the data, I estimate fixed effects models which allow controlling for unobservable factors constant in time potentially generating differences in levels of outcomes among individuals. In the following section, the identification of an effect by comparing trends in the outcomes of a treatment and comparison group is explained. Regarding the construction of these groups, I explore two different alternatives: (i) using groups which the literature on welfare-to-work policies mention as targets and that are empirically more prone to take up mini and midi-jobs (women, young, single mothers, secondary workers and low educated); (ii) constructing comparable groups by matching in pre-reform characteristics. Both approaches provide different possibilities in terms of the outcomes to be analyzed and the type of treatment effect to be estimated, as will be explained later.

5 Fixed effects models and the estimation of the treatment effects

Following the notation in Angrist and Pischke (2009), let D_{it} be a dummy variable representing the treatment for individual i in time t . Y_{it} is the observed outcome, and the potential outcomes are Y_{it}^1 in case of treatment and Y_{it}^0 otherwise.

Suppose:

$$E(Y_{it}^0|U_i, X_{it}, t, D_{it} = 1) = E(Y_{it}^0|U_i, X_{it}, t, D_{it} = 0) \quad (14)$$

being X_{it} a vector of observed time-varying characteristics, U_i the unobservable but fixed confounders, and t the chronological time. Equation (14) means that the potential outcome in case of no treatment is independent on the treatment status, after controlling for U_i , X_{it} and t . Since the potential outcome in case of no treatment is not observed for treated units after the reform, the only possibility is to test for it in the period before, when all units were not treated (see next subsection).

¹¹Here and in the rest of the analysis self-employed and civil servants are excluded, because their behavior is significantly different compared to wage-workers in private-sector.

Assuming further a linear specification for the conditional expectation of the outcome:

$$E(Y_{it}|U_i, X_{it}, t, D_{it} = 0) = \alpha + \lambda_t + U_i' \gamma + X_{it}' \beta \quad (15a)$$

$$E(Y_{it}|U_i, X_{it}, t, D_{it} = 1) = E(Y_{it}|U_i, X_{it}, t, D_{it} = 0) + \delta \quad (15b)$$

Combining these expressions, yield:

$$\begin{aligned} E(Y_{it}|U_i, X_{it}, t, D_{it}) &= D_{it}E(Y_{it}|U_i, X_{it}, t, D_{it} = 1) + (1 - D_{it})E(Y_{it}|U_i, X_{it}, t, D_{it} = 0) \\ &= \alpha + \lambda_t + \delta D_{it} + U_i' \gamma + X_{it}' \beta \end{aligned} \quad (16)$$

The model to be estimated is hence:

$$Y_{it} = \alpha_i + \lambda_t + \delta D_{it} + X_{it}' \beta + u_{it} \quad (17)$$

where $\alpha_i \equiv \alpha + U_i' \gamma$ is the individual fixed effect which captures the time-invariant unobservable confounders, and λ_t is year fixed effects.

Upon verification of the identifying assumption, the resulting estimate for δ from model (17) captures the Average Treatment on the Treated (ATT) on the relevant outcome:

$$\begin{aligned} \delta &= E(Y_{it}|U_i, X_{it}, t, D_{it} = 1) - E(Y_{it}|U_i, X_{it}, t, D_{it} = 0) \\ &= E(Y_{it}^1|U_i, X_{it}, t, D_{it} = 1) - E(Y_{it}^0|U_i, X_{it}, t, D_{it} = 0) \\ &= E(Y_{it}^1|U_i, X_{it}, t, D_{it} = 1) - E(Y_{it}^0|U_i, X_{it}, t, D_{it} = 1) \\ &= E(Y_{it}^1 - Y_{it}^0|U_i, X_{it}, t, D_{it} = 1) = ATT \end{aligned} \quad (18)$$

where the second line just translates the first in terms of potential outcomes, and the third uses assumption (14).¹²

5.1 Validity of the identifying assumption

The identification of the ATT relies in two assumptions: (i) equation (14) and (ii) linearity and additivity of the model. While (ii) responds to the usual parametric specification for the estimation, which is not excessively restrictive, it is possible to exploit the panel structure of the data and the availability of information for a period before the reform to verify (i).

Given two periods, t and t' such that $t < t'$, rewriting the expression (18) for t' , when both $D_{it'} = 1$ and $D_{it'} = 0$ are observed, yields:

$$\begin{aligned} ATT &= E(Y_{it'}^1 - Y_{it'}^0|U_i, X_{it'}, t', D_{it'} = 1) \\ &= E(Y_{it'}^1 - Y_{it'}^0 + Y_{it'}^0 - Y_{it'}^0|U_i, X_{it'}, t', D_{it'} = 1) \\ &= \underbrace{E(Y_{it'}^1 - Y_{it'}^0|U_i, X_{it'}, t, D_{it'} = 1)}_{\text{Before and After (B/A)}} - \underbrace{E(Y_{it'}^0 - Y_{it'}^0|U_i, X_{it'}, t', D_{it'} = 1)}_{\text{Trend of } Y^0 \text{ for } D = 1} \end{aligned} \quad (19)$$

where in the second line $Y_{it'}^0$ is added and subtracted, rearranging in the third line. The ATT is the detrended before-and-after estimator for the treated observations. While $Y_{it'}^0$ is observable for individuals both in the treatment and comparison groups before the reform, after the reform the only potential outcomes observed are $Y_{it'}^1$ for treated individuals and $Y_{it'}^0$ for the rest.

However, using assumption (14) for both t and t' :

$$E(Y_{it'}^0 - Y_{it'}^0|U_i, X_{it'}, t', D_{it'} = 1) = E(Y_{it'}^0 - Y_{it'}^0|U_i, X_{it'}, t', D_{it'} = 0) \quad (20)$$

Plugging in the second term of (19):

$$\begin{aligned} ATT &= E(Y_{it'}^1 - Y_{it'}^0|U_i, X_{it'}, t', D_{it'} = 1) - E(Y_{it'}^0 - Y_{it'}^0|U_i, X_{it'}, t', D_{it'} = 0) \\ &= E(Y_{it'}^1 - Y_{it'}^0|U_i, X_{it'}, t', D_{it'} = 1) - E(Y_{it'}^1 - Y_{it'}^0|U_i, X_{it'}, t', D_{it'} = 0) \end{aligned} \quad (21)$$

¹²If $E(Y_{it}^1|U_i, X_{it}, t, D_{it}) = E(Y_{it}^1|U_i, X_{it}, t)$ was also assumed, then the Average Treatment Effect (ATE) would be recovered. However, this is more difficult to argue because there is not possibility of testing as it is the case for assumption (14) in the period before the reform.

In the last line I used that all the potential outcomes in the first line coincide with the observed outcomes after the substitution. The expression in (20) is usually referred as “parallel trends” assumption, necessary for δ to provide an unbiased estimation of the ATT. It is possible to verify this assumption only for the pre-reform periods. Assuming it holds after, the differences in the trends can be attributed to the presence of the treatment.

Let’s define the variable D_i individual specific and independent of time, which takes the value 1 if the individual is in the treatment group and 0 if she belongs to the comparison group. Using the period 2000-2002, I run the following regression:

$$Y_{it} = \alpha_i^0 + \lambda_t^0 + \sum_{t=00}^{02} \phi_t^0 Year_t * D_i + X_{it}'\beta^0 + \varepsilon_{it} \quad (22)$$

which is similar to equation (17) in that it also contains the individual and year fixed effects and time varying characteristics. The key is the set of year dummies $Year_t$ interacted with the D_i . Parallel trends are assumed whenever the hypothesis that $\phi_{00}^0 = \phi_{01}^0 = \phi_{02}^0 = 0$ is not rejected.

6 Target groups

The selection bias in the estimation of δ by using (17) might persist after controlling for observable and time-invariant unobservable factors, being D_{it} and u_{it} correlated. One way to approach this problem is to define a variable Z_{it} which is exogenous with respect to the treatment (pre-determined) and captures the “assignment to treatment”. It takes the value 1 after the reform for a group which has a higher propensity to take up mini or midi-job and 0 otherwise. Treatment and assignment are related as follows:

$$D_{it} = \pi + \eta Z_{it} + v_{it} \quad (23)$$

To define Z_{it} , let’s consider those groups typically targeted by in-work benefits: women, young (35 years old or younger), single parents, secondary workers (not head of household or spouse) and individuals with low education (high school or less). Even if the legislation on mini and midi-jobs does not include variations for these groups, they have effectively a higher representation, as seen in the last column of table (5). The biggest difference in the proportion of mini and midi-jobs is observed among women compared to men and single with children compared to the rest (in couples or single without children).

The equation to be estimated is (17), where D_{it} is replaced by Z_{it} . The year 2003 is excluded because the reform was implemented in April. The sample is restricted to prime age population (between 25 to 54) to avoid including the extremes labor market behaviors. As is standard in the literature of treatment effects, δ recovers the “Intention to Treat” (ITT) effect, which is typically lower in absolute magnitude than the ATT. The estimates are interpreted as the effect of the policy on the groups it intends to affect.

The outcome variables are: (1) participation, (2) employment, (3) part-time employment, (4) regular employment, (5) regular part-time employment, (6) monthly gross earnings, (7) monthly net earnings, (8) weekly working hours, (9) hourly net wage, (10) change of job. Table (6) presents the mean and standard deviation of the outcomes before (2002) and after (2005) the reform, and by groups in 2002. The most salient change after the reform is the drop in 9 pp. in the share of regular employment, which includes the mechanical redefinition of jobs between €325 and €800 (regular before the reform and marginal after). It is interesting that despite the share of part-time workers remains constant, the proportion of regular part-time increases from 5.5% to 7.5%, which goes against the suspicion that mini and midi-jobs replace part-time employment. Monthly gross earnings and

hourly net wage increase on average, while the working hours remain relatively constant. Finally, the proportion of workers who change job decreases slightly between 2002 and 2005.

In the regressions, outcomes (1) to (5) and (10) are binary variables, and (7)-(9) are in natural logarithm. The first five outcomes are analyzed on the prime age population, and the rest on the population working in all the periods between 2000 and 2007. Control variables X_{it} include time varying relevant characteristics: whether the worker lives in Eastern or Western Germany, if she is single, the number of children, if she is head of household, if she lives in a dual-earner household, and the education level. U_{it} represents unobservables such as motivation, attitudes towards work, reservation wage, etc..

Table (7) shows the estimates for δ . In columns, the outcomes are presented, while the rows show the different choices for Z_{it} . The first row presents a before and after replacing the year fixed effects with a linear trend, and the results are consistent with those discussed for table (6). In the case of binary outcome variables, a linear probability model is used.¹³ Standard errors are clustered at the individual level to account for autocorrelation.

After the reform, female labor participation increases by 4 pp. and employment, 5 pp. relative to men, which represents one third of the preexistent gap. However, the proportion of women in regular jobs decreases by 4 pp. widening the gender gap. There is not significant change in the proportion of part-time employment, which is higher for women (one third of female workers compared to 5% of male), nor in the regular employment among part-timers, higher for women as well (36% of female part-timers and 17.5% of male part-timers). Women do not experience changes in their earnings or working hours, leaving the gap unchanged. A possible underlying mechanism is an increase in labor supply of women. It is interesting that the rate of job change, in which there was no gender difference in 2002, falls 3 pp. relatively for women, potentially due to higher job stability.

Labor participation increases 3 pp. for young workers relatively to older after the reform, reducing the gap of 5 pp.. There are not significant changes in employment and regular employment, which are lower for youth, and in part-time and regular part-time shares, higher for youth. Monthly earnings increase for them, both in gross and net terms, by 8 pp. and 4 pp. respectively. The preexistent gap of €140 approximately is reduced in €50 on average. The higher earnings come from both a higher number of hours worked and a higher hourly wage: $\hat{\delta}$ for the respective outcomes is positive but imprecisely estimated. This results are consistent with a dominant increase in demand for younger workers, which improves earnings and increases labor participation. The rate of job change decreases by 6 pp. closing the pre-existent gap.

Single individuals with children before the reform display higher participation and lower employment rate, higher share of part-time employment and lower regular employment. In the regressions, the coefficients are not statistically significant suggesting no change. However, this might be partly due the relatively small size of the group (5% compared to approximately 25% to 80% for the other cases, except for secondary workers). The only statistically significant estimate suggests that this group faces a 10% reduction in the hourly wage and a 11% increase in the hours compared to people in other types of families, keeping earnings growing at the same pace as the rest of workers.

There are no differences in participation and employment between primary and secondary workers before the reform. Secondary workers hold less part-time employment, and earnings are lower mainly due to a lower net hourly wage. Even if most estimations are imprecise partly due to the small size of the group, the point estimates suggest that the reform induced higher participation and

¹³The estimation of $E(Y|X)$, the object of interest, is not sensibly affected by the specification while the linear probability model imposes the least distributional assumptions.

employment in this group and reduced the proportion of part-timers, against the expectations that mini-jobs are equivalent to part-time employment. In terms of earnings, the group loses relatively to the primary workers, both in gross and net terms. Given there is a relative increase in the number of hours, the main channel of the loss in earnings is a reduction in the hourly net wage compared to primary workers. The results indicate that the gaps between primary and secondary workers both in labor participation and earnings are bigger after the reform.

Participation outcomes do not change for low educated individuals after the reform, except for a mechanical fall in the share of regular employment compared to high educated people. Net and gross monthly earnings of people with low education decrease 5 pp. compared to highly educated workers, and this is mainly due to a fall in the hourly wage.

Overall, the expansion of tax exemptions and subsidies with the reform resulted in an increase in labor participation for female and young people, having the latter improved their earnings as well. For the rest of more affected groups, there is dominant depression in earnings. In line with the theoretical framework presented before, this result is consistent with an outwards shift of labor supply and demand for women and young workers, groups which consequently achieve higher participation. In the remaining groups, the change in participation is not as pronounced, while there is a depression in earnings particularly for workers with low education level, suggesting appropriation of the tax benefit by firms.

To qualify the validity of the estimations, I test the parallel trends assumption. Table (9) shows the statistics corresponding to the test. It is not possible to reject that trends are parallel, except for net monthly earnings for groups by education level, and working hours for groups formed by gender, age and family type. For visual inspection, the graphs of residuals of the regression of the outcomes on the controls and years fixed effects are in figures (C1) to (C5) in the Appendix.

7 Matching strategy

A second approach to address the selection bias is to construct a comparison group to mini and midi-jobbers by using a matching strategy on pre-reform characteristics (Ichino, Schwerdt, Winter-Ebmer, and Zweimuller 2014). Matching relies on balance in observables and has the advantage of providing a more homogeneous group for comparisons. To answer the question addressed by this paper, I focus on two groups of outcomes: (1) total and hourly net earnings and working hours of employed population, (2) probability of transiting to regular employment after taking up a mini or midi-job by the jobless population before the reform.

The matching variables are gender, age, immigration condition, number of children in the household, per capita after-tax-and-transfer household income, education level (less, equal or more than high-school), indicator of new entrants in employment who were students in the period before, work experience and monthly gross earnings. Variables refer to the period before the reform.¹⁴ The treatment is considered as taking up either a mini or midi-job after the reform.

I apply coarsened exact matching using the method by Blackwell, Iacus, King, and Porro (2009), which consists on generating cells with combinations of the matching variables, binning the continuous ones. Then the observations are sorted into the strata and those with missing either treatment or comparison observations are discarded. Observations kept are those in the common support, as it

¹⁴Time varying demographics refer to 2002. The indicator for new entrants in employment is measured as being in this condition in any period between 2000 and 2002. Work experience is the maximum declared in this period, and monthly earnings is the average during these years.

is usually referred in the terminology of the matching literature. Matching weights are computed to balance for the heterogeneous composition of the strata within the common support.

In the balanced panel 2000-2007 with working age population (17-65)¹⁵, there are 8,917 individuals, of which 4,518 are working during the whole observation window (“working population”) and 1,422 are inactive or unemployed in 2002 (“jobless population”). These are the groups of interest in the present analysis. There are 1,194 and 523 mini and midi-jobs in each of them respectively, which constitute the treatment group. The potential comparison groups are formed by the remaining individuals in each sub-sample. After matching, the resulting sub-samples contain 407 treated and 654 matched controls in the working population (1,061 in total), and 110 treated and 109 controls in the jobless population. For more details on the sample, see table (D1) in the Appendix).

The gain of using the matching strategy is to balance the pre-reform observable characteristics. Tables (D2) and (D3) in the Appendix show the mean, standard deviations and a test for difference in means for matching variables and other pre-treatment characteristics of mini and midi-jobbers compared to the rest of the workers, for the original and matched sub-samples of the working and jobless population respectively.¹⁶ While in the original sample means are statistically different, in the sub-sample in the common support differences disappear or at least become smaller in all variables, even those not included in the matching procedure. Hence, the matching strategy renders gains in terms of comparability of the groups of mini and midi-jobs and the rest of the workers. However, this comes at the cost of a considerable loss of observations, such that the remaining sub-samples represent 23% of the original sample of working population, and 15% for the jobless. Figures (E1) and (E2) in the Appendix show what is called in the literature as the “propensity score” for the original sample and the sub-sample in the common support.

The outcomes to be analyzed in the working sub-sample are: (1) net monthly earnings, (2) weekly hours worked, (3) net hourly wage, all in natural logarithm. In the sub-sample of jobless individuals, the outcome of interest is the probability of holding a regular employment. The evolution of the outcomes for the original sample as well as the matched sample with and without matching weights is shown in figure (F1) in the Appendix. Visual inspection suggests that the take-home earnings, both monthly and hourly, as well as the hours worked decrease for the mini and midi-jobbers once the reform is in place. On the other hand, the probability of holding a regular employment increases for the mini and midi-jobbers right after the reform, and decrease thereafter.

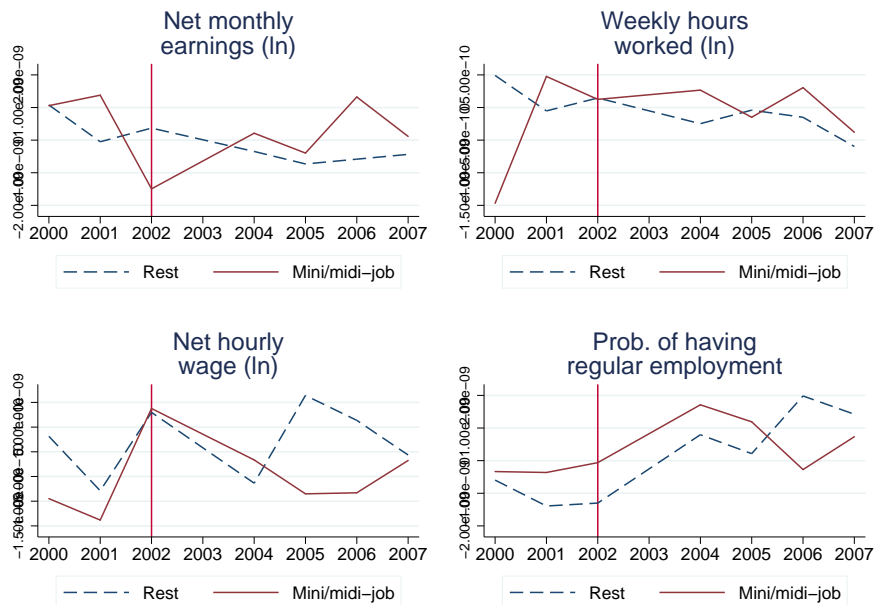
The evolution of the outcomes after accounting for the observable time-varying variables and year fixed effects on the matched sample is displayed in figure (5), where the residuals of the corresponding regressions are plotted. Trends in earnings and hours for mini and midi-jobbers after the reform do not suggest a relative fall compared to the rest of the workers. Regarding the probability of holding a regular employment, it increases soon after the reform and then goes down.

Visually, the parallel trend assumption holds for the hourly net earnings and the probability of being in regular employment, but it is not clear for the rest of the outcomes. Table (10) shows the formal test using equation (22). Let’s define the variable D_i individual specific and independent of time, which takes the value 1 if the individual takes up a mini or midi-job after the reform, and 0 otherwise. The relevant test statistics in table (10) for the matched sample (last two columns) do not allow to reject the hypothesis of parallel trends pre-reform in all the outcomes.

¹⁵I use all ages due to sample size restrictions.

¹⁶The matching variables are not balanced by construction because the algorithm used allows strata with different number of units in the groups of mini or midi-jobbers and the rest of the workers. The last block of columns shows the same statistics using the weights computed with the matching algorithm to compensate for the differential strata sizes.

Figure 5: Evolution of the outcomes. Residuals from regression on observable time-varying controls and year fixed effects



Note: Net monthly earnings, weekly hours of work and net hourly wage correspond to working population; probability of holding regular employment, to jobless population.

Using the matched observations in the balanced panel in 2000-2007, excluding 2003, I estimate the model in equation (17), but modified to differentiate mini and midi-jobs in the spirit of heterogeneous effects. The underlying assumption is that after removing differences in observable characteristics, the selection into mini or midi-jobs is determined by time-invariant unobservables U_i and time-varying observables X_{it} on which I condition. D_{it} equals 1 for all years since the worker's first entrance in a mini or midi-job after 2003.¹⁷ Under assumption (14), δ identifies the ATT and since it is estimated on the matched sample the effect estimated is local to this subgroup of comparable individuals.

Tables (11) and (12) show the estimation of δ for the corresponding outcomes and sub-samples. The first column for each outcome variable shows the estimation by Ordinary Least Squares (OLS), the second, using Fixed Effects (FE), and the third one, using FE in the matched sample.

Estimations using OLS are all significant both statistically and economically. However, the selection bias is apparent when comparing with the lower estimations using FE. The negative sign of OLS estimates in the case of earnings and hours suggests that mini and midi-jobbers work fewer hours and earn less than regular workers. This result is mechanical and potentially due to the definition of mini and midi-jobs based on a maximum of earnings. FE estimates are lower in magnitude, reflecting the differences in trends after controlling for disparities in levels. When restricting to the matched sample with more comparable individuals, estimations became slightly smaller in general, and less precise potentially due to the reduction in the sample size.

¹⁷The treatment is considered since the first entrance, because starting a mini or midi-job can be attributed to the expansion of this type of employment by the reform, while changing the labor situation afterwards is not exogenous, depends on worker's effort, for example. Since the definition of mini-job changed deeply with the reform, the variable D_{it} does not take the value 1 for mini-jobbers before the reform.

Among people working during the whole period 2000-2007, net monthly earnings decrease 7% for mini-jobbers and 2% for midi-jobbers compared to workers in regular employment. These magnitudes are economically significant, equivalent to a loss of €70 and €20 a month respectively, if evaluated at the mean net earnings of €1,000 in the sample. The coefficients are not precisely estimated though.

Decomposing the variation in earnings, hours fall by 10% for the mini-jobbers and 4% for the midi-jobbers compared to the rest of the workers, though the latter is not statistically significant. This magnitude represents 3 and 1 hour a week respectively, given the average is 32 hours in the sample. The net hourly wage, which is on average €7, decreases by 1% (€0.07) for mini-jobbers and 6% (€0.42) for midi-jobbers with respect to the rest, but the coefficients are not statistically different from 0. To sum up, hours worked fall potentially to benefit from the lower tax burden in mini and midi-jobs. However, workers do not receive the benefit because earnings, both monthly and hourly, do not increase. This is consistent with the hypothesis that firms appropriate the benefit of the lower tax burden. It is worth reminding that the lack of growth in net earnings relatively might come from a dominant outwards shift in labor supply or from a higher supply elasticity.¹⁸

Further insight on the mechanism underlying the results is derived from table (13), where indicators of job change and reduction in gross monthly earnings are regressed on three lags of the mini and midi-job indicators (maximum length allowed by the sample). The coefficients of interest are on the contemporaneous values. They capture whether there is a higher probability of changing job or suffering a cut on earnings when entering a mini or midi-job. Focusing on the estimation by FE on the matched sample, workers have 25% higher chances of suffering a reduction in the salary when entering a mini-job, and 14% when starting in a midi-job. The coefficients regarding job change are not statistically significant, providing not conclusive evidence regarding workers leaving their jobs to take up a mini or midi-job. Jointly with the previous results, this suggests that firms might directly depress the gross remuneration of workers, by cutting hours or hourly wage, to take advantage of the lower tax wedge. Net earnings by hour do not improve for workers. This is consistent with the findings by Azmat (2006) for the WFTC, which has a similar design to the mini and midi-jobs in the sense that the benefit is part of the payroll.

For the inactive and unemployed individuals before the reform, the estimations regarding mini-jobbers transiting to regular employment one period after on the matched sample even switch sign compared to the OLS estimates. Selection is very strong in this case. Mini-jobbers face a lower probability of holding regular employment due to their observable and unobservable characteristics. Once accounted for this, mini-jobbers have a 12 pp. higher probability (statistically significant) of obtaining a regular employment if they stay one year in the mini-job. In case they stay two years or more, the coefficients become lower and not significantly different from 0. For the midi-jobs, there is the opposite situation: the coefficients increase with the length of the period (for 2 lags, it is 12 pp. higher, though imprecisely estimated). Estimates are high compared to the unconditional probability of being in regular employment of 14% in the whole sample and 18% since 2004.

A possible interpretation of this result is that mini-jobs act as a probation period: workers accept a low pay and hours of work to signal their ability and motivation to work, and firms screen workers by offering these jobs. But if they stay too long in this type of job, it has a lock-in effect where the signal is negative and it is more difficult to find a regular employment. In the case of the midi-jobs, since they are better paid and involve more hours, they might allow to accumulate human capital

¹⁸Bispinck and Schulten (2011) point out that even if unions tried to limit the number of mini and midi-jobs in certain sectors, such as retail, the rules were not enforceable. This together with the low unionization rate in Germany (60%) hints on the low bargaining power or high supply elasticity of low-income earners.

with time and improve the likelihood of transiting to regular employment.¹⁹

Tables (G1) and (G2) in the Appendix present an analysis of heterogeneity of effects for relevant groups. The main findings suggest that the elimination of the hours limit played a role. Previous mini-jobbers increase hours, the same as young people, Eastern Germans, single parents and secondary workers. However, not in all cases earnings improve, because there are downward pressures on the hourly net wages in mini and midi-jobs. This is the case for single parents for example. Young people who hold mini or midi-jobs are the most benefited in terms of earnings.

Estimations regarding stepping-stone effects for inactive and unemployed workers are imprecise potentially due to the reduced sample size. However, it seems that mini-jobs constitute an effective means for unemployed to transit to regular employment. However, there is a lock-in in this type of jobs for women, Eastern Germans and single parents.

8 Discussion: Robustness and general equilibrium effects

In this section, I qualify the validity of the results by showing they hold under changes in the specification and I discuss how they are affected by general equilibrium effects. Robustness checks are offered for the results using the combined matching and fixed effects strategy.

First, I redefine D_{it} so as it only refers to mini and midi-jobs as main job. The first four columns of table (14) show that the results are qualitatively robust, even if the sample size after matching is smaller for the working population. Most of the estimates do not change sign, though the point estimations are higher in absolute magnitude and more precise. The coefficient regarding the effect of mini-jobs on net monthly earnings is significant and of higher magnitude. For inactive and unemployed people, there is almost no change in the sample and the results, since they mostly take up mini and midi-jobs as main.

A second change in the specification is to consider mini-jobs before the reform as part of the treatment, keeping the original matched samples, as shown in columns 5-8 in table (14). While results in terms of earnings are very similar to the previous specification, for the jobless population the estimates decrease in magnitude and become statistically insignificant. However, the temporal pattern of the coefficients remain.

The first four columns in table (15) is a “standard DID” exercise, in which I disregard that individuals enter into mini and midi-jobs in different moments after the reform. Results do not qualitatively change. Finally, in the last columns I restrict attention to those who are part-timers (or inactive and unemployed in the case of the jobless group) during all the observation period, and I present the results on the original sample due to its limited size. The only treatment is to take up a mini-job, and the comparison group is composed by regular part-timers. This exercise potentially abstract from the decision between being full and part-time. Results on earnings remain, though the change in hours become insignificant as it is to be expected. Coefficients related to the probability of transition to regular employment maintain the temporal pattern but are lower and statistically insignificant.

An additional test for the presence of effects on earnings for people working during the whole period of observation, 2000-2007, is performed using the concept of “intensity of treatment”. Following Duflo (2001) and Bleakley (2007), workers in sectors with more low-paid jobs before the reform are more affected by the expansion of these type of employment with the reform. I define low-paid

¹⁹It is difficult to discard that the positive effect does not come from an improvement on the firm’s possibilities to screen workers on the base of unobservables for the econometrician but not for the firm. It would be an unfair comparison if the workers who enter mini-jobs are the most skillfull of the pool of unemployed and inactive.

jobs as those which comply with the post-reform definition of mini and midi-jobs. The sector in which the worker is before the reform is highly correlated with the sector after: 60% of the workers with valid sector declaration remains in the same sector in between 2002 and 2007. Since it is a pre-determined variable, I consider it exogenous and an indicator of the worker's ability.

The evolution of the outcomes is shown in figure (12) in the Appendix, in which sectors are classified in high and low intensity of treatment according to whether they are above and below the median of low-paid jobs respectively. In a regression framework the specification is:

$$Y_{ijt} = \alpha_i + \lambda_t + \delta(D_j^{pre} * Post_t) + X_{it}'\beta + u_{it} \quad (24)$$

where all the variables are as in equation (17), D_j^{pre} represents the intensity of low-paid jobs in the sector where the worker was employed before the reform (in 2002) and $Post_t$ is an indicator which takes the value 1 after 2003. The intensity is computed as an average of the proportion of low-paid jobs by sector between 2000-2002. I consider separately a more restrictive concept using only the definition of mini-jobs, and a wider one including midi-jobs as well. As shown in table (16), there are not significant coefficients. However, the point estimates suggest that neither the net earnings nor the hours are lower for workers in high-intensity sectors in low-paid jobs compared to the rest. The net hourly wage is between 0.7% and 0.9% lower when the intensity is 10% higher after the reform though. This is consistent with the hypothesis of appropriation of the tax by firms.

A final word is worth regarding the existence of general equilibrium effects. The analysis is based on the comparison of earnings, hours and probabilities of transition to regular employment between mini and midi-jobbers and the remaining workers. However, the comparison group is potentially affected by the reform as well, and the direction of the effect depends mainly on the degree of substitutability between low and high-earnings' workers.

If they are substitutes, the higher attractiveness of mini and midi-jobs due to their lower tax cost might have led firms to reduce the demand for regular workers, yielding downwards pressures on earnings in this sector. Results hence become a conservative estimation of the effect of the reform in the earnings of mini and midi-jobbers. They would overestimate the real effect if wages of regular employment were increasing driven by complementarity with mini and midi-jobbers. However, the demand for regular employment should increase considerably compared to mini and midi-jobs, which is quite implausible because of the relative sizes of the sector.

Finally, regarding the probability of holding regular employment, the reform mechanically decreased it for both the treatment and comparison group. Even if firms substitute or complement marginal and regular employment, the change in this probability should be homogeneous for both groups not biasing the results.

9 Conclusions

The German Mini-job Reform is a controversial policy designed along the lines of the welfare-to-work policies popular in the developed world. It entails tax exemptions and subsidies for workers with gross earnings below a limit, the so-called "mini" and "midi" jobs. While the main goal of this type of interventions is to promote labor participation and improve conditions for workers with low earnings capacity, much of the political debate about the German reform has suggested that it also brought undesired effects related to in-work poverty and lock-in effects in low-quality jobs. In this paper, I provide empirical evidence of the effects of the reform on earnings and employment prospects of targeted workers. I exploit the panel structure of the G-SOEP by estimating fixed effects models, and I provide several alternatives for the construction of comparison groups. On the one hand, I use groups more affected by mini and midi-jobs, i.e. women, young, single parents,

secondary and low-educated workers. On the other hand, I construct a comparison group by matching mini and midi-jobs to the rest of the workers on the basis of demographic and socio-economic pre-reform characteristics.

The theoretical framework of tax incidence in the labor market predicts that a reduction of the tax wedge in the low-earning segment as implied by the Mini-Job Reform is shared by employers and employees depending on the elasticities of supply and substitution among mini and midi-jobbers and regular workers, and the inflow of new workers. The latter is expected to be positive according to the static labor supply model, which on the other hand predicts a reduction in hours of individuals already working. Hence, the expected change in net earnings after the tax reduction is theoretically ambiguous. Empirically, I find that workers in the low-earning segment face downwards pressures on earnings. Using the matched sample, the probability is 25% for mini-jobbers and 14% higher for midi-jobbers to suffer a gross earnings reduction compared to regular workers, while the net monthly and hourly earnings do not increase even if they pay lower taxes. Besides, mini-jobbers reduce hours worked by 10% on average. The findings are consistent with firms appropriating all the economic incidence of the tax reduction.

For inactive and unemployed workers before the reform, mini or midi-job might represent stepping-stones if they yield human capital accumulation or help signalling willingness to work. By these means, jobless workers would transit smoothly to employment with higher earnings. However, it is also possible that working for low wage or hours generates a negative signal regarding the worker type, or detracts time from job search, harming future employment prospects and leading to a dead-end. I find mini-jobbers have 12% higher chances of transition to regular employment after one year, while midi-jobbers increase their chances in a similar magnitude after the third year. At longer horizons for mini-jobs and shorter for midi-jobs, the probabilities are not statistically nor economically significant. This evidence supports mini and midi-jobs potentially serving as stepping-stones.

Encouraging low-earning jobs via tax incentives affects differently groups of the population. In the German experience, younger workers are the winners, increasing labor participation and earnings. The reform seems also effective for activating women. However, some vulnerable groups which are usually targeted by welfare-to-work policies such as single parents and low-educated workers face downward pressures on earnings without improving the chances to be employed.

Even if the Mini-Job Reform took place more than a decade ago, the debate regarding it is ongoing, and many European countries are looking at the German experience to analyze the possibility of adoption of similar policies. Having thorough picture of the consequences of promoting low-earning jobs by tax benefits is hence relevant for policy design. The results in this paper raise questions about the effectiveness of the German design to improve earnings and life quality of workers in the lower tail of the income distribution. On the other hand, they support the hypothesis that jobs with tax subsidies may act as spring board for jobless people to improve their employment prospects.

Table 4: Characteristics of jobless, mini and midi-jobbers and regular workers in 2002 (17-65 years old)

| | Non-working | Mini/midi-job | Regular job |
|---|---------------------|----------------------|----------------------|
| <i>Demographics</i> | | | |
| Female | 0.683 (0.466) | 0.745 (0.436) | 0.423 (0.494) |
| Age | 49.66 (10.51) | 38.71 (12.09) | 39.73 (10.19) |
| Immigrant | 0.162 (0.369) | 0.138 (0.345) | 0.109 (0.312) |
| East | 0.211 (0.408) | 0.194 (0.396) | 0.203 (0.402) |
| Single | 0.245 (0.430) | 0.352 (0.478) | 0.322 (0.467) |
| Children | 0.486 (0.926) | 0.816 (0.974) | 0.688 (0.956) |
| Head of HH | 0.521 (0.500) | 0.460 (0.499) | 0.659 (0.474) |
| Dual earner HH | 0.131 (0.338) | 0.426 (0.495) | 0.527 (0.499) |
| UB or Assist. | 0.219 (0.414) | 0.177 (0.382) | 0.0596 (0.237) |
| Public transfers to HH | 10081.7 (9283.1) | 6198.0 (6762.3) | 3836.1 (5291.8) |
| Per capita annual HH income | 12049.1 (7780.1) | 11120.9 (6920.7) | 14864.2 (7795.2) |
| Less than HS | 0.260 (0.439) | 0.205 (0.404) | 0.111 (0.314) |
| High School | 0.611 (0.488) | 0.693 (0.462) | 0.718 (0.450) |
| More than HS | 0.129 (0.335) | 0.103 (0.304) | 0.171 (0.376) |
| <i>Work history (2000-2002)</i> | | | |
| Working | 0.402 (0.490) | 0.884 (0.320) | 0.988 (0.108) |
| Years of FT experience | 16.11 (13.02) | 10.05 (10.79) | 15.51 (10.80) |
| Years of PT experience | 2.547 (5.883) | 3.313 (5.723) | 1.681 (4.243) |
| Years of unemp. experience | 1.893 (3.143) | 1.003 (2.040) | 0.393 (1.109) |
| Weekly working hours | 7.589 (12.47) | 19.22 (14.62) | 37.60 (12.29) |
| Hourly net wage | 10.82 (14.74) | 8.204 (7.699) | 9.325 (5.013) |
| Gross monthly labor earnings | 450.8 (847.7) | 783.2 (816.2) | 2281.4 (1280.7) |
| Change of job | 0.119 (0.323) | 0.341 (0.474) | 0.294 (0.456) |
| <i>Labor market outcomes after the reform (2004-2007)</i> | | | |
| Weekly working hours | | 15.61 (12.82) | 37.76 (12.42) |
| Hourly net wage | | 8.581 (7.940) | 10.35 (7.063) |
| Gross monthly labor earnings | | 636.6 (653.7) | 2554.1 (1387.8) |
| Change of job | | 0.432 (0.496) | 0.232 (0.422) |
| New worker | | 0.0112 (0.105) | 0.00411 (0.0640) |
| Student before | | 0.000240 (0.0155) | 0.000439 (0.0210) |

Note: Categorization according to labor situation in 2004-2007: Non-working if did not work in any period, mini or midi-jobbers if such an employment in some period, regular job if employment of other type in some period and not mini or midi-job. Work history: working, new worker, student before and change of job is 1 for an individual who is in this status at least one year in 2000-2002; experience refers to the observation with the maximum, and earnings and weekly hours are the average; same definitions for variables included in outcomes.

Table 5: Proportion of people in working age (17-65) not working, in regular jobs and in mini or midi-jobs. 2005

| Groups | Not working | Regular job | Mini/midi-job |
|----------------------|-------------|-------------|---------------|
| Female | 29% | 49% | 22% |
| Male | 16% | 74% | 10% |
| 35 y.o. or younger | 19% | 60% | 21% |
| More than 35 | 25% | 60% | 15% |
| Single with children | 30% | 43% | 27% |
| Rest | 23% | 61% | 16% |
| Secondary worker | 19% | 57% | 23% |
| Primary worker | 23% | 60% | 16% |
| Low education | 25% | 58% | 17% |
| High education | 14% | 74% | 12% |

Note: Balanced panel 2000-2007. Mini or midi-jobs held as main or secondary jobs.

Table 6: Summary statistics, before (2002) and after (2005), and by groups (2002)

| | Before and after | | Gender | | Age | | Family comp. | | Type of worker | | Education | |
|------------------------------|--------------------|--------------------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | 2002 | 2005 | Male | Female | >35 | <=35 | Rest | Sing. w. chil. | Primary | Secondary | High | Low |
| Participation | 0.886 (0.318) | 0.883 (0.321) | 0.966 (0.181) | 0.819 (0.385) | 0.902 (0.297) | 0.854 (0.353) | 0.883 (0.321) | 0.932 (0.253) | 0.886 (0.318) | 0.887 (0.317) | 0.937 (0.243) | 0.877 (0.329) |
| Employment | 0.847 (0.360) | 0.837 (0.370) | 0.929 (0.256) | 0.777 (0.416) | 0.861 (0.346) | 0.818 (0.386) | 0.849 (0.358) | 0.813 (0.391) | 0.847 (0.360) | 0.832 (0.375) | 0.926 (0.262) | 0.832 (0.374) |
| Part-time | 0.157 (0.364) | 0.158 (0.365) | 0.0437 (0.205) | 0.253 (0.435) | 0.156 (0.362) | 0.161 (0.368) | 0.151 (0.358) | 0.252 (0.435) | 0.160 (0.366) | 0.0909 (0.288) | 0.0884 (0.284) | 0.170 (0.376) |
| Regular employment | 0.793 (0.406) | 0.702 (0.457) | 0.922 (0.267) | 0.683 (0.465) | 0.810 (0.393) | 0.758 (0.428) | 0.798 (0.402) | 0.720 (0.450) | 0.792 (0.406) | 0.808 (0.395) | 0.905 (0.293) | 0.772 (0.420) |
| Regular part-time employm. | 0.0542 (0.226) | 0.0749 (0.263) | 0.00695 (0.0831) | 0.0939 (0.292) | 0.0515 (0.221) | 0.0596 (0.237) | 0.0515 (0.221) | 0.0930 (0.291) | 0.0553 (0.229) | 0.0234 (0.152) | 0.0210 (0.143) | 0.0603 (0.238) |
| Gross monthly labor earnings | 1857.1 (1514.8) | 1904.1 (1751.4) | 2620.0 (1525.8) | 1216.8 (1169.9) | 1951.5 (1574.8) | 1668.6 (1368.3) | 1898.4 (1530.5) | 1271.4 (1118.5) | 1865.1 (1524.4) | 1626.6 (1185.4) | 3009.2 (1941.5) | 1645.3 (1317.3) |
| Net monthly labor earnings | 1403.5 (813.1) | 1463.4 (914.1) | 1808.5 (798.0) | 980.9 (580.6) | 1449.1 (867.7) | 1307.7 (675.2) | 1420.0 (824.4) | 1132.9 (531.2) | 1409.1 (819.3) | 1241.4 (585.0) | 1927.3 (997.5) | 1292.1 (720.9) |
| Weekly working hours | 30.38 (18.12) | 29.73 (18.40) | 39.29 (14.57) | 22.90 (17.41) | 30.74 (17.29) | 29.67 (19.66) | 30.71 (18.12) | 25.75 (17.54) | 30.37 (18.13) | 30.68 (17.74) | 38.16 (16.34) | 28.95 (18.07) |
| Hourly net wage | 9.110 (5.918) | 9.319 (5.666) | 10.03 (4.871) | 8.139 (6.714) | 9.147 (5.405) | 9.032 (6.878) | 9.128 (5.994) | 8.803 (4.478) | 9.141 (5.964) | 8.202 (4.278) | 10.81 (4.848) | 8.749 (6.062) |
| Change of job | 0.103 (0.304) | 0.0783 (0.269) | 0.0959 (0.294) | 0.110 (0.312) | 0.0846 (0.278) | 0.141 (0.348) | 0.105 (0.307) | 0.0775 (0.268) | 0.104 (0.305) | 0.0827 (0.276) | 0.112 (0.316) | 0.102 (0.302) |

Note: Balanced panel 2000-2007. Prime age population (25-54).

Table 7: Intention-to-Treat (ITT) estimates. Balanced panel 2000-2007, prime age population (25-54)

| VARIABLES | Partic. | Employm. | Part-time | Regular emp. | Regular PT |
|-----------------------|--------------------|--------------------|------------------|---------------------|--------------------|
| After | 0.01 (0.010) | 0.01 (0.011) | 0.01 (0.013) | -0.08*** (0.014) | 0.04*** (0.011) |
| Female | 0.04*** (0.012) | 0.05*** (0.014) | 0.01 (0.012) | -0.04** (0.018) | 0.01 (0.010) |
| 35 y.o. or younger | 0.03* (0.019) | 0.03 (0.020) | -0.01 (0.013) | 0.03 (0.022) | -0.01 (0.011) |
| Single with children | 0.03 (0.024) | 0.04 (0.033) | -0.05 (0.039) | -0.01 (0.030) | -0.01 (0.036) |
| Secondary worker | 0.02 (0.027) | 0.02 (0.028) | -0.02 (0.023) | 0.01 (0.028) | -0.02 (0.015) |
| Low education | 0.02 (0.012) | 0.01 (0.014) | 0.02 (0.013) | -0.03* (0.017) | -0.01 (0.010) |
| Observations | 31,462 | 31,462 | 31,462 | 31,462 | 31,462 |
| Number of indiv. obs. | 4,495 | 4,495 | 4,495 | 4,495 | 4,495 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Intention-to-Treat (ITT) estimates. Balanced panel 2000-2007, people working all the periods, prime age (25-54)

| VARIABLES | Gross m. earn. | Net m. earn. | Hours | Hr. wage | Job change |
|-----------------------|--------------------|---------------------|-------------------|---------------------|---------------------|
| After | -0.02 (0.018) | 0.00 (0.010) | -0.01 (0.017) | 0.02 (0.015) | -0.02** (0.011) |
| Female | 0.03 (0.028) | 0.01 (0.015) | 0.01 (0.019) | -0.01 (0.015) | -0.03** (0.013) |
| 35 y.o. or younger | 0.08*** (0.024) | 0.04** (0.015) | 0.02 (0.018) | 0.01 (0.017) | -0.06*** (0.014) |
| Single with children | 0.13 (0.077) | -0.01 (0.031) | 0.11** (0.044) | -0.10*** (0.036) | 0.01 (0.038) |
| Secondary worker | -0.01 (0.040) | -0.02 (0.066) | 0.05 (0.038) | -0.04 (0.069) | 0.02 (0.027) |
| Low education | -0.05** (0.023) | -0.05*** (0.015) | -0.02 (0.017) | -0.04*** (0.016) | 0.02 (0.015) |
| Observations | 22,376 | 21,751 | 22,350 | 21,749 | 22,376 |
| Number of indiv. obs. | 3,197 | 3,197 | 3,197 | 3,197 | 3,197 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Test of parallel trends assumption. Panel 2000-2002, prime age population (25-54)

| | Female | | Young | | Single w. childr. | | Secondary | | Low educ. | |
|------------------------------|-------------------------------|---------|--------|---------|-------------------|---------|-----------|---------|-----------|---------|
| | F-stat | p-value | F-stat | p-value | F-stat | p-value | F-stat | p-value | F-stat | p-value |
| | <i>All</i> | | | | | | | | | |
| Participation | 2.54 | 0.0790 | 0.35 | 0.7069 | 2.26 | 0.1043 | 2.97 | 0.0516 | 0.33 | 0.7172 |
| Employment | 2.42 | 0.0891 | 0.26 | 0.7680 | 1.53 | 0.2165 | 1.06 | 0.3460 | 0.43 | 0.6531 |
| Part-time | 0.87 | 0.4200 | 1.48 | 0.2269 | 0.12 | 0.8841 | 0.75 | 0.4710 | 0.18 | 0.8328 |
| Regular employment | 1.61 | 0.2003 | 0.39 | 0.6776 | 2.18 | 0.1132 | 1.78 | 0.1691 | 0.32 | 0.7261 |
| Regular part-time employment | 0.09 | 0.9156 | 0.91 | 0.4013 | 0.30 | 0.7444 | 0.96 | 0.3841 | 0.02 | 0.9846 |
| | <i>Working in all periods</i> | | | | | | | | | |
| Gross monthly earnings (ln) | 2.02 | 0.1328 | 0.93 | 0.3947 | 2.55 | 0.0786 | 0.53 | 0.5912 | 0.45 | 0.6363 |
| Net monthly earnings (ln) | 0.31 | 0.7344 | 1.98 | 0.1384 | 0.46 | 0.6288 | 2.09 | 0.1232 | 8.19*** | 0.0003 |
| Weekly working hours (ln) | 4.29* | 0.0138 | 3.83* | 0.0218 | 3.59* | 0.0277 | 0.51 | 0.5996 | 2.80 | 0.0610 |
| Hourly net wage (ln) | 2.53 | 0.0795 | 0.60 | 0.5463 | 2.73 | 0.0656 | 1.61 | 0.2006 | 0.94 | 0.3902 |
| Change of job | 0.14 | 0.8714 | 1.08 | 0.3410 | 2.47 | 0.0849 | 0.17 | 0.8437 | 0.21 | 0.8131 |

Table 10: Test of parallel trends assumption. Panel: 2000-2002, matched sample

| | F-stat | p-value |
|-----------------------------|--------|---------|
| <i>Working population</i> | | |
| Net monthly earnings (ln) | 0.20 | 0.8193 |
| Log weekly working hours | 0.50 | 0.6089 |
| Hourly net wage (ln) | 0.60 | 0.5489 |
| <i>Jobless population</i> | | |
| Prob. of regular employment | 1.08 | 0.3410 |

Note: *** p<0.01, ** p<0.05, * p<0.1.

Table 11: Estimated effects of holding mini and midi-jobs. Panel 2000-2007, working population

| VARIABLES | <i>Monthly net earnings (ln)</i> | | | <i>Weekly hours worked (ln)</i> | | | <i>Net hourly wage (ln)</i> | | |
|--------------------|----------------------------------|---------------------|------------------|---------------------------------|---------------------|-------------------|-----------------------------|--------------------|------------------|
| | OLS | FE | Matching and FE | OLS | FE | Matching and FE | OLS | FE | Matching and FE |
| Mini-job | -0.75*** (0.027) | -0.10*** (0.031) | -0.07 (0.048) | -0.52*** (0.027) | -0.10*** (0.031) | -0.10* (0.055) | -0.27*** (0.025) | -0.06** (0.028) | -0.01 (0.038) |
| Midi-job | -0.70*** (0.041) | -0.05 (0.039) | -0.02 (0.053) | -0.41*** (0.038) | -0.06 (0.045) | 0.04 (0.068) | -0.31*** (0.041) | 0.00 (0.038) | -0.06 (0.071) |
| Observations | 29,678 | 29,678 | 7,018 | 30,665 | 30,665 | 7,223 | 29,614 | 29,614 | 7,001 |
| Adjusted R-squared | 0.32 | 0.10 | 0.12 | 0.21 | 0.03 | 0.07 | 0.17 | 0.03 | 0.04 |
| Number of indiv. | | 4,416 | 1,039 | | 4,417 | 1,039 | | 4,416 | 1,039 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 12: Estimated effects of holding mini and midi-jobs. Panel 2000-2007, jobless population

| VARIABLES | <i>Probability of regular employment</i> | | | | | |
|--------------------|--|------------------|-----------------|---------------------|--------------------|------------------|
| | OLS | FE | Matching and FE | OLS | FE | Matching and FE |
| Mini-job, 1 lag | -0.10*** (0.027) | -0.00 (0.032) | 0.06 (0.056) | -0.11*** (0.035) | 0.04 (0.031) | 0.12* (0.062) |
| Mini-job, 2 lags | | | | 0.04 (0.053) | 0.07* (0.038) | 0.02 (0.045) |
| Mini-job, 3 lags | | | | -0.10* (0.058) | -0.04 (0.043) | -0.04 (0.079) |
| Midi-job, 1 lag | 0.12** (0.056) | 0.02 (0.051) | 0.06 (0.075) | -0.00 (0.070) | -0.04 (0.057) | 0.06 (0.074) |
| Midi-job, 2 lags | | | | 0.28** (0.115) | 0.25*** (0.084) | 0.07 (0.081) |
| Midi-job, 3 lags | | | | -0.14 (0.159) | -0.11 (0.088) | 0.12 (0.085) |
| Observations | 8,916 | 8,916 | 1,310 | 7,767 | 7,767 | 1,131 |
| Adjusted R-squared | 0.18 | 0.21 | 0.30 | 0.16 | 0.21 | 0.32 |
| Number of indiv. | | 1,356 | 205 | | 1,356 | 205 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 13: Probability of job change and gross monthly earnings reduction in any activity. Panel 2000-2007, working population

| VARIABLES | <i>Prob. of job change</i> | | | <i>Prob. of gross monthly earnings reduction</i> | | |
|--------------------|----------------------------|-------------------|------------------|--|---------------------|---------------------|
| | OLS | FE | Matching and FE | OLS | FE | Matching and FE |
| Mini-job | 0.05** (0.020) | 0.02 (0.023) | 0.03 (0.041) | 0.23*** (0.030) | 0.22*** (0.050) | 0.25** (0.100) |
| Mini-job, 1 lag | 0.02 (0.030) | 0.02 (0.027) | 0.00 (0.038) | -0.28*** (0.050) | -0.28*** (0.042) | -0.20*** (0.072) |
| Mini-job, 2 lags | 0.03 (0.040) | 0.03 (0.041) | 0.04 (0.088) | 0.05 (0.051) | 0.06 (0.048) | -0.08 (0.081) |
| Mini-job, 3 lags | -0.09** (0.038) | -0.07* (0.040) | -0.12 (0.089) | -0.04 (0.054) | -0.03 (0.044) | -0.04 (0.072) |
| Midi-job | 0.09** (0.036) | 0.03 (0.050) | 0.13 (0.100) | 0.20*** (0.042) | 0.14*** (0.046) | 0.14** (0.058) |
| Midi-job, 1 lag | 0.01 (0.053) | 0.01 (0.054) | -0.10 (0.128) | -0.13** (0.064) | -0.14** (0.064) | -0.05 (0.088) |
| Midi-job, 2 lags | -0.04 (0.051) | -0.06 (0.046) | 0.05 (0.060) | -0.13** (0.066) | -0.12** (0.059) | -0.18** (0.092) |
| Midi-job, 3 lags | 0.10 (0.086) | 0.11 (0.098) | -0.13 (0.137) | -0.03 (0.061) | -0.04 (0.063) | -0.19 (0.127) |
| Observations | 25,266 | 25,266 | 5,905 | 25,266 | 25,266 | 5,905 |
| Adjusted R-squared | 0.03 | 0.01 | 0.03 | 0.03 | 0.03 | 0.04 |
| Number of indiv. | | 4,417 | 1,039 | | 4,417 | 1,039 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14: Estimated effects of holding mini and midi-jobs. Robustness check. Panel 2000-2007

| VARIABLES | <i>Only main job</i> | | | | <i>Mini-job before</i> | | | |
|------------------------|----------------------|---------|----------|---------------|------------------------|----------|----------|---------------|
| | Earnings | Hours | Hr. wage | Pr. reg. emp. | Earnings | Hours | Hr. wage | Pr. reg. emp. |
| Mini-job, main | -0.18* | -0.27** | -0.03 | | | | | |
| | (0.093) | (0.106) | (0.068) | | | | | |
| Midi-job, main | 0.04 | 0.09 | -0.03 | | | | | |
| | (0.062) | (0.077) | (0.078) | | | | | |
| Mini-job, main, 1 lag | | | | 0.12* | | | | |
| | | | | (0.061) | | | | |
| Mini-job, main, 2 lags | | | | 0.02 | | | | |
| | | | | (0.043) | | | | |
| Mini-job, main, 3 lags | | | | -0.03 | | | | |
| | | | | (0.079) | | | | |
| Midi-job, main, 1 lag | | | | 0.07 | | | | |
| | | | | (0.076) | | | | |
| Midi-job, main, 2 lags | | | | 0.07 | | | | |
| | | | | (0.081) | | | | |
| Midi-job, main, 3 lags | | | | 0.13 | | | | |
| | | | | (0.087) | | | | |
| Mini-job* | | | | | -0.15** | -0.25*** | 0.04 | |
| | | | | | (0.061) | (0.072) | (0.040) | |
| Midi-job | | | | | -0.02 | 0.05 | -0.06 | |
| | | | | | (0.053) | (0.063) | (0.073) | |
| Mini-job*, 1 lag | | | | | | | | 0.08 |
| | | | | | | | | (0.079) |
| Mini-job*, 2 lags | | | | | | | | 0.02 |
| | | | | | | | | (0.058) |
| Mini-job*, 3 lags | | | | | | | | 0.04 |
| | | | | | | | | (0.052) |
| Midi-job, 1 lag | | | | | | | | 0.04 |
| | | | | | | | | (0.073) |
| Midi-job, 2 lag | | | | | | | | 0.07 |
| | | | | | | | | (0.078) |
| Midi-job, 3 lags | | | | | | | | 0.11 |
| | | | | | | | | (0.085) |
| Observations | 3,879 | 4,054 | 3,864 | 1,104 | 7,018 | 7,223 | 7,001 | 1,131 |
| Number of indiv. | 587 | 587 | 587 | 202 | 1,039 | 1,039 | 1,039 | 205 |
| Adjusted R-squared | 0.15 | 0.11 | 0.03 | 0.31 | 0.13 | 0.09 | 0.04 | 0.32 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 15: Estimated effects of holding mini and midi-jobs. Robustness check. Panel 2000-2007

| VARIABLES | <i>Standard DID</i> | | | | <i>Only part-timers</i> | | | |
|-----------------------|---------------------|--------------------|------------------|------------------|-------------------------|------------------|-------------------|------------------|
| | Earnings | Hours | Hr. wage | Pr. reg. emp. | Earnings | Hours | Hr. wage | Pr. reg. emp. |
| Mini-job*Post | -0.03 (0.057) | -0.07** (0.034) | 0.03 (0.058) | | | | | |
| Midi-job*Post | -0.15*** (0.050) | -0.12** (0.060) | -0.08 (0.053) | | | | | |
| Mini-job*Post, 1 lag | | | | 0.06 (0.090) | | | | |
| Mini-job*Post, 2 lags | | | | -0.05 (0.060) | | | | |
| Mini-job*Post, 3 lags | | | | -0.01 (0.063) | | | | |
| Midi-job*Post, 1 lag | | | | 0.00 (0.084) | | | | |
| Midi-job*Post, 2 lags | | | | -0.01 (0.054) | | | | |
| Midi-job*Post, 3 lags | | | | 0.03 (0.050) | | | | |
| Mini-job | | | | | -0.11*** (0.038) | -0.08 (0.052) | -0.09* (0.053) | |
| Mini-job, 1 lag | | | | | | | | 0.06 (0.034) |
| Mini-job, 2 lags | | | | | | | | 0.05 (0.053) |
| Mini-job, 3 lags | | | | | | | | -0.04 (0.050) |
| Observations | 7,018 | 7,223 | 7,001 | 1,131 | 3,968 | 4,172 | 3,961 | 6,280 |
| Number of indiv. | 1,039 | 1,039 | 1,039 | 205 | 601 | 602 | 601 | 1,094 |
| Adjusted R-squared | 0.13 | 0.07 | 0.04 | 0.31 | 0.08 | 0.02 | 0.02 | 0.14 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 16: Estimated effects using “intensity of treatment”. Panel 2000-2007, working population

| VARIABLES | <i>Monthly net earnings (ln)</i> | | <i>Weekly hours worked (ln)</i> | | <i>Net hourly wage (ln)</i> | |
|--------------------------------|----------------------------------|-------------------|---------------------------------|-------------------|-----------------------------|-------------------|
| | Only mini-jobs | Mini or midi-jobs | Only mini-jobs | Mini or midi-jobs | Only mini-jobs | Mini or midi-jobs |
| Intensity (mini-job)*Post | 0.07 (0.097) | | 0.07 (0.132) | | -0.09 (0.113) | |
| Intensity (mini/midi-job)*Post | | 0.05 (0.074) | | 0.04 (0.099) | | -0.07 (0.083) |
| Observations | 28,077 | 28,077 | 28,722 | 28,722 | 28,016 | 28,016 |
| Number of indiv. | 4,131 | 4,131 | 4,131 | 4,131 | 4,131 | 4,131 |
| Adjusted R-squared | 0.09 | 0.09 | 0.03 | 0.03 | 0.03 | 0.03 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: “Intensity (mini-job)”: more restrictive definition of low-paid jobs (only mini-jobs). “Intensity (mini/midi-jobs)”: wider definition including mini and midi-jobs. Sample of workers with valid sector declaration in 2000-2007.

APPENDIX

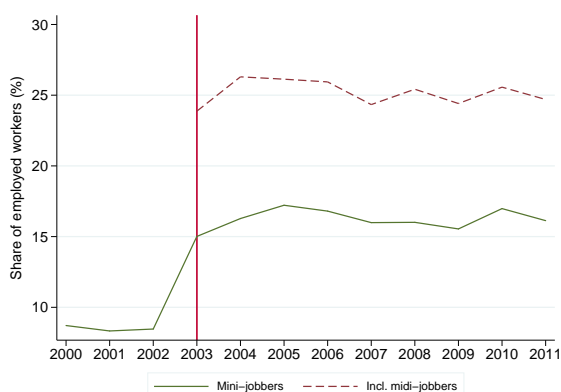
A Labor market numbers according to the G-SOEP

Table A1: Labor market indicators in 2002 and 2005

| | 2002 | 2005 |
|----------------------|-------|-------|
| Labor participation | 77.9% | 80.0% |
| Unemployment rate | 5.5% | 6.0% |
| Hours a week | 34 | 34 |
| Monthly net earnings | 1,332 | 1,360 |

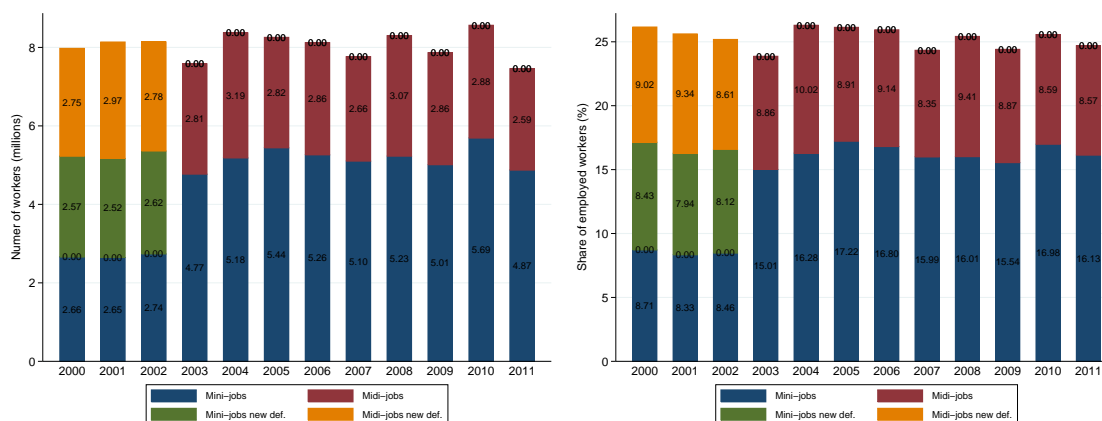
Note: Cross-sectional weights.

Figure A1: Evolution of mini and midi-jobs



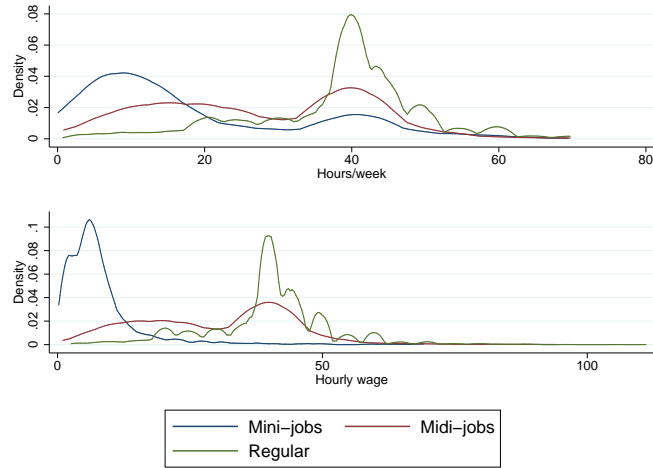
Note: Using the definitions of mini and midi-jobs before and after the reform. Cross-sectional weights.

Figure A2: Evolution of mini and midi-jobs



Note: Using the definitions of mini and midi-jobs before and after the reform. Cross-sectional weights.

Figure A3: Distribution of weekly working hours and hourly net earnings in all occupations, 2005



Note: Hours below the feasible amount of 70 a week. Hourly earnings excluding top 1 percentile.

Table A2: People working at least one period in 2004-2007 (mini and midi-jobs and other employment) by their labor situation in 2002

| Labor status 2002 | Working age population (17-65) | | | | | | Prime age population (25-65) | | | | | |
|----------------------|--------------------------------|----------|-------|----------|----------|-------|------------------------------|----------|-------|----------|----------|-------|
| | ANY JOB | | | MAIN JOB | | | ANY JOB | | | MAIN JOB | | |
| | Mini-job | Midi-job | Other | Mini-job | Midi-job | Other | Mini-job | Midi-job | Other | Mini-job | Midi-job | Other |
| Inactive | 47% | 31% | 22% | 46% | 31% | 24% | 44% | 31% | 24% | 44% | 31% | 25% |
| Student | 28% | 48% | 24% | 27% | 47% | 27% | 24% | 24% | 52% | 19% | 24% | 57% |
| Unemployed | 36% | 32% | 32% | 36% | 31% | 33% | 36% | 31% | 32% | 36% | 30% | 34% |
| Irregular employment | 41% | 39% | 20% | 40% | 36% | 24% | 40% | 26% | 34% | 40% | 22% | 38% |
| Working PT | 24% | 37% | 39% | 21% | 35% | 44% | 23% | 34% | 43% | 19% | 32% | 48% |
| Working FT | 13% | 12% | 76% | 7% | 9% | 84% | 11% | 10% | 79% | 5% | 7% | 88% |
| Mini Job | 54% | 38% | 8% | 54% | 36% | 10% | 58% | 35% | 8% | 57% | 34% | 9% |

Note: Balanced panel 2002-2007.

B Selection into mini and midi-jobs

Table B1: Probability of taking up a mini or midi-job as main job in 2004-2007 of working age population (17-65)

| VARIABLES | All | Non-working | Working |
|------------------------------|---------------------|---------------------|---------------------|
| Female | 0.06*** (0.021) | 0.09* (0.048) | 0.04* (0.023) |
| Age | -0.00** (0.002) | -0.02*** (0.002) | 0.00 (0.002) |
| Immigrant | -0.03 (0.027) | 0.09 (0.058) | -0.07** (0.030) |
| East | -0.06*** (0.022) | -0.04 (0.047) | -0.08*** (0.025) |
| Single | 0.02 (0.025) | 0.03 (0.050) | -0.03 (0.030) |
| Children | 0.04*** (0.011) | 0.03 (0.020) | 0.03** (0.013) |
| Head of HH | 0.00 (0.021) | 0.03 (0.047) | -0.00 (0.023) |
| Dual earner HH | -0.01 (0.026) | -0.00 (0.101) | -0.06** (0.029) |
| UB or Assist. | 0.08** (0.031) | 0.11** (0.054) | 0.06 (0.040) |
| Public transfers to HH | -0.00 (0.000) | -0.00 (0.000) | 0.00 (0.000) |
| Per capita annual HH income | 0.00 (0.000) | -0.00 (0.000) | 0.00 (0.000) |
| High School | -0.00 (0.026) | 0.05 (0.048) | -0.01 (0.031) |
| More than HS | 0.07* (0.039) | 0.02 (0.072) | 0.07 (0.046) |
| Working | 0.29*** (0.029) | 0.15** (0.070) | |
| New worker | 0.07 (0.058) | 0.27 (0.219) | 0.07 (0.059) |
| Student before | -0.07 (0.097) | | -0.04 (0.100) |
| Years of FT experience | 0.00 (0.002) | 0.00 (0.002) | -0.00 (0.002) |
| Years of PT experience | 0.00 (0.002) | 0.00 (0.005) | -0.00 (0.003) |
| Years of unemp. experience | 0.00 (0.005) | 0.00 (0.007) | 0.00 (0.008) |
| Weekly working hours | -0.00* (0.001) | 0.01** (0.004) | -0.00*** (0.001) |
| Gross monthly labor earnings | -0.00*** (0.000) | -0.00** (0.000) | -0.00*** (0.000) |
| Observations | 7,084 | 1,336 | 5,747 |
| Pseudo-R2 | 0.151 | 0.192 | 0.180 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: Non-working and working populations refer to those who were in this situation in 2002, i.e. before the reform.

C Graphs of parallel trends for analysis by target groups

Figure C1: Trends of outcome variables (residuals). Treatment: Female. Comparison: Male

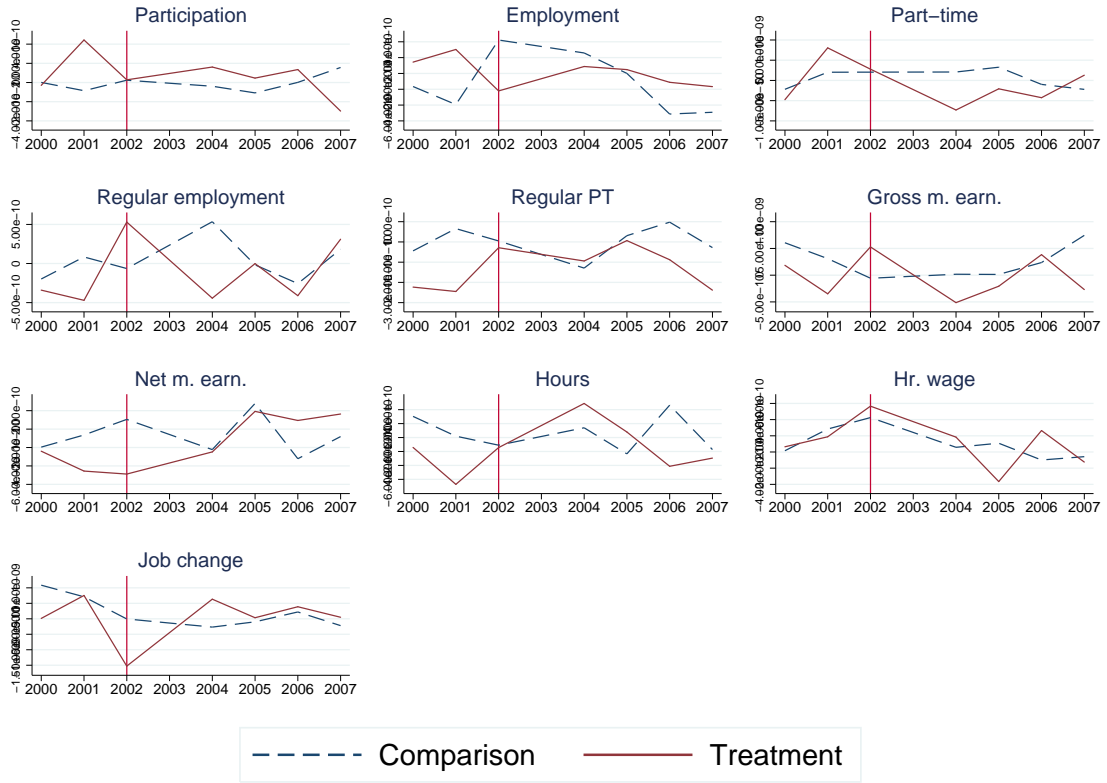


Figure C2: Trends of outcome variables (residuals). Treatment: 35 years old or younger. Comparison: Older than 35

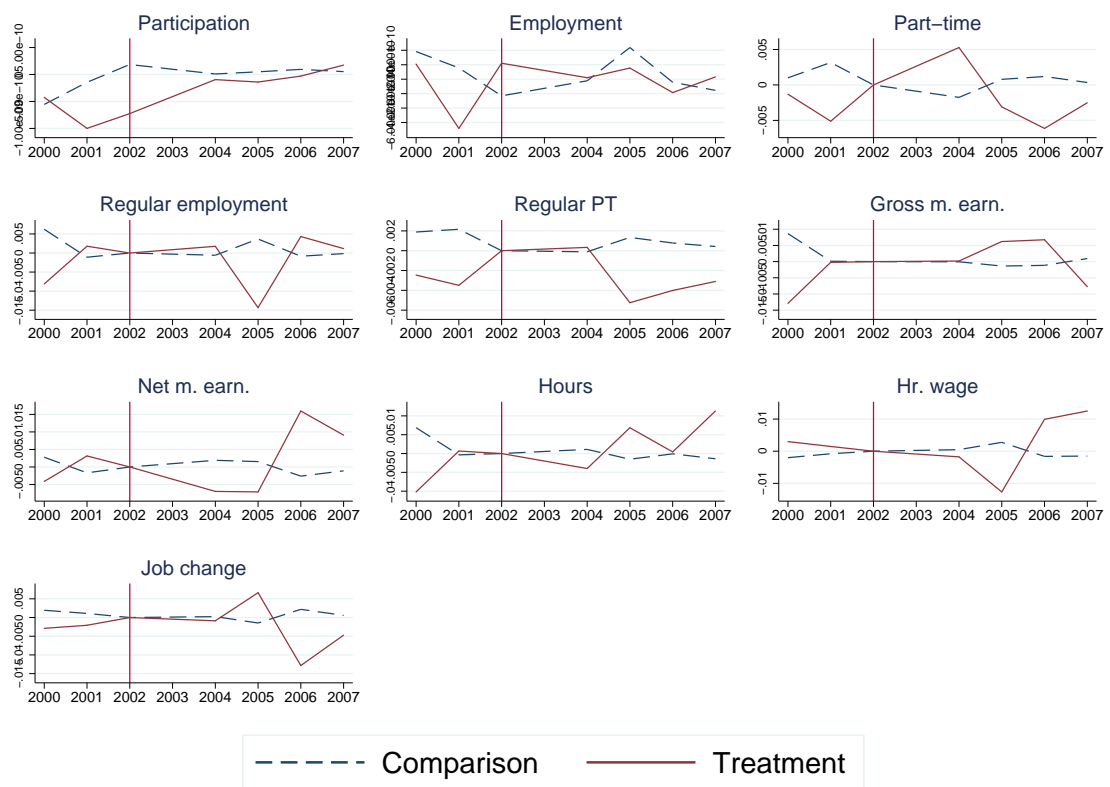


Figure C3: Trends of outcome variables (residuals). Treatment: Single with children. Comparison: Rest

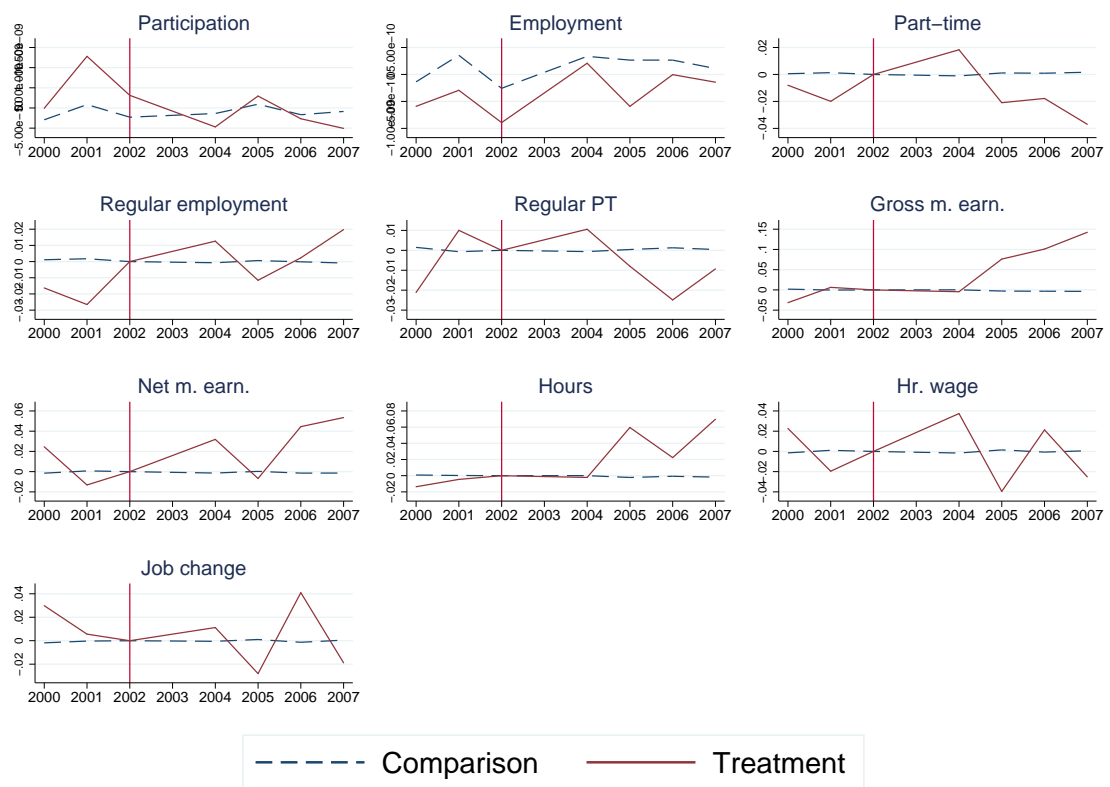


Figure C4: Trends of outcome variables (residuals). Treatment: Secondary worker. Comparison: Primary worker

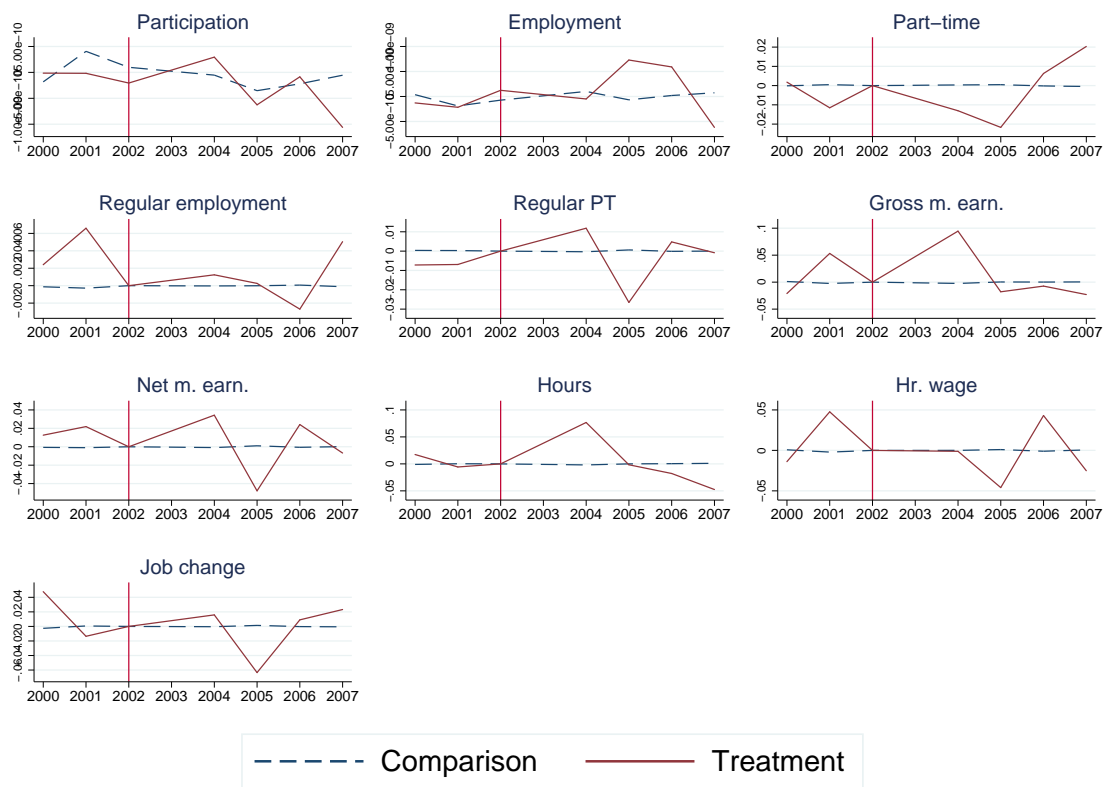
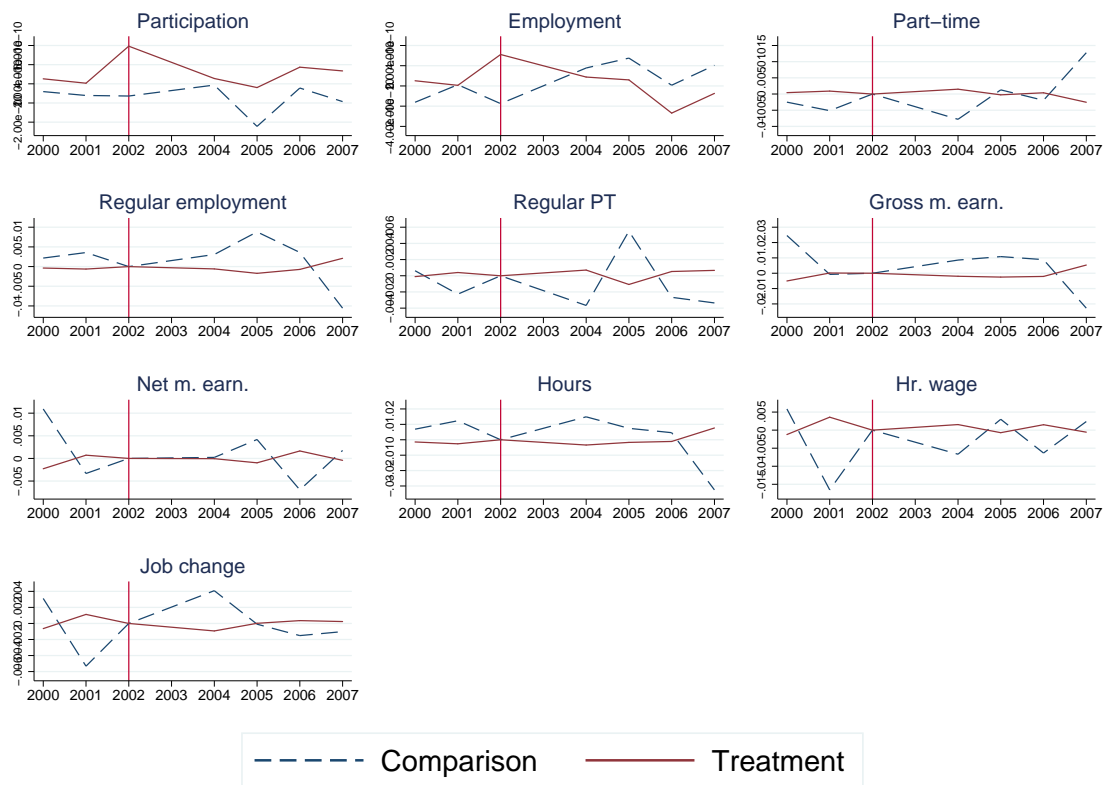


Figure C5: Trends of outcome variables (residuals). Treatment: Low education. Comparison: High education



D Sample size and balance tables. Matching strategy

Table D1: Panel 2000-2007

| | Working age | | Working | | Non-working in 2002 | |
|----------------------|-------------|-------|---------|-------|---------------------|-------|
| | Obs. | Perc. | Obs. | Perc. | Obs. | Perc. |
| Mini-job 2004-2007 | 1,567 | 18% | 626 | 14% | 314 | 22% |
| Midi-job 2004-2007 | 1,326 | 15% | 568 | 13% | 209 | 15% |
| Rest | 6,024 | 68% | 3,324 | 74% | 899 | 63% |
| Total | 8,917 | | 4,518 | | 1,422 | |
| Mini-job 2004-2007 | | | 224 | 21% | 72 | 33% |
| Midi-job 2004-2007 | | | 183 | 17% | 38 | 17% |
| Rest | | | 654 | 62% | 109 | 50% |
| Matched (% of total) | | | 1,061 | 23% | 219 | 15% |

Table D2: Working population (17-65), 2002

| | Original sample | | | Matched sample | | | Matched weighted sample | | |
|------------------------------|-------------------------|-------------------------|--------------------------|-------------------------|-------------------------|------------------------|-------------------------|-------------------------|--------------------|
| | Rest | Mini/midi-job | Diff. | Rest | Mini/midi-job | Diff. | Rest | Mini/midi-job | Diff. |
| Female | 0.398 (0.490) | 0.664 (0.473) | -0.265*** (0.016) | 0.444 (0.497) | 0.576 (0.495) | -0.132*** (0.031) | 0.576 (0.494) | 0.576 (0.494) | -0.000 (0.000) |
| Age | 40.619 (8.962) | 39.678 (10.370) | 0.941** (0.317) | 39.302 (9.144) | 38.128 (9.914) | 1.174* (0.597) | 38.147 (9.986) | 38.128 (9.904) | 0.019 (0.001) |
| Immigrant | 0.116 (0.320) | 0.124 (0.330) | -0.008 (0.011) | 0.020 (0.140) | 0.030 (0.170) | -0.010 (0.010) | 0.030 (0.169) | 0.030 (0.169) | -0.000 (0.000) |
| East | 0.273 (0.446) | 0.211 (0.408) | 0.062*** (0.015) | 0.346 (0.476) | 0.286 (0.452) | 0.060* (0.030) | 0.332 (0.471) | 0.286 (0.452) | 0.047 (1.974) |
| Single | 0.223 (0.417) | 0.250 (0.433) | -0.026 (0.014) | 0.231 (0.422) | 0.246 (0.431) | -0.015 (0.027) | 0.253 (0.435) | 0.246 (0.431) | 0.007 (0.048) |
| Children | 0.769 (0.977) | 0.789 (0.947) | -0.020 (0.033) | 0.606 (0.771) | 0.665 (0.832) | -0.059 (0.050) | 0.665 (0.832) | 0.665 (0.831) | -0.000 (0.000) |
| Head of HH | 0.616 (0.486) | 0.477 (0.500) | 0.139*** (0.017) | 0.590 (0.492) | 0.488 (0.500) | 0.102** (0.031) | 0.511 (0.500) | 0.488 (0.500) | 0.023 (0.390) |
| Dual earner HH | 0.627 (0.484) | 0.668 (0.471) | -0.041* (0.016) | 0.677 (0.468) | 0.675 (0.469) | 0.002 (0.030) | 0.691 (0.463) | 0.675 (0.469) | 0.016 (0.221) |
| UB or Assist. | 0.035 (0.183) | 0.065 (0.246) | -0.030*** (0.007) | 0.005 (0.068) | 0.005 (0.070) | -0.000 (0.004) | 0.005 (0.070) | 0.005 (0.070) | -0.000 (0.000) |
| Public transfers to HH | 3991.765 (5036.312) | 4675.363 (5900.921) | -683.598*** (179.044) | 3590.228 (4725.201) | 3833.995 (5410.640) | -243.767 (315.942) | 3873.711 (4973.423) | 3833.995 (5404.976) | 39.715 (0.011) |
| Per capita annual HH income | 14503.234 (7351.921) | 13163.261 (7030.933) | 1339.973*** (246.633) | 13029.961 (4685.433) | 12889.230 (5052.361) | 140.730 (305.221) | 12918.608 (4893.245) | 12889.230 (5047.072) | 29.377 (0.007) |
| Less than HS | 0.093 (0.291) | 0.154 (0.362) | -0.061*** (0.011) | 0.018 (0.134) | 0.032 (0.176) | -0.014 (0.010) | 0.032 (0.176) | 0.032 (0.176) | -0.000 (0.000) |
| High School | 0.706 (0.456) | 0.692 (0.462) | 0.014 (0.016) | 0.914 (0.280) | 0.882 (0.323) | 0.032 (0.019) | 0.882 (0.323) | 0.882 (0.323) | 0.000 (0.000) |
| More than HS | 0.201 (0.401) | 0.154 (0.361) | 0.047*** (0.013) | 0.067 (0.251) | 0.086 (0.281) | -0.019 (0.017) | 0.086 (0.281) | 0.086 (0.281) | -0.000 (0.000) |
| New worker | 0.016 (0.126) | 0.039 (0.194) | -0.023*** (0.005) | 0.018 (0.134) | 0.030 (0.170) | -0.011 (0.009) | 0.036 (0.186) | 0.030 (0.169) | 0.006 (0.184) |
| Student before | 0.003 (0.052) | 0.008 (0.092) | -0.006** (0.002) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (.) |
| Years of FT experience | 16.508 (9.862) | 11.850 (10.304) | 4.658*** (0.339) | 15.812 (9.827) | 13.363 (10.332) | 2.449*** (0.634) | 13.314 (10.202) | 13.363 (10.322) | -0.049 (0.004) |
| Years of PT experience | 1.747 (4.196) | 4.000 (5.713) | -2.253*** (0.158) | 1.941 (4.456) | 2.749 (4.928) | -0.808** (0.293) | 2.751 (5.253) | 2.749 (4.922) | 0.002 (0.000) |
| Years of unemp. experience | 0.362 (0.921) | 0.552 (1.414) | -0.189*** (0.036) | 0.265 (0.687) | 0.352 (0.928) | -0.087 (0.050) | 0.317 (0.693) | 0.352 (0.927) | -0.035 (0.333) |
| Weekly working hours | 40.072 (9.355) | 30.583 (14.091) | 9.489*** (0.366) | 39.323 (9.703) | 34.399 (13.340) | 4.924*** (0.710) | 36.940 (10.813) | 34.399 (13.326) | 2.541** (7.944) |
| Gross monthly labor earnings | 2445.386 (1236.721) | 1518.220 (1187.915) | 927.165*** (41.533) | 1986.646 (788.589) | 1719.183 (1001.656) | 267.463*** (55.388) | 1799.656 (910.626) | 1719.183 (1000.607) | 80.473 (1.263) |

Note: Balanced panel 2000-2007. In parentheses, standard deviations in each group, standard error for the differences between groups and F-statistics for the difference in the case of the matched weighted sample.

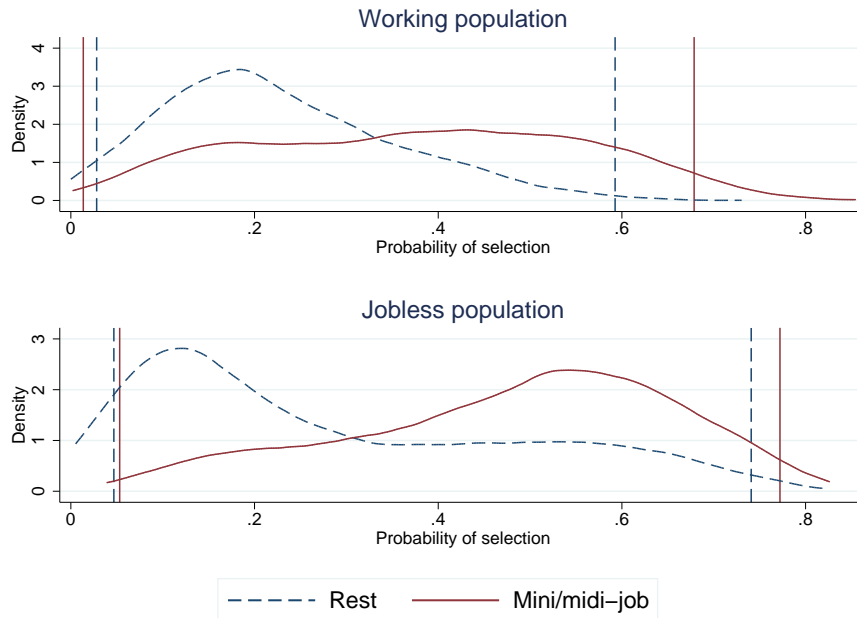
Table D3: Jobless population (17-65), 2002

| | Original sample | | | Matched sample | | | Matched weighted sample | | |
|------------------------------|-------------------------|------------------------|--------------------------|------------------------|------------------------|----------------------|-------------------------|------------------------|--------------------|
| | Rest | Mini/midi-job | Diff. | Rest | Mini/midi-job | Diff. | Rest | Mini/midi-job | Diff. |
| Female | 0.718 (0.450) | 0.775 (0.418) | -0.057* (0.025) | 0.784 (0.413) | 0.734 (0.444) | 0.050 (0.061) | 0.734 (0.453) | 0.734 (0.433) | 0.000 (0.000) |
| Age | 46.930 (11.402) | 36.702 (10.260) | 10.227*** (0.623) | 36.059 (11.224) | 34.011 (10.417) | 2.048 (1.550) | 34.086 (10.686) | 34.011 (10.150) | 0.075 (0.002) |
| Immigrant | 0.181 (0.385) | 0.180 (0.384) | 0.001 (0.022) | 0.098 (0.299) | 0.085 (0.281) | 0.013 (0.041) | 0.085 (0.286) | 0.085 (0.273) | -0.000 (0.000) |
| East | 0.263 (0.440) | 0.283 (0.451) | -0.021 (0.025) | 0.265 (0.443) | 0.266 (0.444) | -0.001 (0.063) | 0.307 (0.473) | 0.266 (0.433) | 0.041 (0.329) |
| Single | 0.200 (0.400) | 0.295 (0.457) | -0.095*** (0.024) | 0.343 (0.477) | 0.362 (0.483) | -0.019 (0.069) | 0.367 (0.494) | 0.362 (0.471) | 0.005 (0.005) |
| Children | 0.669 (1.077) | 1.184 (1.124) | -0.515*** (0.062) | 1.020 (1.169) | 1.138 (1.170) | -0.119 (0.167) | 1.138 (1.193) | 1.138 (1.140) | -0.000 (0.000) |
| Head of HH | 0.428 (0.495) | 0.434 (0.496) | -0.005 (0.028) | 0.235 (0.426) | 0.319 (0.469) | -0.084 (0.064) | 0.250 (0.444) | 0.319 (0.457) | -0.069 (1.009) |
| Dual earner HH | 0.027 (0.163) | 0.056 (0.230) | -0.029** (0.011) | 0.127 (0.335) | 0.117 (0.323) | 0.010 (0.047) | 0.159 (0.375) | 0.117 (0.315) | 0.042 (0.480) |
| UB or Assist. | 0.244 (0.430) | 0.322 (0.468) | -0.078** (0.025) | 0.088 (0.285) | 0.106 (0.310) | -0.018 (0.043) | 0.106 (0.316) | 0.106 (0.302) | -0.000 (0.000) |
| Public transfers to HH | 11531.869 (9195.811) | 9043.500 (6980.383) | 2488.369*** (479.699) | 7704.892 (6555.543) | 7574.298 (7143.280) | 130.594 (978.472) | 7719.830 (6564.676) | 7574.298 (6960.615) | 145.532 (0.021) |
| Per capita annual HH income | 11024.918 (6706.715) | 8874.297 (4622.321) | 2150.622*** (342.388) | 9397.878 (3567.812) | 8522.738 (3601.007) | 875.141 (512.393) | 8787.246 (3541.648) | 8522.738 (3508.923) | 264.508 (0.262) |
| Less than HS | 0.237 (0.426) | 0.236 (0.425) | 0.002 (0.024) | 0.176 (0.383) | 0.170 (0.378) | 0.006 (0.054) | 0.170 (0.385) | 0.170 (0.368) | -0.000 (0.000) |
| High School | 0.645 (0.479) | 0.645 (0.479) | 0.001 (0.027) | 0.794 (0.406) | 0.798 (0.404) | -0.004 (0.058) | 0.798 (0.412) | 0.798 (0.393) | 0.000 (0.000) |
| More than HS | 0.117 (0.322) | 0.120 (0.325) | -0.003 (0.018) | 0.029 (0.170) | 0.032 (0.177) | -0.003 (0.025) | 0.032 (0.180) | 0.032 (0.172) | -0.000 (0.000) |
| New worker | 0.001 (0.034) | 0.025 (0.156) | -0.024*** (0.005) | 0.000 (0.000) | 0.011 (0.103) | -0.011 (0.010) | 0.000 (0.000) | 0.011 (0.101) | -0.011 (1.006) |
| Student before | 0.000 (0.000) | 0.002 (0.045) | -0.002 (0.002) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (.) |
| Years of FT experience | 13.333 (11.867) | 8.444 (8.969) | 4.889*** (0.618) | 5.272 (6.879) | 4.738 (6.351) | 0.533 (0.948) | 5.233 (7.236) | 4.738 (6.188) | 0.495 (0.236) |
| Years of PT experience | 2.185 (4.848) | 1.428 (3.259) | 0.757** (0.246) | 1.336 (3.322) | 1.429 (4.012) | -0.092 (0.525) | 0.802 (2.404) | 1.429 (3.909) | -0.627 (1.908) |
| Years of unemp. experience | 1.789 (2.891) | 1.767 (2.741) | 0.022 (0.161) | 0.757 (1.715) | 1.071 (2.239) | -0.314 (0.284) | 0.828 (1.819) | 1.071 (2.182) | -0.243 (0.659) |
| Weekly working hours | 3.692 (7.568) | 6.737 (9.280) | -3.045*** (0.465) | 1.601 (5.005) | 3.811 (7.823) | -2.211* (0.931) | 1.980 (5.988) | 3.811 (7.623) | -1.831 (2.817) |
| Gross monthly labor earnings | 171.733 (376.217) | 241.933 (378.960) | -70.200** (21.345) | 54.948 (154.590) | 73.851 (178.233) | -18.903 (23.783) | 66.029 (183.447) | 73.851 (173.675) | -7.822 (0.073) |

Note: Balanced panel 2000-2007. In parentheses, standard deviations in each group, standard error for the differences between groups and F-statistics for the difference in the case of the matched weighted sample.

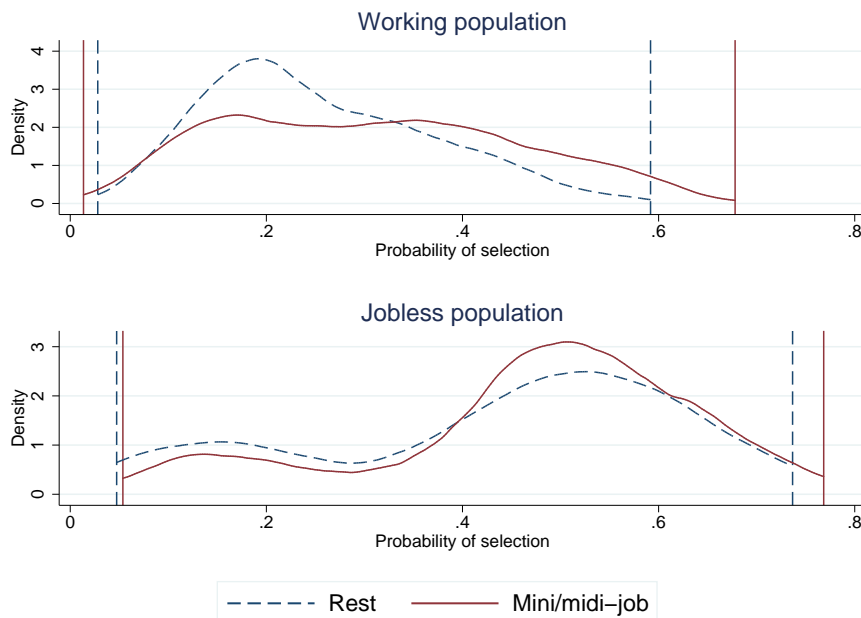
E Propensity score for matching

Figure E1: Density of the probability of selection in the original sub-samples



Note: Vertical lines correspond to the limits of predicted probability in the matched sample.

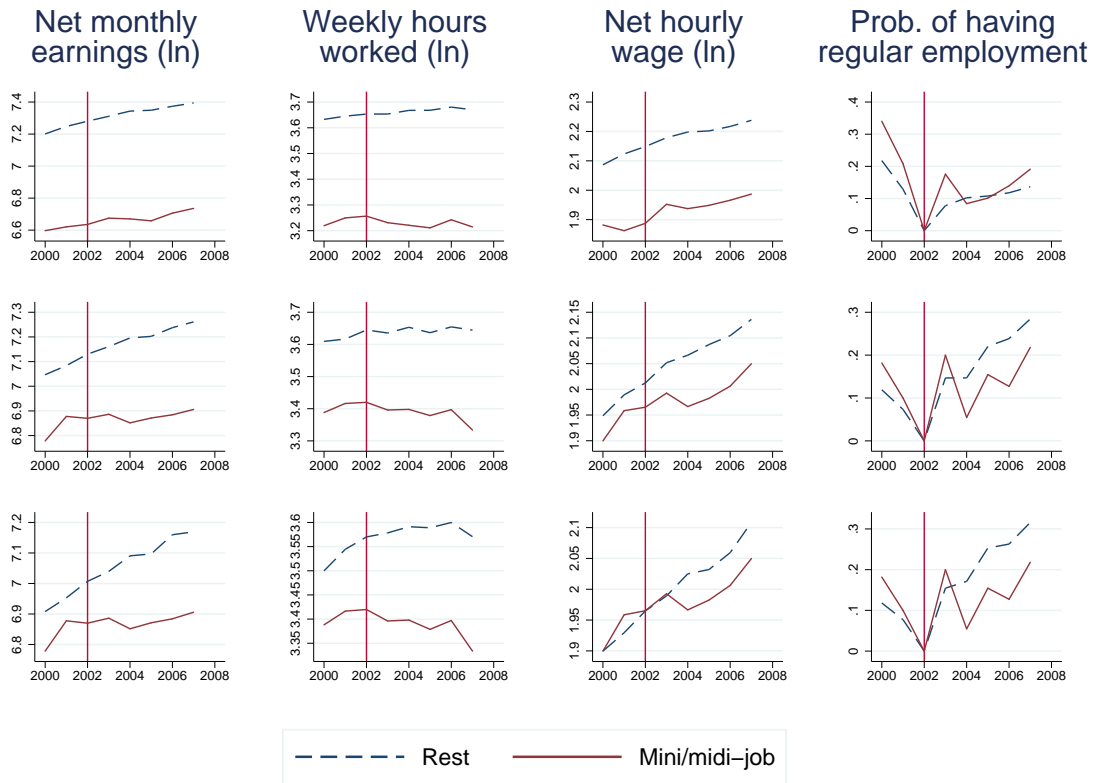
Figure E2: Density of the probability of selection in the matched sub-samples



Note: Vertical lines correspond to the limits of predicted probability in the matched sample.

F Evolution of outcomes. Matching strategy

Figure F1: Evolution of the outcomes



Note: Outcomes in columns. Net monthly earnings, weekly hours of work and net hourly wage correspond to working population; probability of holding regular employment, to jobless population. First row: original sample. Second row: matched sample. Third row: matched sample with matching weights.

G Heterogeneity of effects. Matched sample

Table G1: Heterogeneity of effects of holding mini and midi-jobs. Panel 2000-2007

| VARIABLES | Net monthly earnings (ln) | Weekly hours worked (ln) | Net hourly wage (ln) | Prob. of regular job |
|-----------------------|---------------------------|--------------------------|----------------------|----------------------|
| Mini-job | -0.10* (0.056) | -0.13*** (0.045) | 0.02 (0.040) | |
| Midi-job | -0.05 (0.058) | 0.02 (0.073) | -0.05 (0.078) | |
| Mini-job*MJ before | 0.22** (0.101) | 0.14 (0.269) | -0.19** (0.083) | |
| Midi-job*MJ before | 0.22 (0.162) | 0.20* (0.119) | 0.01 (0.132) | |
| Adjusted R-squared | 0.13 | 0.08 | 0.04 | |
| Mini-job | -0.15** (0.073) | -0.14* (0.074) | -0.03 (0.045) | |
| Midi-job | 0.02 (0.106) | 0.12 (0.111) | -0.11 (0.091) | |
| Mini-job*Female | 0.13 (0.095) | 0.06 (0.103) | 0.03 (0.073) | |
| Midi-job*Female | -0.07 (0.119) | -0.11 (0.136) | 0.06 (0.122) | |
| Mini-job, lag | | | | 0.11 (0.124) |
| Midi-job, lag | | | | 0.19** (0.083) |
| Mini-job, lag*Female | | | | -0.07 (0.140) |
| Midi-job, lag*Female | | | | -0.28*** (0.106) |
| Adjusted R-squared | 0.12 | 0.07 | 0.04 | 0.30 |
| Mini-job | -0.16** (0.063) | -0.17** (0.074) | -0.05 (0.045) | |
| Midi-job | 0.01 (0.063) | -0.03 (0.072) | 0.02 (0.094) | |
| Mini-job*Under35 | 0.23** (0.091) | 0.17* (0.094) | 0.12 (0.079) | |
| Midi-job*Under35 | -0.07 (0.107) | 0.20 (0.124) | -0.18 (0.122) | |
| Mini-job, lag | | | | 0.08 (0.108) |
| Midi-job, lag | | | | -0.11 (0.148) |
| Mini-job, lag*Under35 | | | | -0.01 (0.125) |
| Midi-job, lag*Under35 | | | | 0.19 (0.165) |
| Adjusted R-squared | 0.13 | 0.08 | 0.04 | 0.30 |
| Mini-job | -0.11** (0.053) | -0.12* (0.067) | -0.04 (0.043) | |
| Midi-job | 0.00 (0.056) | 0.06 (0.077) | -0.05 (0.078) | |
| Mini-job*East | 0.18* (0.102) | 0.10 (0.082) | 0.14 (0.091) | |
| Midi-job*East | -0.10 (0.146) | -0.09 (0.128) | -0.00 (0.134) | |
| Mini-job, lag | | | | 0.07 (0.068) |
| Midi-job, lag | | | | 0.12 (0.090) |
| Mini-job, lag*East | | | | -0.01 (0.080) |
| Midi-job, lag*East | | | | -0.23** (0.113) |
| Adjusted R-squared | 0.12 | 0.07 | 0.04 | 0.30 |
| Observations | 7,018 | 7,223 | 7,001 | 1,310 |
| Number of indiv. | 1,039 | 1,039 | 1,039 | 205 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

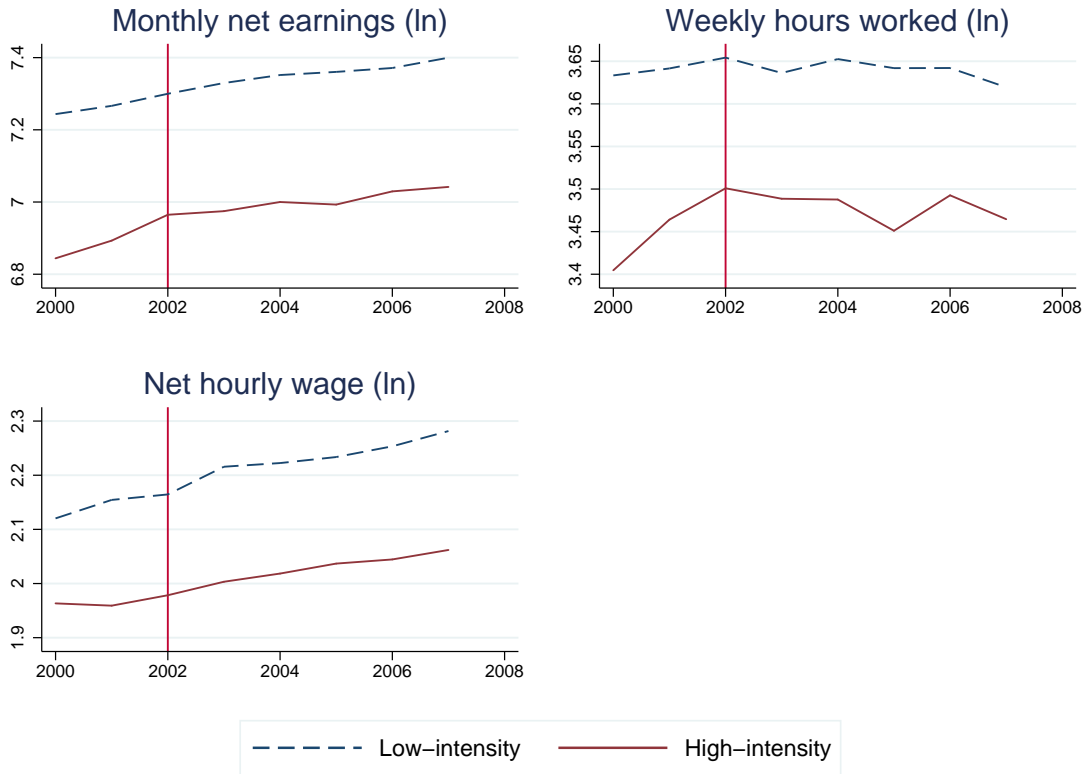
Table G2: Heterogeneity of effects of holding mini and midi-jobs. Panel 2000-2007

| VARIABLES | Net monthly earnings (ln) | Weekly hours worked (ln) | Net hourly wage (ln) | Prob. of regular job |
|--------------------------------|---------------------------|--------------------------|----------------------|----------------------|
| Mini-job | -0.06 (0.050) | -0.13** (0.055) | 0.02 (0.036) | |
| Midi-job | -0.02 (0.057) | -0.00 (0.065) | -0.02 (0.071) | |
| Mini-job*Single w. child. | -0.07 (0.216) | 0.49** (0.198) | -0.45*** (0.149) | |
| Midi-job*Single w. child. | 0.05 (0.164) | 0.36* (0.187) | -0.23** (0.103) | |
| Mini-job, lag | | | | 0.06 (0.057) |
| Midi-job, lag | | | | 0.08 (0.083) |
| Mini-job, lag*Single w. child. | | | | -0.03 (0.079) |
| Midi-job, lag*Single w. child. | | | | -0.14 (0.121) |
| Adjusted R-squared | 0.12 | 0.09 | 0.05 | 0.30 |
| Mini-job, lag | | | | 0.03 (0.051) |
| Midi-job, lag | | | | 0.08 (0.073) |
| Mini-job, lag*Unemployed | | | | 0.30* (0.182) |
| Midi-job, lag*Unemployed | | | | -0.54*** (0.139) |
| Adjusted R-squared | 0.12 | 0.07 | 0.04 | 0.30 |
| Mini-job | -0.07 (0.051) | -0.09 (0.058) | -0.02 (0.040) | |
| Midi-job | -0.04 (0.058) | -0.02 (0.063) | -0.05 (0.078) | |
| Mini-job*Secondary | -0.02 (0.161) | -0.11 (0.148) | 0.11 (0.171) | |
| Midi-job*Secondary | 0.18 (0.107) | 0.49*** (0.187) | -0.06 (0.146) | |
| Mini-job, lag | | | | 0.10 (0.068) |
| Midi-job, lag | | | | 0.02 (0.091) |
| Mini-job, lag*Secondary | | | | -0.12 (0.100) |
| Midi-job, lag*Secondary | | | | 0.14 (0.160) |
| Adjusted R-squared | 0.12 | 0.08 | 0.04 | 0.30 |
| Mini-job | -0.19 (0.334) | -0.23 (0.380) | 0.23 (0.199) | |
| Midi-job | 0.03 (0.635) | 0.06 (0.523) | 0.23 (0.158) | |
| Mini-job*High-school | 0.12 (0.337) | 0.13 (0.385) | -0.27 (0.202) | |
| Midi-job*High-school | -0.04 (0.637) | -0.01 (0.528) | -0.27 (0.173) | |
| Mini-job*More than HS | 0.19 (0.393) | 0.12 (0.388) | -0.12 (0.242) | |
| Midi-job*More than HS | -0.14 (0.642) | -0.02 (0.525) | -0.41** (0.193) | |
| Mini-job, lag | | | | -0.00 (0.051) |
| Midi-job, lag | | | | 0.11 (0.158) |
| Mini-job, lag*High-school | | | | 0.09 (0.077) |
| Midi-job, lag*High-school | | | | -0.06 (0.176) |
| Adjusted R-squared | 0.12 | 0.07 | 0.04 | 0.30 |
| Observations | 7,018 | 7,223 | 7,001 | 1,310 |
| Number of indiv. | 1,039 | 1,039 | 1,039 | 205 |

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

H Evolution of outcomes. Intensity of treatment

Figure H1: Evolution of the outcomes



References

- Akyol, M., M. Neugart, and S. Pichler (2013). Were the Hartz Reforms responsible for the improved performance of the German labour market? *Economic Affairs* 33(1), 34–47.
- Angrist, J. and J. Pischke (2009). *Mostly harmless econometrics: An empiricist's companion*. Princeton University Press.
- Azmat, G. (2014). Incidence, salience and spillovers: The direct and indirect effects of tax credits on wages. *R&R Quantitative Economics*.
- Azmat, Y. (2006). The incidence of an Earned Income Tax Credit: Evaluating the impact on wages in the UK. *CEP Discussion Paper* 724.
- Bargain, O., M. Caliendo, P. Haan, and K. Orsini (2010). “Making work pay” in a rationed labor market. *Journal of Population Economics* 23, 323–351.
- Bispinck, R. and T. Schulten (2011). Trade union responses to precarious employment in Germany. *WSI-Diskussionspapier* 178.
- Blackwell, M., S. Iacus, G. King, and G. Porro (2009). cem: Coarsened exact matching in Stata. *The Stata Journal* 9(4), 524–546.
- Bleakley, H. (2007). Disease and development: Evidence from hookworm eradication in the American South. *Quarterly Journal of Economics*.
- Blundell, R. (2006). Earned income tax credit policies: Impact and optimality. The Adam Smith Lecture, 2005. *Labour Economics* 13, 423–443.
- Blundell, R., M. Costa Dias, C. Meghir, and J. Shaw (2013). Female labour supply, human capital and welfare reform. *NBER Working Paper* (19007).
- Blundell, R., A. Duncan, J. McCrae, and C. Meghir (2000). The labour market impact of the Working Families' Tax Credit. *Fiscal Studies* 21(1).
- Caliendo, M., S. Kunn, and A. Uhlendorff (2012). Marginal employment, unemployment duration and job match quality. *Discussion Paper* (6499).
- Caliendo, M. and K. Wrohlich (2010). Evaluating the German “Mini-Job” reform using a natural experiment. *Applied Economics* 42, 2475–2489.
- Duflo, E. (2001). Schooling and labor market consequences of school construction in Indonesia: Evidence from an unusual policy experiment. *American Economic Review* 91(4), 795–813.
- Eichhorst, W. and V. Tobsch (2013). Has atypical work become typical in Germany? Country case study on labour market segmentation. Employment Working Paper 145, International Labour Office (ILO).
- Eichhorst, W. and K. Zimmermann (2007). And then there were four...: How many (and which) measures of active labor market policy do we still need? *DIW-Diskussionpapiere*.
- Eissa, N. and H. Hoynes (2004). Taxes and the labor market participation of married couples: the earned income tax credit. *Journal of Public Economics* 88(9-10), 1931 – 1958.
- Eissa, N. and J. Liebman (1996). Labor Supply Response to the Earned Income Tax Credit. *The Quarterly Journal of Economics* 111(2), 605–37.
- Fahr, R. and U. Sunde (2009). Did the Hartz Reforms speed-up the matching process? A Macro evaluation using empirical matching functions. *German Economic Review* 10(3), 284–316.

- Fertig, V. and J. Kluve (2006). Alternative beschäftigungsformen in Deutschland: Effekte der neuregelung von zeitarbeit, Minijobs und Midijobs. *Vierteljahrshefte zur Wirtschaftsforschung* 75(3), 97–117.
- Freier, R. and V. Steiner (2008). “Marginal employment”: Stepping stone or dead end? Evaluating the German experience. *ZAF* 2-3, 223–243.
- Fullerton, D. and G. Metcalf (2002).
- Ichino, A., G. Schwerdt, R. Winter-Ebmer, and J. Zweimüller (2014). Too old to work, too young to retire?
- Jacobi, L. and J. Kluve (2007). Before and after the Hartz Reforms: The performance of Active Labour Market Policy in Germany. *ZAF* 1, 45–64.
- Keller, B. and H. Seifert (2012, July). Atypical employment in Germany. Forms, development, patterns. In *16th ILERA World Congress*.
- Leigh, A. (2010). Who benefits from the Earned Income Tax Credit? Incidence among recipients, coworkers and firms. *The B.E. Journal of Economic Analysis and Policy. Advances* 10(1).
- Meyer, B. and D. Rosenbaum (2001). Welfare, the Earned Income Tax Credit, and the Labor Supply of Single Mothers. *Quarterly Journal of Economics* 116(3), 1063–1114.
- Michalopoulos, C., P. Robins, and D. Card (2005). When financial work incentives pay for themselves: evidence from a randomized social experiment for welfare recipients. *Journal of Public Economics* 89(2005), 5–29.
- Michalopoulos, C., D. Tattrie, C. Miller, P. Robins, P. Morris, D. Gyarmati, C. Redcross, K. Foley, and R. Ford (2002). Making Work Pay: Final Report on the Self-Sufficiency Project for Long-Term Welfare Recipients. Technical report, Social Research and Demonstration Corporation (SRDC).
- Moffitt, R. (1983). An economic model of welfare stigma. *The American Economic Review* 73(5), 1023–1035.
- Riddell, C. and W. Riddell (2012). The pitfalls of work requirements in welfare-to-work policies: Experimental evidence on human capital accumulation in the Self-Sufficiency Project. *IZA Discussion Paper* (6738).
- Robins, P., C. Michalopoulos, and K. Foley (2008). Are Two Carrots Better Than One? The Effects of Adding Employment Services to Financial Incentive Programs for Welfare Recipients. *Industrial and Labor Relations Review* 61(3), 410–423.
- Rothstein, J. (2010). Is the EITC as good as an NIT? Conditional cash transfers and tax incidence. *American Economic Journal: Economic Policy*.
- Steiner, V. and K. Wrohlich (2005). Work incentives and labor supply effects of the mini-job reform in Germany. *Empirica* 32, 91–116.