Disincentive Effects of a Generous Social Assistance Scheme

Anders Bruun Jonassen

SFI – The Danish National Centre for Social Research
School of Business and Social Sciences, Aarhus University

Abstract:
This study estimates the disincentive effect of a significant increase in social assistance benefits at age 25 in Denmark for unmarried men and women with only compulsory schooling. The study applies a regression discontinuity approach using panel data on the full population of Denmark in the period 1999 to 2006. At age 25 social assistance benefit levels increase from around the average to the highest level among OECD countries. The relative size of the adverse behavioral response to increased benefits is very much in line with related studies from other countries which analyze increases in benefits from low to average OECD levels. By use of very detailed panel data with weekly observations, the study also assesses the extent to which the estimated disincentive effect is due to an increase in transitions onto the program or a decrease in transitions out of the program. The findings suggest that around two thirds of the estimated effect is due to new recipients joining the program.

1. Introduction

Welfare policy faces the challenge of balancing the three goals of providing sufficient standards of living, ensuring adequate work incentives and keeping government costs low. This is sometimes referred to as the 'iron triangle' of welfare reform. The term reflects the difficult implicit trade-off between these three dimensions. Improvement of one dimension is often gained only at the expense of weakening another.

Social assistance usually constitutes a country's lowest income security net. The levels of these benefits are therefore often directly related to the minimum standards of living. This study provides new evidence on the classic topic in economics of determining the extent to which public income transfers suppress the supply of labor. It does so by estimating the work disincentive effects associated with providing social assistance benefits which are the most generous relative to wages among the OECD countries.

By use of very detailed panel data the study goes on to demonstrate the dynamics related to the estimated adverse response. These dynamics implicitly provide guidelines for targeting policies to counter the associated adverse behavioral response. A more cost-efficient policy in turn improves the potential for policy-makers to more effectively achieve a desired minimum standard of living subject to the 'iron triangle' of welfare reform.

The paper applies a regression discontinuity approach to an age-dependent rule in the Danish social assistance scheme to estimate the disincentive effect associated with a significant increase in benefits at age 25. It does so for both unmarried men and women who did not have children before age 26 and no more than compulsory schooling at 25. The estimated effects for men are very much in line with the comparable literature. The regression discontinuity results for women are new to the literature and of very similar size. The estimates cover the period 1999 to 2006. A placebo test on individuals with children at 25, a group not subject to changes in eligibility, shows no effect.

Further to these static participation effects the paper analyzes the dynamics of the response to higher benefits. The use of exceptionally detailed panel data allows for a persuasive assessment of the adjustment of the response after age 25. The paper provides a detailed look at the process of adjustment to the change in rules and a novel decomposition of the disincentive effects into entries and exits to and from the program.

The results include a significant, albeit modest, response to higher benefits for both men and women. The dynamics of the response to the change in rules clearly demonstrates a very quick adjustment process where higher benefits seem to affect the caseload only shortly after the change in eligibility. A decomposition of the effect reveals that the main contribution to the increase in caseload is due to more individuals joining the program. This component makes up two thirds of the estimated effect, while the remaining third is due to fewer individuals leaving the program.

2. Background

A recent study of U.S. anti-poverty programs reports a major impact on poverty rates in general, an impact which is only affected negligibly by work incentives [Moffitt et al. (2011)]. By far the highest poverty rates of any of the examined groups are found among the non-elderly, non-disabled childless families with no continuously-employed members.

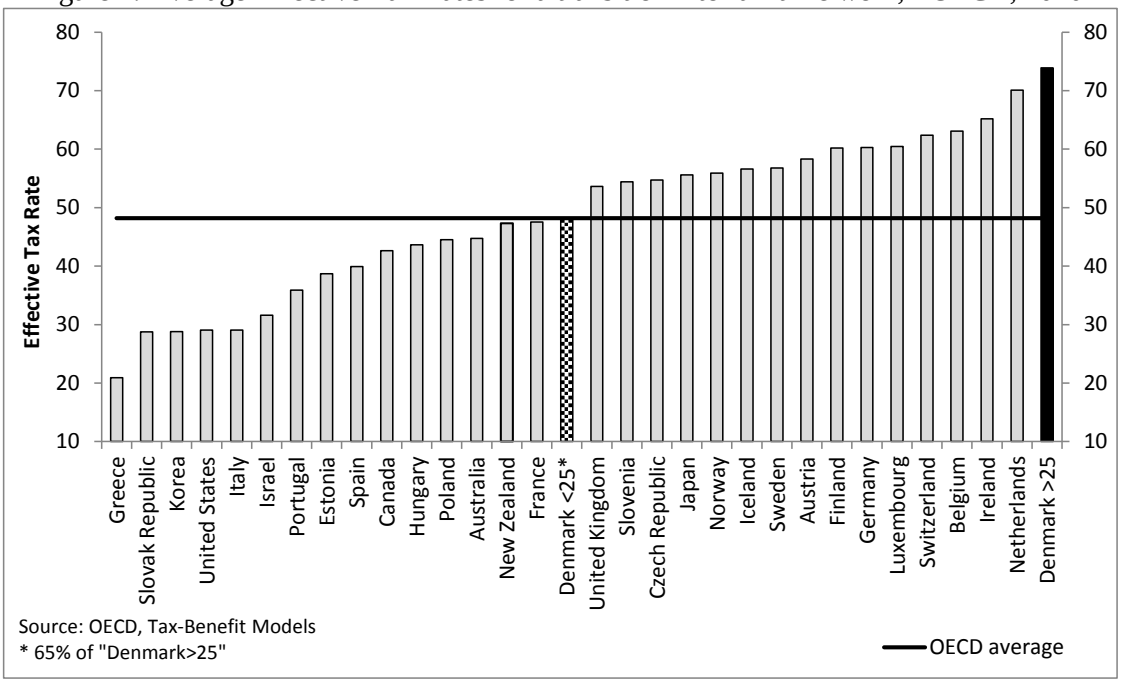
Accordingly, the study finds this demographic group to be the most underserved by the system. Given this result, it would seem that, at least in the U.S., not serving the young, non-disabled individuals with weak labor market attachment and without children comes at the cost of increased poverty. But how large are the costs of providing higher minimum levels of income for this group?

Recent studies of age-dependent rules in the Canadian and French social assistance schemes suggest only relatively modest behavioral responses to providing higher benefits for single men in this demographic group [Lemieux & Milligan (2008) and Bargain & Doorley (2011)]. But what are the costs associated with extending the generosity of social assistance further? And how might the costs of providing income security be limited?

These questions remain highly relevant for governments who face pressure to reduce deficits since an assessment of the cost of a transfer scheme also reveals the potential gains from reforming the scheme. For countries looking to reduce government spending and improve the long term employment-to-population ratio, a reduction of social assistance benefit levels might seem an attractive means to help accomplish both of these objectives.

Given the relative generosity of benefits, the scope for improving work incentives for social assistance recipients is perhaps greater in Denmark than in any other OECD country. For OECD countries figure 1 shows measures of ‘the inactivity trap’, which relates benefit levels to wages across countries. The inactivity trap measure states the average effective tax rate of a transition from unemployment to employment for individuals who are eligible for social assistance, but not entitled to unemployment insurance benefits.

Figure 1. Average Effective Tax Rates for a transition into full-time work, [1] OECD, 2010



The ranking of countries according to the measure of 'the inactivity trap' shows Danish recipients receiving the highest social assistance benefits relative to wages in the OECD. This suggests that Danish recipients face relatively very strong work disincentives. The scope for improving work incentives therefore seems larger in Denmark than in any other OECD country. This top position is, at least partly, a consequence of benefit levels increasing by 55 percent at age 25 in Denmark for individuals without children, corresponding to an increase of 11 percent of average monthly earnings.[2]

Ignoring taxes and other benefits, figure 1 also plots the inactivity trap measure before the 55 percent increase in benefits. This measure puts the Danish average effective tax rate for individuals below 25 at the OECD average. [3] The increase in benefits at 25 in Denmark thus provides a case for analyzing increases in social assistance benefits from around the OECD average to the highest level among OECD countries for young individuals without children.

[1] The measure relates social assistance and other means-tested benefits to work income of an average worker of age 40, and states the average effective tax rate for a transition into full-time work (earning average wages) for a person with no children, without entitlement to unemployment insurance, but entitled to social assistance. The ranking in figure 1 is based on work income of 100 percent of the average wage. The position of Denmark, however, remains unaffected by varying shares of the average wage.

[2] Own calculations based on data on average annual earnings from www.oecd.org and information on benefit levels from www.retsinformation.dk.

[3] Ignoring other benefits and taxes, 65 percent of the Danish average effective tax rate for a transition into full-time work, corresponds to benefits before the increase of 55 percent at 25, and a measure of the 'inactivity trap' of around the OECD average. Thus, the benefits to wage ratio in Denmark is approximately at the OECD average for people who have not yet turned 25.

Previous regression discontinuity studies recovering the disincentive effects of similar age-dependent rules in Canada and France, respectively, analyze increases in social assistance from very low levels to levels around the OECD average [Lemieux & Milligan (2008) and Bargain & Doorley (2011)]. The increases in benefits relative to average wages analyzed in both Lemieux & Milligan (2008) and Bargain & Doorley (2011) are similar to the size of the increase in benefits in this study.[4] The results from this paper may therefore be viewed as an extension of the existing literature, estimating the disincentive effect at a different margin, i.e. the one associated with increasing benefits from medium level to the highest level among all OECD countries.

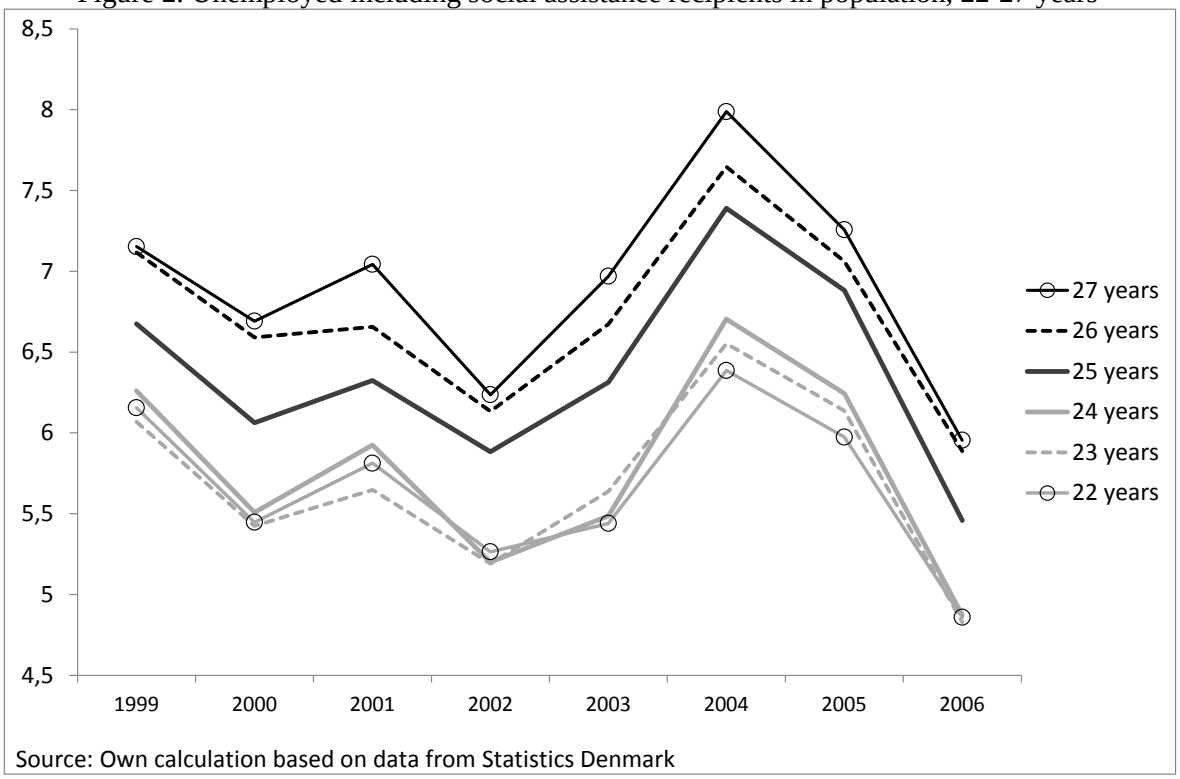
Furthermore, I argue that this paper entails improved conditions for studying the consequences of increased benefits further away from the cut-off point where benefits change than otherwise possible in the related literature. This is due to the scope and very detailed nature of the panel data used and the stability of the empirical relationship in the outcome of interest. Information on the longer run participation patterns is crucial for assessing the real cost of providing social assistance for the young part of the population, since not only the immediate response, but also subsequent adjustment to new benefit levels is crucial for understanding the trade-off between income security and maintaining low government costs.

On one hand, the young population could be regarded among the demographic groups most in need of publicly provided income security due to their vulnerability on the labor market that comes with labor market inexperience and low levels of skill-acquisition. On the other hand, the young population may for much same reasons also be counted among the most susceptible to work disincentives due to lower earnings capacity; as work income typically increases with age, so does the difference between potential earnings and benefits.

The labor performance of the young population is, of course, not only a concern for current but also future costs and economic performance, since today's young will become part of the core labor force of the future. Concerns that the young part of labor force will fail to achieve integration into the labor market are very real given the current high youth unemployment rates internationally. In order to assess the role of benefit levels in determining unemployment figure 2 presents the relationship between the two by showing the unemployment ratio-to-the-population by age for individuals between 22 and 27 years old from 1999 to 2006.

[4] Lemieux & Milligan (2008) analyzes a relative increase in benefits of 175 percent, Bargain & Doorley (2011) an increase of 162 percent. The large increases are, however, relative to a low initial level of benefits. Since the initial level of benefits in the current study, i.e. the benefits for those below age 25, are larger than in the two related studies, the relative increase is smaller (55 percent). Relative to wages, however, Danish benefits increase by 11 percent of average wages, Canadian benefits increase by, 13 percent (measured by 1990 wages), and French benefits increase by 16 percent of average wages. These calculations are based on the benefit levels stated in the respective studies and data on average annual wages from www.oecd.org.

Figure 2. Unemployed including social assistance recipients in population, 22-27 years



Source: Own calculation based on data from Statistics Denmark

The figure shows similar unemployment-to-population ratios for the 22 to 24-year-olds during the whole period. By contrast the ratio is visibly larger for the 25-year-olds. The unemployment ratio is even higher for ages 26 and 27, albeit less obviously so compared to the shift between ages 24 and 25. Differences in unemployment ratios clearly depend on more than social assistance levels, but the indications of figure 2 are not in conflict with the notion of a relationship between benefit levels and unemployment in Denmark.

The remainder of the paper is organized as follows. Section 3 goes through the details of the Danish social assistance scheme. Section 4 describes and provides a look at the data, while section 5 outlines the empirical approach and reports the regression discontinuity results. Section 6 goes through the decomposition of the estimated disincentive effect, while section 7 discusses the results and section 8 concludes.

3. Danish social assistance and related schemes

Social assistance in Denmark is means-tested. Any other sources of income are subtracted from the total social assistance amount received. Only for married couples do benefits depend on the income of a partner. Benefits are not related to previous income and eligibility rules have remained unchanged from 1998 to 2006. Benefit levels depend on age, living arrangements and parental status.

Social assistance recipients under age 25 are eligible for benefits of DKK 6,660 DKK per month (USD 1,110). Those who live with their parents are eligible for around half of this amount. At age 25 the benefit level increases to DKK 10,300 per month (USD 1,716), regardless of living arrangements. Finally, parents responsible for children receive higher benefits, irrespective of age.[5] I will use this feature in the social assistance scheme of age-independence of benefit levels for parents for a placebo test of the results for non-parents.

There is no limit on benefit duration. Recipients below age 30 are required to participate in an active labor market program after 13 weeks. Recipients who are found 'ready for the labor market' are subject to job search requirements. Eligibility rules prohibit wealth beyond a maximum of DKK 10,000 (USD 1,666) and are contingent on a 'social event', such as unemployment, which has made the applicant unable to maintain economic self-support or support of his or her family. Low income is not itself a sufficient condition for eligibility.

Toomet (2005) confirms that income indeed increases at 25 for individuals without children. He does so by estimating the difference in pre-tax income of social assistance recipients before and after turning 25 in the period 1999-2001. For the group of 21-29-year-olds, he finds that turning 25 is associated with an average increase in income of 73 percent.[6]

Besides social assistance three other programs are candidates for discontinuously influencing economic self-support around the age threshold 25 and deserve some attention. The three programs are the unemployment insurance scheme, a program of adult apprenticeship, and publicly provided educational support in the form of study grants.

The first two programs, unemployment insurance and adult apprenticeship entail age-dependent rules at 25, which make the programs more attractive or accessible. The programs therefore raise the possibility that any observed drops in economic self-support could be caused by the rules associated with these programs rather than by the age-dependent rule of the social assistance scheme. Section 4, however, shows that the rules associated with the unemployment insurance scheme should not, and indeed do not, produce discontinuities in the number of unemployment insurance benefit recipients.

[5] The benefit levels for parents corresponds to 130 percent of the benefit level of non-parents above 25.

[6] The estimation in Toomet (2005) includes recipients below age 25 who live with their parents, and who therefore are eligible for only around half of the level of benefits of those not living with parents. Upon turning 25, however, individuals living with their parents are eligible for the same higher benefits as individuals not living with their parents, meaning that they experience an increase in benefits of 222 percent at 25. This explains why the pre-tax social assistance increases by more than 55 percent on average for individuals without children.

The adult apprenticeship program entails a subsidy for firms when taking on an apprentice above age 25 who does not already have an education. The apprentice may enter the program from either employment or unemployment, but since the option only exists for individuals who have turned 25 years old, the program can only affect the self-support ratio after 25. Without accounting for the existence of the program, one runs the risk of interpreting a decline in self-support in the population as being due to the increase in social assistance benefits. In order not to overestimate the influence of the change in benefits on the ratio of self-support, throughout the paper I control for the influence of the adult apprenticeship program on the ratio of self-supporting individuals by adding to the ratio of self-support the ratio of individuals on the adult apprenticeship program.

The study grant scheme has no age-dependent rule around 25, but as social assistance benefits increase at 25 these benefits come to exceed the study grants of the State's educational support. Consequently, the disincentives created by a higher level of social assistance may include educational attainment. Section 4, however, shows that the increase in social assistance benefits does not have an impact on the number of individuals receiving study grants.

4. Data

Data consists of all residents of Denmark who turned 25 in the period 1999-2006.[7] The dataset contains weekly observations on each individual for four years prior to turning 25 as well as four years after. The dataset is extracted from a database called DREAM, maintained by The Danish Labour Market Authority and contains information on all public income transfers. Data comprises a panel of weekly observations on 200,000 unmarried men and 160,000 women from ages 21 to 28, who did not have children before age 26.[8] Potential benefits for this group are related to age at 25 and are not conditional on the income of a partner.

In the group of unmarried individuals with no children before age 26 by far the highest share of social assistance recipients is found among the part of the population who at 25 had completed no more than compulsory schooling (9-10 years of schooling). Just before age 25 around 12 percent of all individuals with only compulsory schooling at 25 received social assistance, while the average share for individuals with some additional education at 25 was 1 percent.

The group with only compulsory schooling at 25 is also by far the largest component of social assistance recipients, accounting for 72 percent of all recipients in the week prior to turning 25, while comprising 19 percent of the population. Due to the relative importance of those with no more than compulsory schooling at age 25, I will throughout the paper devote special attention to this part of the population, consisting of 44,000 men and 23,000 women.

Those who become parents before age 25 are not eligible for an increase in benefits at 25 and are thus 'immune to treatment'. I use this group, consisting of 17,000 unmarried men and 32,000 women in a placebo test of the results.

In DREAM all individuals who at one point receive a public income transfer are recorded with the type of transfer received. Virtually everyone who is not working receives some type of income transfer (Geerdsen (2006), Rosholm & Svarer (2008)). Data does not contain employment information for the period of observation. Individuals with no record for a given week are therefore considered economic self-supporting in the sense that they do not receive public income transfers.

Since eligibility requirements are the same for ages 21-28, there is ex ante no reason to expect that non-working eligible individuals would wait until reaching age 25 to collect social assistance benefits. Also, as mentioned in section 3, low income is in principal not a sufficient condition for eligibility, which requires some 'event', such as unemployment. I therefore argue that changes in self-support at 25 are closely related to changes in employment.[9]

---

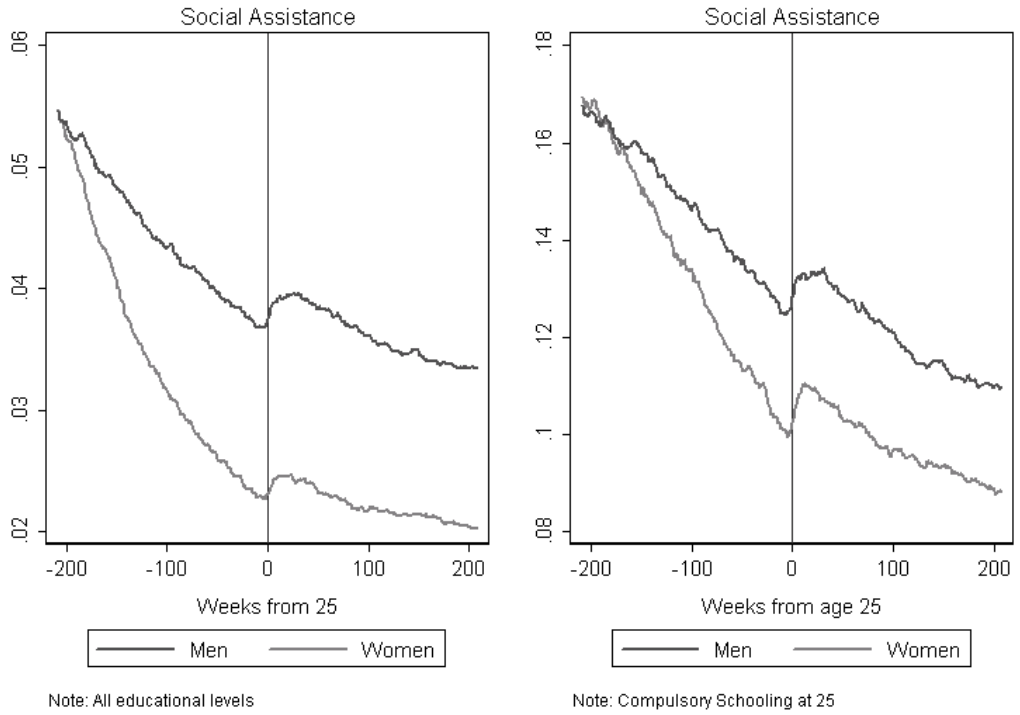
[7] I exclude immigrants and descendants of immigrants from the analysis since immigrants in the period of observation were only eligible for a lower social assistance benefit level in the first seven years of residency in Denmark. The impact of this program is studied in Rosholm & Vejlin (2010).

[8] I condition on not having children before age 26 in order to avoid fertility decisions affecting outcome in the period immediately after change in eligibility.

[9] Previous studies using DREAM data also assume a close relationship between employment and not receiving income transfers. Svarer (2011) estimates effects of sanctions while Graversen & van Ours (2008), Rosholm & Svarer (2008) and Geerdsen (2006) use DREAM to estimate threat effects of active labor market programs for Danish unemployment insurance benefit recipients.

Figure 3 plots the share of social assistance recipients in the population for ages 21-28, i.e. 208 weeks prior to turning 25 and 207 weeks after. Week zero indicates the week of turning 25. The left-hand side of the figure plots the share for all unmarried men and women who at age 25 did not have any children while the right-hand side of the figure shows the same relationship for individuals who had not completed more than compulsory schooling at age 25.

Figure 3. Social assistance rate, 21-29 years



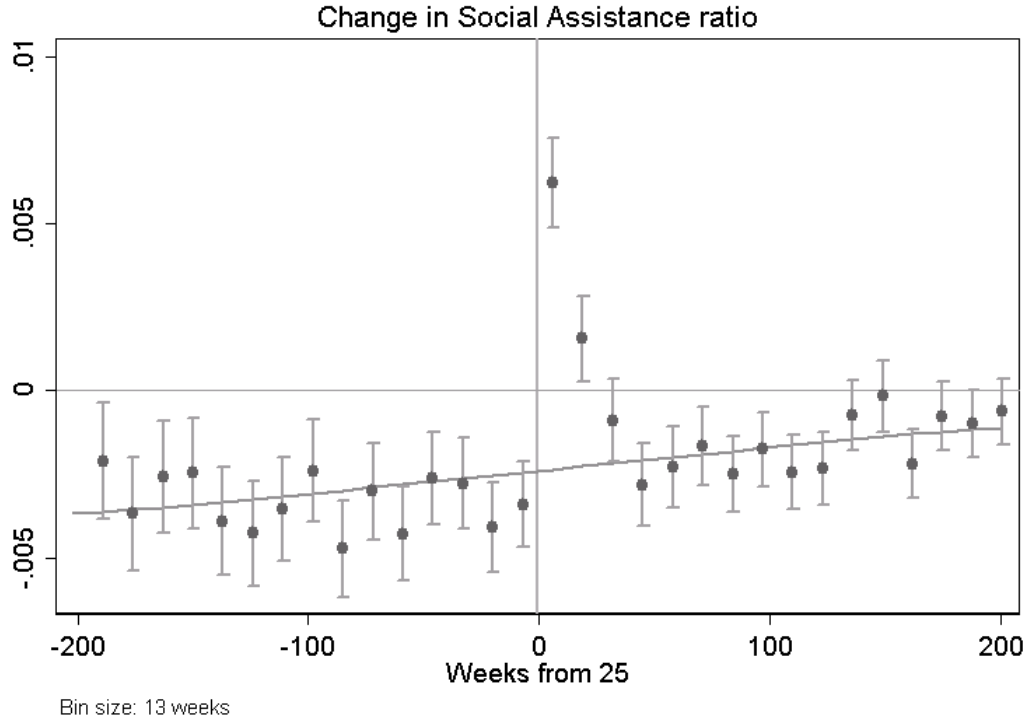
The figures clearly indicate a sharp increase in the share of social assistance recipients at week zero, i.e. in the week of turning 25, for all educational levels as well as for individuals with only compulsory schooling, although the increase is both larger and more pronounced for the second group. Also, in this group the increase in social assistance at week zero appears to be very similar for men and women. This is also the only group for whom I can confirm that the observed increase in recipients is associated with an equivalent drop in self-support. For this reasons, the group with no more than compulsory schooling will be the focus of the remaining analysis.

Since treatment is determined by age, individuals are able to fully foresee the increase in income at 25 before turning 25. A key concern in recovering the causal effect of turning 25 on the likelihood of receiving social assistance, therefore, is whether individuals react to the age-dependent rule prior to turning 25. Such anticipation effects would bias any estimated effects towards zero.

Figure 3, however, reveals no important anticipation effects. This finding is consistent with those in Lemieux & Milligan (2008). The apparent lack of important anticipation effect should, however, perhaps not come as a surprise. Anticipation effects require consumption smoothing over time periods. Reacting prior to the increase in benefits is therefore unlikely among the group at risk of receiving social assistance, a group likely to be credit constrained.

Figure 3 also suggests that adjustment to the change in eligibility takes place within a very short period of time immediately following week zero. After the response time of around six months (26 weeks), the social assistance rate drops, and returns to a trend similar to a continuation of the one observed between ages 21 and 24. This pattern is perhaps even clearer in figure 4, which plots the first-differenced social assistance ratio to the population, grouping age by three months intervals. For expositional convenience, I show men and women together in the graphs that follow.

Figure 4. Change in social assistance rate, men and women, bin size: 13 weeks



The figure indicates a steadily evolving relationship between age and the rate of change in the social assistance ratio. A notable exception to this pattern is the difference between the average social assistance ratios of the first three months after the change in eligibility, where the change in social assistance jumps. In the second period after the cutoff the change in the social assistance ratio continues to increase slightly before returning to the trend in the rate of change before the change in benefit level.

The increase in social assistance may, however, not coincide with a corresponding drop in self-support if the change in social assistance is caused by individuals changing from one type of public income transfer scheme to social assistance in response to the increased benefits of the latter. Figure 5 shows the ratio of self-support to the population along with the sum of the ratio of self-support and the ratio of social assistance recipients to the population.[10]

[10] Recall that the applied measure of self-support includes participants of the adult apprenticeship program mentioned in section 3. The share of participants of this program increases from zero to around 1 percent 26 weeks after week zero. In order not to interpret the drop in self-support as being due the increase in participants of the adult apprenticeship program, the ratio self-support to the population in figure 5 includes participants of the adult apprenticeship program. Not including the adult apprenticeship program would only increase the observed drop in self-support at age 25.

Figure 5. Self-support, 21-29 years, men and women

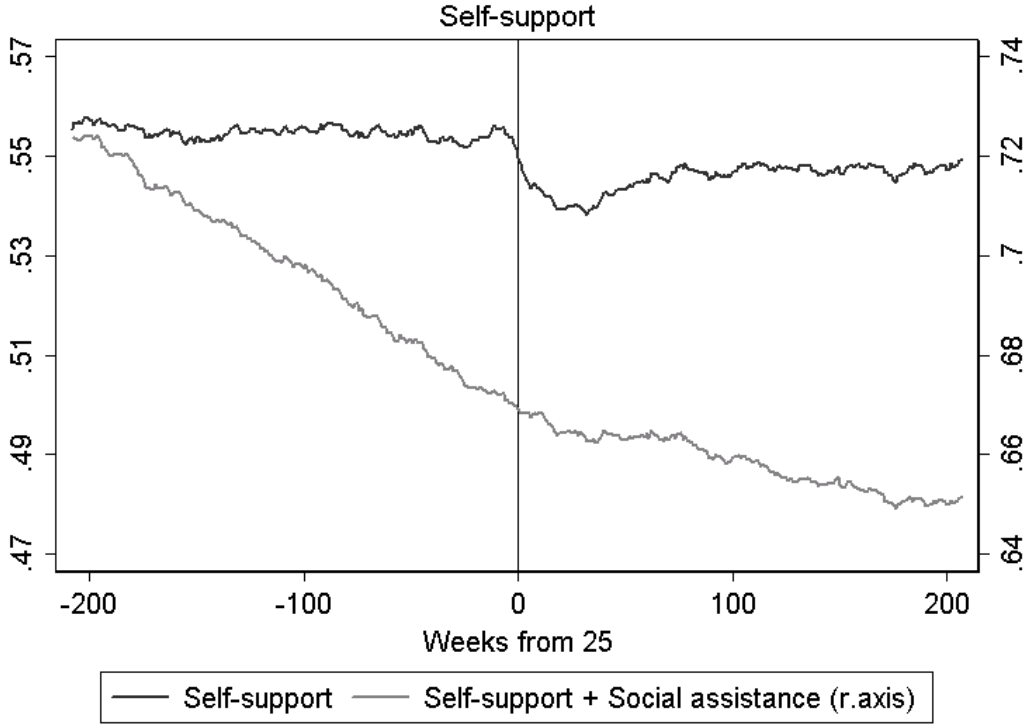
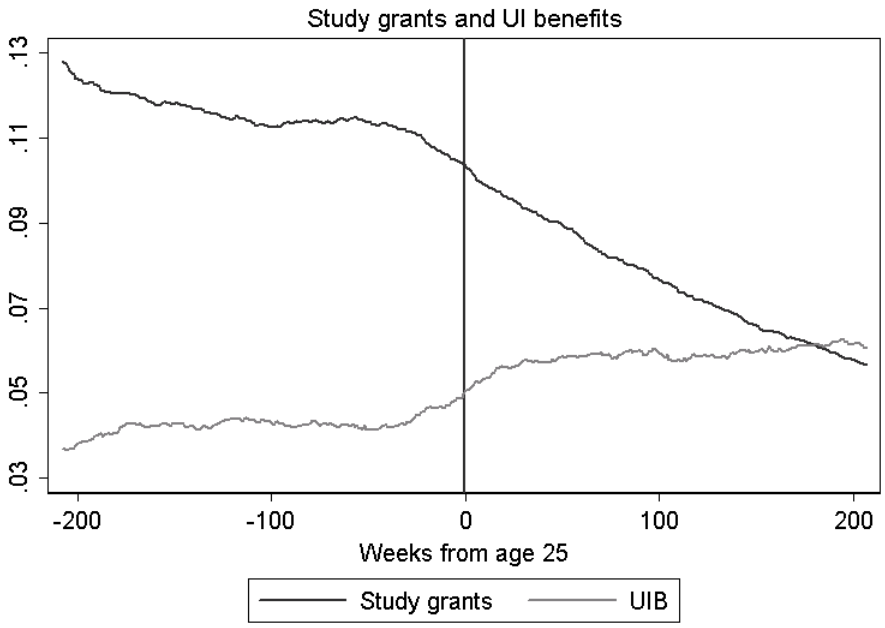


Figure 5 shows that the ratio of self-support to the population does indeed drop by a similar magnitude to the observed increase in social assistance in figure 3. The figure also shows that the sum of the ratio of self-support and the ratio of social assistance recipients to the population does not exhibit any drop at week zero. This means that all variation leading to the observed drop in self-support is captured by the increase in social assistance. In other words, after controlling for the increase in social assistance there is no additional drop in self-support to be explained by potential changes in other programs. Also, the jump in social assistance is not greater than the drop in self-support.

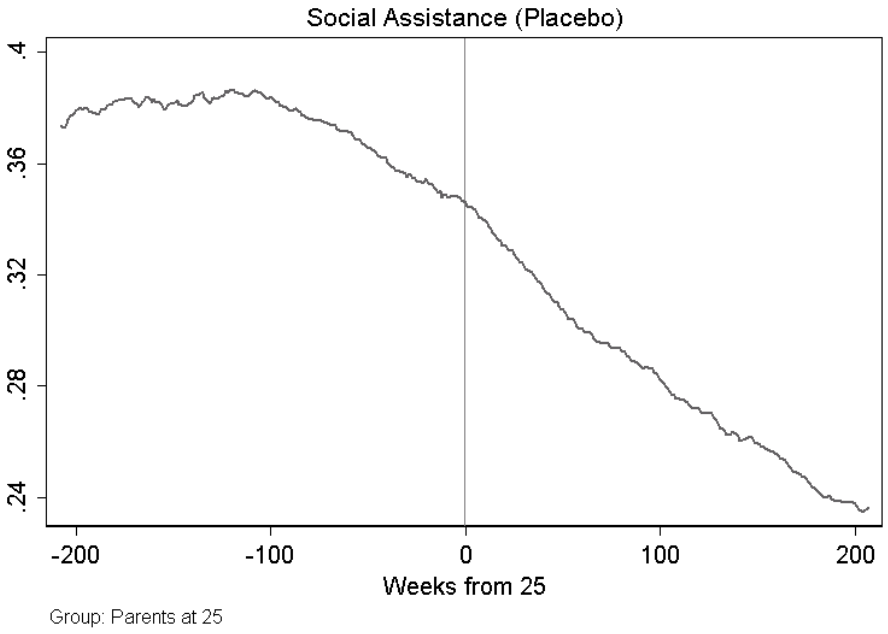
Unlike the simple rule of the social assistance scheme, the age-dependent rule entailed in the unemployment insurance (UI) scheme, mentioned in section 3, implies that individuals with unemployment insurance below age 25 without education (of more than 18 months duration) above higher secondary level, who have not worked (for two years full time within the past three years) will have their UI benefits cut by 50 percent after 26 weeks of unemployment. This means that individuals planning to exploit the more favorable eligibility conditions would gain from the change in rules by taking up unemployment already 26 weeks prior to turning 25. The rules of the UI system should therefore not produce any important discontinuity in the share of recipients at 25. Figure 6 addresses this potential concern and shows no jump in UI benefits recipients at 25. The figure also plots the share of individuals receiving study grants from the State, which also does not exhibit any discontinuity at 25.

Figure 6. Study grants and UI Benefits, 21-29 years , men and women



Before turning to the regression discontinuity estimates, figure 7 demonstrates the social assistance ratio to the population for individuals who were unmarried at 25, but did have at least one child before turning 25, and therefore were not eligible for an increase in benefits. The placebo group shows no sign of a jump in social assistance at week zero, confirming that the jumps for non-parents presented in figure 3 are indeed related to the change in benefit levels.

Figure 7. Social assistance rate, 21-29 years (parents at 25) , men and women



5. Estimation

The regression discontinuity (RD) approach is attractive due to high internal validity and its close resemblance with randomized control trials. Given the assumption of the RD design, variation in treatment is 'as good as random' [Lee & Lemieux (2010)]. This does not, however, mean that we can view the current study as we would a randomized control trial. Since the forcing variable is age, individuals can fully anticipate treatment [Lee & Lemieux (2010)]. As noted in the previous section, however, the ability to anticipate treatment does not appear to jeopardize inference in the current application.

Applying an RD approach in this study requires a constant policy rule, and does not rely on policy reform to recover a causal relationship. The current study uses such a constant policy rule over the course of eight years. The span of several years reduces the influence on any particular periodical shift in economic conditions.

Using the change in eligibility at 25, I apply the RD approach to estimate the behavioral response at that same cutoff. Treatment in this study consists of eligibility to a higher level of social assistance. For everyone eligible, the probability of treatment rises from 0 to 1 at age 25, making this a sharp regression discontinuity design. I estimate the causal effect of treatment, i.e. the average treatment effect on the treated, where the treated consist of those who acquire eligibility to a higher level of social assistance.

The main identifying assumption of the RD approach is that of no discontinuities aside from the discontinuity in treatment. If all other factors behave continuously around the cutoff of interest, then any observed jump in outcome can be attributed to the jump in the probability in treatment. Since the forcing variable is age, manipulation of the forcing variable is not a concern, as time cannot be manipulated [Lee & Lemieux (2010)] and the possibility of 'cheating' with age is zero given the central registration of all individuals.

To be specific, the identifying assumption is that factors affecting employment or educational decisions do not exhibit any 'jumps' around the cutoff age of 25. That is, factors affecting outcome are allowed to depend on age, just not discontinuously so around the cutoff. Taking into account any smooth relationship between age and all other relevant characteristics, I thus assume that individuals just below age 25 are otherwise identical to individuals just above age 25. Identification does not require panel data, but the assumption of no discontinuity in individual characteristics on each side of the cutoff does become all the more compelling when the individuals being compared are actually the same, just observed at different points in time.

The empirical model to be estimated is:

$$Y_{ia} = \beta_1 TREAT_{ia} + \delta(a) + \varepsilon_{ia}$$

where Y_{ia} is the outcome for individual *i* in week *a*, i.e. social assistance or self-support in one of 416 weeks running from -208 to 207. $TREAT_{ia}$ takes the value 1 for $a \geq 0$, meaning that individual *i* has turned 25 and is eligible for the higher benefit level, and 0 otherwise. $\delta(a)$ is a continuous function capturing the effect of age on the outcome variable.

As previously mentioned, and illustrated by figures 3 and 4, response times to the change in rules plays a role in the current study which uses weekly observations. The reaction to the higher benefit level is quick but not instantaneous. If one believes that the observed increase in social assistance from week zero to the peak after approximately six months (figure 3) is indeed in response to the new rules, then failing to take into account this process of adjustment will lead to an underestimation of the true impact of the change in benefit levels.

Accordingly, I allow for response time in the empirical model. I do so by including a dummy for each week defined as being within the period of response.[11] An alternative approach could be that of grouping data into larger time periods to decrease the influence of the period of adjustment on the estimated regression line. The response time to a change in rules is an object of interest in itself, which this study reveals new evidence on through the detailed nature of the applied panel data. I therefore prefer the use of dummies to the disguising of the response time by grouping data.

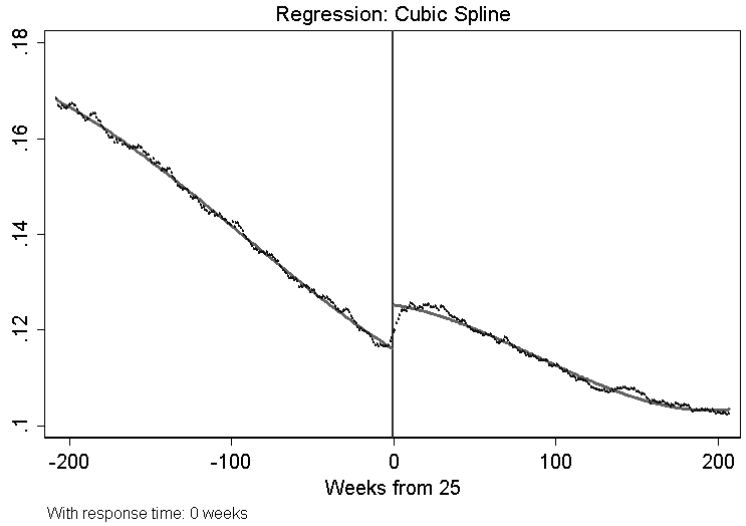
Lemieux & Milligan (2008) and Bargain & Doorley (2011) apply groupings on quarters and years, although for different reasons.[12] In the current study, applying groupings of 1 to 4 quarters produces very similar results to the results from my preferred more explicit modeling of response times through inclusion of response time dummies. I present results with and without allowing for response time.

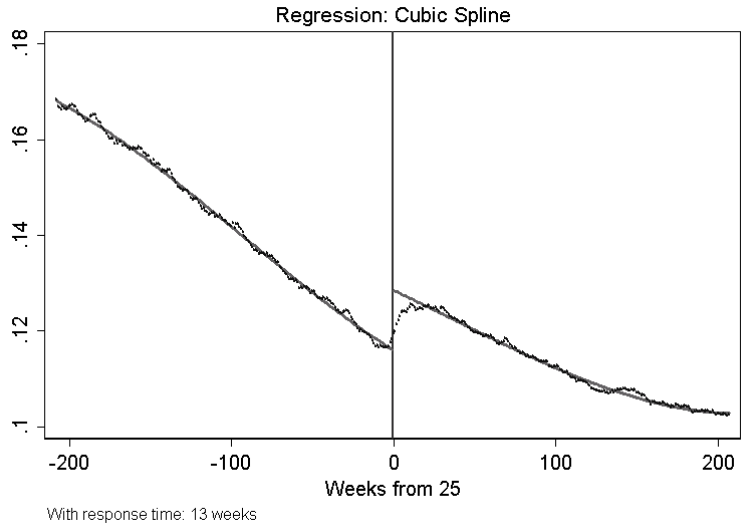
I estimate the increase in social assistance and corresponding drop in self-support by applying different polynomial specifications for $\delta(\cdot)$. I use the quadratic spline, cubic spline and quartic spline, thereby allowing for flexible specifications with different slopes on either side of the cutoff. Figure 8 presents the graphical representation of the empirical specification for men using the cubic spline specification and allowing for no response time, 13 weeks of response, and 26 weeks of response time, respectively.

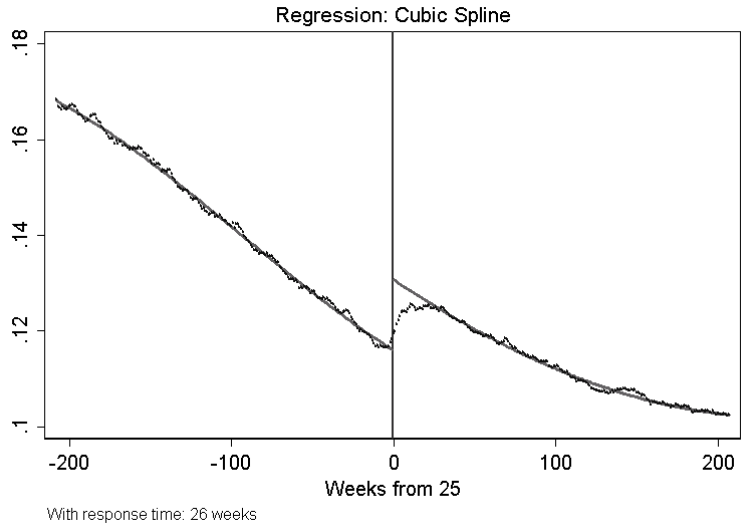
[11] I thank Sascha O. Becker for suggesting this solution to dealing with response time.

[12] Lemieux & Milligan (2008) have access to annual data, while Bargain & Doorley (2011) apply quarterly and yearly groupings to reduce noise in their sample.

Figure 8. 3rd order polynomial, response time 0, 13 and 26 weeks





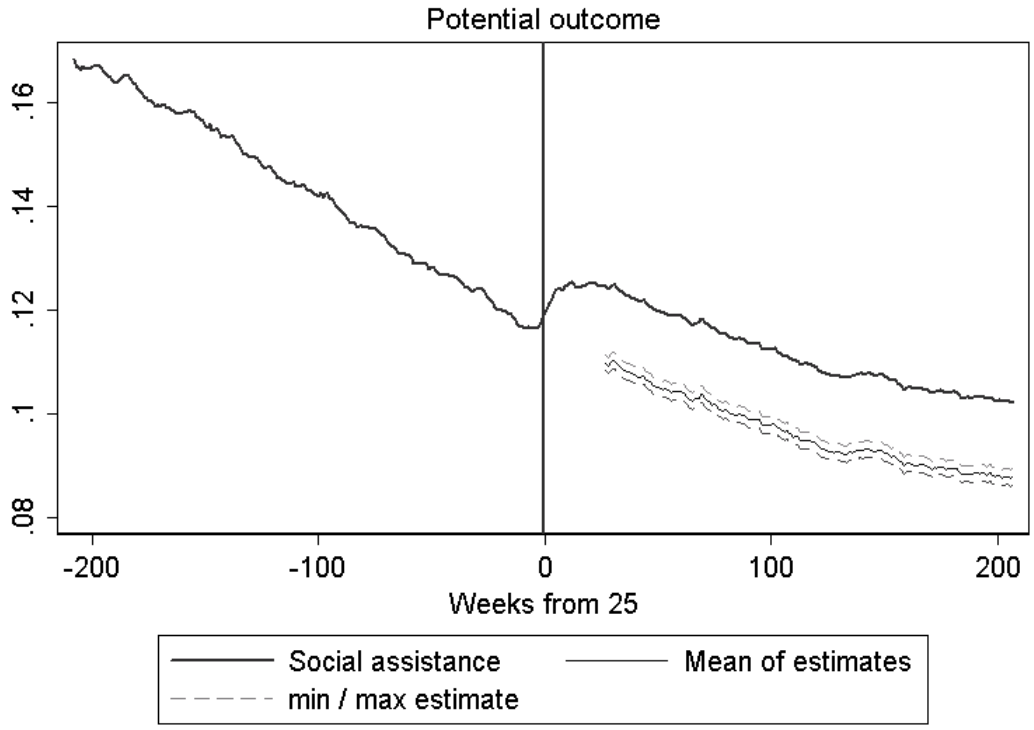


Depending on polynomial specification and not allowing for any response time the estimation results for the population of unmarried individuals, with no children before 26 with no more than compulsory schooling at 25, yields an estimated jump in the ratio of social assistance recipients in the range 0.8 - 1.3 percentage points of the population. The corresponding drop in self-support is estimated between -0.9 and -1.3 percentage points.

When allowing for response time of a single quarter the jump in social assistance is estimated in the range 1.1-1.5. When allowing for a response time of half a year yields an estimated jump in the range 1.3-1.6 percentage points of the population. The estimates of the drop in social assistance rate when allowing for response time are in the range -1.1 to -1.8.[13]

Figure 9 shows a representation of the potential outcome based on the estimates allowing for six months of response time. The figure plots the social assistance rate along with three lines representing the social assistance rate subtracted respectively the smallest, the largest and the mean of the estimates of the disincentive effect. The three lines start after the allowed response time of 26 weeks.

Figure 9. Potential outcome with 26 weeks response time



[13] This range does not include estimates from the two most flexible specifications when allowing for the longest response time of 26 weeks. These specifications produce unrealistically large estimates of -2.3 and -2.5 percentage. The divergence between the estimates for social assistance and self-support when allowing for maximum flexibility and response time is due to the less monotonic trend in the self-support ratio after 26 weeks (see figure 5) compared to the more monotonic trend in social assistance. When grouping on six months intervals instead of using dummies to capture response time, the estimates for the cubic and quartic spline specifications are reduced to the more reasonable -1.5 and -1.9 percentage points, respectively.

The plot of the potential outcome in figure 9 is, of course, not in itself evidence of the true social assistance rate in the absence of a change in benefit levels. The RD estimate is only valid in the immediate neighborhood of the cutoff. Given the stability of the relationship between age and outcome away from the cutoff, and the use of panel data, the plot does, however, nicely complement the story told so far of a 'one-shot' upward shift in the social assistance rate curve, which would otherwise have remained on an uninterrupted descending trend. This is also the observed pattern in the placebo group depicted in figure 7 of section 4. The story is further supported by the decomposition of the effect in section 6.

Table 1 presents the regression results for men and women, respectively. Based on these results, and the fraction of the population 'at risk' of responding to the change in eligibility, I calculate the participation elasticity with respect to the benefit level. The group 'at risk' of responding is the share of the population not receiving public income transfers. This group consists of 60 percent of the population of men and 47 percent of the population of women.

Table 1: RD estimates of the effect of increased benefits on SA recipients

	Quadratic	Cubic	Quartic
No response time			
Men	0.012***	0.008***	0.007***
	(0.001)	(0.001)	(0.001)
Women	0.012***	0.010***	0.008***
	(0.002)	(0.002)	(0.002)
Response time: 13 weeks			
Men	0.015***	0.011***	0.009***
	(0.002)	(0.002)	(0.003)
Women	0.014***	0.015***	0.014***
	(0.002)	(0.003)	(0.003)
Response time: 26 weeks			
Men	0.018***	0.014***	0.013**
	(0.002)	(0.003)	(0.005)
Women	0.014***	0.016***	0.014**
	(0.003)	(0.004)	(0.006)
No. of observations			
Men	44,134		
Women	23,186		
No. of time periods	416		

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$

The estimates are in the range 0.7 - 1.2 percentage points for men and 0.8 - 1.2 for women when not allowing for response time. The corresponding participation elasticities with respect to the benefit level are between -.04 to -.02 and -.05 to -.03 for men and women respectively.

Allowing for response time of 26 weeks yields estimates of 1.3 - 1.8 percentage points for men and an elasticity of -.05 to -.04. For comparison, Lemieux & Milligan (2008) find estimates for men in the same demographic group in the range -.05 to -.03, while the comparable elasticities in Bargain & Doorley (2011) are found to be in the range -.06 to -.04.

Allowing for response time of 26 weeks yields estimates of 1.4 - 1.6 percentage points for women yielding a little larger participation elasticity of -.06 to -.05, due to a smaller group 'at risk'. Regression discontinuity estimates for single childless women with low educational attainment are, to my knowledge, new to the literature.[14]

The size of the response divided by the group at 'risk' gives the share of the population concerned by the disincentive effect at 25. The affected share is calculated at 1-3 percent of men and 2-3 percent of women.

Figures A1 and A2 of the appendix show the graphical representation of the medium estimates for men and women respectively. For men the estimate is from the cubic spline and for women from the quartic spline.

[14] Bargain & Doorley (2011) mentions having analyzed the response to higher benefits for single women, but do not present the results. The authors reveal that the estimate for women in their study is smaller than for men.

6. The ins and outs

Section 5 established the existence and size of the overall disincentive effect of increased benefits at 25. Either an increase in transitions into social assistance or a decrease in transitions out of social assistance can, however, account for the estimated increase in social assistance. Which of these causes is the dominant factor in explaining the decrease in self-support is arguably crucial for applying an appropriate policy to counter the adverse behavioral effect.

In what follows I exploit the panel data to look at changes in the propensity to receive social assistance in a given week compared to the propensity of receiving social assistance in a week half a year earlier. I decompose the overall change into transitions into social assistance and transitions out of social to get at the relative importance of the components. I use this decomposition of the disincentive effect to assess the relative importance of the two components in explaining the increase in the ratio of recipients six months after turning 25.

Figures 10 and11 illustrate the transition rates into and out of social assistance, respectively.

Figure 10. Transitions into social assistance, men and women

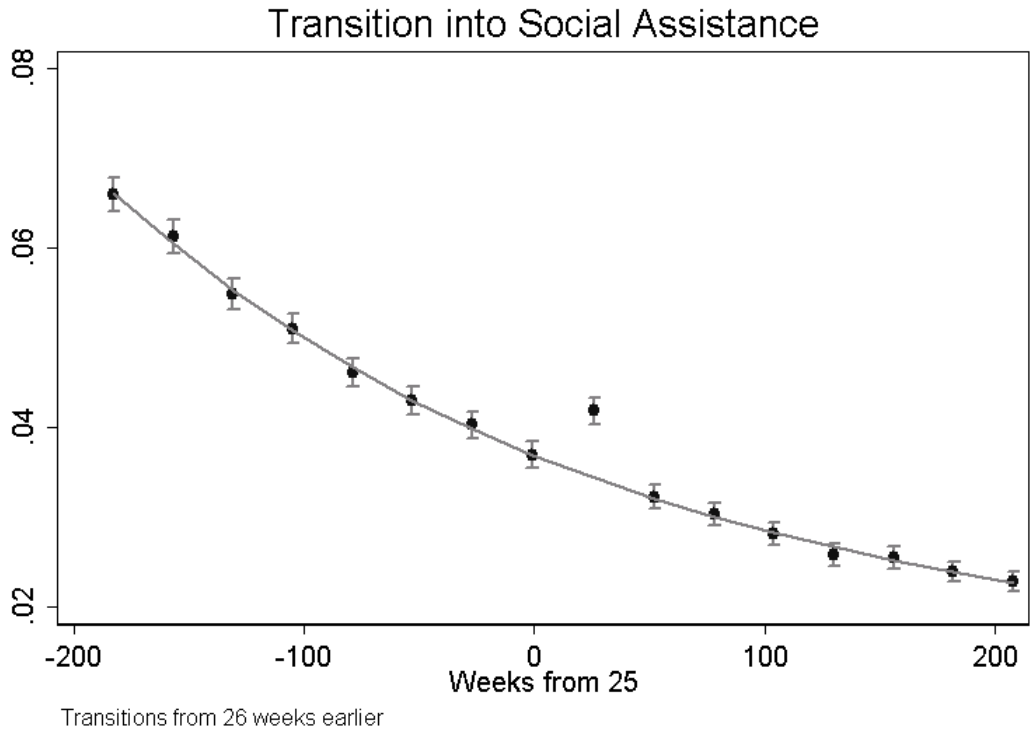
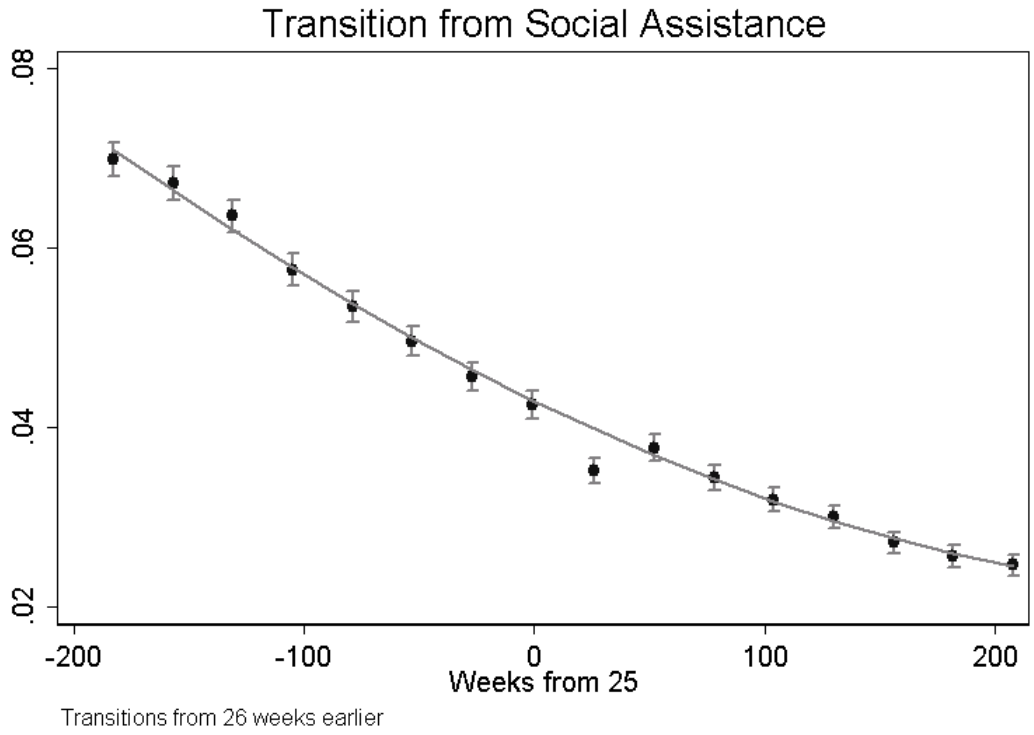


Figure 11. Transitions out of social assistance, men and women

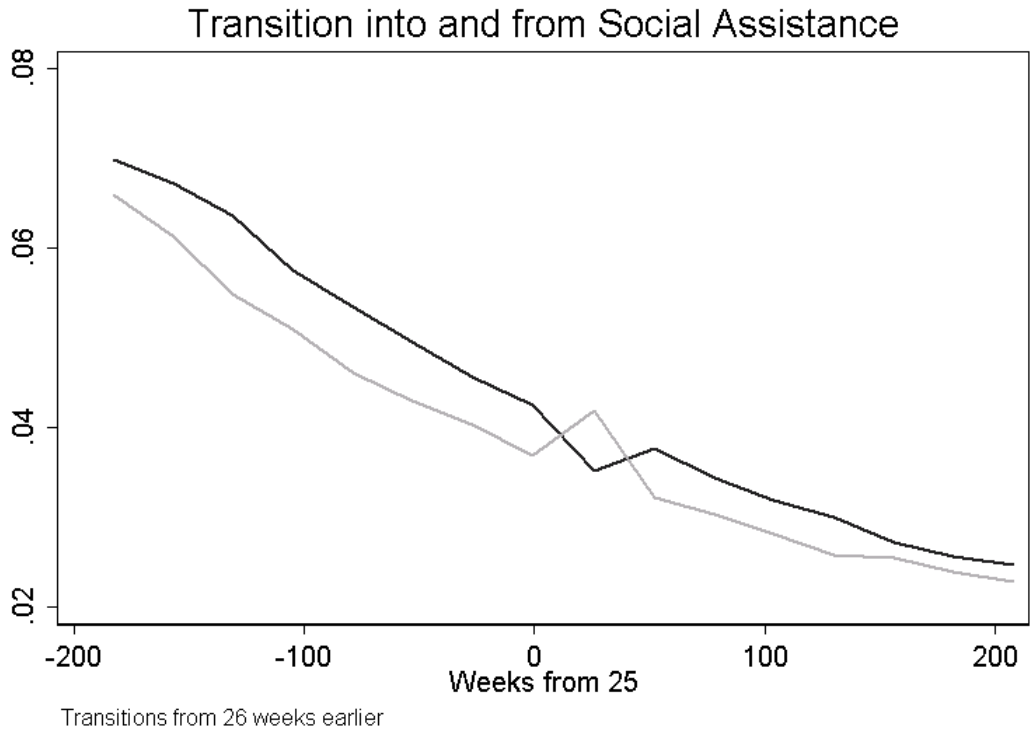


The two figures in turn suggest the striking conclusion that the change in benefit levels only affects transition rates in the first six months after the new rule come into place. According to figure 10, new participants enter the program during the first six months, but in the subsequent period the transition rate is no higher than we would have expected it to be in the absence of a change in eligibility.

The same is the case for transition out of the program shown in figure 11. Those individuals who are on the program and experience the change in income arising from the change in rules leave the program at a slower pace. But subsequent transitions occur with the same frequency as the trend for ages below 25.

The increase in transitions into social assistance illustrated in figure 10 accounts for almost two thirds of the overall increase in the social assistance rate after 26 weeks. While the decrease in transitions out of social assistance of figure 11 accounts for the remaining third. Figure 12 presents the two transition rates together in the same graph.

Figure 12. Transitions into and out of social assistance, men and women



7. Discussion

The estimations in section 5 showed that the increase in benefit levels at 25 in Denmark in the period of observation gave rise to a significant negative behavioral response. The sizes of the corresponding participation elasticities are similar for men and women and very much in line with the results from comparable studies from countries with similar age-dependent rules. The findings suggest that the response to increasing social assistance benefit levels is proportional to the level of benefits. That is, the response does not seem to increase more than proportionally with the benefit level, nor does the higher baseline benefit level mean that all individuals 'at risk' of responding to work disincentives have already responded. The associated behavioral effect from increasing benefits does not appear to depend on initial benefit levels.

Even after assessing the scope for reducing the disincentive effects the question of which kind of policy that would prove (cost) effective is very much an open one. The extent to which such a policy should be targeted towards retaining or gaining employment is not immediately clear from the regression discontinuity results, since a rise in social assistance can be due to either more individuals joining the program as well as fewer individuals leaving the program. The decomposition of the effect presented in section 6 suggests, however, that around two thirds of the adverse behavioral response could be avoided by retaining economic self-sufficiency for those who transfer onto the program.

Another conclusion from the elasticities calculated in section 5 is that the behavioral response is modest compared to the size of the associated increase in minimum living standards. However, even modest adverse behavioral responses might constitute a barrier for providing more generous benefits, depending on policy-makers' preferences in balancing the trading-off between living standards with encouraging work and keeping costs low. First-differencing of the social assistance ratio to the population, however, shows that the response to higher benefits is confined to the period just around the change in eligibility. At 25 the social assistance ratio jumps, but only to return to its previous trend within a short period of time after the change in benefit levels. The observation that all adjustment takes place around the cutoff in turn shows an increased potential for implementing policy more effectively to reduce the adverse behavioral response.

One way of eliminating the adverse behavior would, of course, be to not increase benefits at the expense of the current and future unemployed who are not affected by disincentives. However, since the change in eligibility does not appear to affect the decline in the social assistance rate after around six months, and the main part of the response is due to new participants, a reduction of benefits extending beyond this period of time would, it seems, constitute an excessive measure to counter the response. That is, if the purpose of reducing benefits is to eliminate the adverse behavioral response to higher benefits, with the unintended consequence of reducing living standards for the entire group of recipients, the results suggest that reducing benefits for more than six months means reducing living standards beyond what is necessary to counter the larger part of the adverse response.

An obvious alternative policy candidate is perhaps an in-work subsidy for low income earners, such as the earned income tax credit. In order to increase cost efficiency of this type of program by improving targeting, the suggestions for future research of this paper include research on the work income levels at which individuals become susceptible to reacting to low incentives. Alternative policies could include letting benefits increase only after six months on the program. Such a policy,

of course, relies on the estimated adverse behavioral effect being large enough in size for policy makers to justify a lowering of minimum living standards of the short term social assistance recipients.

8. Conclusion

This paper estimates the effect on the share of social assistance recipients of increasing benefit levels from an average OECD level to the highest level in all OECD countries. The estimated effect is modest in size and very much in line with previous findings from Canada and France, for less generous transfers. This suggests that increases in benefit levels produces similar participation elasticities irrespective of the initial benefit level. The study also decomposes the increase in recipiency into those joining the program and a smaller proportion leaving the program. The results from this exercise clearly indicate that transition rates are only affected just around the change in rules. Furthermore, two thirds of the observed rise in social assistance participants is due to an increase in transitions onto the program. This in turn suggests that a policy capable of retaining employment targeted at those ‘at risk’ of responding to lower incentives could effectively reduce the larger part of the adverse behavioral response.

Literature

Bargain, Olivier & Doorley, Karina, 2011.
"Caught in the trap? Welfare's disincentive and the labor supply of single men," Journal of Public Economics, Elsevier, vol. 95(9-10), pages 1096-1110, October.

Geerdsen, Lars Pico, 2006.
"Is there a Threat Effect of Labour Market Programmes? A Study of ALMP in the Danish UI System," Economic Journal, Royal Economic Society, vol. 116(513), pages 738-750, 07.

Graversen, Brian Krogh & van Ours, Jan C., 2008.
"How to help unemployed find jobs quickly: Experimental evidence from a mandatory activation program," Journal of Public Economics, Elsevier, vol. 92(10-11), pages 2020-2035, October.

Lee, David S. & Lemieux, Thomas, 2010.
"Regression Discontinuity Designs in Economics," Journal of Economic Literature, American Economic Association, vol. 48(2), pages 281-355, June.

Lemieux, Thomas & Milligan, Kevin, 2008.
"Incentive effects of social assistance: A regression discontinuity approach," Journal of Econometrics, Elsevier, vol. 142(2), pages 807-828, February.

Moffitt, Robert A. & Ben-Shalom, Yonatan & Scholz, John Karl, 2011.
"An Assessment of the Effectiveness of Anti-Poverty Programs in the United States," NBER Working Papers 17042, National Bureau of Economic Research, Inc.

Rosholm, Michael & Svarer, Michael, 2008.
"The Threat Effect of Active Labour Market Programmes," Scandinavian Journal of Economics, Wiley Blackwell, vol. 110(2), pages 385-401, 06.

Rosholm, Michael & Vejlin, Rune, 2010.
"Reducing income transfers to refugee immigrants: Does start-help help you start?," Labour Economics, Elsevier, vol. 17(1), pages 258-275, January.

Svarer, Michael, 2011.
"The Effect of Sanctions on Exit from Unemployment: Evidence from Denmark," Economica, London School of Economics and Political Science, vol. 78(312), pages 751-778, October.

Toomet, Ott, 2005.
“Does an Increase in Unemployment Income Lead to Longer Unemployment Spells? Evidence using Danish Unemployment Assistance Data,” Aarhus University Economics Paper, No. 2005-07

Appendix

Figure A1. 3rd order polynomial, men, response time 26 weeks

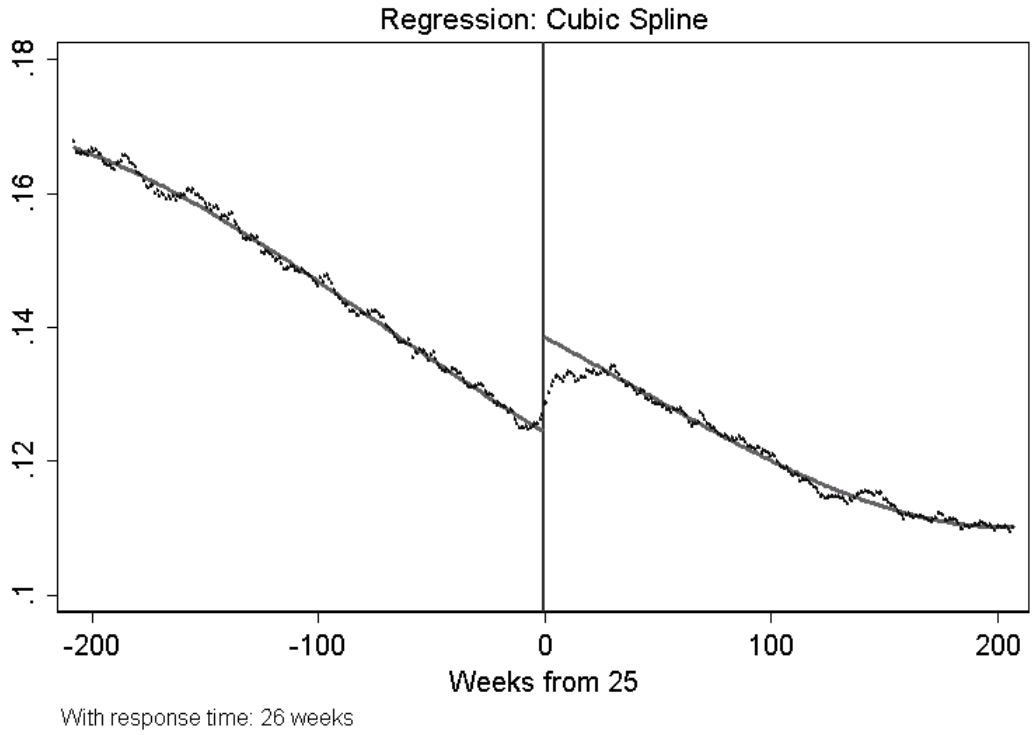


Figure A2. 4th order polynomial, women, response time 26 weeks