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# The effect of active labor market policies on crime: Incapacitation and program effects☆

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ABSTRACT

We estimate the effects of active labor market policies on men's crime. To do this, we exploit a local policy change in Denmark that targeted unemployed people without unemployment insurance. Our results show that crime rates decreased among treated men relative to both untreated unemployment insured and uninsured men. Lower property crime accounted for the decrease in overall crime. Increased earnings from higher employment rates cannot explain the decrease in crime. Instead, participation in the active labor market program reduced young men's propensity to commit crime. The results suggest that active labor market programs have substantial secondary effects on criminality.



## 1. Introduction

In 2015, OECD countries spent on average 0.53% of their GDP on active labor market programs (ALMPs), although research has shown that the direct effects of such programs on employment and income are modest (Card et al., 2010; Crépon et al., 2013; Heckman et al., 1999; Kluve, 2010). Nevertheless, the programs may have important secondary effects. First, mandatory ALMPs resemble workfare and can prevent the not-so-needy from claiming benefits intended for others (Besley and Coate, 1992, 1995). Second, making ALMPs mandatory can reduce problems of adverse selection into unemployment insurance (UI) schemes by separating workers with high and low utility of leisure (Kreiner and Tranæs, 2005). Third, policymakers have argued that being active has a value in itself (Torfing, 1999), for example by reducing anti-social behavior among the unemployed.[1]

In this article, we study the effects of ALMPs on one type of anti-social behavior, namely crime. The social benefit obtained from crime reduction can be substantial. Crime and its consequences impose strong negative externalities on both individuals and the community (see, for example, Aizer and Doyle, 2015; Czabanski, 2008; McCollister et al., 2010). Conventional methods of reducing crime, such as incarceration or increased policing, are generally costly. The crime-reducing effect of ALMPs does not have to be very large in order for ALMPs to represent net savings for the public purse compared to the cost of trials, incarcerations, victimization, and other expenses associated with crime.

ALMPs may impact crime both directly and indirectly. Indirectly through an increase in income either because the policies have an employment effect, or because some programs offer compensation at a higher level than unemployment benefits, lowering the relative benefit of crime in expected terms (Engelhardt et al., 2008). Participating in an ALMP can, however, also have a direct effect on crime, either because relief work, training, and education all reduce leisure time and thus leave less time for crime—an incapacitation effect (Aizer, 2004; Anderson, 2014; Berthelon and Kruger, 2011; Jacob and Lefgren, 2003)—or

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[1] From now on, we will use the terms *mandatory work and training requirement, mandatory work requirement, workfare, activation policy, active labor market policy*, and *active labor market programs* interchangeably, with the same meaning.

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because the programs positively change the lifestyle and goals of the participants—a socialization effect.

To test whether ALMPs affect crime, we study the relationship between a local active labor market policy and crime in Denmark, focusing on the effect for unemployed uninsured welfare recipients—a group with a high crime rate and for whom the employment effect of ALMPs has been particularly weak.[2] Building upon research showing that unemployment stimulates crime (e.g., Bell et al., 2014; Corman et al., 2014; Fougére et al., 2009) and that school attendance and after school programs can have an incapacitation effect (Aizer, 2004; Anderson, 2014; Berthelon and Kruger, 2011; Jacob and Lefgren, 2003; Landersø et al., 2017), we aim to identify the effect of "being active" on young men's propensities to commit crime.

We address the endogeneity issue of program participation by exploiting a radical municipal reform. In 1987, the Danish municipality of Farum (situated to the north of the Danish capital of Copenhagen) introduced immediate ALMP participation requirements for all individuals without unemployment insurance (no-UI individuals) who received welfare benefits. In the rest of Denmark, ALMP participation would normally not occur until no-UI individuals had received welfare benefits continuously for much longer periods, with very few exceptions to this rule—the Danish government did not introduce nationwide mandatory ALMP participation until the 1990s (and for most people only when they were far into their unemployment spells). Our results show that the introduction of the ALMP significantly and substantially reduced crime for no-UI men. We find that the main force behind the reduction was a decrease in property related offenses. The decrease occurred both on the intensive and extensive margin, and was driven at least partly by individuals who remained on welfare. The findings suggest that the effect of ALMPs on crime potentially is long-lasting and at least partly due to incapacitation.

The remainder of the paper progresses as follows: In Section 2, we discuss the relationship between unemployment and crime. Section 3 explains the institutional details of active labor market programs in Denmark. In Sections 4–7 present and analyze the Farum policy. In the final section we discuss the implications of our findings.

## 2. Unemployment, crime, and ALMPs

The social science literature has argued for the existence of a strong positive relationship between unemployment and crime for almost a hundred years (see Cantor and Land, 1985 for details). Early reviews of the literature can be found in Wilson (1983), Long and Witte (1981), and Chiricos (1987). A growing number of recent studies corroborates the earlier findings (e.g. Corman et al., 2014; Fougére et al., 2009; Imai and Krishna, 2004). When examining specific types of crime, research finds positive relationships between unemployment and especially property crime (see Chalfin and McCrary, 2014, for review), and has also linked long-term unemployment to violent crime (Nordin and Almén, 2017).

In his seminal 1968 work, Becker posited that individuals engage in crime when the expected returns to crime are higher than the expected returns obtainable through earnings on the labor market. Both individual employment status and local unemployment levels affect expected earnings, and through that the likelihood of engaging in criminal activity. However, the unemployed likely also forgo other pro-social benefits of employment that also affect crime. First, when employed, people engage in a number of forms of routine behavior under the auspices of other non-criminal peers. Routine action theory (RAT) (e.g., Cohen and Felson, 1979) predicts that the presence of such capable guardians, as well as the absence of suitable targets for crime when working, will dampen the likelihood of committing crime even for people who are likely offenders. Based on RAT, employment functions as a form of incapacitation similar to what research on the relationship between school attendance, supervision, and crime has found (Aizer, 2004; Anderson, 2014; Berthelon and Kruger, 2011; Jacob and Lefgren, 2003; Landersø et al., 2017). Simply put, spending time at work leaves less time, energy, and opportunity to engage in criminal activities.

Second, employment may function as a turning point for both potential and active offenders (Hagen, 1993; Sampson and Laub, 1995; Uggen, 2000). Work embeds people in pro-social environments. In such environments, peers may expose potential offenders to law-abiding norms (Buonanno et al., 2009; Mehlkop and Graeff, 2010), thereby either causing a normative shift, or imposing a fear of sanctions from peers among individuals considering engaging in criminal activities. In both cases, employment imposes a socializing effect.

Although ALMPs are not regular employment, they do share structural aspects with regular employment (and are intended, at least officially, to lead to regular employment). Whereas employees sell their labor for wages, participants in mandatory ALMPs have to participate in order to remain eligible for welfare benefits. ALMP participants have to adhere to a time schedule similar to a work schedule, and are subject to the same drug and alcohol policies that most employees are. ALMPs also embed participants in new social groups – either through job training at actual companies, or through participation in other types of activation alongside other ALMP participants (although such peers may be more crime prone than colleagues met through regular employment). In these ways, ALMPs are similar to normal employment, with the differences being that welfare benefits are lower than wages, ALMP participation is meant to be temporary, and the average ALMP participant may be less law abiding than the average employed individual. We do believe, however, that there exist enough similarities between ALMPs and employment to expect that introducing mandatory ALMPs may have a substantial effect on crime—both because ALMPs impose incapacitating time constraints, and because ALMPs force participants into new social environments.

As mentioned above, unlike the pro-social peer environments created by employment, ALMPs may create a more criminogenic milieu if ALMPs allow a large number of crime-prone individuals to interact with each other (see Bayer et al., 2009; Corno, 2017; Damm and Dustmann, 2014, for studies of the effect of direct and indirect exposure to criminal peers). Whether negative peer effects occur will likely depend on the concentration of active criminal peers in each particular ALMP, raising important questions about external validity of individual ALMPs depending on peer mixing. Although this line of inquiry would likely have high scientific value, studying the moderating effect of peer group composition is outside the scope of the present study.

## 3. Unemployment and welfare in Denmark

In Denmark, unemployed individuals fall into two categories: those who are members of an unemployment insurance fund (UI fund), which is a voluntary public system in Denmark (see Parsons et al., 2015), and those who are not. The former are entitled to UI benefits and the latter to means-tested social assistance benefits (also called welfare benefits). Unemployed individuals with personal savings or an employed spouse may not be entitled to any assistance, or may be subject to some reduction in the amount of benefit they can receive unless they are members of a UI fund. At the beginning of the 1990s, an individual had to be working for an employer, be self-employed, or to have participated in a recognized type of post-secondary education for at least 18 months to qualify for membership of a UI fund.

[2] For Denmark, both Bolvig et al. (2003) and Graversen (2004) find that most training programs have a large lock-in effect, which reduces the transition out of unemployment during the program period, but that they only have modest treatment effects after the program-period. Bolvig et al. (2003) find negligible lock in effects and strong treatment effect for both private and public employment programs, whereas Graversen (2004) finds the treatment effect only for the private employment programs. But Graversen also finds that private employment programs are more effective with workers who have characteristics that make them more employable than the other welfare recipients. Recent international meta-analyses finds similar results (Card et al., 2010; Kluve, 2010).

Individuals eligible for welfare benefits are on average younger, less highly educated, have less work experience, and have had longer unemployment periods compared to individuals eligible for UI (see Graversen, 2004). Welfare benefits eligible individuals also tend to be less integrated in society, more likely to suffer from alcohol or drug abuse, and more likely to have physical or mental health problems. Furthermore, a relatively large fraction of the welfare benefit recipients in Denmark are composed of immigrants and refugees. For the period we study, more than two thirds of immigrants and refugees are not included in the official unemployment statistics, since they are not considered to be immediately available for work (Graversen, 2004). Both UI and welfare benefits are administered locally, through the local UI fund and the local municipalities, respectively. For UI benefits, local UI funds have to follow the national policy strictly. For welfare benefits, municipalities are allowed to, or at least are tolerated to, deviate substantially from the national policy. During the 1990s, several changes were made to the welfare benefit system. Increasingly, emphasis was placed workfare (activation). In our analysis, we consider how a radical activation policy carried out at the local level affected crime. But first we give a more detailed overview of UI and welfare benefit policies in Denmark, to outline precisely who such policies target.

### 3.1. Unemployment insurance and welfare benefits in Denmark

Membership of an unemployment insurance (UI) fund is voluntary in Denmark, and workers must be members to collect UI benefits in the event of unemployment. The scheme is state-subsidized. The government decides most parameters, such as the size and duration of benefits and the size of the insurance premium (the UI-fund membership fee). The fee is set so that the scheme breaks even at an unemployment rate of approximately three percent. The benefit is proportional to previous earnings, up to a relatively low maximum, and the replacement rate – set at 90% of previous earnings – has always been high in international terms. Graduates from tertiary educational programs can enter the UI system directly after finishing their education, but start out with a lower level of UI benefits.

Uninsured workers who become unemployed, and insured workers whose UI benefits have expired because of the length of their unemployment period, are entitled to welfare benefits in the form of social assistance (SA), named in Danish by a term that translates literally as "cash aid." Welfare benefits are means-tested benefits and not based on an individual's previous earnings, but rather on current family income and savings, and on the presence or absence of dependent children (under the age of 18) in the household—e.g., having an employed spouse may lead to a decrease in benefits depending on the spouse's income. The local municipal government administers the SA benefit payments in accordance with the benefit scheme rules established at the national level. The SA benefit level for individuals without children is set at 60% of the maximum UI benefit (if the individual is married to a person who has an income, then the amount of the spouse's income that is in excess of the basic SA level is deducted from the SA benefits). Individuals with dependent children get 80% of the maximum UI benefits (also means-tested).

In 1994, the Danish government linked the SA benefit level to the UI maximum benefit level. The same legislation established that SA benefits were to be taxable, just as the UI benefits had been for decades. The indexation levels, 60% and 80%, were set so the net benefits were approximately the same before and after 1994 for people with low incomes, such as young uninsured unemployed individuals.

Social Assistance is for needy individuals. The SA system does not consider those entitled to another form of public transfer as needy. The recipient restriction excludes students, pensioners, and insured UI-fund members from receiving SA benefits, and leaves the following three categories of people as being eligible for SA: (1) registered unemployed individuals who are not insured in a UI-fund; (2) long-term unemployed individuals who are members of a UI-fund but whose benefit entitlement has expired; and (3) jobless individuals who are not registered as being unemployed because of social or health problems (but who are not sick enough to receive a disability pension).

## 4. The Farum ALMP

During the 1980s, Danish municipalities only activated unemployed individuals receiving welfare payments after long periods of unemployment, and only if the municipality believed that the unemployed person was unwilling or incapable of finding work themselves. The activation programs in Farum, a mid-sized Danish municipality half an hour's drive north of the capital of Copenhagen, were similar in character until the end of 1986, focusing on employment/activation in service jobs within the municipality, such as, e.g., shoveling snow for the elderly and cleaning up local nature reserves (Birkbak, 1997, p. 13). However, from May 1987, the municipality made a series of radical changes to its activation policy for unemployed uninsured welfare recipients.

First, Farum introduced mandatory ALMP participation from the first day no-UI people applied for welfare (SA benefit payments), requiring that welfare recipients showed up for "workfare" at 7 a.m., Monday through Friday, in order to be eligible for benefits. Second, activation took place either in private firms or at the local municipality run activation facility called the "Production House." In both cases, activated individuals received *only* welfare benefits payments. Third, from 1988 individuals with minor physical or mental disabilities who received welfare benefit payments were also subject to lighter forms of activation (individuals receiving disability pension did not participate in the program). Alcoholics and drug addicts were sent for mandatory treatment.[3] From 1990, *all* uninsured welfare recipients were subject to immediate activation. Farum made no distinctions based on age, gender, education, language abilities, ethnic background, or any demographic characteristic (other than mental or physical disabilities) (Birkbak, 1997).

In late 1990s and early 2000s, Farum relaxed their activation policies in response to a series of lawsuits from Danish labor unions and complaints from the Ministry of Employment alleging that the policies violated the laws protecting workers and gave unfair competitive advantages to some firms. Despite the heavy criticisms, the Danish national government effectively adopted schemes resembling those of Farum, so that by 1999 welfare recipients below the age of 30 were placed in mandatory activation after shorter periods of unemployment. Later reforms in 2002 further increased the similarities. The main difference was that the other municipalities enforced the national policy to a weaker extent than what had been the case in Farum.[4]

We use the introduction of immediate ALMP requirements in Farum as treatment and examine the causal effect of participation requirements on crime in Farum compared to the rest of Denmark. Fig. 1 shows the impact of the ALMP reform in Farum on total crime rates, property crime rates, violent crime rates, and the residual category of "other crimes". From 1987, when Farum implemented the reform, the crime rate among no-UI men dropped below the national average for no-UI men. The difference in crime rates remained until the close of the 1990s. Farum disbanded its tough ALMP policy around 2000, while the rest of Denmark at the same time strengthened the general ALMP requirements for the unemployment uninsured. As seen from Fig. 1, Farum's crime rate for no-UI men then caught up to the rest of Denmark. For the same period, there was no discernible difference in crime rates across Farum and the rest of Denmark for unemployment insured (UI) men, who did not face any special ALMP policy if living in Farum (see Fig. 2 in the following

[3] However, this group was small, accounting for only a handful of individuals a year according to the Danish substance abuse treatment database.

[4] During the 2000s the municipality of Farum also saw massive political scandals, leading to the conviction and incarceration of the Mayor Peter Brixtofte for fraud, misuse of office, and misappropriation of funds. The criminal activities of the mayor had, however, no barring on the activation policies implemented, because these activities first began occurring halfway through the 1990s.

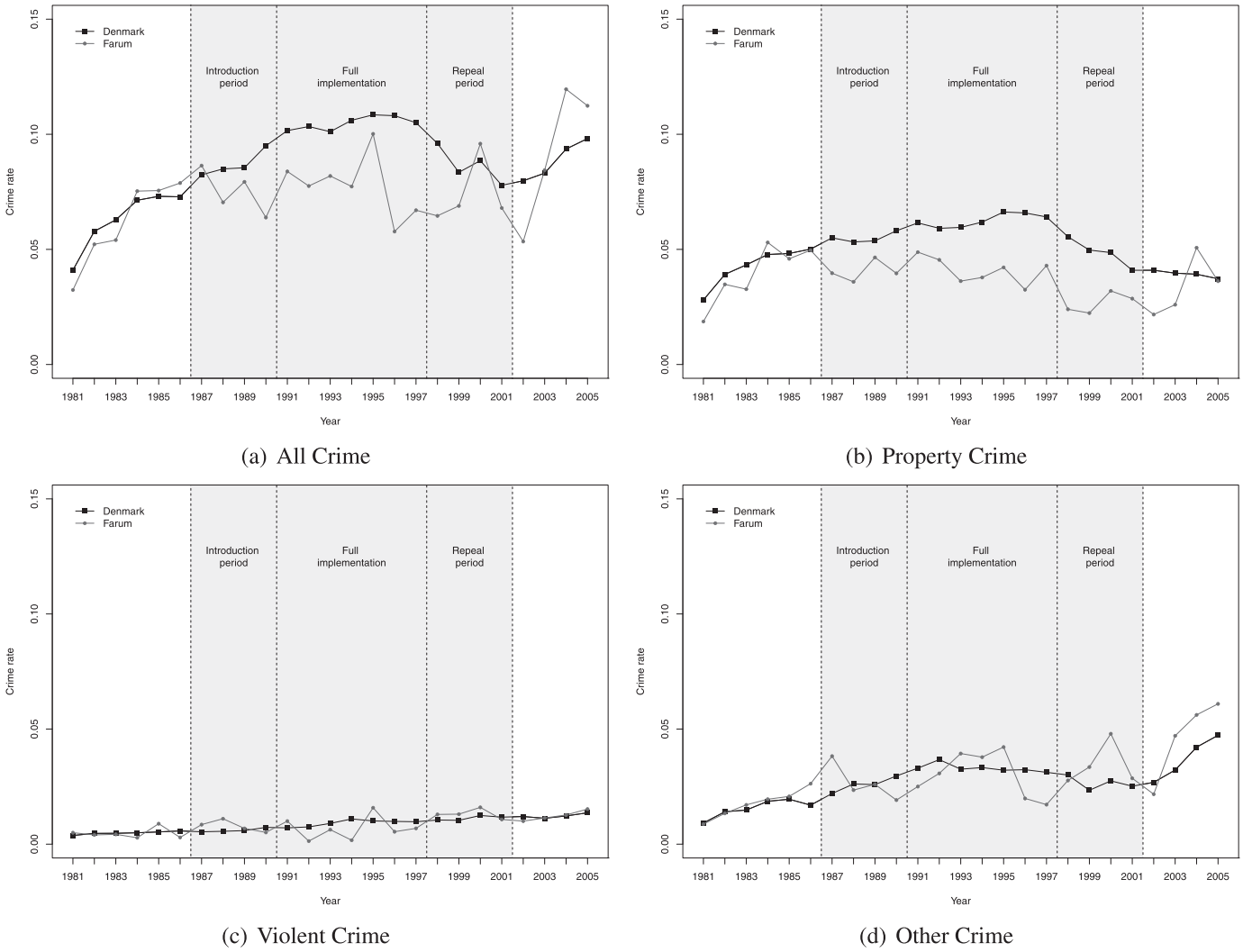


**Fig. 1.** The average annual number of crimes per capita (crime rate) in Farum and the rest of Denmark, unemployment uninsured men (no-UI) men age 18–35 years across crime types, 1981–2005.
*Note*: The figures show the annual crime rate from 1981 to 2005 in the municipality of Farum compared to the rest of Denmark for all men age 18–35 without unemployment insurance and who were not enrolled in educational programs. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001.
*Source*: Own calculations on data from Statistics Denmark.

section). As also seen from Fig. 1, the entire crime reduction in Farum appears driven by a decrease in property crime, with no visible response for violent crimes or other crimes (including drug offenses).

Table 1 shows the distribution of crimes among no-UI men in Farum and the rest of Denmark. Approximately 94% of the sample did not commit any crime in a given year, and there is little difference in the distribution of annual number of crimes between the two groups. Around 4.5% committed one crime, around 1% committed two crimes, and the last 0.5% committed three crimes or more. Thus, most of the variation occurs on the extensive margin. For that reason, we both consider whether the policy affected crime on the extensive margin (did fewer men commit crime) and whether the policy affected crime on the intensive margin (did men commit fewer crimes).

**Table 1**
Distribution of annual number of crimes committed for no-UI men in Farum and Denmark.

| Annual number of committed crimes | Farum | Denmark |
|---|---|---|
| 0 | 0.945 | 0.939 |
| 1 | 0.043 | 0.045 |
| 2 | 0.009 | 0.011 |
| 3 | 0.003 | 0.003 |
| 4 | 0.001 | 0.002 |
| 5+ | <0.001 | <0.001 |
| Number of person years | 16,236 | 411,041 |

*Note*: Table shows the distribution of crimes for the main sample of no-UI men divided by whether the men lived in the treatment municipality Farum or in the rest of Denmark. Crime included all conviction for non-traffic related offenses. The maximum number of annual crimes observed for Farum is less than ten. To ensure that no individual may be identified in the data, we do not report shares derived from sample sizes smaller than 5 observations.
*Source*: Own calculations on data from Statistics Denmark.

## 5. Data

All Danish residents have a unique personal identification number, which allows us to create a detailed panel data set drawn from the en-

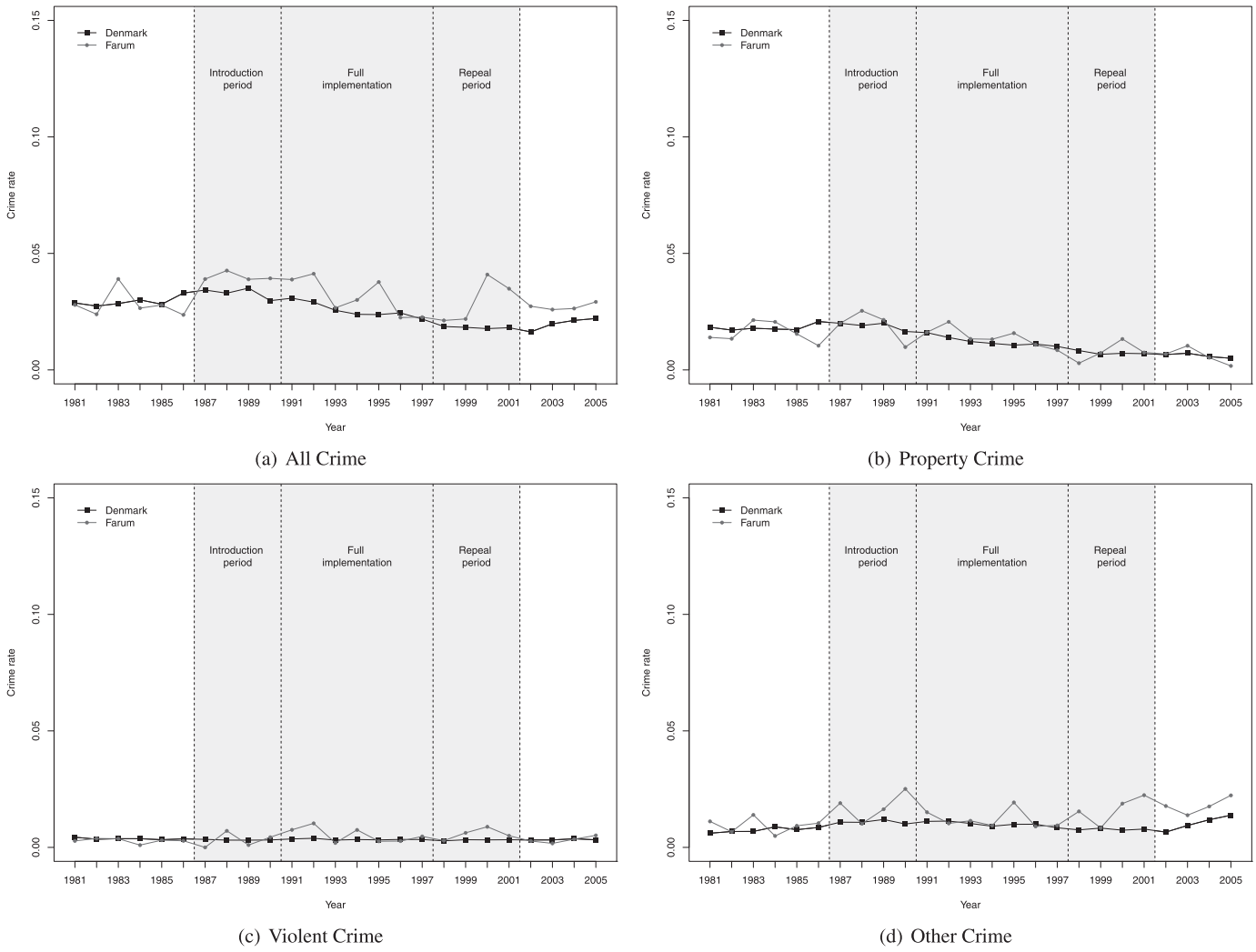


**Fig. 2.** The average annual number of crimes per capita (crime rate) in Farum and the rest of Denmark, unemployment insured men (UI) men age 18–35 years across crime types, 1981–2005.
*Note*: The figures show the annual crime rate from 1981 to 2005 in the municipality of Farum compared to the rest of Denmark for all men age 18–35 with unemployment insurance who were not enrolled in an educational program. The unemployment insured were *not* targeted by the intensive workfare policy that Farum enacted in 1987, and also did not see radical changes in activation requirements at the national level.
*Source*: Own calculations on data from Statistics Denmark.

tire Danish population. The data has information on demographics, education, and labor market outcomes. From the police departments we also link information on each individual's criminal record. We focus on men between the ages of 18 and 35. Men in this age group have the highest crime rate compared to any other demographic groups, with the age-crime profile peaking around age 18–20 (Landersø et al., 2017). Approximately 25% of all Danish men have been convicted before the age of 30 (Tranæs and Geerdsen, 2008). At the same time, individuals in this specific age group have been the target of numerous labor market reforms since the late 1980s (Bach, 2002), some local and some national. We draw upon this unique data to evaluate how the Farum ALMP affected eligible men's crime.

### 5.1. Crime measures

Our measure of criminal activity is the annual number of criminal acts leading to convictions that an individual commits, disregarding traffic violations. From now on we will simply call it crime. We also simply call the average number of crimes for a group the crime rate. We measure crime at the day an individual committed the act. We obtain information on criminal activity from the Central Crime Register. The data consist of all charges filed against individuals. The information includes whether the case went to court and the subsequent verdict, including whether the charges were withdrawn or not, and whether the case was dismissed in court or not. We further break the crime rate down into three types: property crime (e.g., burglary, shoplifting, and theft), violent crimes (e.g., assault, rape, and manslaughter), and other crimes (e.g., drug-related offenses). We present both the annual number of convictions for each crime type, as well as a binary indicator of any conviction for each crime type a given year.

### 5.2. Descriptive statistics for Farum and the rest of Denmark

In Table 2 we present sample statistics for the variables used in our analysis. The sample consists of all men between age 18 and 35 in the municipality of Farum from year 1981 to 2005, and the corresponding 10% random sample drawn from the rest of Denmark. We choose to compare the residents of Farum to a random sample of all Danish men instead of a sample of neighboring, or similar, control municipalities. The neighboring municipalities to Farum are very different from both Farum and, on average, Denmark. Farum is located between more rural municipalities to west, and more affluent municipalities to the east. Farum's position as the "odd one out" in the local area is partly attributable to an urban and transit development plan known as the *Finger Plan* going back

**Table 2**
Annual sample statistics comparing men Age 18–35 in Farum to men in rest of Denmark (DK) across UI status, 1981–2005.

| | DK no-UI | Farum no-UI | All no-UI | DK UI | Farum UI | All UI |
|---|---|---|---|---|---|---|
| Crime, All | 0.086 | 0.074 | 0.086 | 0.026 | 0.031 | 0.026 |
| | (0.401) | (0.353) | (0.399) | (0.192) | (0.238) | (0.193) |
| Crime, Property | 0.050 | 0.037 | 0.050 | 0.013 | 0.014 | 0.013 |
| | (0.289) | (0.236) | (0.287) | (0.132) | (0.129) | (0.133) |
| Crime, Violence | 0.008 | 0.008 | 0.008 | 0.003 | 0.004 | 0.003 |
| | (0.096) | (0.093) | (0.096) | (0.061) | (0.068) | (0.061) |
| Crime, Other | 0.027 | 0.029 | 0.029 | 0.009 | 0.013 | 0.009 |
| | (0.202) | (0.193) | (0.193) | (0.106) | (0.166) | (0.108) |
| $I$(Crime, All > 0) | 0.061 | 0.055 | 0.061 | 0.022 | 0.025 | 0.022 |
| | (0.239) | (0.229) | (0.239) | (0.145) | (0.155) | (0.146) |
| $I$(Crime, Property > 0) | 0.038 | 0.030 | 0.038 | 0.012 | 0.012 | 0.012 |
| | (0.192) | (0.171) | (0.191) | (0.107) | (0.109) | (0.107) |
| $I$(Crime, Violence > 0) | 0.008 | 0.008 | 0.008 | 0.003 | 0.004 | 0.003 |
| | (0.089) | (0.087) | (0.089) | (0.057) | (0.062) | (0.057) |
| $I$(Crime, Other > 0) | 0.023 | 0.024 | 0.023 | 0.008 | 0.011 | 0.008 |
| | (0.150) | (0.156) | (0.150) | (0.091) | (0.103) | (0.091) |
| Age | 26.872 | 26.320 | 26.850 | 26.922 | 27.306 | 26.933 |
| | (5.391) | (5.520) | (5.397) | (4.479) | (4.879) | (4.796) |
| Year | 1992.748 | 1992.197 | 1992.727 | 1992.483 | 1992.167 | 1992.476 |
| | (7.257) | (7.163) | (7.254) | (7.001) | (6.878) | (6.998) |
| $Policy_{1987-01}$ | | 0.592 | 0.022 | | 0.631 | 0.015 |
| | | (0.491) | (0.148) | | (0.482) | (0.121) |
| High school[b] | 0.387 | 0.373 | 0.386 | 0.650 | 0.656 | 0.651 |
| | (0.487) | (0.483) | (0.487) | (0.477) | (0.475) | (0.477) |
| Married | 0.245 | 0.280 | 0.246 | 0.327 | 0.441 | 0.330 |
| | (0.430) | (0.445) | (0.431) | (0.469) | (0.496) | (0.470) |
| Children | 0.244 | 0.279 | 0.246 | 0.379 | 0.452 | 0.381 |
| | (0.429) | (0.448) | (0.430) | (0.485) | (0.498) | (0.486) |
| Western/Danish | 0.925 | 0.892 | 0.923 | 0.965 | 0.850 | 0.962 |
| | (0.264) | (0.311) | (0.266) | (0.183) | (0.357) | (0.190) |
| Earnings[c] | 1.311 | 1.634 | 1.323 | 2.097 | 2.336 | 2.103 |
| | (1.399) | (1.571) | (1.407) | (1.076) | (1.292) | (1.082) |
| Share of year on welfare[d] | 0.179 | 0.115 | 0.177 | 0.027 | 0.037 | 0.027 |
| | (0.333) | (0.258) | (0.330) | (0.130) | (0.153) | (0.131) |
| In same muni. as parent(s) | 0.454 | 0.459 | 0.454 | 0.481 | 0.326 | 0.477 |
| | (0.498) | (0.498) | (0.498) | (0.500) | (0.469) | (0.499) |
| In same home as parent(s) | 0.222 | 0.302 | 0.225 | 0.131 | 0.138 | 0.131 |
| | (0.416) | (0.459) | (0.418) | (0.337) | (0.345) | (0.337) |
| Both parents in Farum | 0.006 | 0.277 | 0.017 | 0.003 | 0.224 | 0.008 |
| | (0.080) | (0.447) | (0.128) | (0.057) | (0.417) | (0.092) |
| Both parents outside Farum | 0.614 | 0.230 | 0.599 | 0.675 | 0.322 | 0.667 |
| | (0.487) | (0.421) | (0.490) | (0.468) | (0.467) | (0.471) |
| $N^*T$ | 410,816 | 16,227 | 427,043 | 986,573 | 23,608 | 1,010,181 |

*Note*: Table shows the means and standard deviations of dependent variables and covariates for the full sample of UI men and no-UI men as well as the two samples divided by whether or not they reside in the treatment municipality Farum for the period 1981–2005. The municipality enacted a radical activation policy for no-UI unemployed people in the period 1987–2001. Unemployment insured (UI) includes all men who were member of an unemployment insurance fund. Unemployment uninsured (no-UI) include all men who were uninsured and not enrolled in an educational program.
*Source*: Own calculations on data from Statistics Denmark.
[a] High school degree or higher.
[b] Earnings measured in DKK 100,000 at 2000-level.
[c] Only available from 1984 and onward.

as far as 1947 (see Knowles, 2012, for details). Comparatively, residents of Farum are more similar to the general Danish population than to individuals in their neighboring municipalities. All variables presented in Table 2 are time-variant. For an overview of time-invariant characteristics, we refer to Table A.1 in Appendix.

From Table 2 we see that the average age of no-UI males in Farum is lower than for the rest of Denmark. Similarly, the average age of UI males in Farum is higher than those in the rest of Denmark. That is, in Farum fewer young men were insured against unemployment than in the rest of Denmark. The more pronounced differences between Farum and the rest of Denmark were in the marriage rate, likelihood of having children, and the share of non-Danish/western immigrants and descendants. Men between 18 and 35 years of age in Farum were more likely to be married, have children, and come from a non-Western background.

Furthermore, the UI men were on average older and more highly educated than the no-UI men were. Note that high school includes all 12 year programs, including vocational-tracked high school that does not give access to enter higher education, but does give access to the UI system. In Farum, the unemployment insured were 57% more likely to be married than the no-UI group were, and in the rest of Denmark, the UI group were 33% more likely to be married than the no-UI group were. In the rest of Denmark, the proportion of the population made up

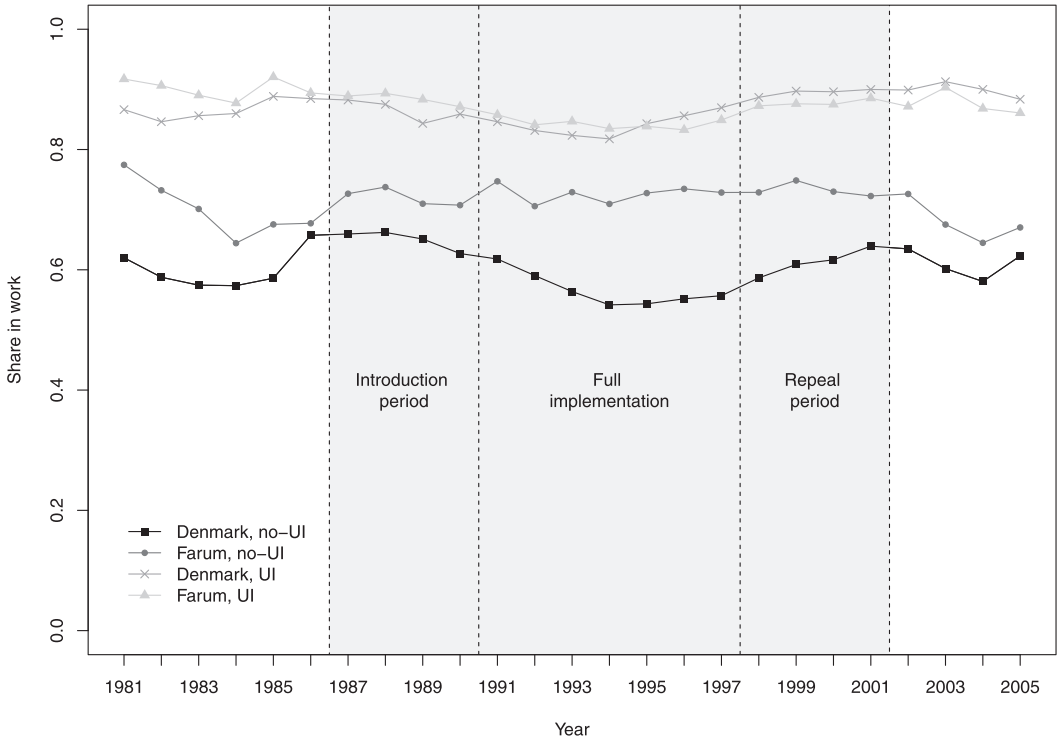


**Fig. 3.** Annual share of UI and no-UI men in work in Farum and Denmark age 18–35, 1981–2005.
*Note*: The figure show the annual share of unemployment insured (UI) and unemployment uninsured (no-UI) men age 18–35 in the municipality of Farum compared to the rest of Denmark who were employed measured end of November for each year. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality of Farum. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001. The UI group were not subjected to strict or immediate activation requirements, neither at the local nor the national level.
*Source*: Own calculations on data from Statistics Denmark.

of native Danes and immigrants from Western countries was larger for the unemployment insured than for the uninsured, but the opposite was the case in Farum.

Next, we note that the annual crime rate for the no-UI men is more than three times as high as that for the UI men, both in Farum and in the rest of Denmark. Among no-UI men, property crime accounts for around 60% of all crime, where for UI men it accounts for 50%. The indicator for committing any annual crime is less than three times higher, indicating that criminally active no-UI men commit more crime than criminally active UI men do.[5]

In addition, we see that whereas neither violent nor the other crime types differ substantially between the annual extensive and intensive margins, there is a substantial difference between the margins for property crime. Thus, if the Farum policy decreased property crime, it could both be along the intensive and the extensive margins. The crime rate for insured individuals is higher in Farum than in the rest of Denmark. For no-UI men, the crime rate is lower in Farum than the rest of Denmark, but completely driven by lower property crime rates. This difference could be partly due to the fact that during the sample period, the no-UI individuals in Farum were subject to a very strict activation policy, which, we argue, reduced their criminal activities.

Yet, other explanations also exist. In Farum, the no-UI men were also twice as likely to be living with their parents as the insured men were. In the rest of Denmark, the unemployment uninsured men also were more likely to stay with parents than the UI individuals, but the difference is not as large as in Farum. Last, in Farum the uninsured were more likely to live in the same municipality as their parents than the insured, but in the rest of Denmark, the insured had a slightly higher probability of doing so than the uninsured. These differences could also explain the difference in crime rates between Farum and the rest of Denmark for the no-UI groups, if living with parents causes no-UI men to experience stronger degrees of social control through parental oversight.

Recall that in Fig. 1 we plotted the crime rates for the no-UI men in Farum. The crime rates for uninsured young men did not differ between Farum and the rest of Denmark until 1987. Thereafter, we see the crime rate for the rest of Denmark starting to increase, whereas the rate for Farum remained constant. The gap between Farum and the rest of Denmark lasted until around 1998, when the crime rate for the rest of Denmark started to decline to the level of Farum. Fig. 2 shows the crime rates for UI men. We do not see any large discrepancy between the crime rates of the UI men in Farum and the rest of Denmark until around year 2000. The increase in the crime rate in Farum after that date was due to an increase in crime types such as fraud and substance-related offenses.

We only see the divergence in crime rates between Farum and the rest of Denmark for no-UI men—and Farum instituted immediate ALMP participation only for no-UI individuals. Hence, we suspect that the relative decline in crime rates among the uninsured men in Farum from around 1987 onward was primarily caused by the intensive ALMP policy. Fig. 3 plots the annual share of UI and no-UI men in Farum and the rest of Denmark who were registered as employed at end of November each year. We do see an indication of an employment increase among no-UI men in Farum around the time of the implementation of the policy, which lends credence to the argument that increased employment caused by the strict new activation policy contributed to a drop in crime.

[5] This finding is also echoed in the time-invariant characteristics presented in Table A.1 in Appendix, where the share of no-UI men who ever commit crime while in the sample is only around 15% higher than the share of UI men who ever commit crime while in the sample is.

However, as we show in the results section, crime in Farum actually only significantly decreased for those who remained unemployed for large portions of the year, and we see no effect of the policy on men's gross income.

There could be other explanations for the relationship between the timing of the changes in rules relating to ALMPs, the decrease in crime, and the uptake in employment. One possibility is that during the policy period, the composition of the unemployment uninsured group in Farum diverged dramatically from that of the rest of Denmark, and thus their labor supply behavior diverged as well. To take such factors into account, we carefully control for observed characteristics, as well as conduct fixed effect estimations.

## 6. Models for evaluating the Farum policy

To evaluate the effect of the policy reform in Farum, we use the following linear difference-in-differences model:

$$C_{it} = X_{it}\beta + \sum_{a=19}^{35} I_a(a_{it})\gamma_a + \sum_{y=1982}^{2005} I_y(t)\gamma_y + \sum_{k=2}^{274} I_k(k_{it})\gamma_k + I_F(k_{it}) \times I_P(t)\delta + \epsilon_{it} \quad (1)$$

where $C_{it}$ is the annual number of crimes committed of individual $i$ in period $t$, $X_{it}$ is the vector of individual control variables, $I_a$ is the age dummy for age $a$, $I_y$ is the year dummy, and $I_k$ is the municipality dummy, which equals 1 if individual $i$ lives in municipality $k$ in period $t$, i.e. if $k_{it} = k$, and 0 otherwise. $I_F$ is the Farum dummy, which equals 1 if individual $i$ lives in period $t$ in Farum municipality, i.e. if $k_{it} = F$, and 0 otherwise. $I_P$ is the policy dummy, which equals 1 if the time period $t$ belongs to the policy period in Farum, and 0 otherwise. The policy effect is identified by the parameter $\delta$.

We estimate Eq. (1) for no-UI and UI men separately. $\delta$ is the unbiased OLS estimator if $\epsilon_{it}$ is orthogonal to $I_F \times I_P$, and the parallel trends assumption is met. As seen from Fig. 1, prior to the reform, both UI and no-UI men in Farum had crime rates that were very close to parallel and of similar magnitudes as men from the rest of Denmark with the same insurance status. Thus, alone from inspecting Fig. 1, the parallel trends assumption so far appears feasible.

We further test the parallel trends assumption by including leads following the approach by Autor (2003), allowing the time trends for Farum to differ from the rest of the sample pre-policy period.

$$Y_{iy} = X_{iy}\beta + \sum_{a=19}^{35} I_a(a_{it})\gamma_a + \sum_{y=1982}^{2005} I_y(t)\gamma_y + I_F(k_{iy}) + \sum_{y=1981}^{1986} I_y(t)\phi_y \times I_F(k_{iy}) + I_F(k_{it}) \times I_P(t)\delta + \epsilon_{iy} \quad (2)$$

where $Y_{yt}$ is the crime outcomes (all crime, property crime, violent crime, and other crime) for individual $i$ in year $y$, $X_{iy}\beta$ capture observables (being married, having children, and higher education), $I_F$ is a dummy for living in Farum, $\phi_y$ is a set of estimates for lead dummies capturing time trends in Farum pre-policy. The policy effect is identified by the parameter $\delta$. We report the results from the model as part of the Results section, but there is no evidence of different pre-policy trends in crime for Farum compared to the rest of Denmark, and the policy parameter does also not change substantially. However, other potential issues remain: a) possible correlation between the error-term and treatment status; and b) serial correlation in the error term leading to overrejection of the null hypothesis (Bertrand et al., 2004).

### 6.1. Challenges to identification

The above OLS estimation is subject to two sources of bias. First, those who were uninsured could have changed their status from no-UI to UI during the policy period to avoid ALMP participation. Indeed, later we present evidence that during the policy period, the level of UI membership in Farum relative to that of the rest of Denmark was higher than in other periods. However, this endogeneity bias would tend to reduce the estimated policy effect for the no-UI men in Farum, since the individuals who would switch from no-UI to UI status during the policy period would be those who were more likely to have better labor market prospects and be less criminally inclined than the rest of the no-UI group. Thus, the OLS policy effect would be a conservative estimate. At the same time, the switch in UI status would increase the crime rate of the UI men during the policy period, which would bias their policy effect estimates upwards.

Second, individuals who were more criminally inclined could have left Farum during the policy period, which could have been the reason for the reduction in arrests in Farum during the policy period. This is a more serious issue, because *a priori* we cannot be sure of the direction of the bias of such selective mobility. To deal with it, we first estimate the difference-in-differences model with individual-level fixed effects. That is, we add fixed effects to the above equation as follows:

$$C_{it} = X_{it}\beta + \sum_{a=19}^{35} I_a(a_{it})\gamma_a + \sum_{y=1982}^{2005} I_y(t)\gamma_y + \sum_{k=2}^{274} I_k(k_{it})\gamma_k + I_F(k_{it}) \times I_P(t)\delta + \alpha_i + \epsilon_{it} \quad (3)$$

The fixed effects estimator then will be unbiased if

$$E\left[\epsilon_{it}|I_P(t)=1, I_F(k_{it})=1, X\right] - E\left[\epsilon_{it}|I_P(t)=0, I_F(k_{it})=1, X\right] - \left\{E\left[\epsilon_{kt}|I_P(t)=1, I_F(k_{it})=0, X\right] - E\left[\epsilon_{kt}|I_P(t)=0, I_F(k_{it})=0, X\right]\right\} = 0$$

and biased if LHS is non-zero. Bias occurs if people who left Farum during the policy period committed more crimes afterwards, and if people who came to Farum during the policy period committed more crimes before, even after controlling for Farum and time dummies. That is, if the time-varying component of the error term of the crime equation is correlated with Farum dummy.

We use the Heckman sample selection procedure to formally deal with the selection issue (Heckman, 1979). That is, we run the following first stage probit:

$$\Pr\left(I_F(k_{it}) = 1|Z_{it}\right) = \Phi\left(\theta Z_{it}\right) \quad (4)$$

where $Z_{it}$ includes constant term, $X_{it}$, age and time dummies. As an exclusion restriction, we include in $Z_{it}$ dummies indicating whether both parents live in Farum or not and whether both parents live outside Farum or not. Then, we estimate the following second stage regression model:

$$C_{it} = X_{it}\beta + \sum_{a=19}^{35} I_a(a_{it})\gamma_a + \sum_{y=1982}^{2005} I_y(t)\gamma_y + \sum_{k=2}^{274} I_k(k_{it})\gamma_k + \lambda_1\left(Z_{it}\right)I_F(k_{it})\gamma_{F1} + \lambda_2\left(Z_{it}\right)\left(1 - I_F(k_{it})\right)\gamma_{F2} + I_F(k_{it}) \times I_P(t)\delta + \alpha_i + \varepsilon_{it} \quad (5)$$

where

$$\lambda_1(Z_{it}) = \frac{\phi(\theta Z_{it})}{\Phi(\theta Z_{it})}, \lambda_2(Z_{it}) = \frac{\phi(\theta Z_{it})}{1 - \Phi(\theta Z_{it})}$$

are the inverse Mill's ratios used to correct for the endogeneity bias due to selection. The first term, $\lambda_1$ is used to correct for sample selection bias on crimes committed in Farum and the second term, $\lambda_2$ is the one for the correction of the sample selection bias of crimes committed in the rest of Denmark.

The exclusion restriction is that parents' residential decision affects the decision of individuals to live in Farum or elsewhere, but not the individuals' decisions to commit crime. The restriction could be violated when criminally inclined children leave Farum to avoid activation and parents follow, when parents of criminally active children are on welfare themselves and leave Farum to avoid activation, or if parental

**Table 3**
OLS models estimating the effect of the Farum policy on crime rates for no-UI men.

| | OLS1 | OLS2 | OLS3 | FE1 | FE2 | FE3 |
|---|---|---|---|---|---|---|
| High school | −0.050*** | −0.050*** | −0.050*** | 0.042*** | 0.042*** | 0.042*** |
| | (0.002) | (0.002) | (0.002) | (0.003) | (0.003) | (0.003) |
| Married | −0.018*** | −0.018*** | −0.018*** | 0.013*** | 0.013*** | 0.013*** |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Children | −0.015*** | −0.015*** | −0.015*** | −0.002 | −0.002 | −0.002 |
| | (0.002) | (0.002) | (0.002) | (0.003) | (0.003) | (0.003) |
| Earnings | −0.034*** | −0.034*** | −0.034*** | 0.001 | 0.001 | 0.001 |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| $Policy_{1987-90}$ | −0.017** | | | −0.026** | | |
| | (0.009) | | | (0.009) | | |
| $Policy_{1991-97}$ | −0.021** | | | −0.022* | | |
| | (0.009) | | | (0.011) | | |
| $Policy_{1998-01}$ | −0.009 | | | −0.008 | | |
| | (0.009) | | | (0.011) | | |
| $Policy_{1987-01}$ | | −0.017*** | | | −0.020** | |
| | | (0.007) | | | (0.008) | |
| $Policy_{1987-97}$ | | | −0.018*** | | | −0.021** |
| | | | (0.007) | | | (0.009) |
| Individual fixed effects | No | No | No | Yes | Yes | Yes |
| $N^*T$ | 427,043 | 427,043 | 427,043 | 427,043 | 427,043 | 427,043 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
*Note*: The table shows the results of OLS regression results of individual annual number of committed crimes on the policy specifications (three-part policy period, full policy period, and limited policy period) and a set of covariates for men aged 18–35 without unemployment insurance for the years 1981–2005. Parameters for municipality dummies, age dummies, and years dummies not shown. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001. Clustered standard errors in parentheses. OLS1–OLS3 shows results without controlling for individual level fixed effects, and FE1–FE3 show results where we do control for individual level fixed effects.
*Source*: Own calculations on data from Statistics Denmark.

wealth/resources affect children's decision to stay in Farum. To minimize potential bias, we control for parental wealth (father's wealth, mother's wealth, and a dummy for no parental wealth) and parental annual unemployment degree (measured between 0 and 100). Parents with wealth would not be eligible to social assistance if they were to become unemployed. At the same time, we control for parental resources that may affect selection into whether children choose to live in Farum. We report results both with and without the controls for parental unemployment and wealth.

Parental location could also affect criminal behavior of children if children reduce criminal activity when they live with parents. To control for this, we include dummies indicating whether children were living with their parents, and whether they were living in the same municipality as their parents. Including the location variables should also partially control for the remaining endogeneity bias when children left Farum to avoid activation and parents followed to live together with them, even if the exclusion restriction does not hold perfectly. The models adjusted for selective migration produce similar results as the results derived from Eq. (3), so for the sake of brevity we only report the adjusted models in appendix.

Last, there is the question of calculating correct standard errors. Bertrand et al. (2004) argue that one tends to overreject the hypothesis of no policy effect in the difference-in-differences estimation if the serial correlation is not properly taken into account when deriving the standard errors of the parameter estimates. Furthermore, they show that in short panels, unless one has many local governments with differential timings of policy intervention, the problem persists even if the serial correlation is taken into account by using robust procedures. To further test this, we therefore estimate additional models using a wild bootstrap approach (Flachaire, 2005). For the resampling in the bootstrap, we draw on the block-level of *i* instead of *it*, thereby block sampling entire individuals. We then run the regression in Eq. (3), isolate the error term $\epsilon_{it}$, multiply $\epsilon_{it}$ with the random variable $u_{it}$ drawn from a Rademacher distribution, and add $\epsilon_{it}{}^{*}u_{it}$ to the predicted value $\hat{C}_{it}$ to obtain our new dependent variable $C_{it}^{*}$. We then re-estimate the model in Eq. (3) with $C_{it}^{*}$ as the dependent variable. We run the wild block bootstrap procedure for 2500 repetitions. Since the wild bootstrap procedure only apply to the linear case, we use the score approach developed by Kline and Santos (2012) to estimate standard errors for the migration-adjusted models in an otherwise similar fashion.

## 7. Results

We present the estimation results for the radical activation reform introduced in Farum in 1987. We first divide the policy period into three. The first period is from 1987 to 1990, the second period from 1991 to 1997, and the third from 1998 to 2001. We consider the 1987–1990 period as the introductory phase of the reform, and the 1991–1997 period as the fully implemented policy period. As we mentioned earlier, the requirement that *all* welfare recipients faced immediate, mandatory activation was only fully implemented from 1990. Finally, we consider the 1998–2001 period as the ending period of the policy where the Farum activation policy and the national level policy started to converge.

In Table 3, we report the policy effects on the annually crime rate for the no-UI men between the ages of 18 and 35, estimated by OLS. In the first result column (OLS1), we report the OLS results obtained when we separately estimate the policy effects of the three periods. We also consider two longer policy periods: one that starts in 1987 and ends in

2001, and the other that starts in 1987 and ends in 1997. We can see that married men, men with children, and men who earned more committed less crime. The high school dummy is also negative and significant.[6]

The policy effect estimate is the coefficient for the interaction term of Farum and the policy period dummies. For the case where the policy period is divided into three sub-periods, the policy is estimated to have a significant crime-reduction effect only for the introduction period (1987–90) and the full implementation period (1991–97). We estimate the policy to reduce the annual crime rate by 0.017 and 0.021 respectively, which is a 23% and 28% reduction in the crime rate relative to the mean crime rate of the no-UI men in Farum (see Table 2). In columns 2 and 3 of Table 3, we present similar results where the policy period is set to be 1987–2001 and 1987–97 respectively. In both cases, policy effects are again estimated to be negative, statistically significant, and large, with an annual reduction by 0.017 crimes, i.e. a 21% reduction in annual arrest rate for the 1987–01 policy period and a 0.018 (24%) annual reduction for the 1987–97 policy period.

In Table 3, we also report the fixed effects results. The estimated policy effects are similar to those of the OLS in the same table. That is, if we divide the policy periods into three sub-periods, the 1998–2001 period is estimated to be negative but insignificant, but the introduction and full implementation periods, 1987–90 and 1991–97, are estimated to be negative and significant, resulting in an annual reduction in crime by 0.026 and 0.022. If we set the policy period to be 1987–2001, the policy effect is significant and reduces the annual crime rate by 0.020 crimes per individual per year, and for the 1987–97 policy period the effect is again significant and the annual reduction is estimated to be 0.021.[7] To test for type 1 error on the policy estimates due to serial correlation in the error term, we also estimate the models using wild block-bootstrapped nonparametric standard errors. We report these results later in Table 5 in the next subsection. The parameters do not differ, but standard errors are larger.

Note that the coefficients for higher education, and married are positive and significant. Only the coefficient for having children dummy is negative and insignificant. Whereas these results appear counterintuitive at first, they are consistent with previous research. Lyngstad and Skardhamar (2013) showed that for Norway, men who married decrease their criminal activities prior to marriage, but then increased criminal activities after marriage. Imai and Krishna (2004) estimated the dynamic model of criminal decision on life cycle data of arrests. They concluded that it is the highly criminal individuals who tend to reduce their criminal activities more after the age of 18. That is, the average change in crime rate after the age of 18 for criminal types is negative, and the same for non-criminal types that have average changes that are close to zero. Then, if we run a regression where the dependent variable is the over time change in crime rate, and the independent variable is a dummy that equals one if the individual is a non-criminal type (assuming that the criminal/non-criminal types are observable) the estimated non-criminal type coefficient will be positive. Even though the criminal/non-criminal types are not observable, if variables such as high school graduation (especially when, as in our case, high school also includes those who graduate from vocational tracks) and marital status are positively correlated with being a non-criminal type, then their coefficients should also be positive. That is, our results are consistent with those of Imai and Krishna (2004) when the criminal types are more prevalent among men with low education and/or who are single.

A potential concern is that the estimated policy effect could be due to an increase in income because of transition into employment, or because individuals who work in workfare jobs may have slightly higher income than they had during passive welfare spells.[8] Therefore, we control for

**Table 4**
OLS models of the effect of the Farum policy on crime rates for no-UI men including pre-policy leads.

| | FE1 | FE2 | FE3 |
|---|---|---|---|
| High school | 0.042*** | 0.042*** | 0.042*** |
| | (0.004) | (0.003) | (0.004) |
| Married | 0.013*** | 0.013*** | 0.013*** |
| | (0.003) | (0.003) | (0.003) |
| Children | −0.002 | −0.002 | −0.002 |
| | (0.002) | (0.003) | (0.002) |
| Earnings | 0.001 | 0.001 | 0.001 |
| | (0.001) | (0.001) | (0.001) |
| $Farum_{1981}$ | −0.004 | 0.001 | 0.003 |
| | (0.020) | (0.020) | (0.020) |
| $Farum_{1982}$ | −0.001 | 0.004 | 0.007 |
| | (0.020) | (0.019) | (0.018) |
| $Farum_{1983}$ | −0.022 | −0.017 | −0.015 |
| | (0.019) | (0.019) | (0.017) |
| $Farum_{1984}$ | −0.003 | 0.003 | 0.006 |
| | (0.019) | (0.019) | (0.017) |
| $Farum_{1985}$ | 0.000 | 0.006 | 0.008 |
| | (0.019) | (0.019) | (0.017) |
| $Farum_{1986}$ | −0.014 | −0.008 | −0.005 |
| | (0.019) | (0.018) | (0.017) |
| $Policy_{1987-90}$ | −0.031** | | |
| | (0.014) | | |
| $Policy_{1991-97}$ | −0.027* | | |
| | (0.017) | | |
| $Policy_{1998-01}$ | −0.012 | | |
| | (0.013) | | |
| $Policy_{1987-01}$ | | −0.021* | |
| | | (0.011) | |
| $Policy_{1987-97}$ | | | −0.021** |
| | | | (0.009) |
| Individual fixed effects | Yes | Yes | Yes |
| $N^*T$ | 427,043 | 427,043 | 427,043 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
*Note*: The table shows the results of OLS regression results of individual annual number of committed crimes on the policy specifications (three-part policy period, full policy period, and limited policy period), a set of covariates, and a set of pre-policy leads ($Farum_{1981}$–$Farum_{1986}$) for men aged 18–35 without unemployment insurance for the years 1981–2005. Parameters for municipality dummies, age dummies, and years dummies not shown. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001. Clustered standard errors in parentheses. We control for individual level fixed effects.
*Source*: Own calculations on data from Statistics Denmark.

[6] The RHS variables include the age, year, and municipality dummies, but we do not present the coefficient estimates for these due to space limitations.

[7] Note that the fixed effect estimates are larger in magnitude than the OLS. The FE estimates are larger because $\alpha_i$ also includes whether a person living in Farum ever received the treatment. Since most men in Farum never participated in activation, this makes the OLS estimate an ITT, where the untreated group who would be eligible for treatment if they became unemployed drives the policy estimate towards zero. The fixed effect removes the ever received treatment indicator, leaving us with an estimate that is closer to an ATT. This will become more evident when we examine the policy effect across welfare dependency degree. It is only those, who actually participated in the program, whose crime decreased. Those who never become unemployed, who also have lower crime rates, are differenced out in the fixed effect model.

[8] Income is likely to be correlated with employment status, and thus could be subject to the same endogeneity issue as the relationship between employment

**Table 5**
OLS models of the effect of the Farum policy on crime across crime types using wild block bootstrap to obtain nonparametric standard errors.

| | All crime | Property crime | Violent crime | Other crime |
|---|---|---|---|---|
| [87 − 90] × Farum | −0.025* | −0.025*** | 0.004 | −0.003 |
| | [−0.052; 0.004] | [−0.045; −0.006] | [−0.006; 0.013] | [−0.019; 0.014] |
| [91 − 97] × Farum | −0.025 | −0.022** | −0.001 | −0.001 |
| | [−0.057; 0.007] | [−0.043; −0.001] | [−0.010; 0.008] | [−0.019; 0.020] |
| [98 − 01] × Farum | −0.012 | −0.018* | 0.005 | 0.001 |
| | [−0.044; 0.020] | [−0.040; 0.002] | [−0.006; 0.018] | [−0.018; 0.020] |
| [87 − 01] × Farum | −0.021* | −0.022*** | 0.003 | −0.001 |
| | [−0.044; 0.003] | [−0.039; −0.006] | [−0.006; 0.011] | [−0.015; 0.012] |
| [87 − 97] × Farum | −0.020* | −0.017** | −0.001 | −0.002 |
| | [−0.044; 0.002] | [−0.032; −0.001] | [−0.008; 0.006] | [−0.016; 0.012] |
| Individual fixed effects | Yes | Yes | Yes | Yes |
| $N^*T$ | 427,043 | 427,043 | 427,043 | 427,043 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
*Note*: The table shows the results of OLS regression results of individual annual number of committed crimes, as well as outcomes for different types of crime, on the policy specifications (three-part policy period, full policy period, and limited policy period) and a set of covariates for men aged 18–35 without unemployment insurance for the years 1981–2005. Parameters for being married, having children, having at least a high school degree, earnings, and municipality dummies, age dummies, and years dummies not shown. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001. All models control for individual level fixed effects. Critical values obtained using 2500 repetition of a wild block bootstrap procedure using a Rademacher distribution.
*Source*: Own calculations on data from Statistics Denmark.

earnings in our model. Controlling for gross income instead of earnings yields similar results to those seen in Table 3. Moreover, as we shall see below, crime is reduced the most for men who rarely are employed, and the no-UI individuals enrolled in the Farum program did not earn more than unemployed elsewhere.[9]

### 7.1. Testing the parallel trends assumption

The fundamental assumption underlying our identification strategy is that absent the ALMP, crime rates for no-UI men in Farum would have evolved parallel with crime rates for no-UI men in the rest of Denmark. While we cannot test that assumption directly, we instead estimate our main model including leads for the pre-policy period, as specified in Eq. (2), including individual fixed effects. Thereby, we test for differences in trends pre-policy, as well as examining whether including leads changes the policy estimates substantially. We present the results in Table 4. None of the leads are significant at any traditional level, and there is no indication of a systematically different trend in Farum pre-policy compared to the rest of Denmark. In addition, there is also no substantial change in any of the policy estimates, although the standard errors do increase slightly.

### 7.2. Effect on types of crime

Table 5 shows estimates of the effect of the Farum policy on type of crime. Estimates are wild block bootstrapped using 2500 repetitions, in order to take into account the increased risk for type 1 errors due to serial correlation in the error term. For the total crime rate, estimates are not substantially different from the estimates presented in Table 3, but the confidence intervals are wider and insignificant for the policy periods 1991–97 and 1998–2001. When we examine individual crime types, we only see a substantial and negative reduction for property related offenses. For violent crimes and other crimes estimates are close to zero and insignificant. Apparently, decreasing property related offenses drive the entire effect of the Farum policy. Property crimes account for more than 75% of all crimes in Denmark (and 60% in our sample), and the Danish property crime rate is among, if not the, highest rate in Europe (Harrendorf et al., 2010). Property crime are also substantially more likely to occur during day time (than for example violent crimes), when shops are open and house owners and tenants are at work. Previous work has also documented the link between unemployment and specially property crime, so given that ALMPs have an effect on crime, it is not surprising that the effect appears to be on property crime.

### 7.3. Effects on the extensive margin

The Farum immediate activation policy appears to significantly and substantially lower the number of crimes committed in the municipality. However, it does not answer the question of whether the reduction is due to fewer people committing crime annually, or just fewer crimes committed by those who commit crime. To examine whether the reduction is solely on the annual intensive margin, or also occurs at the annual extensive margin we rerun the model based on Eq. (3) with a binary indicator $I(C_{it} > 0)$ as the dependent variable. We saw in Table 5 that a decrease in property crime drives the effect of the Farum policy, so we both estimate the models using an indicator for all crime as the dependent variable, and an indicator solely for property crime. The results are presented in Table 6. Both tables show a substantial decrease in the likelihood of committing crime a given year, but the estimates are only significant for the property crime indicator, estimating the decrease in the annual likelihood of committing any property crime at around 1 percentage point. Thus, it is not only decreased criminal activity among the very criminally active that drives our effects, but also a general decrease in the propensity to engage in any property crime.[10]

### 7.4. Robustness checks

The reduction in crime for no-UI men during the policy period could also be due to changes in Farum that are unrelated to the activation

and crime. We show later that the biggest crime reduction is found for men with practically no employment records.

[9] Fig. A.1 reports the development in average gross income for no-UI men in Farum and Denmark across the study period. There is no indication of an income increase caused by the policy.

[10] For models for both UI and no-UI men including pre-reform leads with crime at the extensive margin as the dependent variable, see Table A.2 in Appendix.

**Table 6**
OLS models of the effect of the Farum policy on annual crime indicator and property crime indicator for no-UI men.

| | $FE_{I(Crime>0)}$ 1 | $FE_{I(Crime>0)}$ 2 | $FE_{I(Crime>0)}$ 3 |
|---|---|---|---|
| $Policy_{1987-90}$ | −0.014 | | |
| | [−0.039; 0.011] | | |
| $Policy_{1991-97}$ | −0.011 | | |
| | [−0.036; 0.015] | | |
| $Policy_{1998-01}$ | −0.003 | | |
| | [−0.033; 0.026] | | |
| $Policy_{1987-01}$ | | −0.010 | |
| | | [−0.030; 0.011] | |
| $Policy_{1987-97}$ | | | −0.011 |
| | | | [−0.031; 0.008] |
| | $FE_{I(Property\ crime>0)}$ 1 | $FE_{I(Property\ crime>0)}$ 2 | $FE_{I(Property\ crime>0)}$ 3 |
| $Policy_{1987-90}$ | −0.018*** | | |
| | [−0.027; −0.008] | | |
| $Policy_{1991-97}$ | −0.010* | | |
| | [−0.020; 0.000] | | |
| $Policy_{1998-01}$ | −0.008 | | |
| | [−0.018; 0.002] | | |
| $Policy_{1987-01}$ | | −0.012*** | |
| | | [−0.020; −0.004] | |
| $Policy_{1987-97}$ | | | −0.011*** |
| | | | [−0.019; −0.003] |
| Individual fixed effects | Yes | Yes | Yes |
| $N^*T$ | 427,043 | 427,043 | 427,043 |

* $p<0.10$, ** $p<0.05$, *** $p<0.01$.
*Note*: The table shows the results of OLS regression results of individual annual indicator of committing any crime, as well as outcomes for different types of crime, on the policy specifications (three-part policy period, full policy period, and limited policy period) and a set of covariates for men aged 18–35 without unemployment insurance for the years 1981–2005. Parameters for being married, having children, having at least a high school degree, earnings, and municipality dummies, age dummies, and years dummies not shown. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001. All models control for individual level fixed effects. Critical values obtained using 2500 repetition of a wild block bootstrap procedure using a Rademacher distribution.
*Source*: Own calculations on data from Statistics Denmark.

policy. These might be, for example, an increase in police spending in Farum, or an increase in municipal spending on youth activities. To take account of that possibility, we next run the same regressions for UI men. If, during the policy period, crime decreased for the no-UI men but not for UI men, then we can rule out the effect of policies that affected both insured and uninsured men.

In the first 3 results columns of Table 7, we report the results of the OLS estimations for the UI men. The individual non-policy covariates have coefficient estimates similar to those for the no-UI men. All the coefficients are negative, and significant at the 1% level. On the other hand, the policy effects are very different from those of the no-UI men. In result column 1, we can see that the policy effect of all the sub-periods (the introductory period of 1987–90, the fully implemented period of 1991–97, and the final period 1998–2001) are all positive, and significant for the 1998–01 period. The policy effect estimate for the 1987–01 period is insignificant and positive, and even though that of the 1987–97 policy period is negative, its absolute value is small and also insignificant. In sum, we do not see any evidence of a negative policy effect for the insured men. Similar results are confirmed in columns FE1 to FE3 (also in Table 7), where we report the fixed effects estimates for the UI men, using the same model specification as the one for the no-UI men.[11]

Further, two types of endogeneity could bias the fixed effects estimation of the policy effect for the no-UI men. First, in order to avoid activation when unemployed, individuals might join a UI fund. In Fig. A.2 in the Appendix, we plot the proportions of men aged 18–35 in Farum and in the rest of Denmark with UI membership. We can see that a smaller fraction of young men were insured in Farum than in the rest of Denmark, and that the difference slowly grew over time until 1990. After that, the difference shrunk until 1995, hereafter it began to grow again.

Therefore, we also estimate insurance choice probabilities using probit models. The results, presented in Table A.4 in Appendix, show that after controlling for the observables such as age, education, marital status, children, year, and Farum residence, the interaction term of Farum and policy period dummies was positive and significant. Individuals who first are able to find and maintain employment and then join the UI fund are the stronger workers, and therefore less criminally active. Thus, the decrease in the proportion of no-UI individuals in Farum during the policy period should have increased the average crime rate among no-UI individuals. Therefore, insurance choice would bias the policy parameter estimates towards zero. Hence, the negative policy effect we obtain is likely to be a conservative estimate. On the other hand, individuals who switched their status from no-UI to UI during the policy period may have been the more criminally active among the insured, and thus may have increased the arrest rate for the UI-men during the policy period. This could be the reason for the slightly positive policy effects estimated by the OLS and fixed effect models for the UI men reported in Table 7.

Second, another potential source of bias would arise if, during the policy period, no-UI men left, or stayed out of, Farum for fear of activation. Here, we cannot *a priori* assess whether individuals who left or stayed out of Farum would be more criminally active or not. Hence, we use the Heckman two-step approach to estimate jointly the location and the criminal choice. In Tables A.5–A.7 in Appendix, we report the results of the Heckman two-step estimation. Table A.5 reports the results

[11] Table A.3 in Appendix tests the parallel trends assumption for the UI sample by including pre-policy leads. We are not able to reject the parallel trends assumption from the results, indicating that pre-policy, UI men in Farum had similar trends in crime as UI men from the rest of Denmark.

**Table 7**
OLS models of the effect of the Farum policy on crime rates for UI men.

| | OLS1 | OLS2 | OLS3 | FE1 | FE2 | FE3 |
|---|---|---|---|---|---|---|
| High school | −0.023*** | −0.023*** | −0.023*** | 0.001 | 0.001 | 0.001 |
| | (0.001) | (0.001) | (0.001) | (0.002) | (0.002) | (0.002) |
| Married | −0.002*** | −0.002*** | −0.002*** | 0.005*** | 0.004*** | 0.004*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Children | −0.008*** | −0.008*** | −0.008*** | −0.003*** | −0.003*** | −0.003*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Earnings | −0.015*** | −0.015*** | −0.015*** | −0.001*** | −0.001*** | −0.001*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $Policy_{1987-90}$ | 0.004 | | | 0.003 | | |
| | (0.006) | | | (0.006) | | |
| $Policy_{1991-97}$ | 0.003 | | | 0.004 | | |
| | (0.004) | | | (0.004) | | |
| $Policy_{1998-01}$ | 0.009** | | | 0.007 | | |
| | (0.004) | | | (0.005) | | |
| $Policy_{1987-01}$ | | 0.005 | | | 0.004 | |
| | | (0.003) | | | (0.004) | |
| $Policy_{1987-97}$ | | | −0.001 | | | 0.001 |
| | | | (0.004) | | | (0.004) |
| Individual fixed effects | No | No | No | Yes | Yes | Yes |
| $N^*T$ | 1,010,181 | 1,010,181 | 1,010,181 | 1,010,181 | 1,010,181 | 1,010,181 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
*Note*: The table shows the results of OLS regression results of individual annual number of committed crimes on the policy specifications (three-part policy period, full policy period, and limited policy period) and a set of covariates for men aged 18–35 with unemployment insurance for the years 1981–2005. Parameters for municipality dummies, age dummies, and years dummies not shown. The unemployment insured were *not* targeted by the intensive workfare policy that Farum enacted in 1987, and also did not see radical changes in activation requirements at the national level. Clustered standard errors in parentheses. OLS1–OLS3 shows results without controlling for individual level fixed effects, and FE1–FE3 show results where we do control for individual level fixed effects.
*Source*: Own calculations on data from Statistics Denmark.

using individual-level clustered standard errors, Table A.6 includes controls for parental resources, and Table A.7 uses score block bootstrapped standard errors.

For the no-UI men, having parents living outside Farum has a negative effect on being in Farum, and having parents living in Farum has a positive significant effect. That is, instruments are significant in explaining Farum residence. The selection term for the crime rate in Farum is positive, and the selection term for the crime rate in the rest of Denmark is estimated to be negative, which would normally imply upward bias of the fixed effects estimation without selection bias correction. However, the actual direction of bias of the policy effect depends on when the individuals left Farum, before, during, or after the policy. If we compare the estimated policy effects of Table A.5 with those of Table 3, we see that all the coefficients are very similar in magnitude. Note that the effect of living together with parents is negative for all specifications, whereas the effect of living in the same municipality with parents is positive. Both are significant. In the Heckman two-step procedure for the UI men, we do not see any negative policy effect, which again excludes any possibility of exogenous changes in Farum having a noticeable impact in reducing crime for both the insured and uninsured during the policy period (see Table A.8 in Appendix).[12]

### 7.5. Direct and indirect effects of activation

So far, we have reported results that indicate that the ALMP was effective in reducing crime for young no-UI men in Farum. Next, we try to explain why. We have already seen that when controlling for income, the policy effect still remains significant and substantial. Below, we consider two other ways how the policy could have affected crime. First, ALMP implementation could have induced welfare recipients to take up regular employment, which might have reduced crime. This would be an indirect effect of activation on crime. Secondly, a direct effect would be when activation reduces the number of crimes committed by individuals who remain on welfare. The literature has not previously investigated such effects in a labor market setting.[13]

In Table 8, we present OLS results of the effects of activation policy reform in Farum where we control for the fraction of days in a year on welfare. Thereby we are able to distinguish between an indirect effect of the policy caused by increased employment from a direct effect among those remaining on welfare during the policy period. We derive this information from aggregating data on monthly welfare benefit payments, which are available for the period 1984–2005. To ensure comparability, we re-ran our main estimates from Table 3 limiting the sample period to 1984–2005. Results remained nearly identical. Due to space limitations, we only report the coefficient estimates of the policy effects. Because the clustered standard errors and the wild block-bootstrap estimates do not differ substantially from each other, and the latter are computationally cumbersome to calculate given our sample sizes, we only report results based on clustered standard errors. We show results both for the crime rate and for the crime indicator.

We can see that the receipt of welfare benefits increased crime significantly and that the direct policy effect on the crime rate was negative and significant for the introduction policy period of 1987–90 and for the 1987–97 period for the uninsured. Similarly, there were also significant and substantial effects on the extensive margin for the same periods. For the fixed effect models, the estimated policy effects have the same signs as the OLS estimates and for the crime rate are significant for the expected periods. For the crime indicator, not all policy periods are significant, but the signs remains similar to the crime rate estimates. The cor-

[12] As another robustness check, we estimated the regular and fixed effects logit models. The policy effects have the same sign and significance as those of the OLS for regular logit models, but the logit models with fixed effect failed to converge. Those results can be obtained from the authors on request.

[13] However, Aizer (2004), Anderson (2014), Berthelon and Kruger (2011), Jacob and Lefgren (2003), and Landersø et al. (2017) have all shown that incapacitation effects exist for school age children and adolescents.

**Table 8**
OLS models of the effect of the Farum policy on crime rates for no-UI controlling for welfare dependency.

| | Crime rate | | Crime indicator | |
|---|---|---|---|---|
| | OLS1 | FE1 | OLS2 | FE2 |
| Welfare | 0.315*** | 0.096*** | 0.1953*** | 0.0505*** |
| | (0.006) | (0.006) | (0.0031) | (0.0031) |
| $Policy_{1987-90}$ | −0.021** | −0.026** | −0.0132** | −0.0135** |
| | (0.009) | (0.011) | (0.0059) | (0.0067) |
| $Policy_{1991-97}$ | −0.006 | −0.023* | −0.0029 | −0.0100 |
| | (0.010) | (0.013) | (0.0058) | (0.0070) |
| $Policy_{1998-01}$ | −0.009 | −0.009 | 0.0052 | −0.0024 |
| | (0.010) | (0.012) | (0.0064) | (0.0076) |
| Welfare | 0.315*** | 0.096*** | 0.1952*** | 0.0504*** |
| | (0.006) | (0.006) | (0.0031) | (0.0031) |
| $Policy_{1987-01}$ | −0.007 | −0.020** | −0.0042 | −0.0090 |
| | (0.008) | (0.010) | (0.0047) | (0.0056) |
| Welfare | 0.315*** | 0.096*** | 0.1952*** | 0.0505*** |
| | (0.006) | (0.006) | (0.0031) | (0.0031) |
| $Policy_{1987-97}$ | −0.015** | −0.020** | −0.0088* | −0.0106** |
| | (0.007) | (0.009) | (0.0045) | (0.0054) |
| Individual fixed effects | No | Yes | No | Yes |
| $N^*T$ | 371,262 | 371,262 | 371,262 | 371,262 |

Clustered standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
*Note*: The table shows the results of OLS regression results of individual annual number of committed crimes (OLS1 and FE1) and indicator of committing any crime a given year (OLS2 and FE2) on the policy specifications (three-part policy period, full policy period, and limited policy period) and a set of covariates that includes municipality of residence, high school education, marriage, earnings, children, age, and year fixed effects. We only have information on welfare dependency from 1984 and onward, so we limit the sample to the period 1984–2005. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001. OLS1 and OLS2 do not control for individual fixed effect, FE1 and FE2 do control for individual fixed effect. Crime Indicator = I(Crime Rate > 0).
*Source*: Own calculations on data from Statistics Denmark.

responding fixed effect estimates for UI men are shown in Table A.9 in Appendix. Here we see no effect of the policy period on crime rates.[14] In total, decreased welfare take up did not appear to mediate the effect of the policy.

Next, we examine whether the effect of the policy differs across whether men received welfare benefits or not. We divide the sample into two subsamples—one that includes men in years where they do not claim any welfare, and one that includes men in years where they claim at least one day of welfare. We report the results in Table 9. For men not on welfare (FE1 and FE2) we do see a significant decrease in both the crime rate and in the likelihood of committing any crime for the early years of the policy (1987–1990). For men on welfare (FE3 and FE4), we see a significant crime decreasing policy effect for the full policy period (1987–2001) that is substantially larger than the effect found for men not on welfare. The estimates for the two other policy specifications are of similar magnitude as the 1987–2001 specification, but insignificant. The lack of significance is likely due to power issues, because the sample of men on welfare is substantially smaller than our full sample. The results from Table 9 indicate that the early years of the policy may have lowered criminal activity among employed individuals. However, the brunt of the effect are carried by those who remained on welfare, indicating a direct effect of the policy on crime that are concentrated among program participants.

The Farum ALMP could also decrease crime if ALMP participants ended up in employment after participation, substituting illegal earnings from criminal activities with legal earnings from paid work. To test this, we rerun the model from Eq. (3) with annual gross income measured at year 2000-level as the dependent variable. The results, reported in Table 10, show only a small indications that the Farum policy affected gross income among no-UI men. In the introduction period (1987–90) we do estimate a 4.6% increase in gross income for no-UI men. The same table also show a slight but significant decrease in welfare dependency during the policy period, but occurring later than the increase in gross income. Similarly, we find a small increase in the likelihood of receiving any labor market earnings at the same time as welfare dependency decreased. Yet, absent any effect on gross income in the same period, the effect on welfare indicates that some men left the welfare system and likely gained employment, but none were left better of in terms available funds. In total, the policy did appear to increase employment among some participants, but most of the crime decrease occurred among welfare recipients who remained in the program. Thus, although some of the crime reducing effect of the policy likely did occur through increased employment, a substantial amount of the effect was driven by people who remained on welfare, indicating a direct effect of ALMP on crime among the hard-to-employ.

[14] Note that there are individuals who are registered as being unemployment insured in the data, and still received welfare payments (however, most individuals in the insured group received UI). Since the register data only contain information on unemployment insurance status at the end of the year, this could reflect a transition from no-UI to UI status during a year. But what is more important is that individuals need to be a UI member for at least one year before being eligible for UI payments. Those who were members of the UI fund but are not yet eligible for UI benefit could only receive welfare benefits, but they were not subject to the tough activation policies implemented in Farum because of their UI membership. In order to deal with this, we compare the arrest rates of the no-UI and UI recipients, where in both cases the welfare and UI payments are controlled for, but the tough activation rule only applied for the no-UI group. The fact that the interaction term of the policy period and Farum dummy is negative and statistically significant only for the no-UI men supports our claim that the tough activation policy was effective in reducing crime.

**Table 9**
OLS models of the effect of the Farum policy on crime rates and crime indicator for unemployment uninsured individuals conditional on whether they received any welfare a given year.

| | No welfare dependency year $t$ | | Any annual welfare dependency year $t$ | |
|---|---|---|---|---|
| | Crime rate FE1 | Crime indicator FE2 | Crime rate FE3 | Crime indicator FE4 |
| $Policy_{1987-90}$ | −0.015** | −0.012*** | −0.057 | −0.033 |
| | (0.006) | (0.005) | (0.041) | (0.023) |
| $Policy_{1991-97}$ | −0.006 | −0.004 | −0.066* | −0.029 |
| | (0.006) | (0.004) | (0.039) | (0.022) |
| $Policy_{1998-01}$ | 0.005 | 0.003 | −0.077 | −0.036 |
| | (0.006) | (0.005) | (0.047) | (0.026) |
| $Policy_{1987-01}$ | −0.006 | −0.005 | −0.065** | −0.032* |
| | (0.004) | (0.003) | (0.033) | (0.019) |
| $Policy_{1987-97}$ | −0.011** | −0.009** | −0.036 | −0.018 |
| | (0.004) | (0.003) | (0.031) | (0.017) |
| Individual fixed effects | Yes | Yes | Yes | Yes |
| $N^*T$ | 319,722 | 319,722 | 107,321 | 107,321 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
*Note*: The table shows the results of OLS regression results of individual annual number of committed crimes (FE1 and FE3) and indicator of committing any crime a given year (FE2 and FE4) on the policy specifications (three-part policy period, full policy period, and limited policy period) and a set of covariates that includes municipality of residence, high school education, marriage, earnings, children, age, and year fixed effects. We divide the sample between those who do not receive any welfare a given year, and those who spend a day or more on welfare a given year. All models control for individual fixed effect. We only have information on welfare dependency from 1984 and onward, so we limit the sample to the period 1984–2005. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001. Clustered standard errors in parentheses. Crime Indicator = I(Crime Rate $> 0$).
*Source*: Own calculations on data from Statistics Denmark.

**Table 10**
OLS of the effect of the Farum policy on welfare dependency, likelihood of earnings, and gross income for no-UI men.

| | Welfare dependency | P(labor earnings $> 0$) | Gross income | log(gross income) |
|---|---|---|---|---|
| $Policy_{1987-90}$ | 0.008 | 0.001 | 0.334 | 0.046* |
| | [−0.008; 0.025] | [−0.019; 0.021] | [−0.332; 0.996] | [−0.004; 0.095] |
| $Policy_{1991-97}$ | −0.027*** | 0.030*** | −0.110 | −0.018 |
| | [−0.045; −0.009] | [0.009; 0.051] | [−0.826; 0.596] | [−0.075; 0.039] |
| $Policy_{1998-01}$ | −0.030*** | 0.028** | 0.354 | −0.055 |
| | [−0.047; 0.012] | [0.006; 0.050] | [−0.567; 1.272] | [−0.126; 0.039] |
| $Policy_{1987-01}$ | −0.015** | 0.019** | 0.176 | −0.004 |
| | [−0.029; −0.002] | [0.003; 0.035] | [−0.395; 0.726] | [−0.049; 0.041] |
| $Policy_{1987-97}$ | −0.000 | 0.009 | −0.029 | 0.026 |
| | [−0.001; 0.000] | [−0.006; 0.025] | [−0.661; 0.601] | [−0.015; 0.066] |
| Individual fixed effects | Yes | Yes | Yes | Yes |
| $N^*T$ | 427,043 | 427,043 | 427,043 | 427,043 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
*Note*: The table shows the results of OLS regression results of regressing welfare dependency (measured as share of year), indicator of any labor market earnings in a year, annual gross income measured in DKK 10,000 at 2000-level, and the log of gross income on the policy specifications (three-part policy period, full policy period, and limited policy period) and a set of covariates for men aged 18–35 without unemployment insurance for the years 1981–2005. Parameters for being married, having children, having at least a high school degree, earnings, and municipality dummies, age dummies, and years dummies not shown. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001. All models control for individual level fixed effects. Critical values obtained using 2500 repetition of a wild block bootstrap procedure using a Rademacher distribution.
*Source*: Own calculations on data from Statistics Denmark.

## 8. Concluding remarks

We have estimated the effects of ALMPs on the criminal behavior of unemployed young men, who were not insured against unemployment. We exploited a unique and radical policy experiment that began in 1987 in Farum, where a 100% work or training requirement was imposed on all unemployment uninsured welfare recipients immediately from the day they applied for unemployment compensation (welfare). By comparing the changes in crime rates among the welfare recipients in Farum before and after 1987 with those in

the rest of Denmark, we identified the effect of mandatory immediate ALMPs on the crime rate of young men without unemployment insurance.

We find that tough activation requirements imposed by ALMP reduce crime. The policy effect is both statistically and economically significant, and isolated to property crime. The effect likely originates not only indirectly from the reduction in welfare take-up and increase in employment, but also from reduced criminal activities among individuals who receive welfare benefits and are activated, which indicates a direct effect of "being active" on crime. While the ALMP also enforced mandatory substance abuse treatment among welfare recipients dealing with such issues, official drug and alcohol treatment statistics indicate that less than a handful people a year received such treatment. Instead, we expect the effect to be primarily driven by incapacitation during the day. Although often portrayed as a night time activity in the media, most property crime in Denmark occurs during normal working hours in the daytime, when potential victims of burglary are not at home and shops are open and accessible for shoplifting. While this of course does not rule out a socialization effect or other type of positive peer influence, the absence of impact on other types of crime than property crime, and the indication that continuing welfare recipients accounted for the main reduction in crime, are suggestive. It may be that changes to the expected future employment possibilities among ALMP participants also played a role, but the indications are that the ALMP directly lowered crime among participants.

### 8.1. Perspective

Recent work has suggested that programs targeting marginal individuals prone to commit crime may generate substantial crime reducing benefits (Siwach, 2018). Our results suggest that this is indeed the case, and that activation programs that induce fewer threat effects (see Black et al., 2003; Graversen and Van Ours, 2008) and are more focused on providing an attractive program content could be more effective in reducing crime among welfare recipients. Recipients most frequently targeted by such programs are also the most criminally active. Given sufficiently strong crime reduction effects, active labor market programs could be a better choice for the benefit of the general public than existing and more costly punishment schemes or reintegration schemes.

Extrapolating from our results to the crime rates for no-UI men outside Farum during the period 1987–2001, we can provide an estimate for how many fewer crimes would have occurred in the period if all municipalities had carried out the same ALMP policy as Farum did. The average annual number of crimes committed by no-UI men aged 18–35 in that period was 0.094, amounting to 14,507 crimes a year. Assuming that everyone faced a similar labor market as in Farum, the introduction of the Farum policy nationwide instead of locally would have led to 2924 fewer crimes a year in the period 1987–2001. According to our own calculation on data from Statistics Denmark, Denmark had in the period 1987–2001 on average 62,258 criminal convictions for unique criminal acts a year. Thus, under the above mentioned assumptions, a nationwide implementation of the Farum ALMP policy could have led to a 5% decrease in the annual national crime rate for the period.

## Appendix A

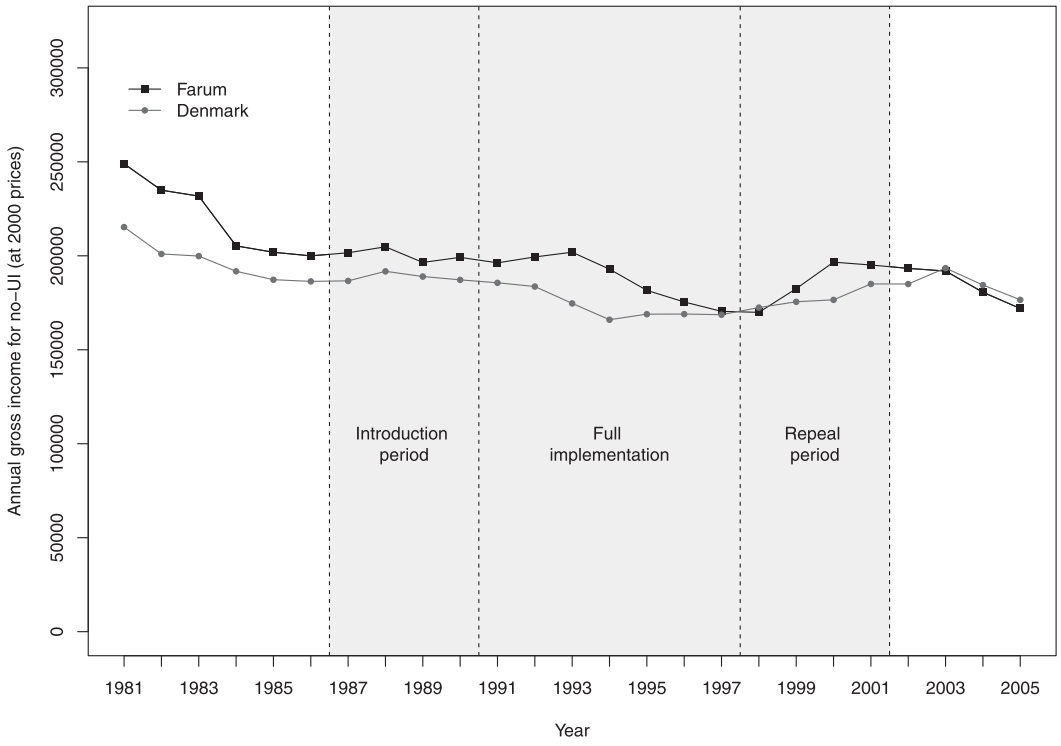


**Fig. A1.** Annual gross income for unemployment uninsured (no-UI) men age 18–35 years in Farum and Denmark (measured at 2000-level).
Figure shows the average gross income at 2000-level from 1981 to 2005 in the municipality of Farum compared to the rest of Denmark for all men age 18–35 without unemployment insurance and who were not enrolled in educational programs. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001.
*Source*: Own calculations on data from Statistics Denmark.

**Table A1**
Descriptive statistics for time-invariant characteristics for the sample.

| | Never in Farum, no-UI | Ever in Farum, no-UI | All, no-UI | Never in Farum, UI | Ever in Farum, UI | All, UI |
|---|---|---|---|---|---|---|
| Ever convicted while in sample | 0.118 | 0.156 | 0.121 | 0.106 | 0.123 | 0.107 |
| | (0.323) | (0.362) | (0.327) | (0.308) | (0.328) | (0.309) |
| DK/Western | 0.885 | 0.848 | 0.882 | 0.950 | 0.888 | 0.947 |
| | (0.320) | (0.359) | (0.322) | (0.219) | (0.315) | (0.225) |
| Birth year | 1967.348 | 1966.532 | 1967.299 | 1963.723 | 1962.999 | 1963.688 |
| | (10.801) | (10.087) | (10.761) | (9.990) | (8.725) | (9.933) |
| At least on parent with high school | 0.425 | 0.529 | 0.431 | 0.431 | 0.498 | 0.434 |
| | (0.494) | (0.499) | (0.495) | (0.495) | (0.500) | (0.496) |
| *N* | 97,370 | 6222 | 103,592 | 120,913 | 6231 | 127,144 |

*Note*: Table shows the means and standard deviations of time invariant characteristics for all individuals in the full sample of UI men and no-UI men as well as the two samples divided by whether or not they reside in the treatment municipality Farum for the period 1981–2005. Unemployment insured (UI) includes all men who were member of an unemployment insurance fund. Unemployment uninsured (no-UI) include all men who were uninsured and not enrolled in an educational program.
*Source*: Own calculations on data from Statistics Denmark.

**Table A2**
OLS models of the effect of the Farum policy on crime indicator for no-UI and UI men including pre-policy leads.

| | No-UI men | | | UI men | | |
|---|---|---|---|---|---|---|
| | FE1 | FE2 | FE3 | FE1 | FE2 | FE3 |
| $Farum_{1981}$ | −0.002 | −0.002 | 0.001 | −0.003 | −0.002 | −0.004 |
| | (0.012) | (0.012) | (0.012) | (0.006) | (0.006) | (0.006) |
| $Farum_{1982}$ | 0.008 | 0.012 | 0.011 | −0.007 | −0.006 | −0.008 |
| | (0.012) | (0.012) | (0.011) | (0.006) | (0.006) | (0.006) |
| $Farum_{1983}$ | −0.008 | −0.004 | −0.005 | 0.003 | 0.005 | 0.003 |
| | (0.012) | (0.012) | (0.011) | (0.006) | (0.006) | (0.005) |
| $Farum_{1984}$ | 0.006 | 0.010 | 0.009 | −0.004 | −0.002 | −0.004 |
| | (0.012) | (0.011) | (0.011) | (0.006) | (0.006) | (0.005) |
| $Farum_{1985}$ | 0.003 | 0.007 | 0.006 | −0.004 | −0.002 | −0.004 |
| | (0.012) | (0.008) | (0.010) | (0.006) | (0.006) | (0.005) |
| $Farum_{1986}$ | −0.012 | −0.008 | −0.009 | −0.010* | −0.008 | −0.010** |
| | (0.011) | (0.011) | (0.010) | (0.006) | (0.006) | (0.005) |
| $Policy_{1987-90}$ | −0.017** | | | −0.004 | | |
| | (0.008) | | | (0.046) | | |
| $Policy_{1991-97}$ | −0.011 | | | 0.000 | | |
| | (0.008) | | | (0.004) | | |
| $Policy_{1998-01}$ | −0.003 | | | 0.002 | | |
| | (0.008) | | | (0.004) | | |
| $Policy_{1987-01}$ | | −0.009 | | | 0.000 | |
| | | (0.007) | | | (0.004) | |
| $Policy_{1987-97}$ | | | −0.011* | | | −0.002 |
| | | | (0.006) | | | (0.003) |
| Individual fixed effects | No | No | No | Yes | Yes | Yes |
| *N*T* | 427,043 | 427,043 | 427,043 | 1,010,181 | 1,010,181 | 1,010,181 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
*Note*: The table shows the results of OLS regression results of whether an individual committed any crime a given year on the policy specifications (three-part policy period, full policy period, and limited policy period), a set of covariates, and a set of pre-policy leads ($Farum_{1981}$–$Farum_{1986}$) for men aged 18–35 without unemployment insurance for the years 1981–2005. Parameters for municipality dummies, age dummies, and years dummies not shown. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001. Unemployment insured (UI) includes all men who were member of an unemployment insurance fund. Unemployment uninsured (no-UI) include all men who were uninsured and not enrolled in an educational program. Clustered standard errors in parentheses. We control for individual level fixed effects in model FE1–FE3, but not in models OLS1–OLS3.
*Source*: Own calculations on data from Statistics Denmark.

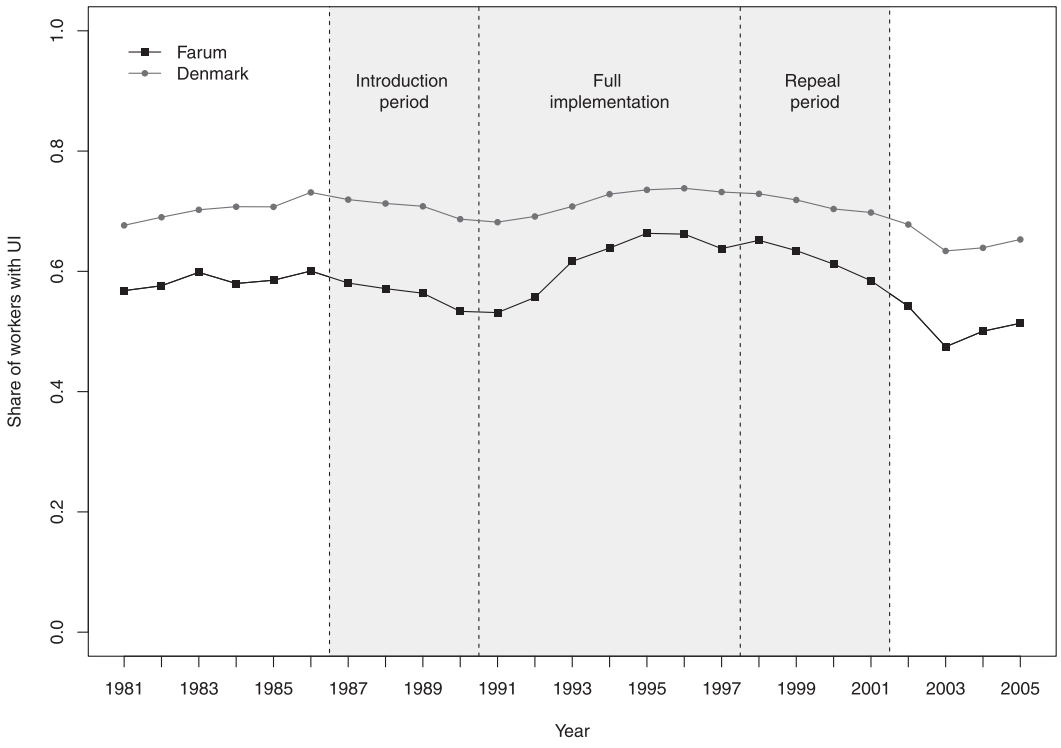


**Fig. A2.** Share with unemployment insurance (UI) membership, men age 18–35 years in Denmark and Farum, 1981–2005.
Figure shows the share of the male labor force who had unemployment insurance (UI membership) from 1981 to 2005 in the municipality of Farum compared to the rest of Denmark for all men age 18–35 who were not enrolled in educational programs. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001.
*Source*: Own calculations on data from Statistics Denmark.

**Table A3**
OLS models of the effect of the Farum policy on crime rates for UI men including pre-policy leads.

| | FE1 | FE2 | FE3 |
|---|---|---|---|
| High school | 0.001 | 0.001 | 0.001 |
| | (0.002) | (0.002) | (0.001) |
| Married | 0.005*** | 0.005*** | 0.005*** |
| | (0.001) | (0.001) | (0.001) |
| Children | −0.003*** | −0.003*** | −0.003*** |
| | (0.001) | (0.003) | (0.001) |
| Earnings | −0.001*** | −0.001*** | −0.001*** |
| | (0.000) | (0.000) | (0.000) |
| $Farum_{1981}$ | −0.001 | 0.000 | −0.004 |
| | (0.008) | (0.008) | (0.007) |
| $Farum_{1982}$ | −0.006 | −0.005 | −0.009 |
| | (0.008) | (0.008) | (0.007) |
| $Farum_{1983}$ | 0.011 | 0.011 | 0.007 |
| | (0.008) | (0.008) | (0.007) |
| $Farum_{1984}$ | −0.004 | −0.002 | −0.007 |
| | (0.008) | (0.008) | (0.007) |
| $Farum_{1985}$ | −0.001 | 0.000 | −0.005 |
| | (0.008) | (0.008) | (0.007) |
| $Farum_{1986}$ | −0.007 | −0.005 | −0.010 |
| | (0.007) | (0.007) | (0.006) |
| $Policy_{1987-90}$ | 0.002 | | |
| | (0.006) | | |
| $Policy_{1991-97}$ | 0.002 | | |
| | (0.005) | | |
| $Policy_{1998-01}$ | 0.006 | | |
| | (0.005) | | |
| $Policy_{1987-01}$ | | 0.004 | |
| | | (0.004) | |
| $Policy_{1987-97}$ | | | −0.002 |
| | | | (0.003) |
| Individual fixed effects | Yes | Yes | Yes |
| $N^*T$ | 1,010,181 | 1,010,181 | 1,010,181 |

*Note*: The table shows the results of OLS regression results of individual annual number of committed crimes on the policy specifications (three-part policy period, full policy period, and limited policy period), a set of covariates, and a set of pre-policy leads ($Farum_{1981}$–$Farum_{1986}$) for men aged 18–35 with unemployment insurance for the years 1981–2005. Parameters for municipality dummies, age dummies, and years dummies not shown. The unemployment insured were *not* targeted by the intensive workfare policy that Farum enacted in 1987, and also did not see radical changes in activation requirements at the national level. Clustered standard errors in parentheses. We control for individual level fixed effects.
*Source*: Own calculations on data from Statistics Denmark.

**Table A4**
Probit estimation for unemployment insurance (UI) choice.

| | Probit 1 | Probit 2 | Probit 3 |
|---|---|---|---|
| High school | 0.401*** | 0.401*** | 0.401*** |
| | (0.005) | (0.005) | (0.005) |
| Married | −0.032*** | −0.032*** | −0.032*** |
| | (0.005) | (0.005) | (0.005) |
| Children | 0.230*** | 0.230*** | 0.230*** |
| | (0.005) | (0.005) | (0.005) |
| Western or Danish | 0.261*** | 0.261*** | 0.261*** |
| | (0.010) | (0.010) | (0.009) |
| Farum | −0.286*** | −0.286*** | −0.266*** |
| | (0.018) | (0.018) | (0.016) |
| $Policy_{1987-01}$ | 0.072*** | | |
| | (0.021) | | |
| $Policy_{1987-90}$ | | 0.021 | |
| | | (0.025) | |
| $Policy_{1991-97}$ | | 0.101*** | |
| | | (0.027) | |
| $Policy_{1998-01}$ | | 0.073** | |
| | | (0.029) | |
| $Policy_{1987-97}$ | | | 0.052** |
| | | | (0.020) |
| $N^*T$ | 2,021,047 | 2,021,047 | 2,021,047 |

Clustered standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
*Note*: Table shows probit estimates for insurance status *Pr* (unemployment $insured_{it} = 1$) regressed on the policy specifications (three-part policy period, full policy period, and limited policy period) and a set of covariates. Parameters for municipality dummies (besides Farum), age dummies, and years dummies not shown. Farum enacted an intensive workfare policy for no-UI individuals in 1987. The policy enforced immediate daily activation requirements for all welfare recipients without unemployment insurance in order for them to remain eligible for welfare. From 1988, the policy also targeted individuals with light physical and mental disabilities, and from 1990 the policy targeted all welfare recipients in the municipality. The rest of Denmark strengthened their activation requirements for no-UI individuals during the 1990s, but never enforced as strict requirements as Farum did. The Farum activation policy was discontinued in 2001. The estimation sample includes all men, who exist in either the no-UI sample or the UI-sample. Individuals from both samples are included as long as they either have UI or do not have UI, but not when enrolled in an educational program. By including people from the no-UI sample after those sample members switch to having UI, as well as including people from the UI sample after those sample members switch to no-UI, we end of with a larger sample size than we would have obtained by just combining the two samples directly. Clustered standard errors in parentheses.
*Source*: Own calculations on data from Statistics Denmark.

**Table A5**
Heckman two-step estimation, the effect of Farum policy on crime rates for no-UI men accounting for selection into Farum.

| | First step | Second step | | |
|---|---|---|---|---|
| | Probit | FE1 | FE2 | FE3 |
| High school | 0.040* | 0.041*** | 0.041*** | 0.041*** |
| | (0.020) | (0.003) | (0.003) | (0.003) |
| Married | −0.009 | 0.012*** | 0.013*** | 0.012*** |
| | (0.024) | (0.003) | (0.003) | (0.029) |
| Children | 0.121*** | −0.002 | −0.002 | −0.002* |
| | (0.024) | (0.003) | (0.003) | (0.002) |
| Earnings | 0.093*** | 0.001 | 0.001 | 0.001 |
| | (0.005) | (0.001) | (0.001) | (0.001) |
| Parents same home | 0.248*** | −0.017*** | −0.018*** | −0.018*** |
| | (0.023) | (0.003) | (0.003) | (0.003) |
| Parents same muni. | −0.128*** | 0.015*** | 0.015*** | 0.015*** |
| | (0.024) | (0.003) | (0.003) | (0.003) |
| Denmark or Western country | −0.128*** | | | |
| | (0.025) | | | |
| Parents outside Farum | −0.556*** | | | |
| | (0.023) | | | |
| Parents in Farum | 1.945*** | | | |
| | (0.036) | | | |
| Farum | | −0.048 | −0.052 | −0.049 |
| | | (0.055) | (0.055) | (0.055) |
| Inverse Mill's ratio $\lambda_1$ | | 0.082* | 0.085** | 0.082* |
| | | (0.043) | (0.043) | (0.043) |
| Inverse Mill's ratio $\lambda_2$ | | −0.003 | 0.001 | −0.003 |
| | | (0.031) | (0.031) | (0.031) |
| $\text{Policy}_{1987-90}$ | | −0.025*** | | |
| | | (0.009) | | |
| $\text{Policy}_{1991-97}$ | | −0.022* | | |
| | | (0.011) | | |
| $\text{Policy}_{1998-01}$ | | −0.008 | | |
| | | (0.011) | | |
| $\text{Policy}_{1987-01}$ | | | −0.019** | |
| | | | (0.008) | |
| $\text{Policy}_{1987-97}$ | | | | −0.020** |
| | | | | (0.009) |
| Individual fixed effects | No | Yes | Yes | Yes |
| $N^*T$ | 427,043 | 427,043 | 427,043 | 427,043 |

Clustered standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Table shows results from a two-step Heckman sample selection model for men age 18–35 without unemployment insurance. First step consists of a probit model that regresses residing in Farum $Pr(\text{Farum}_{it} = 1)$ on a set of covariates, including parents location as the instruments. The second step consists of OLS models regressing individual annual number of committed crimes on the policy specifications (three-part policy period, full policy period, and limited policy period), a set of covariates, and two selection parameters for selection into Farum ($\lambda_1$) and out of Farum ($\lambda_2$). Parameters for municipality dummies (besides Farum), age dummies, and years dummies not shown. In models FE1–FE3 we control for individual-level fixed effects. Clustered standard errors in parentheses.
*Source*: Own calculations on data from Statistics Denmark.

**Table A6**
Heckman two-step estimation, the effect of Farum policy on crime rates for no-UI men accounting for selection into Farum, including parental status controls.

| | First step | Second step | | |
|---|---|---|---|---|
| | Probit | FE1 | FE2 | FE3 |
| High school | −0.040** | 0.041*** | 0.041*** | 0.041*** |
| | (0.020) | (0.003) | (0.003) | (0.003) |
| Married | −0.001 | 0.012*** | 0.012*** | 0.012*** |
| | (0.024) | (0.003) | (0.003) | (0.003) |
| Children | 0.123*** | −0.002 | −0.002 | −0.002 |
| | (0.024) | (0.003) | (0.003) | (0.003) |
| Earnings | 0.091*** | 0.001 | 0.001 | 0.001 |
| | (0.005) | (0.001) | (0.001) | (0.001) |
| Parents same home | −0.198*** | 0.015*** | 0.015*** | 0.015*** |
| | (0.018) | (0.003) | (0.003) | (0.003) |
| Parents same muni. | −0.003** | −0.018 *** | −0.018 *** | −0.018 *** |
| | (0.001) | (0.003) | (0.003) | (0.003) |
| Mother's wealth | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.000) | (0.002) | (0.002) | (0.002) |
| Father's wealth | 0.000*** | 0.000 | 0.000 | 0.000 |
| | 0.000 | (0.000) | (0.000) | (0.000) |
| No parental wealth | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Father's unemployment | −0.160*** | 0.000* | 0.000* | 0.000* |
| | (0.024) | (0.000) | (0.000) | (0.000) |
| Mother's unemployment | 0.255*** | 0.000 | 0.000 | 0.000 |
| | (0.023) | (0.000) | (0.000) | (0.000) |
| Denmark or Western country | −0.169*** | | | |
| | (0.026) | | | |
| Parents outside Farum | −0.622 | | | |
| | (0.023) | | | |
| Parents in Farum | 1.887*** | | | |
| | (0.036) | | | |
| In Farum | | −0.042 | −0.039 | −0.040 |
| | | (0.056) | (0.056) | (0.056) |
| Inverse Mill's ratio $\lambda_1$ | | 0.077 * | 0.079 * | 0.076 * |
| | | (0.043) | (0.043) | (0.044) |
| Inverse Mill's ratio $\lambda_2$ | | 0.009 | 0.007 | 0.009 |
| | | (0.032) | (0.032) | (0.032) |
| $\text{Policy}_{1987-90}$ | | −0.025 ** | | |
| | | (0.009) | | |
| $\text{Policy}_{1991-97}$ | | −0.022 * | | |
| | | (0.011) | | |
| $\text{Policy}_{1998-01}$ | | −0.009 | | |
| | | (0.011) | | |
| $\text{Policy}_{1987-01}$ | | | −0.020 ** | |
| | | | (0.008) | |
| $\text{Policy}_{1987-97}$ | | | | −0.021 ** |
| | | | | (0.009) |
| Individual fixed effects | No | Yes | Yes | Yes |
| $N^*T$ | 427,043 | 427,043 | 427,043 | 427,043 |

Clustered standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Table shows results from a two-step Heckman sample selection model for men age 18–35 without unemployment insurance. First step consists of a probit model that regresses residing in Farum $Pr(\text{Farum}_{it} = 1)$ on a set of covariates, including parents location as the instruments. The second step consists of OLS models regressing individual annual number of committed crimes on the policy specifications (three-part policy period, full policy period, and limited policy period), a set of covariates, and two selection parameters for selection into Farum ($\lambda_1$) and out of Farum ($\lambda_2$). Parameters for municipality dummies (besides Farum), age dummies, and years dummies not shown. In models FE1–FE3 we control for individual-level fixed effects. Clustered standard errors in parentheses.
*Source*: Own calculations on data from Statistics Denmark.

**Table A7**
Heckman two-step estimation second step, the effect of Farum policy on crime rates for no-UI men using score block bootstrapped standard errors.

| | Second step | | |
|---|---|---|---|
| | FE1 | FE2 | FE3 |
| Inverse Mill's ratio $\lambda_1$ | 0.082* | 0.085** | 0.082* |
| | [−0.002;0.166] | [0.001;0.169] | [−0.003;0.165] |
| Inverse Mill's ratio $\lambda_2$ | 0.003 | 0.001 | 0.003 |
| | [−0.057;0.063] | [−0.061;−0.063] | [−0.056; 0.065] |
| $\text{Policy}_{1987-90}$ | −0.025*** | | |
| | [−0.044;−0.006] | | |
| $\text{Policy}_{1991-97}$ | −0.022* | | |
| | [−0.044;0.000] | | |
| $\text{Policy}_{1998-01}$ | −0.009 | | |
| | [−0.031; 0.013] | | |
| $\text{Policy}_{1987-01}$ | | −0.019** | |
| | | [−0.036;−0.003] | |
| $\text{Policy}_{1987-97}$ | | | −0.020** |
| | | | [−0.038; −0.003] |
| Individual fixed effects | Yes | Yes | Yes |
| $N*T$ | 427,043 | 427,043 | 427,043 |

Score bootstrapped standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Table shows results from the second step of a two-step Heckman sample selection model for men age 18–35 without unemployment insurance. First step consists of a probit model that regresses residing in Farum $Pr(\text{Farum}_{it} = 1)$ on a set of covariates, including parents location as the instruments (not shown). The second step consists of OLS models regressing individual annual number of committed crimes on the policy specifications (three-part policy period, full policy period, and limited policy period), a set of covariates) and a set of covariates that includes municipality of residence, high school education, marriage, earnings, children, age, and year fixed effects, and two selection parameters for selection into Farum ($\lambda_1$) and out of Farum ($\lambda_2$). Parameters for covariates not shown. We control for individual-level fixed effects. 95% confidence intervals calculated using score bootstraps with 2500 repetitions following Kline and Santos (2012). Significance levels calculated using quasi-*F*-test.
*Source*: Own calculations on data from Statistics Denmark.

**Table A8**
Heckman two-step estimation of the effect of the Farum policy on crime rate, 2nd step results for UI-Men.

| Dependent variable | Crime rate |
|---|---|
| $\text{Policy}_{1987-90}$ | 0.003 |
| | (0.006) |
| $\text{Policy}_{1991-97}$ | 0.003 |
| | (0.004) |
| $\text{Policy}_{1998-01}$ | 0.007 |
| | (0.005) |
| $\text{Policy}_{1987-01}$ | 0.004 |
| | (0.004) |
| $\text{Policy}_{1987-97}$ | 0.001 |
| | (0.004) |
| Individual fixed effects | Yes |
| $N^*T$ | 1,010,181 |

Clustered standard errors in parentheses. $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.
Table shows results from the second step a two-step Heckman sample selection model for men age 18–35 with unemployment insurance. First step consists of a probit model that regresses residing in Farum $Pr(\text{Farum}_{it}=1)$ on a set of covariates, including parents location as the instruments (not shown). The second step consists of OLS models regressing individual annual number of committed crimes on the policy specifications (three-part policy period, full policy period, and limited policy period), a set of covariates that includes municipality of residence, high school education, marriage, earnings, children, age, and year fixed effects, and two selection parameters for selection into Farum ($\lambda_1$) and out of Farum ($\lambda_2$). Parameters for covariates not shown and selection parameters. Models control for individual-level fixed effects. Clustered standard errors in parentheses.
*Source*: Own calculations on data from Statistics Denmark.

**Table A9**
OLS models of the effect of the Farum policy on crime rate and crime indicator for UI men controlling for welfare dependency.

| | Crime rate | Crime indicator |
|---|---|---|
| Welfare | 0.051*** | 0.033*** |
| | (0.005) | (0.000) |
| [87 − 90] × Farum | 0.006 | 0.001 |
| | (0.006) | (0.003) |
| [91 − 97] × Farum | 0.006 | 0.005 |
| | (0.004) | (0.003) |
| [98 − 01] × Farum | 0.009* | 0.006* |
| | (0.005) | (0.003) |
| Welfare | 0.051*** | 0.033*** |
| | (0.005) | (0.001) |
| [87 − 01] × Farum | 0.007* | 0.004 |
| | (0.005) | (0.003) |
| Welfare | 0.051*** | 0.033*** |
| | (0.005) | (0.001) |
| [87 − 97] × Farum | 0.002 | 0.001 |
| | (0.004) | (0.002) |
| Individual fixed effects | Yes | Yes |
| $N^*T$ | 884,197 | 884,197 |

Clustered standard errors in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.
*Note*: The table shows the results of OLS regression of individual annual number of committed crimes (Crime Rate) and indicator of committing any crime a given year (Crime Indicator) on the policy specifications (three-part policy period, full policy period, and limited policy period) and a set of covariates that includes municipality of residence, high school education, marriage, earnings, children, age, and year fixed effects. Sample consists of men with unemployment insurance age 18–35. We only have information on welfare dependency from 1984 and onward, so we limit the sample to the period 1984–2005. We control for individual fixed effects. Crime Indicator = I(Crime Rate > 0).
*Source*: Own calculations on data from Statistics Denmark.

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