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Life after prison
The relationship between employment and re-incarceration

Abstract:
We explore the relationship between formal employment and recidivism using a dataset that follows every Norwegian resident released from prison in 2003 for several years. By the end of 2006, 27 percent are re-incarcerated. Using a Cox proportional hazard model that controls for a host of individual characteristics, we find that the hazard of re-incarceration is 63 percent lower for those getting employed compared to those not getting employed. While some of the moderating association between employment and re-incarceration is accounted for by observable individual characteristics, the substantially lower hazard for those getting employed indicates a possibility of a considerable benign effect of employment on recidivism. Our analysis thus provides further indication that provision of employment opportunities can facilitate the return to society after release from prison.

Keywords: prison, recidivism, employment

JEL classification: J19, K49

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1 Introduction

One overarching goal for prison services, policymakers and social workers is to rehabilitate prisoners to a life without crime. Legitimate sources of income and a meaningful and socially acceptable position in the social structure are often considered important precondition for establishing a new law-abiding life. An ordinary job is central in this respect. Not much is known, however, about the extent that released prisoners are able to enter the labour market. Indeed, empirical evidence on effects of post-release employment on recidivism is surprisingly limited (Uggen & Wakefield 2008; Visher, Winterfield & Coggeshapp 2005; Wilson, Gallagher & MacKenzie 2000). It is therefore of major importance to investigate the relationship between entry onto employment and recidivism. In this paper we look at the mediating role of employment, both just at the time of release and after some time, for recidivism.

The role of employment in crime desistance has strong support also from criminological theory. Work is one of the most important opportunities for a "turning point" in a criminal career (Laub & Sampson 2001), and it is the basis for several rehabilitation initiatives (Bushway & Reuter 1997; Jess 2005). A wide range of theoretical approaches assume a crime-preventive effect of employment, including social control (Laub & Sampson 2003), rational choice (Becker 1993; Ehrlich 1973) and changed identity (Giordano, Cernkovich & Rudolph 2002). Thus, there are reasons to believe that employment opportunities reduce the likelihood or extent of criminal activities.

Despite the great emphasis on re-entry to society, there are not many large-scale studies that examine the lives of prisoners after release from prison, particularly not considering employment (for an overview, see Bowles & Florackis 2007; Visher & Travis 2003). In this article, we utilize a dataset of the entire cohort of persons released from prison sentences in Norway in 2003 to investigate the impact of employment on re-incarceration through 2006. We start by giving a descriptive analysis of transition rates from prison to re-incarceration and employment. Previous studies have failed to control for events that occur after the date of release, while we have information on post-release employment spells in nearly continuous time. We estimate the difference in hazard rates for recidivism between those who do and do not get employed. We explore the importance of selection by including a rich array of observable individual characteristics, including pre-prison work experience and crime records.

2 Employment and Recidivism – Theoretical Perspectives

The crime preventive impact of employment is compatible with a host of theoretical perspectives. From a practical and economic perspective, changes in labour market opportunities can result in substitution of time between licit and illicit work. The individual will then have to allocate his time between licit and illicit activities, according to expected costs and benefits (Becker 1993; Ehrlich 1973). If the expected returns from licit work are low because one can only get unskilled jobs, and the expected returns from crime is higher, illicit income opportunities are more attractive. For convicted persons, the effects of stigma may be a serious hindrance to get a job (Grogger 1995, Pager 2003) leaving the possible licit income sources to various welfare benefits. In such a situation, a life based solely on legal income sources may not be a very attractive option. The opportunities for getting a decent paid job will rarely be truly blocked, but the *effort* needed to get it may nevertheless be perceived as prohibitive. For those with weak bonds to society, there would also be little to loose by breaking conventional norms (Hirschi 1969).

Such considerations will be important to the individual when considering applying for a job or not, but they will also affect considerations of additional illicit activities if actually getting a job (Ehrlich 1973). A job will secure a stable income – although maybe low – and illicit activities may preclude future legal income opportunities. Ex-convicts who get a job will then have more to loose than those who do not get a job, and this should be so even if there are selection processes determining who gets a job. However, the economic perspective is less capable of explaining types on crime with little or no ability to provide material gains, like violent crime or traffic violations, unless they are means to an economic end.

Felson (1998) points out that even though people might be motivated for offending they cannot do so unless an opportunity is present, and how the individuals allocate their time is a central factor also from this perspective. Situational action theory (Wikström 2006) extends this perspective for youth crime, but the idea applies also to adults: regardless of individuals 'criminal propensity', exposure to criminogenic settings through life style have a major impact on offending. Less structured routine activities, like being without steady employment, increase idleness time where one might be more exposed to criminogenic settings. Hanging out with deviant friends and peers may lead to exposure to settings and temptations that one may even prefer to avoid. In contrast to the economic perspective, which mainly considers rational choice between income generating activities, these theories offers extensions of the effect of employment to types of crime that are not rationally purposeful or do not

generate income. Note also that according to these theories, licit income from welfare would not necessarily be any hindrance for additional crimes, while activities such as work or schooling would.

In recent years, there has been increased research on desistance from crime, and several studies have stressed the importance of forging a new identity as a responsible and law-abiding citizen. In this tradition, employment has been reported to play a significant role in changing a life-style (Farrall & Calverley 2006; Laub & Sampson 2003; Uggen, Manza, & Angela 2004). Giordano et al (2002) argue that the agents are actively seeking and participating in their own desistance. Opportunities for change, such as an ordinary job, serve as "hooks for change" that the agent actively seeks out and grabs. Change is then conditional on an initial motivation, the presence of an opportunity for change, and that the individual perceives the new situation as a positive development that makes this new path meaningful and desirable, motivating him to continue along this line (Giordano et al. 2002: 1001). Neither a motivation nor an opportunity is sufficient, so there is necessarily a reciprocal relationship between the agent, opportunities and re-evaluation of one's situation. Qualitative aspects of the job may then also be of importance. For example, it has been suggested that it is job *stability* that leads to desistance from crime, as it is a precondition for providing social control (Sampson & Laub 1993).

3 Previous Studies

When considering employment after release from prison, it is important to keep in mind that the prison population to a large extent consists of persons with weak ties to the labour market and a host of other related problems (Kyvsgaard 1989; Nilsson 2003; Skardhamar 2003). This is likely to hamper entry into the labour market after release. To the best of our knowledge, very little is known about how many gets employment after release, or how long it takes from release to possible employment. In the case of Norway, it has been suggested that about 30% of the inmates have a job at the time of release from prison (Skardhamar 2003), but whether this has any bearing upon recidivism is largely unexplored.

Most recidivism studies have only had accesses to basic information on the individual's background, such as age, sex, citizenship, type of crime, and perhaps also previous criminal history as this is the kind of data typically available from the prison services administrative registers (Visher 2003). Of the very few studies that do consider employment after release, Visher et al (2008) found that many released from prison get some kind of work (although often unstable jobs), but in their paper they did not assess the relationship with recidivism. Nilsson (2003) found that lack of previous job experiences were related to higher re-incarceration rates after three years since release, but they did not have

information on employment *after* release. One recent study found that those participating in education and job programs inside prison had significantly reduced re-entry or delayed re-entry to prison (Sedgley, Scott, Williams, & Derrick 2008), and Berk (2008) found that those who were granted work-release from prison had significantly higher employment chances, but only lower recidivism for inmates who had committed income-generating crimes.

Several studies of crime in the life course have suggested that employment is one of the most important factors that may lead to desistance. For example, Sampson and Laub (1993) followed their sample from age 7 to 32, but without finding a general relationship between work and desistance. However, getting *stable* employment was strongly correlated with desistance. There are also a number of qualitative studies focusing on offenders' own experiences of the importance of getting a job. These consistently report that work is not only a way of securing a stable income, but also a source of self-esteem, bringing structure to their daily life, and generally provide an opportunity for more profound changes. Work is frequently reported to be one of several important opportunities for a turning point in a criminal career (Farrall & Calverley 2006; Giordano et al. 2002; Laub & Sampson 2003).

The impact on the overall population of unemployment on crime may differ from effect of unemployment on the criminal behaviour of previously convicted persons, and it will indeed differ from the crime preventive effect of employment on the general population. Fergusson et al (2001) followed a sample from age 18 to 21 studying the impact of unemployment on several measures of psychosocial adjustments including crime and drug use. While controlling for unobservables using individual level fixed effects models, they concluded that unemployment led to increased probability for crime and several other negative outcomes. Using panel data, Thornberry and Christenson (1984) considered unemployment and found support for reciprocal causal structures over time as crime may reduce the chances of future employment, which again increase the probability of offending.

Although there are sound theoretical arguments for why employment would be important to reduce recidivism, it is hard to document empirically whether employment has a causal effect on recidivism. If we observe less recidivism among those who do get employed compared to those who doesn't, is this difference caused by employment *per se*, or is it simply due to those less likely to re-offend being most likely to get a job? It may indeed also be that those most motivated manage to desist from crime only if they actually get a job. To disentangle these processes, and assess to what extent employment actually have a causal effect on recidivism, is methodologically challenging, and experimental studies of sufficient methodological quality are scarce (Bloom 2006; Visher et al. 2005; Wilson et al. 2000).

Evaluation of labour marked programs directed at inmates or ex-offenders are particularly relevant in our context. Uggen (2000) found that supported work reduced recidivism, but only for adult offenders. But the overall picture stemming from meta-analysis of labour market programs directed at former inmates is more uncertain. Visher et al. (2005) found only eight random assignment studies, of which only two of the samples included more than a few hundred individuals. They concluded that there was no overall evidence that employment services reduced recidivism (see also Bloom 2006). Another review by Wilson et al (2000) also included quasi-experimental methods, and concluded more positively, but they noted that a causal interpretation was hampered for methodological reasons.

In sum, the empirical evidence is scarce. The great importance of work reported by observational studies is only in part supported by evidence from experimental studies of labour market programs directed at inmates and former inmates. As noted by Uggen and Wakefield (2008), one reason is the complexity of the relationship which is hard to properly disentangle in this way. In particular, it is likely that a crime preventive effect of work may vary over subgroups of inmates such as e.g. young offenders or those who have a family with children (Sampson & Laub 1993; Uggen 2000; Uggen & Wakefield 2008). The null-effect of some experimental studies is also likely to be attributed to specific nature of the programs, such as the *kinds* of work offered, kinds of offenders targeted or types of prisons. The evidence is therefore not conclusive regarding the general effect of employment. We may also note that several of the experimental evaluation studies of labour market programs do not report whether the participants actually got an ordinary job, only the effect of trying to get them a job (Sedgley et al. 2008; Uggen 2000; Visher et al. 2005; Wilson et al. 2000). The actual mechanism is then not necessarily work as such (although this is clearly what is intended), but could also be eg increased motivation or gaining a new view of life etc.

There are notable limitations in the existing literature. First, most studies on inmates and work are on particular subpopulations, and we know little about the overall patterns of employment after release. Second, recidivism studies do generally not include information on employment at or after release. Third, most of the studies we were able to find are from the US, where both the prison population and the labour market are much different from Europe, and Norway in particular. It is therefore even less clear what the mediating role of employment for recidivism is in a European or Scandinavian context. Our study addresses all these limitations of previous studies, by exploiting Norwegian register data on every resident released from a Norwegian prison in 2003, with detailed information on post-release employment spells and re-incarceration. The main focus of our study is to elicit the mediating role of post-release employment spells for re-incarceration.

4 Method and Data

The system of administrative registers, as provided by Statistics Norway, enables us to combine information on imprisonment with a range of data outside the criminal register system. We use survival data methods to study the relationships between the released inmates' labour market attachment and re-incarceration. Many of the variables in our dataset are measured with exact dates, enabling us to apply survival models – and we will mainly rely on variants of the Cox proportional hazard model (Hosmer & Lemeshow 1999). Such models allow us to explicitly handle the *timing* of recidivism, while at the same time controlling for a host of observable characteristics and taking right-censoring, such as deaths and emigration, into account. We follow individuals to their first re-imprisonment, and the methodology allows for repeated employment spells.

Every resident in Norway has one unique ID number, and this ID enables unequivocal linking of an individual's data from different registers (and over time). The registers cover all the residents of Norway, and contain a wide range of information organized as either time series or event histories (depending on the type of variable) at the individual level for each resident. Therefore, many of the limitations associated with survey data, such as low response rates or attrition, or the data being limited to a particular geographical area or having a small number of observations, do not plague our study. Furthermore, the only attrition from the data is natural—that is, due to death and emigration—and the provided information is generally very reliable (Røed & Raaum 2003).

We use imprisonment data containing complete records of every inmate in Norwegian prisons over the period 2001-2006. We have organized these prison records as event histories so that we can study re-incarceration measured at exact dates. We also have exact and reliable information on length of time served, type of crime and which prison the sentence is served in.

The second data source is a longitudinal database for research purposes called *FD-Trygd* (Akselsen, Lien, & Sivertstøl 2007). It contains information on every Norwegian resident from 1992 to 2007 on demographic events (age, sex, emigration, immigration, citizenship, deaths, etc.), socio-economic data (years of education, earnings, welfare program participation, etc.), labour market history, etc.

The sample consists of all inmates released from prison sentence (not custody) during 2003. We are only able to include persons who have an ID-number (thus, excluding foreigners, asylum seekers and illegal immigrants), in all 7,489 persons. We include information on imprisonment spells during 2001–2002, and if someone is released several times in 2003 we rely on the first release. Our applied

measure of re-incarceration includes both sentenced prison spells and custody. Characteristics of the population are shown in Table 1 (N=7,489). Unless indicated otherwise, all variables are measured at the day of release or before. The vast majority were men (92 percent), and largely adult, with a mean age of about 33 years at the time of release. Very few (five per cent) are below 20 years, but many are between 20 and 25 years (23 per cent). As is well known from previous studies, the prison population is characterized by low educational level. The mean years of schooling is just above the compulsory secondary school in Norway (10 years), and seven per cent had not even completed compulsory secondary school. Only five percent had education exceeding high school (more than 13 years). A few were not Norwegian citizens (six percent) and eleven per cent was immigrants or children of two immigrants.

It is also well know from previous studies that there is a high prevalence of inmates with serious health and mental health problems (Friestad & Hansen 2005). We have no comprehensive measure of health, but we know whether the inmate was drawing disability pension at the beginning of 2003. Every Norwegian resident with a health problem that seriously impedes work is eligible for disability, and currently more than 10 per cent of the working-aged Norwegian population receives disability pension. Among the released prisoners, about 10 per cent is on disability pension. Though this is above the average in the overall population for men of comparable age, it might be lower than one would expect given previous studies (Friestad & Hansen 2005).

Almost a third of the prisoners served a sentence for traffic violations, and almost a fourth for larceny-theft. A fifth served for violence and about 13 percent for drug abuse, possession or dealing. White collar crime (six percent) and sexual offences (two percent) are more uncommon. We should, however, be careful in making explicit interpretation of crime types as an inmate typically serves for several different offences and in the Norwegian data one is to be registered with the offence that is the most severe (measured with in terms of the legal maximum penalty). For example, someone convicted for both larceny and serious drug crimes will be registered under drug crimes, as the maximum penalty is 21 years for drug crimes although the actual sentence may be much shorter.

Table 1: Descriptive statistics at time of release (unless otherwise specified)

	Mean/Fraction (st.dev.)	Median	5th percentile	95th percentile
Age	33.44 (10.96)	31.46	19.96	54.60
<20	0.05			
<25	0.28			
Sex (male=1)	0.92			
Years of education 2002	10.71 (2.61)	10.00	8	14
<10	0.07			
<13	0.68			
>=14	0.05			
Norwegian citizen	0.94			
Immigrant or parents are immigrants	0.11			
Prison time (days)	97.46 (182.22)	40.00	15	368
<16	0.07			
<22	0.26			
<31	0.45			
<61	0.69			
>366	0.05			
Number of prison spells since 0101 2001 before the current one	0.35 (0.77)	0	0	2
Re-imprisoned by end of 2006	0.27			
Earnings 2002	147 133.10 (168 227.30)	101 744.80	0	426 098.20
=0	0.27			
<50,000	0.40			
<100,000	0.50			
>=300,000	0.17			
On disability pension beginning of 2003	0.09			
Number of years with positive and non-minor earnings over 1995-2002	4.00 (2.99)	4.00	0	8
Employed at time of release	0.25			
Vocational training at time of release	0.10			
Type of crime				
White collar	0.06			
Larceny-theft	0.23			
Violent	0.19			
Sexual	0.02			
Drug	0.13			
Vandalism and environmental	0.01			
Traffic	0.31			
Other	0.03			
Missing	0.01			

Note: Number of persons 7,489.

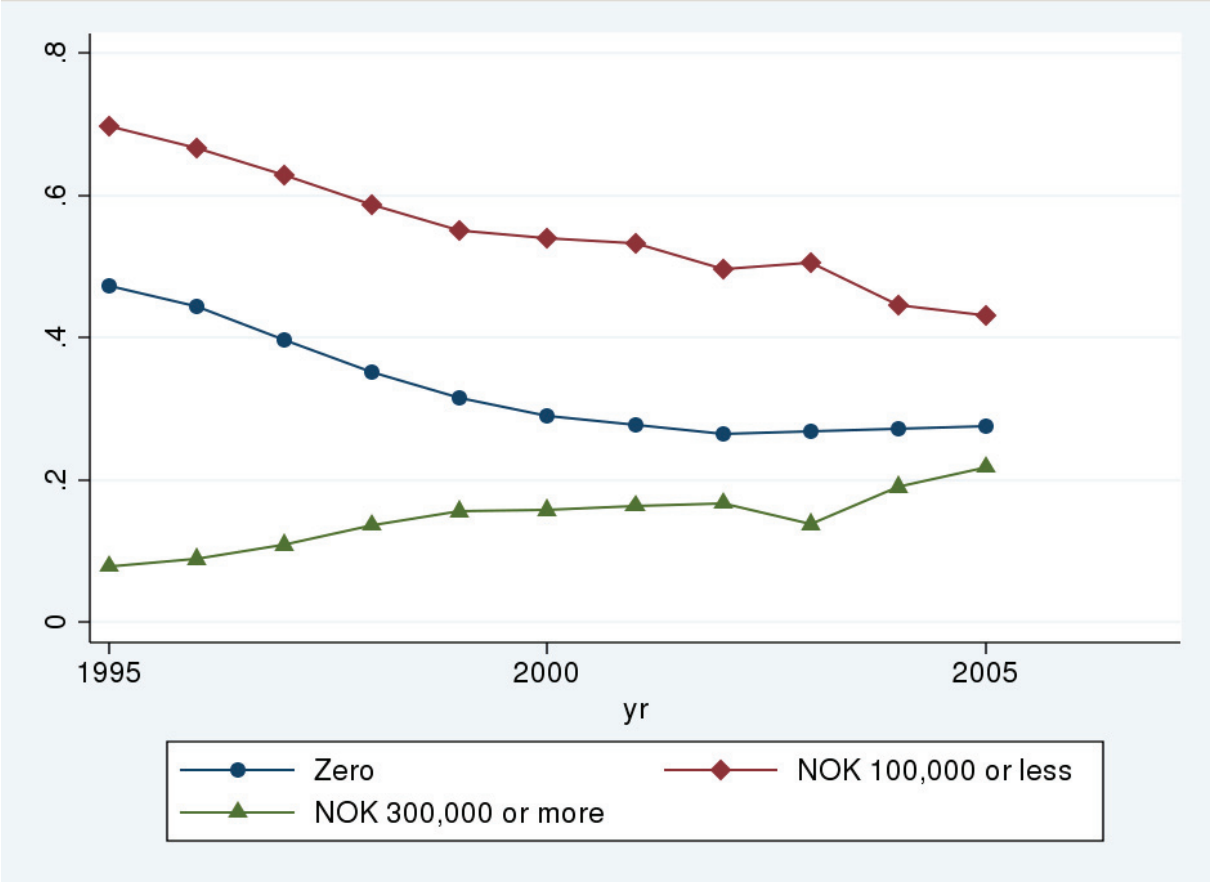
Most of the released prisoners had served relatively short prison terms, with a median of 40 days. In our sample, seven percent had served less than 16 days and 26 percent less than 22 days. Five percent had served more than a year in prison. The high frequency of shorter terms may be related to less punitive policies in Norway compared to e.g. the UK and USA. Differences in incarceration rates between Norway and these countries are also remarkable. While the US incarceration rates are about 751 per 100,000 population (BJS, 2009)[1], the UK rate is about 140 (European Sourcebook, 2006), and Norway's rate is about 91 per 100,000 (Statistics Norway, 2008). Attempts to explain these differences often refer to Norway's social safety net, highly egalitarian cultural values as well as less punitive policies than the US and the UK (Christie 2000; Pratt 2008).

We now turn to the relationship between labour market attachment and re-incarceration. Earnings is often considered a good proxy for integration into the formal labour market. Figure 1 provides information on the proportion of our released inmates with various levels of annual earnings from 1995 to 2005. We note the small drop in the proportion of inmates with high earnings (NOK 300 000 or more) in the year of release (2003). Recalling from Table 1 that the vast majority of inmates served short sentences, very few would be precluded from having earnings in any of the years preceding 2003 due to the imprisonment spell that ends in 2003. Some may of course have been serving previous sentences during these years, but that is clearly also an indication of weak labour market attachment.

About 30 percent of these subjects had no earnings in 2002 and nine percent were drawing disability pension (Table 1). Thus, about 40 percent of the sample was practically outside the labour force in the year before release. However, there are also some inmates that seem to be integrated in the labour market, and 25 percent were employed at time of release (Table 1). The inmates with a job at the time of release typically serve sentences of a few weeks for violence or traffic violations (not including speed-tickets etc, but typically drunk-driving and seriously reckless driving). From Figure 1 we see that the proportion with no earnings is falling somewhat over time, which is likely to be related to the aging of our sampled persons. The proportion with reasonable earnings (NOK 300 000 or more) has also been increasing somewhat over time.

[1] URL: http://www.ojp.usdoj.gov/bjs/pub/pdf/pim08st.pdf

Figure 1: Ratio of the inmates with given level of earnings (in fixed 2008 prices) in given year



5 Findings

5.1 Post-release employment and re-incarceration

Our main interest is what happens *after* release from prison, primarily with respect to employment and re-incarceration. Figure 2 provides Kaplan-Meier estimates of the survival functions from release to either re-incarceration or employment. The time scale is measured in days from release. The survivor function gives the probability of still being at risk of the event in question (or censoring) past the given time. By the end of 2006, 27 per cent (Table 1) of our sample had been re-imprisoned, but this ratio does not take censoring into account. While correcting for censoring in Figure 2, one could say we expect that it takes about three years before 25 per cent have been re-incarcerated (and about 30 per cent are re-incarcerated by four years).

In the case of employment, about 25 per cent (Table 1) were employed at the time of release. These are not "at risk" of becoming employed after release, and are therefore not used to calculate the Kaplan-Meier estimate in Figure 2. Of the remaining, the probability of not getting employed beyond four years after release is about 57 per cent. Although more than 40 percent of the sample got a job eventually during this period (in addition to those who already had one), it took 475 days until 25 per cent got a job. The transition to employment is therefore rather slow for those not holding a job at the time of release.[2]

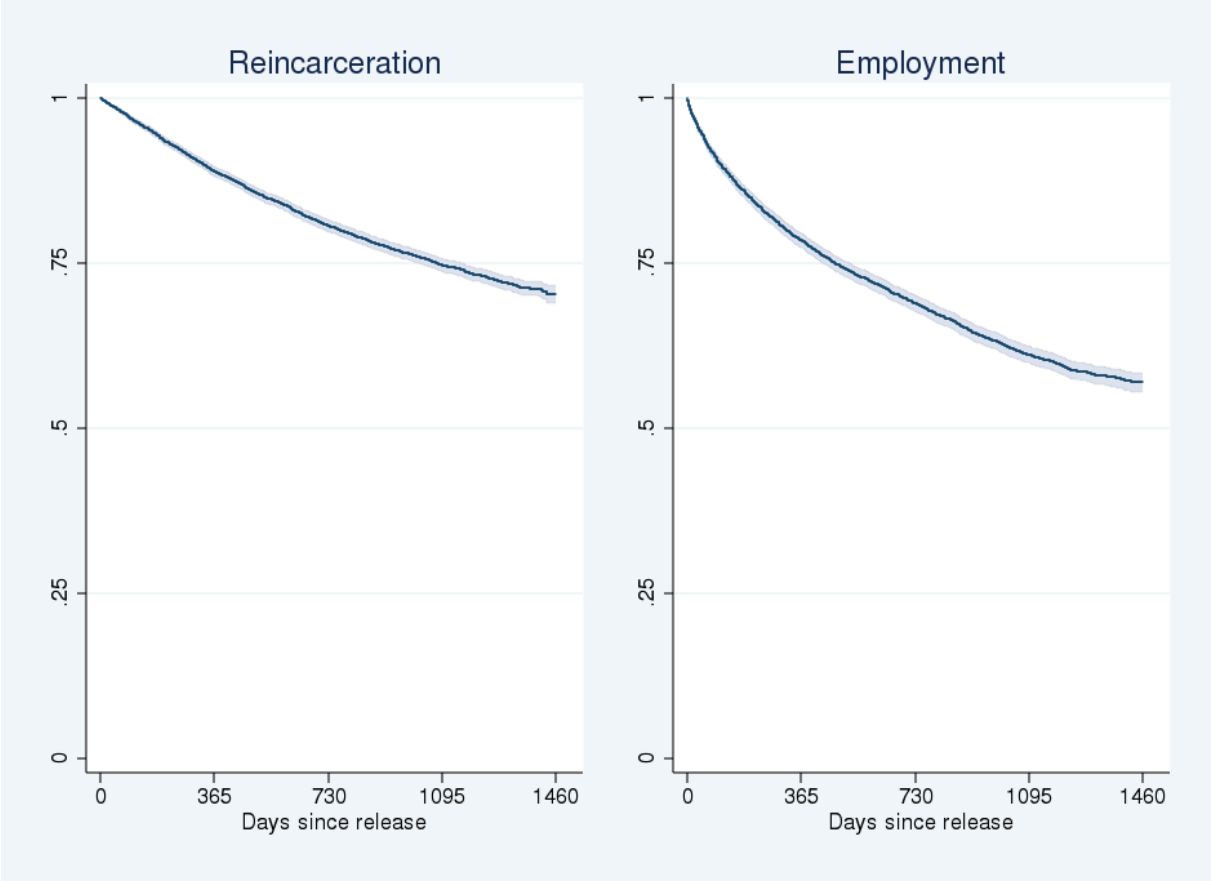
The time patterns become more visible if we look at estimates for the hazard function provided in Figure 3. The hazard function is the instantaneous rate of "failure". It can be thought of as the probability that the event in question occurs on a specific day, given that it has not happened before that day. The very fine-graded time-scale (days) used in this figure implies that the probabilities in a given day (the y-axis) will be very low, and we may therefore give more attention to the shape of the curve than the exact numbers.

The hazard function (smoothed) for re-incarceration increases the first couple of hundred days after release, before it starts to decrease. The increase at the beginning might be because it takes some time from a crime is committed till the person can be re-incarcerated. It could also be that some released prisoners manage to stay away from crime the first time after release, but that the good intentions do not last for very long. After the peak at a couple of hundred days, it seems that the longer one manages to keep out of prison, the less likely is it that one will be re-incarcerated. The declining hazard may be explained by the most crime-prone subjects being arrested and re-incarcerated after a short time, implying that the remaining group becomes less and less crime-prone. It is also of course possible that being able to stay out of prison for some time enhances ones confidence that a life without crime is possible, e.g. as the prospects of employment increases or the social bounds and control gets tighter.

[2] Disability pension could be a reason for not getting a job, but a Kaplan-Meier plot not reported here reveals that this is not so relevant for our sample. Hardly anyone had a disability pension entry in this period. (But recall that 9 per cent were already disabled at the time of release). However, vocational training programs were more common, and the transition rate is about half that of employment. It should be mentioned that some participants in vocational training programmes might be registered as employed, so these are not mutually exclusive outcomes.

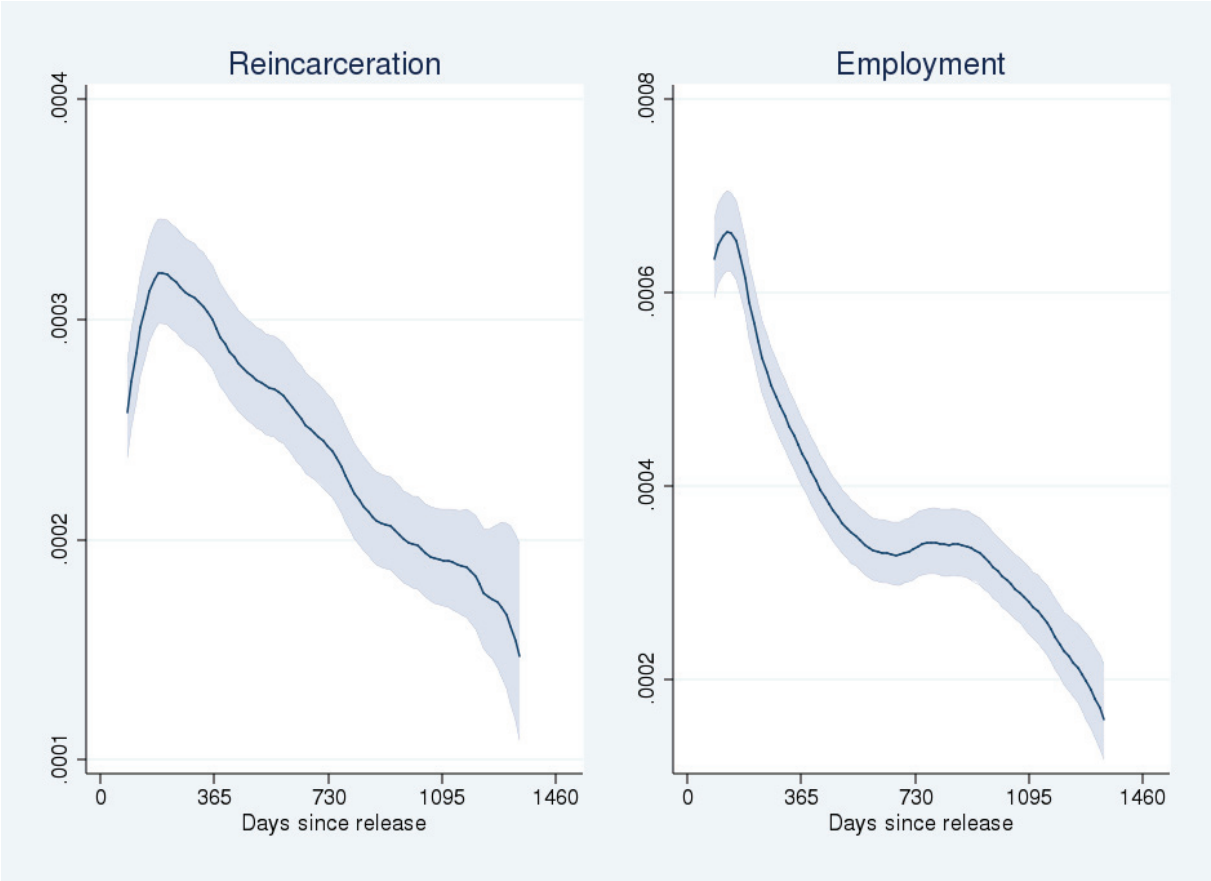
The hazard function for employment is mainly declining, showing that the likelihood of entering employment declines as time after release passes.[3] One possible interpretation of the declining hazards is that the most employable will get a job relatively soon after release. Those with less formal skills, little work experience and social or behavioural problems may have more difficulties to get a job, and it will take longer time to get it. This process of selection makes the remaining group comprise less and less motivated (or capable) persons as time passes. Employers may also expect subjects not getting employment soon after release to be less productive, implying that the simple passing of time reduces the chances of getting a job.

Figure 2: Kaplan-Meier estimates of the separate survival function of re-incarceration and employment (with 95% CI bands)



[3] The interval of flattening and even slightly increasing hazards after about two years may be related to the decline in unemployment and increase in available jobs that took place in Norway from 2005. It might also be related to Norwegian unemployment benefits typically being limited to 104 consecutive weeks; see Røed and Zang (2005) and Røed and Westlie (2007).

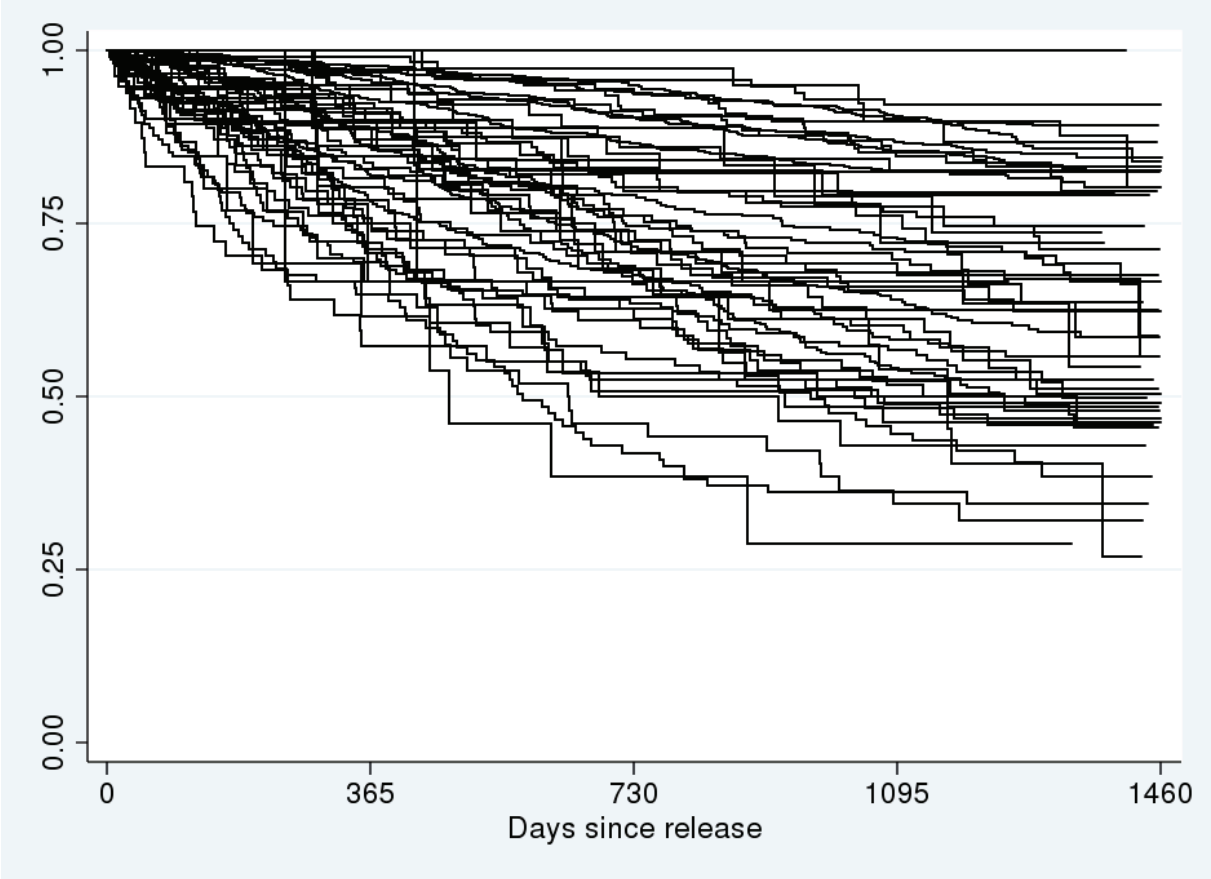
Figure 3: Smoothed hazard estimates of the separate hazard functions for re-incarceration and employment (with 95% CI bands).



Individual characteristics are only one factor that may determine the released prisoner's ability to return to society, the characteristics and conditions of the prison where the sentence was served another (Visher & Travis 2003). There are notable differences between prisons. Some are large, but most Norwegian prisons are quite small, and they vary considerably in security level (Pratt 2008). There are also differences with respect to cooperation with employment services (NAV), rehabilitation programmes offered, and so forth. To underline that recidivism can potentially be affected by prison conditions, in Figure 3 we include Kaplan-Meier estimates by prison (the prison from which the subject was released). We observe that there is huge variation both in the probability of re-incarceration by four years (to any prison) and in how quickly the subjects are re-incarcerated (to any prison). Some prisons are small (down to about 20 inmates), implying that many of these estimates are

very imprecise. Nevertheless, there are ample reasons to expect some real differences between prisons that should be explored and accounted for in further analyses.[4]

Figure 4: Kaplan-Meier survival estimates for re-incarceration by prison



5.2 Regression Results on Recidivism

Based on the theory outlined in Section 2 above, we would expect some factors to reduce the likelihood of recidivism, like recent labour force participation or higher education. Similarly we would expect other factors, like long time in prison and being male, to increase the likelihood of recidivism. Table 2 provides the results from a regression relying on the Cox proportional hazard model with a number of time-invariant control variables measured at or before time of release. The dependent variable is time from release to re-incarceration (including custody), and we report hazard ratios.

[4] One main reason for this variation is presumably that the inmates are to some extent allocated to prisons based on individual assessments. The type of crime committed along with inmate's motivation, behaviour, and perceived security risk affects where the sentence is served. We may therefore expect the likelihood of recidivism of prisoners serving in low-security prisons to be lower than the one for those serving in high-security prisons. The variation evident from Figure 4 is still remarkable, and significant differences across prisons remain when we account for observable characteristics of the prisoners (Cox regression with prison fixed effects and controls for observable individual characteristics, results not reported). Overall, this leaves us with the possibility of substantial effects of prison policies, conditions and environments on recidivism.

First, we consider variables related to the previous labour market attachment of the released inmates. As expected, we see that the relative hazard ratio for prisoners being employed at time of release is low, about 0.58. This means that those who are employed at the time of release have a hazard of re-incarceration that is 42 percent lower than for those without employment at the time of release (conditional on the other covariates). Thus, the likelihood of re-incarceration is much smaller for subjects employed at the time of release. Similarly, we see that the hazard tends to decline with higher earnings in 2002, and it is also declining in the number of years with positive and non-minor earnings over 1995-2002.

The hazard is lower for prisoners that have graduated from high-school (13 years or more of schooling), for whom entry into the labour market may be easier. These results are consistent with a conjecture that persons well integrated into the labour market are more capable of returning to society after prison.

Second, we also include some comments on other variables that may not be closely related to the previous labour market attachment of the released inmates. The hazard is increasing in the length of the served prison term, as well as in the number of imprisonment spells preceding the current one since 2001; which might be related to the fact that long or frequent prison spells precludes the person's integration into the labour market. There is a weak tendency that persons on disability pension at the beginning of 2003 have a lower hazard, which might indicate that a legal source of income may partially substitute for labour market attachment when it comes to reducing recidivism.

Some of the results are somewhat more unexpected. Being enrolled in vocational training at time of release has no statistical significant impact on re-incarceration. The hazard is not decreasing in age – it is the same for all age groups below 45, but for those above 45 it is lower. We also observe that for immigrants the hazard is significantly lower. However, this result would also evolve if immigrants being arrested after imprisonment are more likely to be expelled from the country instead of re-incarcerated. We find some signs of this in the data, as the coefficient on the immigrant dummy becomes insignificant if we exclude from our sample those who emigrated during the observation period.

Table 2: Hazard ratios from proportional Cox regression on time till re-incarceration with time-invariant covariates

	Hazard ratio	Robust standard error	z-value	p-value
Employed at time of release (dummy)	0.57	0.05	-6.92	0.00
Earnings 2002, dummies (≥150,000 omitted)				
Zero	1.38	0.13	3.50	0.00
>0 & <50,000	1.28	0.11	2.75	0.01
≥50,000 & <100,000	1.19	0.11	1.80	0.07
≥100,000 & <150,000	1.28	0.12	2.55	0.01
Number of years with positive and non-minor earnings (pension points) over 1995-2002	0.94	0.01	-4.74	0.00
Education, dummies (years of schooling 2002, ≤10 omitted)				
>10 & ≤12	1.00	0.10	-0.03	0.98
=13	0.75	0.05	-4.09	0.00
>13	0.47	0.10	-3.66	0.00
Missing	1.16	0.11	1.58	0.11
Disability pension at beginning of 2003 (dummy)	0.86	0.08	-1.76	0.08
Vocational training at time of release (dummy)	0.99	0.08	-0.17	0.87
Male (dummy)	1.77	0.19	5.33	0.00
Length of prison term, dummies (months, ≤1 omitted)				
>1 & ≤2	1.28	0.09	3.46	0.00
>2 & ≤3	1.50	0.14	4.32	0.00
>3 & ≤5	1.65	0.15	5.59	0.00
>5 & ≤9	1.87	0.17	6.96	0.00
>9 & ≤18	1.59	0.16	4.57	0.00
>18	2.27	0.29	6.29	0.00
Age at time of release, dummies (years, <20 omitted)				
≥20 & <25	0.94	0.10	-0.60	0.55
≥25 & <30	1.00	0.12	-0.04	0.97
≥30 & <35	1.07	0.13	0.59	0.55
≥35 & <45	0.91	0.11	-0.78	0.43
≥45	0.62	0.09	-3.44	0.00
Immigration status, dummies (born in Norway by parents born in Norway omitted)				
Immigrant	0.83	0.07	-2.03	0.04
Born in Norway by immigrants	0.99	0.18	-0.04	0.97
Others (adopted etc.)	0.88	0.09	-1.26	0.21
Number of prison spells since 2001 before current spell	1.45	0.04	14.20	0.00
Type of crime, dummies (5/6 omitted)				
White collar	0.47	0.12	-2.91	0.00
Larceny-theft	1.08	0.25	0.34	0.74
Violent	0.75	0.18	-1.24	0.22
Sex	0.30	0.10	-3.80	0.00
Drug	0.77	0.18	-1.12	0.26
Traffic	0.53	0.13	-2.69	0.01
Other	0.74	0.20	-1.13	0.26
Missing	0.93	0.28	-0.26	0.80
Number of subjects: 7 489 Number of failures: 2 018 Number of observations: 13 775				

We see that the hazard is lowest for those serving for sex offences. Other categories with relatively low hazards include white collar crimes and traffic violations, while the hazard is higher for larceny-theft. The variables capturing type of crime may not be straightforward to interpret, since it is not uncommon to serve sentences of several types of crime at the same time. Moreover, when interpreting these findings, we should consider that we may have a lower likelihood of observing re-incarceration by the end of 2006 for types of crime that are infrequently detected or that it takes a long time to investigate.

5.3 Time-Varying Employment Spells and Selection

In the previous two sub-sections we found some support for the conjecture that integration into the labour market reduces recidivism. Here we explore this further by focusing on re-incarceration for subjects that do and do not have spells of employment *after* release from prison. We do so by estimating the hazards of re-incarceration for subjects with and without employment spells after release from prison, applying the Cox proportional hazard model with employment spells as time-varying covariates.

In Model 1 of Table 3 we report results with no control variables included in the model. The hazard of recidivism while employed is only about 22 percent of the hazard when not employed. This difference is most likely largely due to selection on prison and personal characteristics. In Model 2 and 3 we take account of prison characteristics by adding prison frails and prison fixed effects. As expected, accounting for prison characteristics increases the estimated relative hazard rate of employment spells from 0.22 to about 0.30.[5] In Model 4 we add controls for the observable individual characteristics included in the regression reported in Table 2 to the prison fixed effect model. This increases the relative hazard rate further from 0.30 to 0.37. Together this indicates that the observable individual determinants of recidivism are not randomly distributed across the ones with and without employment spells; which enhances a concern that the estimate would have been even higher had we been able to control for more unobserved determinants of recidivism, like motivation etc. However, the covariate-adjusted hazard rate is still low (0.37) for those with employment spells compared to those without, leaving us with the possibility of a substantial benign effect of employment on recidivism.

[5] We also ran parametric models (Weibull) with shared frailty on prison and got similar results. We were not able to have shared frailty models accounting for time-invariant individual effects converge (Brinck 2007).

Table 3: Hazard ratios from proportional Cox regression on time till re-incarceration with time-varying post-release employment spells

	Model 1	Model 2	Model 3	Model 4
Dummy for spell with employment (time-varying)	0.22** (0.016)	0.29** (0.022)	0.30** (0.022)	0.37** (0.029)
Time in-variant covariates from regression reported in Table 2 included	NO	NO	NO	YES
Prison fixed effects included	NO	NO	YES	YES
Shared prison frails included	NO	YES	NO	NO

Note: Covariates are included in the models as indicated, but estimated coefficients are not reported. * and ** indicate significance at 5 and 1 percent level. Robust standard errors in parentheses for all models except Model 4, where traditional standard errors are reported. Number of subjects, failures and observations are 7 489, 2 018 and 13 775.

6 Discussion

We used data on a total population sample of inmates released from Norwegian prisons in 2003, and followed them in Norwegian register data through 2006. We find that a substantial proportion of the prison population is generally weakly linked to the labour market both prior to and after imprisonment. However, about 25 per cent were employed at the time of release from prison, and of those not employed upon release, more than half got a job during the four-year observation period, though for many, it took several months and even years before they got a job. We also find that 25 per cent are re-incarcerated after about three years. To assess whether employment is associated with lower re-incarceration, we apply proportional hazard models including a host of control variables. We find that the hazard of re-incarceration for those employed at the time of release is 42 per cent lower than for those released to non-employment.

Our main focus is on the mediating role of post-release employment spells for recidivism. We find that post-release employment spells are strongly associated with lower re-incarceration. Some of the association between employment and re-incarceration is moderated by observable individual characteristics, such as pre-imprisonment employment histories, previous incarceration spells and educational level. The change in the estimated relative hazard that occurs when we *do not* and *do* control for individual characteristics is moderate (from 0.22 to 0.37). Moreover, after controlling for a host of individual characteristics, the re-incarceration-hazard of those obtaining work remain substantially and significantly lower than the one for those not obtaining work. The covariate-adjusted hazard of those obtaining employment is only 37 per cent of the hazard of those not obtaining

employment. The remaining large difference in the hazards leaves us with the possibility of a substantial benign effect of employment on recidivism.

Our findings are consistent with theories suggesting that access to employment facilitates the return to society after release from prison, for example as work is one possible turning point in a criminal career. It is suggested that a job provides the individual with not only a legal source of income, but also structured routine activities, increased social controls, and changed identity as a law-abiding citizen (Laub and Sampson, 2003; Farrall and Calverley, 2006; Ehrlich, 1973; Giordano et al. 2002). Employment is an important part of a pathway to desistance from crime, as persons motivated for a life without crime need an opportunity to actively make that transition. Along with for example marriage or becoming a parent, work can constitute such an opportunity.

Still, the desistance process is typically gradual and reciprocal (Laub and Sampson, 2001), and it is problematic to assess the causal directions of the association. Policy implications of empirical studies like the current one are therefore not obvious. It is inherently hard to rule out that the estimated effect of employment on re-incarceration is spurious, since there are probably selection processes at play. For example, former prisoners who are motivated for a new law abiding-life would both tend to desist from crime and to get employed. Since we cannot observe motivation in our data, we would tend to observe less crime among subjects that get employed, even if employment has no causal effect on recidivism. If this selection bias is the whole story about the observed association between employment and recidivism, policy programs that facilitate inmates' entry into employment after release would have no impact on recidivism. Thus, our study does not provide convincing evidence on the impacts of policies that facilitate employment on recidivism. To convincingly assess beneficial effects would require application of reliable evaluation methods as applied in other areas of social planning. The key element of such methods is *random assignment* into well-defined treatment and control groups.

There are some additional limitations to our study that may be addressed in future work. We only have data on formal employment, while many of those registered without work may have an informal job. Though illicit work is probably more common in this population, it seems reasonable that formal employment is more adequate than illicit work in preventing crime. A more serious limitation is whether differences in re-incarceration rates should be interpreted as differences in actual criminal behaviour. It is a difference between *detected* crimes and actually *committed* crimes, and further between crimes that are *sentenced*, to which prison term is the most severe kind of punishment. Our

data on re-incarceration only captures crimes that are detected, sentenced, and punished with imprisonment. It seems obvious that more persons have recidiviated in this period, but that the recidivism has not resulted in imprisonment. As data on reported crimes or charges becomes available, it would be interesting to extend our analysis to include such related measures of recidivism.

An important policy question, which empirical studies like the present one should help illuminate, is whether (and how) programs to improve employment opportunities of former inmates can advance integration into society. Even though those least likely to recidivate are also the most likely to get a job, it may be that getting a job makes it substantially easier to desist from a criminal life style. It seems important that those motivated to get a job and to change their life-style get the opportunity to do so. Similarly, those reasonably well integrated into the labour market prior to imprisonment may more easily keep away from further offending if they are enabled to maintain their job relations. However, the literature on post-imprisonment employment is scarce, and further research is needed. For example, the impact of specific employment initiatives directed towards ex-offenders is inconclusive (Bloom, 2006; Visher et al, 2005). A major challenge is to handle selection on unobservables to address the causal direction of the association between work and crime after release. One should also investigate the transitions to employment from different kinds of prison regimes in more detail. The mediating role of employment may be different for persons serving in traditional prisons compared to those convicted to perform community work. The processes that reduce recidivism are likely to be conditional upon successful re-entry to society, and integration into the labour market may show to be one of the most important means of social integration.

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