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Pre-Imprisonment Employment Drops: Another Instance of the Ashenfelter Dip?

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PRE-IMPRISONMENT EMPLOYMENT DROPS:
ANOTHER INSTANCE OF THE ASHENFELTER DIP?

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A number of recent studies examining the effects of imprisonment on ex-prisoner labor market outcomes have reported sizable pre-imprisonment employment drops. The precise cause of these employment declines has not yet been identified. The present Article provides evidence that these geometric declines in employment prior to imprisonment are largely unrelated to the long-term economic trajectories of the soon-to-be imprisoned, and instead reflect the mechanical disruption of labor market activity resulting from pre-imprisonment criminal case processing, especially pretrial incarceration.

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INTRODUCTION

In recent years, researchers and policymakers have increasingly focused their attention on the employment challenges facing former prisoners.[2] This heightened interest has been driven by the recognition that ex-prisoners face numerous barriers to employment[3] and by the hope that increasing employment among ex-prisoners could reduce their persistently high rates of criminal recidivism.[4] Underpinning this policy perspective have been numerous studies estimating the impact that imprisonment has on the post-release labor market status and performance of ex-prisoners.[5] In

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[2] *See* JOAN PETERSILIA, WHEN PRISONERS COME HOME: PAROLE AND PRISONER REENTRY 105–23 (1st ed. 2003) (drawing on interviews with inmates, former prisoners, and prison officials to discuss shortcomings in prisoner reentry services); PRISONER REENTRY AND CRIME IN AMERICA 1 (Jeremy Travis & Christy Ann Visher eds., 2005) (discussing policies for prevention of recidivism); BRUCE WESTERN, PUNISHMENT AND INEQUALITY IN AMERICA 91 (2006) [hereinafter PUNISHMENT]; Bruce Western, *The Impact of Incarceration on Wage Mobility and Inequality*, 67 AM. SOC. REV. 526, 528 (2002) [hereinafter *Impact of Incarceration*] (noting that the stigma of incarceration, erosion of job skills, and erosion of social contacts are three key mechanisms explaining why prison and jail time are linked to slow wage growth).

[3] Harry J. Holzer et al., *The Effect of an Applicant's Criminal History on Employer Hiring Decisions and Screening Practices: Evidence from Los Angeles*, *in* BARRIERS TO REENTRY? THE LABOR MARKET FOR RELEASED PRISONERS IN POST-INDUSTRIAL AMERICA [hereinafter "BARRIERS"] 117, 118 (Shawn Bushway et al. eds., 2007) (discussing multiple barriers for ex-offenders seeking jobs, including diminution of human capital during incarceration, general reluctance of employers to hire workers with criminal history records, and legal prohibitions on certain occupations hiring ex-offenders).

[4] Eric Holder, U.S. Att'y Gen. Remarks at the European Offenders Employment Forum held in Washington, DC (Oct. 8, 2010), http://www.justice.gov/iso/opa/ag/speeches/2010/ag-speech-101008.html [https://perma.cc/5BYM-YB4C] (noting that "stable employment is one of the keys to successful reintegration" and that "when quality, employment-centered programs are made available during and after incarceration, one demonstration showed they can cut recidivism rates in half"); *see generally* MATTHEW R. DUROSE ET AL., BUREAU JUST. STAT., RECIDIVISM OF PRISONERS RELEASED IN 30 STATES IN 2005: PATTERNS FROM 2005 TO 2010 (2014), https://www.bjs.gov/content/pub/pdf/rprts 05p0510.pdf [https://perma.cc/TCD4-QGAG].

[5] *See, e.g.*, John H. Tyler & Jeffrey R. Kling, *Prison-Based Education and Reentry into the Mainstream Labor Market*, *in* BARRIERS, *supra* note 3, at 227, 249 [hereinafter *Prison-Based Education*] (examining effects of "prison GEDs" on post-release labor market integration); William J. Sabol, *Local Labor-Market Conditions and Post-Prison Employment Experiences of Offenders Released from Ohio State Prison*, *in* BARRIERS, *supra* note 3, at 257, 297 (examining post-prison employment experience of offenders released from Ohio state prisons during 1999 and 2000); Haeil Jung, *Increase in the Length of Incarceration and the Subsequent Labor Market Outcomes: Evidence from Men Released from Illinois State Prisons*, 30 J. POL'Y ANALYSIS & MGMT. 499, 529 (2011) (examining the impact of imprisonment on the employment and earnings of male prisoners in the State of Illinois); Jeffrey R. Kling, *Incarceration Length, Employment, and Earnings*, 96 AM. ECON. REV. 863, 865 (2006) [hereinafter *Incarceration Length*] (using an instrumental variable model to

general, these studies have reported substantial long-term declines in employment and wages for the formerly imprisoned—declines that have been linked to changes in prisoner human capital, social capital, and social stigma.[6]

Intriguingly, a number of these studies have also reported substantial employment drops among prisoners *prior* to imprisonment.[7] This unexpected finding raises the possibility that prisoners might be experiencing pre-imprisonment labor market difficulties of a kind similar to those observed among participants in studies of job-training programs.[8] In those studies, job-training program participants were found to have lower pre-program earnings as a result of employment difficulties that

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estimate the impact of imprisonment on employment and earnings); Becky Pettit & Christopher J. Lyons, *Status and the Stigma of Incarceration: The Labor-Market Effects of Incarceration, by Race, Class, and Criminal Involvement*, *in* BARRIERS, *supra* note 3, at 203, 204 (examining effect of incarceration on employment and hourly wages in jobs covered by unemployment insurance through data gathered from individuals who were formerly incarcerated in a Washington State prison).

   [6] Western, *Impact of Incarceration*, *supra* note 2, at 541. *But see* Robert Apel & Gary Sweeten, *The Impact of Incarceration on Employment During the Transition to Adulthood*, 57 SOC. PROBS. 448, 468 (2010) (finding that ex-prisoners are less likely to search for work rather than being less likely to find it); Robert J. LaLonde & Rosa M. Cho, *The Impact of Incarceration in State Prison on the Employment Prospects of Women*, 24 J. QUANTITATIVE CRIM. 243, 260 (2008) (reporting that changes in labor market outcomes for female prisoners are temporary and positive); Kling, *Incarceration Length*, *supra* note 5, at 874 (2006) (using an instrumental-variables model to find that there is little evidence that incarceration has adverse labor market consequences for the imprisoned in the medium term); Charles E. Loeffler, *Does Imprisonment Alter the Life-Course? Evidence on Crime and Employment from a Natural Experiment*, 51 CRIMINOLOGY 137, 156–58 (2013) (finding that the poor labor market outcomes of the imprisoned is a state shared by similarly situated non-prisoners, suggesting that prison itself has little to do with the consistently weak labor market participation of ex-prisoners); David J. Harding et al., *Imprisonment and Labor Market Outcomes: Evidence from a Natural Experiment,* 124 AM. J. SOC. 49, 49 (2018) (reporting evidence of heterogeneous treatment effects of imprisonment on labor employment outcomes by race for a population of Michigan prisoners).

   [7] *See, e.g.*, LaLonde & Cho, *supra* note 6, at 247; Jung, *supra* note 5, at 506–07; Harding et al., *supra* note 6, at 68–69.

   [8] *See* James J. Heckman et al., *The Economics and Econometrics of Active Labor Market Programs*, *in* 3 HANDBOOK OF LABOR ECONOMICS 1865, 1932 (Orley C. Ashenfelter & David Card eds., 1999) (examining active labor market policies and discussing methods used to evaluate their success in integrating the unemployed and economically disadvantaged); Orley Ashenfelter, *Estimating the Effects of Training Programs on Earnings*, 60 REV. ECON. & STAT. 47, 51 (1978) [hereinafter *Effects*] (reporting entry-into-training-program drops in employment); Orley Ashenfelter & David Card, *Using the Longitudinal Structure of Earnings to Estimate the Effect of Training Programs*, 67 REV. ECON. & STAT. 648, 648 (1985) [hereinafter *Longitudinal Structure*] (illustrating the use and limitations of longitudinal earnings data for the estimation of job-training program effects).

subsequently caused them to enter job-training programs.[9]   If the imprisoned were found to be affected by a similar positive selection process, then it would suggest that even soon-to-be prisoners, with their often lengthy prior criminal records, were still sensitive to changes in their labor market status.[10]   Such a finding would lend support for classic sociological theories and more recent economic interpretations of criminal behavior, both of which predict that an individual's decision to offend is influenced by their economic position and the unavailability of better economic alternatives.[11]   This finding is especially intriguing as the imprisoned have generally been thought to be less sensitive to changes in their labor market status due to their more substantial prior criminal involvement and disengagement from the formal labor market.[12]   On the other hand, if labor market participation prior to imprisonment were found

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[9] *See, e.g.*, Ashenfelter, *Effects*, *supra* note 8, at 56–57 (discussing selection bias problem in data sets for studies on job-training program participation, particularly with respect to female trainees whose employment status may be the cause rather than the result of entrance to training).

[10] *See* LaLonde & Cho, *supra* note 6, at 251 (noting that "the circumstances that make women more likely to enter prison in any given quarter may also make them less likely to be employed. . . . [W]e would expect relative employment rates to decline the closer a woman is to the quarter that she enters prison"); Jung, *supra* note 5, at 506 (noting that "earnings fall drastically over the two years prior to incarceration and then rebound immediately following release," a phenomenon known as Ashenfelter's dip).

[11] *See* Robert Agnew, *Foundation for a General Strain Theory of Crime and Delinquency*, 30 CRIM. 47, 74–76 (1992) (arguing for the proposition that would-be offenders choose to commit crimes, especially property crimes, due to the unavailability of legitimate mechanisms to pursue socially acceptable goals); Albert K. Cohen, *The Sociology of the Deviant Act: Anomie Theory and Beyond*, 30 AM. SOC. REV. 5, 10 (1965) (discussing links between strain and deviance); Richard A. Cloward, *Illegitimate Means, Anomie, and Deviant Behavior*, 24 AM. SOC. REV. 164, 176 (1959) (synthesizing anomie and deviance theories of Durkheim and Merton to formalize the connection between deviancy and blocked economic opportunities); Robert K. Merton, *Social Structure and Anomie*, 3 AM. SOC. REV. 672, 672 (1938) (introducing the idea that economic and social position can help explain why anomie and other forms of social alienation occur).

[12] *See, e.g.*, Richard B. Freeman, *Crime and the Employment of Disadvantaged Youths*, *in* URBAN LABOR MARKETS AND JOB OPPORTUNITY 201, 234–35 (George E Peterson ed., 1st ed. 1992) [hereinafter *Disadvantaged Youths*] (discussing finding that low unemployment rates during peak economic opportunities were "insufficient to deter large numbers of disadvantaged youths from crime"); Richard B. Freeman, *The Economics of Crime*, *in* 3 HANDBOOK OF LABOR ECONOMICS 3530, 3541–44 (Orley C. Ashenfelter & David Card eds., 1999) [hereinafter *Economics*] (discussing that high rates of unemployment frequently correlate with increased rates of crime but generally only among individuals who hold a favorable attitude towards offending); Richard B. Freeman, *Why Do So Many Young American Men Commit Crimes and What Might We Do About It?*, 10 J. ECON. PERSP. 25, 33–34 (1996) [hereinafter *American Men*] (criticizing the simplicity of the proposition that the collapse of the job market for unskilled labor contributed to the rise of criminal activity).

to be uncorrelated with participation in criminal activities, then there must be another explanation for the observed employment losses prior to imprisonment.[13] In this Article, I argue for such an alternative explanation. Specifically, that much of the pre-imprisonment employment losses observed among the soon-to-be imprisoned can be explained by mechanical disruption of formal labor market activity as a result of routine pre-imprisonment criminal case processing, especially pretrial incarceration. While this finding is of intrinsic interest in its own right, reinforcing the importance of scrutinizing the labor market consequences of pretrial incarceration,[14] it also has important implications for the estimation of imprisonment effects. Researchers often rely on data from the months prior to imprisonment to form the counterfactual condition for a within-person causal estimate of the effects of imprisonment.[15]   However, the co-occurrence of pretrial incarceration and imprisonment suggests that this approach may not produce an isolated estimate of the effects of imprisonment, but instead a compound estimate of the joint effects of pretrial incarceration, conviction, and imprisonment if an insufficient lag structure is employed.

The remainder of the paper is divided into four sections. Section I describes past research on the economic lives of the imprisoned. Section II describes the analytical strategy and data used in this study. Section III reports results.   And Section IV concludes with a discussion of the implications of the reported findings.

I. THE ECONOMIC SITUATION OF THE IMPRISONED

Both before and after their incarceration, the imprisoned have consistently been observed to have extremely low levels of employment and very low wages while employed.[16] The Bureau of Justice Statistics

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[13] *See* LaLonde & Cho, *supra* note 6, at 249–50 (discussing possible explanations for the pattern of declining pre-prison employment rates); Jung, *supra* note 5, at 506 (noting that earnings fall drastically over the two years prior to incarceration).

[14] *See* Will Dobbie et al., *The Effects of Pretrial Detention on Conviction, Future Crime, and Employment: Evidence from Randomly Assigned Judges*, 108 AM. ECON. REV. 201, 236 (2018) (finding adverse labor market consequences for pretrial detention). For recent studies on the effects of pretrial incarceration on case outcomes and criminal recidivism, *see* Paul Heaton, Sandra Mayson, & Megan Stevenson, *The Downstream Consequences of Misdemeanor Pretrial Detention*, 69 STAN. L. REV. 711, 728 (2017) (reporting adverse effects of pretrial detention on case outcomes).

[15] Sabol, *supra* note 5, at 293–94; Tyler & Kling, *Prison-Based Education*, *supra* note 5, at 235; LaLonde & Cho, *supra* note 6, at 248; Jung, *supra* note 5, at 511.

[16] *See* Sabol, *supra* note 5, at 268–72; Tyler & Kling, *Prison-Based Education*, *supra* note 5, at 237; Kling, *Incarceration Length*, *supra* note 5, at 867–68; Loeffler, *supra* note 6,

reported that prior to their incarceration, U.S. prisoners in 1997 were between two and three times as likely to be unemployed as the general population.[17]   More recent studies of prisoners from Florida, Ohio, and Washington State have reported pre-imprisonment unemployment rates ranging from 50% to 74%.[18]   These exceedingly high levels of pre-imprisonment unemployment are followed by similar or even higher levels of long-term post-imprisonment unemployment, suggesting that the majority of prisoners are chronically unemployed both before and after their imprisonment.[19]   This dismal reality has generated considerable interest among researchers intent on understanding how imprisonment contributes to the labor market challenges of ex-prisoners[20] and among policymakers hoping to boost the post-imprisonment labor market attachment of ex-prisoners, with the expectation that doing so might reduce the persistently high levels of criminal recidivism also observed among ex-prisoners.[21]

In spite of this recent interest in the relationship between imprisonment and employment, scholars have generally not examined the pre-imprisonment labor market experiences of prisoners in great detail. Most recent studies of the labor market effects of imprisonment report very little information on how employment and wages of soon-to-be imprisoned sample members vary over time.[22]   Intriguingly, however, for those studies

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at 157; Becky Pettit & Christopher J. Lyons, *Incarceration and the Legitimate Labor Market: Examining Age-Graded Effects on Employment and Wages*, 43 LAW & SOC. REV. 725, 741–42, 750 (2009); CAROLINE HARLOW, BUREAU JUST. STAT., EDUCATION AND CORRECTIONAL POPULATIONS 1, 10 (2003).

[17] CAROLINE HARLOW, BUREAU JUST. STAT., *supra* note 16, at 10.

[18] Pettit & Lyons, *supra* note 5, at 210; Sabol, *supra* note 5, at 268; Tyler & Kling, *Prison-Based Education*, *supra* note 5, at 237.

[19] *See* Pettit & Lyons, *supra* note 16, at 750; Kling, *Incarceration Length*, *supra* note 5, at 867–88; Pettit & Lyons, *supra* note 5, at 210; Sabol, *supra* note 5, at 268; Tyler & Kling, *Prison-Based Education*, *supra* note 5, at 236–37.

[20] *See Introduction* to BARRIERS, *supra* note 3, at 2–6 (suggesting that greater use of incarceration may confine less-educated individuals to a secondary labor market that is characterized by low wages and erratic employment); Apel & Sweeten, *supra* note 6, at 449 (examining whether currently existing penal policies produce worse life outcomes for incoming offenders than they did in earlier decades); Pettit & Lyons, *supra* note 16, at 727 (examining age-graded effects of incarceration on post-release employment and wages in era of prison expansion); PRISONER REENTRY AND CRIME IN AMERICA, *supra* note 2, at 209 (examining the realities of prisoner reentry at the peak of the era of mass incarceration); BRUCE WESTERN, PUNISHMENT, *supra* note 2, at 199 (exploring how incarceration and related practices contribute to social and economic inequality in the United States).

[21] Holder, Remarks at the European Offenders Employment Forum, *supra* note 4 (stating the Department of Justice's dedication to reentry programs focused on employment opportunities to reduce recidivism).

[22] *See, e.g.*, Loeffler, *supra* note 6, at 157.

that do report such information, employment declines have been consistently observed beginning at least several quarters prior to imprisonment.[23]   Rosa Cho and Robert LaLonde hypothesized that this pattern could be caused either by pre-imprisonment incarceration in county jails or by other changes in life circumstances correlated with entry into the prison—framing the basic alternatives to be tested in the present study.[24] Further, Haeil Jung suggested that the pre-imprisonment employment declines observed in his sample of male prisoners were similar to those observed in studies of job-training and other means-tested social welfare programs.[25]   None of these studies, however, have attempted to identify the specific causes of these precipitous declines in employment prior to imprisonment nor have they considered the larger methodological implications for the estimation of imprisonment labor market effects.

The absence of a more substantial examination of the pre-imprisonment labor market experiences of prisoners is surprising, since the quarters immediately prior to imprisonment offer an unparalleled window into the economic circumstances of soon-to-be prisoners at exactly the time that their involvement in criminal activities has brought them into contact with the criminal justice system.   The exact sequence of events leading up to imprisonment has the potential to shed light on whether economic distress in the form of unemployment or low wages while employed leads to participation in crime or, conversely, whether participation in crime leads to economic distress—a question with substantial implications for theories of criminal behavior and criminal justice policy.

Early research on the relationship between economic conditions and crime rates at the macro-level posited a strong positive relationship between unemployment levels and aggregate crime rates.[26]   Most of these studies, however, only found a rather modest relationship between these two variables, indicating that while unemployment and crime may co-vary, the variance in unemployment is both insufficient and insufficiently correlated to explain the substantial changes that have occurred in the crime rate over the course of the twentieth century when most research was conducted.[27]

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[23] *See* Sabol, *supra* note 5, at 268–69; Tyler, *supra* note 19, at 242; LaLonde & Cho, *supra* note 6, at 254; Jung, *supra* note 5, at 506.

[24] LaLonde & Cho, *supra* note 23, at 249–50.

[25] Jung, *supra* note 23, at 506.

[26] Theodore G. Chiricos, *Rates of Crime and Unemployment: An Analysis of Aggregate Research Evidence,* 34 Soc. Probs. 187, 199 (1987).

[27] *See* Freeman, *Economics*, *supra* note 12, at 3542. Scholars have also noted that aggregate unemployment has the potential to increase the motivation for crime in the population while simultaneously decreasing criminal opportunities. *See* David Cantor & Kenneth C. Land, *Unemployment and Crime Rates in the Post-World War II United States:*

At the individual level, stronger evidence of a relationship between unemployment and crime has been reported. A number of different longitudinal samples have all reported that employment is inversely related to adult crime rates,[28] with Sampson and Laub's work suggesting a strong negative correlation between job stability in early adulthood and subsequent crime participation.[29]

Two challenges to the simplest interpretation of this work—that economic difficulties contribute to criminal offending—have been offered. The first challenge highlights the reciprocal and occasionally complementary nature of employment in legal and illegal markets.[30] Criminal acts and legal employment are not mutually exclusive ways of spending time or making a living. Given the sporadic nature of criminal offending, even income-generating criminal offending, participation in crime does not preclude participation in legal employment.[31] Furthermore, legal employment can provide opportunities for criminal acts. The second, and more direct challenge, comes from research that shows that many individuals with more than minimal criminal involvement begin offending early in their lives, becoming socially embedded in criminal or delinquent social networks, which both increases the likelihood of criminal justice involvement and decreases the likelihood of being in a subsequent position to participate in the conventional labor market.[32] The rapid declines in legitimate employment observed among soon-to-be prisoners potentially could speak to either of these schools of thought on the employment-crime relationship, assuming that the temporal ordering of criminal act, unemployment, and imprisonment can be reconstructed.

A Theoretical and Empirical Analysis, 50 AM. SOC. REV. 317, 329 (1985). More recent research, however, has suggested that changes in criminal opportunities explain very little of the already small unemployment and crime relationship. *See, e.g.*, Gary Kleck & Theodore G. Chiricos, *Unemployment and Property Crime: A Target-specific Assessment of Opportunity and Motivation as Mediating Factors*, 40 CRIMINOLOGY 649, 666 (2002).

[28] Terence P. Thornberry & R. L. Christenson, *Unemployment and Criminal Involvement: An Investigation of Reciprocal Causal Structures*, 49 AM. SOC. REV. 398, 400 (1984); Ann Witte & Helen Tauchen, *Work and Crime: An Exploration Using Panel Data*, 49 PUB. FIN. 155, 157 (1994).

[29] Robert J. Sampson & John H. Laub, *Crime and Deviance over the Life Course: The Salience of Adult Social Bonds*, 55 AM. SOC. REV. 609, 617 (1990).

[30] Thornberry & Christenson, *supra* note 28, at 399; *see also* Freeman, *Economics*, *supra* note 12, at 3543–44.

[31] *See* Thornberry & Christenson, *supra* note 28, at 399; *see also* Freeman, *Economics*, *supra* note 12, at 3543–44.

[32] *See* John Hagan, *The Social Embeddedness of Crime and Unemployment*, 31 CRIMINOLOGY 465, 486 (1993) (arguing for the importance of adolescent crime and criminal justice involvement for understanding future adult unemployment).

The observed declines in employment prior to imprisonment have implications not only for theories of criminal behavior, but also for criminal justice policy. If imprisonment is preceded by a decline in employment, it is possible that the criminally-involved are not as insensitive to the changes in the labor market as previously thought.[33] This could suggest that policies designed to limit this rapid decline in employment or intervene earlier in this decay process might be able to limit further declines in employment and subsequent contact with the criminal justice system—an incredibly costly outcome for all involved. However, the best test for such a relationship is not whether employment decreases prior to imprisonment, but whether employment decreases prior to the arrest leading to imprisonment. The arrest is the clearest available signal of initial or renewed criminal involvement through initial contact with the criminal justice system. Employment declines prior to arrest would indicate that unemployment might be contributing to criminal involvement. On the other hand, the absence of employment declines prior to arrest would reaffirm the perspective that an individual's participation in criminal behavior, even among individuals with connections to the formal labor market, is not particularly sensitive to changes in labor market status.

Finally, the methodological implications of pre-imprisonment declines in employment are not only of interest in their own right, but also because the empirical reality of a precipitous decline in pre-imprisonment employment and earnings has important methodological implications for estimates of the labor market effects of imprisonment. If employment and wage trends leading up to imprisonment change swiftly due to pre-imprisonment criminal justice contact or other endogenous events, then conventional estimation strategies could produce biased estimates of the effects of imprisonment.[34] Within-person analytical strategies for estimating the individual-level effects of imprisonment rely on stability of the individual-level employment and wage trends prior to imprisonment to estimate the implied or explicit counterfactual of what an imprisoned individual's life would have been like in the absence of prison. One common solution to the estimation problems created by the declining pre-imprisonment wage trends is to compare prisoners' post-release employment and wages to their employment and earnings several quarters prior to any short-term pre-imprisonment instability—an approach

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[33] Freeman, *American Men*, *supra* note 12, at 30–36; Freeman, *Economics*, *supra* note 12, at 3542–43.

[34] *See* JOSHUA D. ANGRIST & JORN-STEFFEN PISCHKE, MOSTLY HARMLESS ECONOMETRICS 230 (2009).

implemented and well-described in prior work.[35] Such an approach, however, requires the additional assumption that no confounding processes are at work during the period of instability immediately prior to the treatment of interest, in this case imprisonment. The presence of any such confounding social processes would mean that prisoners, instead of being observed before and after an isolated experience of imprisonment, would be observed in a slightly but critically different counterfactual condition— before and after receipt of a compound treatment consisting of arrest, conviction, and possibly pretrial incarceration. An estimate of this compound treatment may still have some theoretical value, as it captures the effects of an entire cycle through the criminal justice system, but its implications for penal policy are far less clear.

For all of these reasons, it is important to better understand why employment and wages fall so rapidly in the quarters before imprisonment.

II. DATA AND METHODS

The data in this study were drawn from the electronic records of the Circuit Court of Cook County (*hereinafter* Circuit Court). The Criminal Division of the Circuit Court handles all non-federal felony criminal cases originating in Cook County, Illinois.[36] As such, cases range from retail theft to homicide, although the majority of cases involve illegal drug distribution or property theft.[37] This distribution of cases is typical of large urban county court districts in the United States, which have seen the fraction of their caseloads devoted to drug cases increase steadily in the last three decades.[38]

A sample consisting of all felony cases initiated in the Circuit Court between 2000 and 2005 where the defendant was subsequently convicted and sentenced to imprisonment was identified from the records of the Clerk of the Circuit Court of Cook County (N=127,803).[39] In order to avoid contaminating the estimates of imprisonment's effects on prisoner employment with the effects of previous imprisonments, the sample of cases was further limited to individuals who had not been sentenced to imprisonment for the fifteen years prior to their first sentence to

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[35] *See, e.g.*, LaLonde & Cho, *supra* note 6, at 248 (discussing methodology and statistical model).

[36] *See* BUREAU JUST. ASSISTANCE, REVIEW OF THE COOK COUNTY FELONY CASE PROCESS AND ITS IMPACT ON THE JAIL POPULATION 4 (2005).

[37] *See* Charles E. Loeffler, *supra* note 6, at 145.

[38] THOMAS H. COHEN & TRACEY KYCKELHAHN, BUREAU JUST. STAT., FELONY DEFENDANTS IN LARGE URBAN COURTS, 2006, at 3 (2010).

[39] BUREAU JUST. ASSISTANCE, *supra* note 36, at 35.

imprisonment in the period between 2000 and 2005 (N=61,145). These records were linked to statewide criminal history records using fingerprint identifiers and supplemented with state quarterly UI-earning data for sample members from the Illinois Department of Employment Security (IDES).[40] Because nearly half of sample members with either missing necessary linking information or superficially-valid linking information were found to have no evidence of any covered labor market activity, only those sample members with some evidence of participation in the covered labor market were included, as it would be impossible to distinguish between non-participation in the covered labor market and unemployment (N=32,656). Using the resulting employment information, indicators for quarterly employment status (non-zero earnings) were calculated for each sample member. Basic demographic characteristics for the final sample are reported in Table 1. In general, the sample closely mirrors the population of individuals sent from Cook County to the Illinois Department of Corrections. Roughly 80% of the sample is African-American with the remainder split almost evenly between White and Hispanic individuals.[41] Only 10% of the sample is female. The average age of the sample is thirty-two.

Because imprisonment removes prisoners from the conventional labor market, most studies with longitudinal measures of employment calculate quarterly employment and wage rates using synthetic or relative time, where the entry into prison and the exit from prison form the end of the pre-treatment period and the beginning of the post-treatment period, respectively.[42] This allows researchers to visualize the employment and wage trends of multiple prisoners going into and out of a period of imprisonment, something that would be impossible to do if these trends were shown using actual chronological (calendar) time. Using this approach, the substantial drop in employment leading up to entry into prison has been routinely observed.[43]

Figure 1a replicates this finding using quarterly employment rates for Cook County felony cases sentenced for the first time to the Illinois Department of Corrections between 2000 and 2005. Since imprisonment is presumed to have no effect on employment and wages in the period leading up to imprisonment, one possible interpretation of this precipitous drop in

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[40] *See* Loeffler, *supra* note 6, at 147.

[41] *See* Charles E. Loeffler, Estimating the Effects of Imprisonment on the Life-Course (May 6, 2011) (unpublished Ph.D. Dissertation, Harvard University) (on file with author).

[42] *See, e.g.*, LaLonde & Cho, *supra* note 6, at 247; Kling, *Incarceration Length*, *supra* note 5, at 867 (2006); Pettit & Lyons, *supra* note 5, at 240.

[43] Harding et al., *supra* note 6, at 70–71.

employment would be some selection process similar to that observed in the literature on returns to job training.[44] In those studies, pre-program drops in employment were linked to selection into program participation itself.[45] Essentially, the recently unemployed workers sought out or were referred to job-training programs as a result of their economic distress.[46] If this same logic held for soon-to-be prisoners, it would suggest that they too were struggling economically prior to their arrest, conviction, and imprisonment and that the criminal justice system caught them at the nadir of a downward employment spiral. Due to the rarity of pre-arrest measures in the criminological literature, this narrative is especially intriguing. If this downward dip indeed signaled general difficulties among the soon-to-be imprisoned, it would have significant implications both for expectations of subsequent criminal activity and for the potential to develop more effective criminal justice interventions through employment services, job training, and other programs designed to increase labor market participation and performance even among the population with repeated involvement with the criminal justice system.

As intriguing as this hypothesis is, a more complete explanation for the pre-imprisonment decline must take into account any potential negative effects of arrest and pretrial incarceration on employment. As their cases wind their way through the courts, the typical soon-to-be prisoner in Cook County spends several months in pretrial custody.[47] Even for those individuals who are allowed to spend this period in the community on pretrial release, the arrest event leading to eventual imprisonment may sufficiently disrupt their labor market participation that the time from arrest to imprisonment may nonetheless be an extended period of unemployment.[48] Furthermore, the period from arrest to eventual imprisonment is filled with court hearings, which, independent of any effects of arrest, may affect the likelihood of employment and the extent of any earnings.[49] If even one of these factors held true for the soon-to-be imprisoned, then the pre-imprisonment decline in employment that was

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[44] *See* Heckman et al., *supra* note 8, at 1932; Ashenfelter, *Effects*, *supra* note 8, at 51 (reporting entry-into-training-program drops in employment); Ashenfelter & Card, *Longitudinal Structure*, *supra* note 8, at 648 (illustrating the use and limitations of longitudinal earnings data for the estimation job training program effects).

[45] Ashenfelter, *Effects*, *supra* note 8, at 57.

[46] Ashenfelter & Card, *Longitudinal Structure*, *supra* note 8, at 648.

[47] Bureau Just. Assistance, *supra* note 36, at 35.

[48] *See* Dobbie et al., *supra* note 14, at 214.

[49] *See id; see also* Holzer et al., *supra* note 3, at 118.

attributable to independent economic distress would be accordingly diminished.

In order to test for the effects of pretrial case processing effects on pre-imprisonment employment, three different empirical tests were conducted. The first test for the effects of pretrial case processing on pre-imprisonment employment levels compares the pre-imprisonment employment levels as measured from the quarter of entry into prison to the pre-imprisonment employment levels as measured from the quarter of arrest eventually leading to imprisonment. If the employment trajectories of the soon-to-be arrested also manifest the geometric declines observed among the soon-to-be imprisoned, then positive selection may be at work. If, however, the employment trajectories of the soon-to-be arrested are stable going into the quarter of arrest, then it is much more likely that post-arrest/pre-imprisonment case processing are contributing to the observed geometric declines in employment.

The second empirical test compares the pre-imprisonment employment levels of the imprisoned more formally. Equation 1 defines Y_{it} as a dummy variable indicating a prisoner's employment status in a given calendar quarter. $f_i(t, \tau)$ captures the time-varying relationship between subsequent imprisonment and the employment probabilities of sample members, where time is calculated relative to imprisonment.

$$Y_{it} = f_i(t, \tau) + \alpha_i + u_{it}$$

The relationship between employment and quarter relative to imprisonment is estimated separately for each of the ten quarters leading up to the first sentence to imprisonment for an individual sample member. For all other quarters prior to imprisonment, the relationship is jointly estimated. Also in equation 1, α_i is an individual-specific intercept and u_{it} is an independently distributed error time-varying error term. This equation is then re-estimated with a dummy variable indicating whether the sample member was incarcerated during a given quarter. Quarterly pre-imprisonment incarceration status was imputed using each sample member's credit for time served awarded at the time of sentencing to estimate the quarter in which they began earning credit towards any eventual prison sentence. Due to the imprecision of this measure of pretrial incarceration, with some small number of individuals not given credit for periods of pretrial detention, it is likely that this estimator is a lower-bound estimate on the effects of pretrial incarceration on pre-imprisonment employment. Finally, the equation is re-estimated using an alternative time definition. Instead of estimating relative to imprisonment, the equation is re-estimated using time to arrest leading to imprisonment. For all of these estimates, individual fixed effects and robust standard errors were used.

The third empirical test examines the wage trends for individuals who were employed prior to imprisonment. For this group, earnings trends relative to the two alternative synthetic time definitions are graphed in order to see whether wages conditional on employment in the period leading up to arrest are changing as rapidly as wages during the period immediately prior to imprisonment.[50] If they are, this could mean either hours worked or wages are changing. However, a rapid change in wages likely reflects a change in the hours worked and the absence of any change in wages during the pre-arrest period likely would mean that sample members are experiencing neither additional distress nor changes in their time allocation during the period prior to their contact with the criminal justice system.

III. RESULTS

The significant explanatory power of looking prior to arrest leading to imprisonment as opposed to looking only prior to imprisonment itself can be seen by examining synthetic time graphs using two different relative time definitions—the quarter of arrest and the quarter of imprisonment (Figure 1b). If the pre-imprisonment drop in employment extends back beyond the quarter of arrest leading to imprisonment, then the attribution of this decline to non-criminal justice contact factors (i.e., independent economic distress) is strengthened. However, if no such pre-arrest drop is observed, then the pre-imprisonment drop is almost certainly concentrated in the period between arrest and imprisonment, suggesting that criminal justice processes are the principal cause.

The pattern that emerges is one in which a substantial portion of the pre-imprisonment drop in employment disappears when an earlier starting date is used. Examining the trends for quarterly employment prior to the quarter of arrest reveals little decay in employment rates until the quarter of arrest. This suggests that the large pre-imprisonment employment drop reflects a considerable quantity of post-arrest employment losses, which are most readily explained by the adverse effects of some combination of arrest, court appearances, pretrial confinement, and conviction. The substantially smaller drop in employment in the quarters prior to arrest also suggests that, unlike the pre-enrollment employment drops seen with many job training programs, which are primarily reflections of lives in economic distress, the employment patterns of soon-to-be prisoners are more complicated. The otherwise relatively stable (albeit low) employment patterns seem to be interrupted only slightly by independent economic

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[50] Wages are inflation-adjusted to 2009 dollars.

troubles and much more substantially by the precipitous effects of arrest, jail, and eventually prison.

This understanding of the employment situation of the soon-to-be imprisoned is reinforced by the statistical tests of significance reported in Table 2. Beginning in the fourth quarter prior to imprisonment, employment rates are significantly lower than the long-term trend for sample members (Column 1). Employment rates are approximately 5% lower four quarters before imprisonment, 10% lower three quarters before imprisonment, 20% lower two quarters before imprisonment, and 50% lower in the quarter prior to the quarter of imprisonment. Once a measure of quarterly pretrial incarceration status is added to the regression equation, the magnitude of the relationship between pre-imprisonment quarter and employment is halved. The decline in the fourth pre-imprisonment quarter is non-existent and even the decline in the quarter prior to the quarter of imprisonment is reduced to less than 20% of the long-term trend. Still, the basic trajectory of the pre-imprisonment decline in employment remains across the four quarters prior to imprisonment, just at a lower level than was observed when no effort was made to account for pretrial incarceration status in the quarters before imprisonment.

Column 3 reports the results of the re-estimation of the regression of employment status on dummy variables for the quarters leading up to imprisonment, but instead of estimating relative to imprisonment, the dummy variables represent the quarters prior to the arrest event leading to eventual conviction and sentencing to imprisonment. In contrast to the results reported in Column 1 and consistent with the graphical test reported in Figure 2, employment rates relative to quarter of arrest are stable or significantly above their long-term trends in all but the quarter of arrest leading to eventual imprisonment. The absence of any significant decline in employment in the quarters prior to arrest leading to imprisonment provides the strongest evidence that pretrial events, be they jail, court, or other, are responsible for the employment declines observed in the pre-imprisonment period. However, the fact that not all of the pre-imprisonment declines are absorbed by the addition of a measure of pretrial custodial status—albeit an imperfect one—suggests that pretrial incarceration may not provide a comprehensive explanation for pre-imprisonment declines. It is possible that conviction effects or other endogenous events may offer explanation for this remaining decline in employment.

Additional evidence in support of this perspective can be found in an examination of quarterly earnings for prisoners employed prior to arrest and imprisonment (Figure 2). Quarterly earnings for the employed are

essentially flat throughout the period leading up to the arrest event leading to imprisonment. This suggests that for the subset of soon-to-be prisoners who are employed in the UI-covered economy, their labor market performance is unaffected by their impending arrest. However, when earnings relative to imprisonment are analyzed, another interesting feature of the employment of the soon-to-be imprisoned emerges. As this group experiences arrest events leading to pretrial incarceration, the employment rate drops, but this mechanical increase in unemployment does not draw evenly from the distribution of those employed in the previous quarter. Instead, this new unemployment draws heavily from those workers with the lowest reported wage earnings. This results in a rapid increase in average earnings for those workers who retain employment until their eventual imprisonment. Put simply, those prisoners with relatively higher paying jobs or more regular job hours are able to maintain employment longer than lower-paid and lower-working-hour workers. Given that stable employment is one of the factors considered by judges when deciding whether a defendant should be held in pretrial custody, this result is to be expected.[51] Nonetheless, it provides a further indication that employment and pretrial detention are negatively correlated.

IV. DISCUSSION

As far as we can tell from UI-based wage data, the soon-to-be imprisoned do not manifest evidence that they are experiencing any more or less economic distress than usual in the quarter leading up to the arrests that lead to their eventual imprisonment. As such, it appears that their arrests are uncorrelated with their formal labor market performance, which could be considered as an otherwise random, albeit highly disruptive, event in the economic and social life of the soon-to-be imprisoned. This raises the question: why are arrests leading to imprisonment not preceded by more signs of economic distress?

Several plausible explanations for this lack of pre-arrest economic distress exist. First, it is worth reiterating that economic distress is the norm for soon-to-be prisoners.[52] Past studies using administrative data have generated considerable evidence of economic distress both before and after

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[51] *See* Stephen Demuth, *Racial and Ethnic Differences in Pretrial Release Decisions and Outcomes: A Comparison of Hispanic, Black, and White Felony Arrestees*, 41 CRIMINOLOGY 873, 881 (2003) (discussing theories of judicial decision-making).

[52] ADAM LOONEY & NICHOLAS TURNER, BROOKINGS INST., WORK AND OPPORTUNITY BEFORE AND AFTER INCARCERATION 1, 7 (2018), https://www.brookings.edu/wp-content/uploads/2018/03/es_20180314_looneyincarceration_final.pdf [https://perma.cc/WN2Y-U4XG].

arrests leading to imprisonment.[53] And even surveys of prisoners, which show higher rates of employment (roughly 70%),[54] presume such a high rate of pretrial incarceration that they generally do not ask prison inmates about labor market activity in the period between arrest and imprisonment[55]—suggesting either an opportunity for additional research or further evidence of the profoundly disruptive effect that pretrial incarceration has on the economic lives of the soon-to-be imprisoned.

Second, it is also possible that legitimate earnings activity can be accompanied by illegal activities. Numerous studies have shown that illegal earnings can be intermittent, and part- or full-time employment in the legal labor market has the potential to produce complementary wages.[56] It is even possible that these two forms of employment are not simply complementary opportunities to smooth inconsistent returns from illegal earnings activity, but that legal employment can give rise to expanded opportunities for illegal earnings through theft, drug selling, or other illegal activity.[57] Whether or not legal and illegal earnings are complementary, it appears that participation in the legal labor market does not preclude participation in illegal acts, which is just to say that criminal activities are not limited to the unemployed. However, the reverse may not be true, as suggested by John Hagan's work on the social embeddedness of crime[58]

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[53] *See, e.g.*, LaLonde & Cho, *supra* note 6, at 246; Kling, *Incarceration Length*, *supra* note 5, at 867–68; Loeffler, *supra* note 6, at 157; David J. Harding et al., *supra* note 6, at 68.

[54] Christopher J. Mumola & Jennifer C. Karberg, Bureau Just. Stat., Drug Use and Dependence, State and Federal Prisoners, 2004 1, 8 (2007).

[55] Bureau Just. Stat., The Survey of Inmates in State Correctional Facilities and the Survey of Inmates in Federal Correctional Facilities Questionnaire (2004), https://www.bjs.gov/content/pub/pdf/sisfcf04_q.pdf. (source on file with author).

[56] *See* Jeffrey Fagan, *Drug Selling and Licit Income in Distressed Neighborhoods: The Economic Lives of Street-Level Drug Users and Dealers*, *in* Drugs, Crime, and Social Isolation: Barriers to Urban Opportunity 100, 129 (Adelle V. Harrell & George E. Peterson eds., 1992) [hereinafter *Drug Selling*] (finding that legal labor market participation competed with criminal work); *see also* Jeffrey Fagan, *Women and Drugs Revisited: Female Participation in the Cocaine Economy*, 24 J. Drug Iss. 179, 179 (1994) [hereinafter *Women*] (finding that women involved in drug markets engage in a variety of income-generating activities, both legal and illegal); Jeffrey Fagan & Richard B. Freeman, *Crime and Work*, 25 Crime & Just. 225, 234–59 (1999) (reporting that many criminal offenders engage in both legal and illegal work in succession or often simultaneously); Peter Reuter et al., Money from Crime: A Study of the Economics of Drug Dealing in Washington, D.C. 62–66 (1990) (discussing legal and illegal sources of income among individuals arrested on drug charges).

[57] *See* Jeffrey Fagan, *Drug Selling*, *supra* note 56, at 129.

[58] *See* Hagan, *supra* note 32, at 486 (arguing for the importance of adolescent crime and criminal justice involvement for understanding future adult unemployment).

and Richard Freeman's work on crime and labor market participation.[59] Both scholars suggest that rather than unemployment leading to crime, participation in crime can lead to subsequent unemployment, where the mechanism of unemployment can either be contact with the criminal justice system or social selection into a trajectory of continued criminal involvement largely disconnected from the conventional labor market. This embedding or selection process, under this analysis, then restricts the ability of crime-involved individuals to participate in the legitimate economy at any future time at which they attempt to do so.

Regardless of why arrests leading to imprisonment are not preceded by more signs of economic distress, the substantial and mechanical disruption caused by arrest and pretrial incarceration suggests that future work on the labor market experiences of prisoners could benefit from improved measures of pretrial incarceration status. In fact, there are two distinct benefits that could come from collecting and analyzing this additional information. For the purposes of estimating the effects of imprisonment on subsequent probabilities of employment and earnings, pre-imprisonment information on prisoner employment and earnings is useful for estimating the within-individual labor market effects of imprisonment. However, if imprisonment is always or nearly always preceded by a precipitous drop in employment and earnings, then typical empirical strategies for estimating the effects of imprisonment on employment and earnings may misestimate the true causal effects of imprisonment. Past employment and earnings are time-varying confounding variables.[60] As such, they are ill-suited for use in a fixed effects regression research design, which assumes that fixed effects will only be used to control for time-invariant differences between individuals.

A lagged dependent variable estimation strategy offers a useful alternative to fixed effects regression. By examining the employment immediately before and after imprisonment, a comparison of quarterly employment for the several quarters before imprisonment will compare economic performance already lowered by arrest, pretrial custody, and conviction to economic performance with the added effects of imprisonment. While this may seem reasonable enough, this configuration precludes the possibility of first measuring the lagged effects of arrest, detention, and earnings, since these quantities are obscured by the non-lagged effects of subsequent imprisonment. Previous attempts to resolve

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[59] Freeman, *Disadvantaged Youths*, *supra* note 12, at 201.

[60] For more details on time-varying confounders, see ANGRIST & PISCHKE, *supra* note 34, at 113. For more details on prisoner reentry, see PETERSILIA, *supra* note 2, at 3–20.

this problem by implicitly or explicitly examining non-imprisoned individuals and comparing their trajectories to those of imprisoned individuals rests upon the assumption that they share similar enough economic trajectories to allow for an unbiased estimation of imprisonment's effects.[61] Unfortunately, this assumption seems unlikely to be true.[62] The soon-to-be imprisoned are much more likely to experience an extended period of pretrial detention than the non-soon-to-be imprisoned.[63] For these reasons, it seems that panel data of earnings for prisoners are unlikely to provide an isolated estimate of the effects of imprisonment and instead provide an estimate of the joint effects of arrest, pretrial detention, conviction, and eventual imprisonment.

Collecting better information on the pretrial incarceration of prisoners and the employment trajectories of incarcerated non-prisoners could also be quite valuable for another reason. Studies of the employment experiences of ex-prisoners have repeatedly noted a temporary employment boost immediately after release from prison.[64] The exact cause of this spike has not been fully explored. It has been speculated that this could be due to parole work requirements or other features of the prison reentry process.[65] Having employment information on ex-jail inmates who are not then sent to prison could help shed light on whether these employment spikes are a function of the generic experience of incarceration or prison-specific policies.

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[61] *See, e.g.*, Western, *Impact of Incarceration*, *supra* note 2, at 528.

[62] *See* Apel & Sweeten, *supra* note 6, at 459–62.

[63] Marian R Williams, *A Comparison of Sentencing Outcomes for Defendants with Public Defenders Versus Retained Counsel in a Florida Circuit* Court 23 JUSTICE SYSTEM JOURNAL 249, 254 (2002).

[64] Sabol, *supra* note 5, at 269; LaLonde & Cho, *supra* note 6, at 247; Jung, *supra* note 5, at 507; Kling, *Incarceration Length*, *supra* note 5, at 868.

[65] *See* Sabol, *supra* note 5, at 270, 291.

Table 1. Means and standard deviations of variables

Black	0.79
Hispanic	0.11
White	0.10
Male	0.90
Age at Sentencing	32.31 (11.81)
Pre-Imprisonment Employment Rate	0.23 (0.42)
Pretrial Incarceration Rate (as measured by credit for time served at sentencing)	0.95
Avg. Length of Pretrial Incarceration (w/o zeroes)	159.17 (168.62)
Number of Observations	32,656

Source: Author calculations based on matched Circuit Court of Cook County and Illinois Department of Employment Security data.

Table 2. Alternative estimates of pre-imprisonment employment declines

Variables	Pre-Prison Basic (1)	Pre-Prison w/ Time-served (2)	Pre-Arrest (3)
Qtr. Prison Entry or Arrest	-0.163 (0.002)***	-0.079 (0.003)***	-0.055 (0.002)***
1st pre-event quarter	-0.096 (0.002)***	-0.051 (0.003)***	0.038 (0.002)***
2nd pre-event quarter	-0.052 (0.002)***	-0.026 (0.002)***	0.062 (0.002)***
3rd pre-event quarter	-0.023 (0.002)***	-0.007 (0.002)**	0.060 (0.002)***
4th pre-event quarter	-0.011 (0.002)***	-0.000 (0.002)	0.061 (0.002)***
5th pre-event quarter	-0.000 (0.002)	0.007 (0.002)*	0.061 (0.002)***
6th pre-event quarter	0.007 (0.002)***	0.012 (0.002)***	0.061 (0.002)***
7th pre-event quarter	0.015 (0.002)***	0.018 (0.002)***	0.058 (0.002)***
8th pre-event quarter	0.019 (0.002)***	0.021 (0.002)***	0.056 (0.002)***
9th pre-event quarter	0.020 (0.002)***	0.022 (0.002)***	0.053 (0.002)***
10th pre-event quarter	0.023 (0.002)***	0.025 (0.002)***	0.042 (0.002)***
Time served in quarter		-0.120 (0.003)***	
Fixed Effects	Yes	Yes	Yes

Constant	0.234 (0.001)***	0.245 (0.001)***	0.228 (0.000)***
Person/quarter obs.	1,066,852	1,066,852	1,066,852
Persons	32,656	32,656	32,656
R^2	0.007	0.006	0.004

Notes: *** indicates coefficients were significant at 1% level.

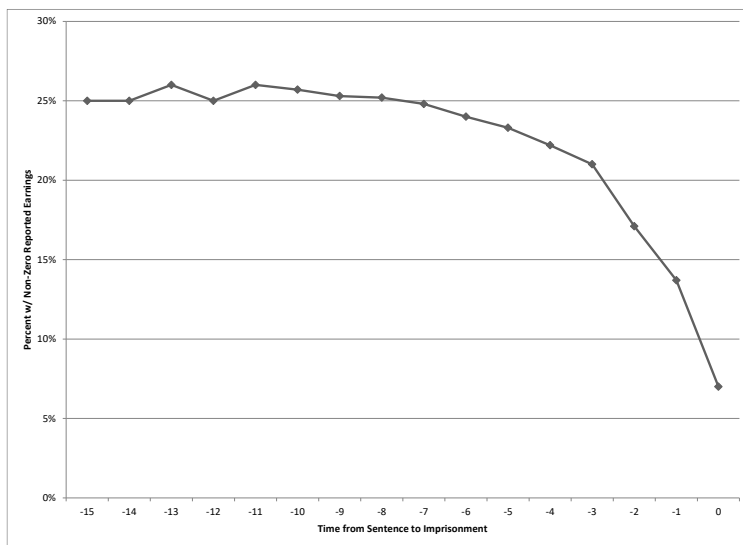Figure 1a. Quarterly Employment from Time of Sentencing

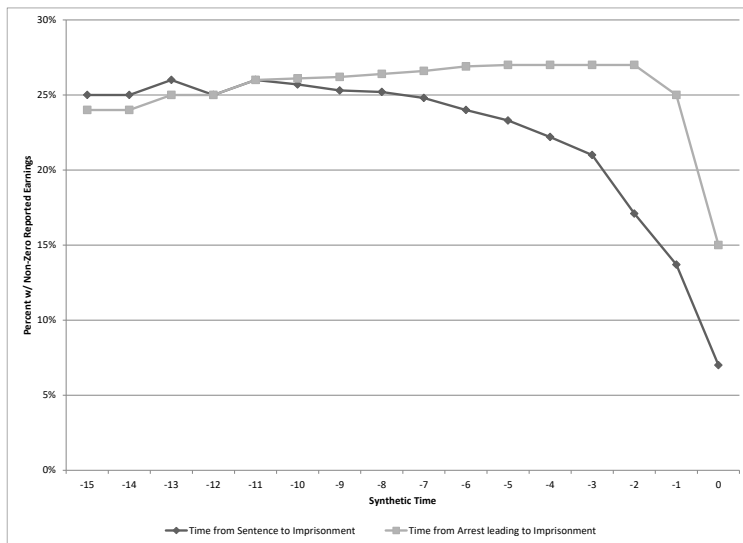Figure 1b. Quarterly Employment from Arrest and Sentencing

Figure 2. Average Quarterly Wage Earnings for Employed Soon-To-Be Prisoners