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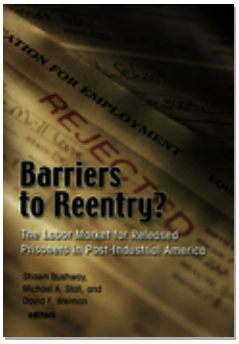

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Chapter 10

The Impact of Local Labor-Market Conditions on the Likelihood that Parolees Are Returned to Custody

Steven Raphael and
David F. Weiman

The post-release employment experience of a paroled ex-offender is frequently offered as an important determinant of whether the individual successfully completes his or her term of community supervision. Support for this proposition comes from research demonstrating a positive relationship between labor-market conditions and crime rates, and evaluations of parolee employment programs showing significant associations between program participation, employment, and recidivism. However, drawing inferences from this empirical evidence about the effect of employment interventions on recidivism and parole violations is problematic for several reasons. Research that demonstrates an aggregate impact of unemployment on crime does not demonstrate that the criminal behavior of released prison inmates is sensitive to available employment opportunities. One might argue that such offenders are a particularly hardened group, and that the supply of ex-offenders to both the legitimate labor market as well as to criminal activity is likely to be inelastic.

Concerning the evaluation evidence of targeted program interventions, very little of this research is based on careful experimental or quasi-experimental research methods. Program participation is rarely determined by random assignment and hence it is impossible to distinguish programmatic effects from unobserved differences in motivation

or determination. In light of these weak methodological designs, two recent reviews of this research have concluded that while suggestive, this research does not offer conclusive evidence that intervention impacts the post-release outcomes of ex-offenders (Bushway and Reuter 2002; Wilson, Gallagher, and MacKenzie 2000).

In this chapter, we assess whether the availability of employment opportunities impacts the likelihood that a paroled ex-offender is returned to custody, using a source of variation in employment conditions that is unlikely to be related to unobserved differences in motivation. Using administrative data from the California State Department of Corrections, we assess whether the likelihood that a paroled offender is returned to prison depends on the local labor-market conditions in the county where the offender is released at the time of release. We test for overall effects of local labor-market conditions on all individuals paroled during the 1990s and for groups of parolees stratified by variables that are highly correlated with the likelihood of being returned to custody.

We find moderate effects of county unemployment rates at the time of release on the likelihood that a paroled offender is returned to custody. The difference in return rates between those paroled to low-unemployment counties and those paroled to high-unemployment counties widens as the period analyzed increases—in other words, there is little impact on the likelihood of returning within six months, a larger impact on returning within twelve months, and a larger effect on returning within twenty-four months. When we stratify by offender characteristics, we find that the impact of employment conditions on the likelihood of reincarceration is larger for offenders that are relatively less likely to violate the imposed parole terms. Hence, the post-release criminal activity of the most problematic parolees is least impacted by local labor-market conditions.

Combined with findings from research on the impact of local unemployment rates on the employment probabilities of low-skilled workers (Sabol, chapter 9, this volume; Holzer and Offner 2002), our results imply that the impact of being employed on the probability of being returned to custody is small for the average parolee, on the order of one to two percentage points. However, our results also indicate that the employment effects for parolees that are at relatively low-risk of violating parole are fairly large. For the lowest-risk parolees, our results suggest that having a job reduces the likelihood of being returned to custody on a parole violation by six to twelve percentage points (13 to 26 percent of the three-year recidivism rate for low-risk releases). Thus, targeted workforce development efforts may be quite effective at reducing the return-to-custody rates among subgroups of former inmates.

Parole in the United States and in California and Its Impact on Employment Opportunities

Parole is technically defined as a period of conditional supervision following release from prison. An inmate can be paroled either at the discretion of state parole boards (referred to as discretionary parole) or via statutory requirements (referred to as mandatory parole). Over the last two decades, the proportion of parolees released at the discretion of state parole boards has declined considerably, from roughly 55 percent in 1980 to 25 percent in 1999. Comparable figures for mandatory parole are 20 percent in 1980 and 42 percent in 1999. Roughly 70 percent of released prison inmates enter state parole systems. Of the remaining 30 percent, approximately 20 percent are released as a result of the expiration of their sentence (in which case they receive no post-release supervision), and 10 percent are released for other reasons, such as commutations or release to probation (Hughes, Wilson, and Beck 2001).

The conditions of parole often vary with the offender. At a minimum, parolees are required to maintain contact with a supervising parole agent, not to abuse drugs, and not to engage in criminal activity of any kind. However, additional conditions may be placed on certain offenders, such as prohibitions against alcohol consumption, requirements that the ex-offender stay away from victims, and requirements that the parolee make restitution to victims. Parole violations can result in a number of alternative sanctions. For example, a parolee who fails a drug test may be fined, may be required to attend a substance abuse program, or in some instances may be returned to prison (Legislative Analyst's Office of California 1998). In general, length of time on parole does not exceed three years and the average parole term is slightly over a year.[1]

California's parole system differs from that of many other states along several dimensions. To start, practically all offenders released from California prisons are subject to parole supervision. This is not the case in other states. For example, William Sabol (chapter 9, this volume) reports that roughly 60 percent of releases in Ohio during the late 1990s were conditionally released. Nationwide, roughly 70 percent of released inmates are conditionally released. This relatively intensive use of parole is due to several factors. First, determinate sentencing legislation passed in 1977 increased the proportion of convicted offenders sentenced to prison terms while reducing the discretion of the Board of Prison Terms (BPT), the California state parole board, over who is or isn't paroled. Second, during the early 1990s, the BPT dropped the practice of reviewing the files of soon-to-be-released prison inmates for

possible unconditional discharge (Legislative Analyst's Office of California 1998). Given this intensive use of parole and the size of the state, nearly one in five parolees in the United States reside in California (Travis and Lawrence 2002).

California punishes parole violators more harshly than other states. This can be seen in higher parole failure rates, differences in the composition of the population of parole violators currently in state prison custody, and an increasing proportion of parole violators in state prison admissions. For instance, only 20 percent of California's ex-offenders released to parole in 1999 successfully completed their terms of community supervision, compared to 42 percent nationally. Among parole violators incarcerated in state prisons, 23 percent of California's inmates were returned to custody for public-order violations (in other words, a technical violation such as missing an appointment with a probation officer) compared to 13 percent nationally. The California and national figures for parolees being returned to custody were 27 and 23 percent for drug violations, 25 and 30 percent for property crimes, and 24 and 34 percent for violent crimes (Hughes, Wilson, and Beck 2001). These patterns indicate that parole violators in California prisons are incarcerated for less serious infractions than parole violators returned to custody in other states.

Finally, parole violators account for an unusually large proportion of prison admission in California. In 1999, nearly 70 percent of admissions to California state prisons were attributable to parole violations (see figure 10.4). The California figure exceeds not only the national average of 35 percent but the rate of every other state in the nation, with Utah a distant second at 55 percent (Hughes et al. 2001).[2]

The potential impact of local labor-market conditions on the likelihood that parolees violate the terms of their supervised release depends on both the demand side of the market for ex-offenders as well as the supply side behavior of ex-offenders themselves. Concerning the supply side, to the extent that paroled ex-offenders are responsive to changes in incentives, one would predict that better labor-market conditions would reduce the likelihood of being returned to custody. Lower unemployment rates coincide with higher wages (Blanchflower and Oswald 1995) and a higher likelihood of finding gainful employment in legitimate activities. In this regard, a tighter labor market increases the expected value of the return to playing it straight and decreases the relative attractiveness of engaging in criminal activity. As long as the labor-supply elasticity of ex-offenders is greater than zero,[3] an ex-offender released under favorable labor-market conditions should be more likely to seek legitimate employment and less likely to engage in crime for personal gain than an otherwise similar ex-offender released under less favorable conditions. Any factor that reduces the likelihood

of committing a crime is likely to reduce the likelihood of a parole violation.

In addition to the economic incentives that may deter a parole violation, gainful employment occupies a parolee's time, keeping the parolee off the streets and probabilistically reducing the likelihood that the ex-offender encounters high-risk situations. A job may also provide daily structure and regimentation, factors that may be particularly important for ex-offenders whose social contacts to those outside of prison have deteriorated during the recently served prison term.

To be sure, whether parolees are more likely to be employed post-release when labor-market conditions are favorable will depend crucially on the demand side of the labor market. Surveys of employers of low-skilled workers consistently show that employers are quite averse to hiring ex-offenders and quite frequently check the criminal history records of job applicants (Holzer, Raphael, and Stoll 2002a; chapter 4, this volume). While there is little research assessing how employer demand for ex-offenders varies with the business cycle, the one study that does attempt to investigate this question (Holzer, Raphael, and Stoll 2002a) finds little evidence of increased hiring of ex-offenders when labor markets are tight. This may be due in part to the fact that a fairly large proportion of employers who indicate that they are unlikely to hire ex-offenders are prohibited by law from doing so (Holzer, Raphael, and Stoll, chapter 4, this volume).

However, there is evidence that employer willingness to hire applicants with criminal history records depends to a certain extent on the severity of the offense committed (Holzer, Raphael, and Stoll, chapter 4, this volume). Specifically, employers are least willing to hire ex-offenders who have committed violent crimes and property crimes (in that order). In contrast, employers are more willing to hire applicants who have served time for a drug offense. Hence, the extent to which employer demand for ex-offenders varies with labor-market conditions is likely to depend on the characteristics of the ex-offender.

There is aggregate evidence that tight labor markets coincide with lower crime levels. Steven Raphael and Rudolf Winter-Ember (2001) as well as Eric Gould, Bruce A. Weinberg, and David B. Mustard (2002) show that state and county-level property crime rates are lower when unemployment is lower. Moreover, the magnitude of the unemployment effect is sufficiently large to explain a fair portion of the decline in property-crime rates occurring during the 1990s. Such evidence is consistent with an impact of labor-market conditions on the criminal activity of parolees and, by extension, the likelihood that ex-offenders violate the terms of parole.

Whether these unemployment effects are being driven in part by lower offending by parolees, however, will depend in part on the extent

to which parolees are on the margin between offending and not offending (or, less restrictively, that the amount of offending is sensitive to relative returns). The studies cited above cannot assess this question since data on crime attributable to parolees is not separately available. Hence, the aggregate evidence is also consistent with the behavior of hardened offenders (such as those on parole) being completely insensitive to labor-market conditions. In this instance, the aggregate relationship between unemployment and crime would be driven entirely by the responsiveness of less serious offenders to variation in legitimate economic opportunities. Evaluations of state employment programs tailored to paroled ex-offenders provide more direct evidence of the impact of employment on the likelihood that an ex-offender violates parole. Evaluations of earlier state interventions reviewed by Shawn Bushway and Peter Reuter (2002) arrived at quite pessimistic conclusions regarding the ability of training and job search assistance to lower the recidivism of parolees. Evaluations of more recent state programs, however, are uniformly more positive. In a review of recent research, Joan Petersilia (2002) cites several evaluations that find program effects on the likelihood that parolees find employment on the order of twenty percentage points, and effects on the likelihood of rearrest and being returned to prison custody on the order of ten percentage points. A review of nineteen studies by David B. Wilson, Catherine A. Gallagher, and Doris L. MacKenzie (2000) finds similar program effects.[4]

The difference between the results from earlier and later research may be driven by several factors. For one, the large increase in incarceration rates since the early 1970s (the period corresponding to the earlier wave of research) likely implies that the United States is incarcerating people for increasingly less-serious offenses, and that such individuals are more responsive to the services offered by state programs. That is to say, with a low incarceration rate (such as that of the 1970s) the average prisoner may be more difficult to serve than the average prisoner when incarceration rates are high. Alternatively, the larger impacts of more recent evaluations may be due to flaws in the methodological design of these more recent evaluations. Bushway and Reuter (2002) as well as Wilson, Gallagher, and MacKenzie (2000) note that few of the program evaluations are based on randomized designs where program participation is determined by random assignment rather than self-selection. Moreover, many of the evaluations do not control for differences in offender characteristics that may simultaneously explain program participation and recidivism and parole violation rates. Hence, although this research is suggestive, the estimated program effects are likely to be upper-bound estimates of the potential for policy intervention to increase employment and reduce recidivism among paroled ex-offenders.

Description of the California Data and the Empirical Strategy

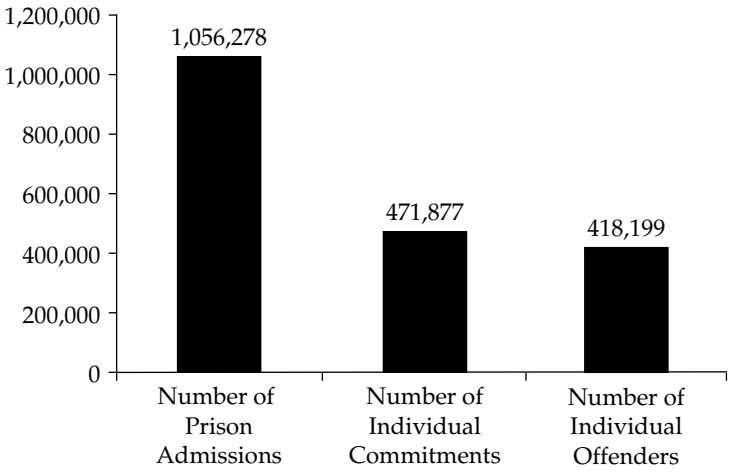
The research on the relationship between unemployment and criminal activity discussed above only partially informs the question of whether employment prospects are related to the likelihood that parolees are returned to custody. The aggregate research fails to directly test for a relationship between economic conditions and the behavior of paroled ex-offenders. The program evaluations directly analyze the outcomes for parolees, but program participation itself is likely to be determined by unobserved factors such as motivation or determination not to be sent back to prison. Such factors are also likely to influence the probability that an ex-offender successfully completes his or her parole term; consequently the estimates from this research are likely to be biased upwards.

In this project, we assess the impact of employment conditions on the likelihood that paroled inmates in California are returned to custody, using a source of variation in labor-market conditions that is unlikely to be correlated with unobserved offender characteristics. Specifically, we assess whether the labor-market conditions in the county of release at the time that the offender is released influences the likelihood of a parole violation. Our empirical strategy requires that we construct a parole violation measure as well as characterize the local labor-market conditions that an individual parolee is exposed to upon release. Before discussing our estimation strategy, a discussion of the structure of the data used to create the dependent and independent variables of analysis is needed.

Constructing Parole Violation Measures

Our principal data source comes from administrative records maintained by the California Department of Corrections (CDC). We use these records to construct four parole violations measures that serve as our dependent variables. We requested data on all commitments with prison terms beginning during the period from January 1, 1990, to December 31, 1999. A prison term corresponds to a specific spell served in a California state prison, and a prison commitment refers to a specific prison sentence associated with the commission of and conviction for a felony offense. An individual offender can (and often does) serve multiple terms for a single commitment. Ex-offenders are returned to prison for subsequent terms on the same commitment when they violate the terms of their parole. An ex-offender who commits a new felony while on parole is prosecuted and (if found guilty) sent to prison on a new commitment.[5]

Figure 10.1 Number of Prison Admissions, Individual Commitments, and Individual Offenders Entering the California State Prison System, 1990 to 1999

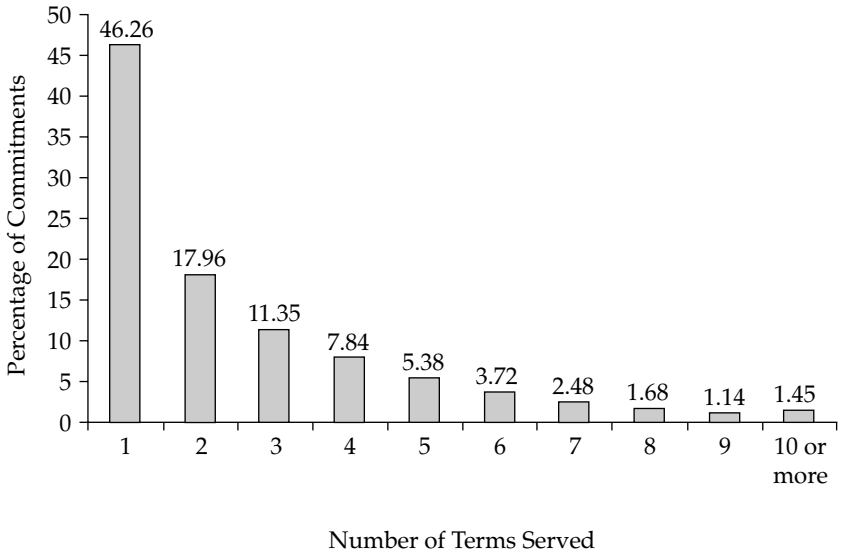


Source: Authors' tabulations of CDC administrative data.

In the data provided to us, each record corresponds to an individual term. Included in each record is a term counter that increases within a given commitment (first term, second term, third term, and so forth), a unique commitment identification variable, unique identifiers for individual offenders, basic demographic information, information on the offense committed, the county of commitment, and, most important, the start and end dates for each term.[6] Over 95 percent of the terms beginning during the 1990s end during the 1990s, with a median term length of roughly twelve months. For all terms ending during the decade, the inmate is discharged to parole status.

Figures 10.1 through 10.4 summarize several aspects of the California prison term data. Collectively, these figures document the extremely high incidence of parole violations that result in the ex-offenders' being returned to custody, as well as the high contribution of parole violations to prison admissions in California. Figure 10.1 shows the number of terms (the number of records in our data set), the number of unique court commitments, and the number of individual offenders. The fact that the number of commitments is only slightly greater than the number of offenders indicates that a relatively small proportion of offenders were prosecuted and sentenced more than once during the decade. Conversely, the fact that the number of terms is more than double the

Figure 10.2 Distribution of Court Commitments by the Number of Terms Served, Commitments with Any Time Served During the 1990s



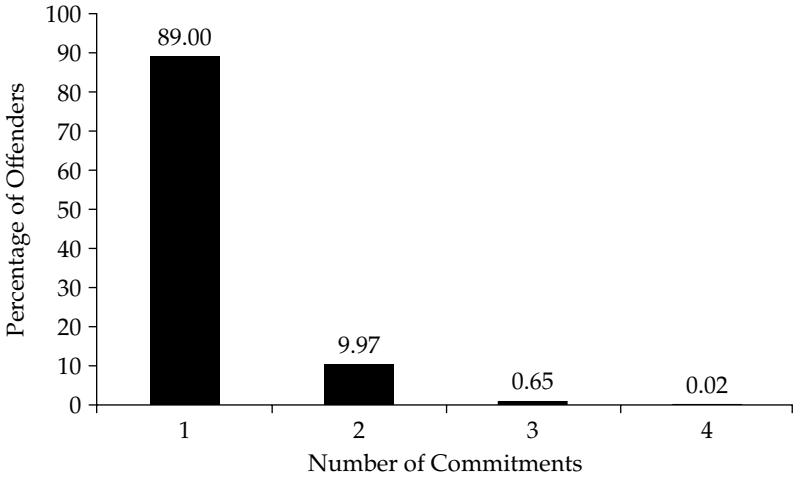
Source: Authors' tabulations of CDC Administrative data.

number of commitments indicates that the lion's share of repeat spells in California prisons is due to parole violations rather than new felony offenses.

Figures 10.2 and 10.3 reinforce this interpretation. Figure 10.2 presents the relative frequency distribution for the 471,877 individual commitments by the number of terms served, and figure 10.3 presents the relative frequency distribution for the 418,199 offenders by the number of commitments incurred during the decade. As can be seen, multiple terms are served on over half of the commitments. On the other hand, 90 percent of offenders accumulate only one commitment during the time period observed.

Finally, figure 10.4 summarizes the number of new admissions to the state prison system by whether the new admission is the first term of a new commitment or the second or higher term on an existing commitment.[7] First-term admissions give the number of new commitments to the state prison system, and the number of second or higher term admissions provide the number of admissions that are due to parole violations. Over the decade, the proportion of admissions accounted

Figure 10.3 Distribution of Offenders Entering the California State Prison System by the Number of Individual Commitments, 1990 to 1999

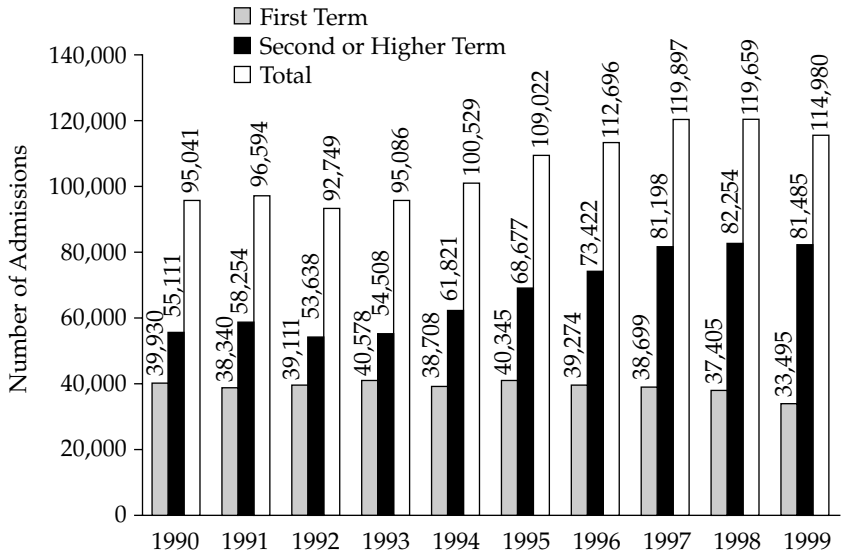


Source: Authors' tabulations of CDC administrative data.

for by parole violators increased from approximately 60 percent to 70 percent of all admissions. These figures are high for California (relative to past years) and relative to other states.

We use the administrative records to construct our parole-violation measures in the following manner. We first restrict the term records to those terms that end during the 1990s. This ensures that all base terms correspond to a subsequent period on parole. We then sort the term records by the unique commitment identification number and the term counter variable (the variable that counts terms within a commitment). For each commitment, we identify the total number of terms served on the commitment and attach this figure to each term record within a given commitment.[8] If the term-counter code number is less than the total number of terms served on the commitment, than we know that the current term is followed by a subsequent prison spell resulting from a parole violation. For such observations, we merge the in dates for the subsequent terms and calculate the time (in months) between the release date from the base term and the in date for the new term. If, on the other hand, the term-counter identification for a given term record equals the value of the total terms served, then the term is the last term served. For such observations, we set the variable measuring the time between terms to an arbitrarily large number.[9]

Figure 10.4 Total New Admissions, Admissions Due to Parole Violations, Admissions Due to New Commitments, 1990 to 1999

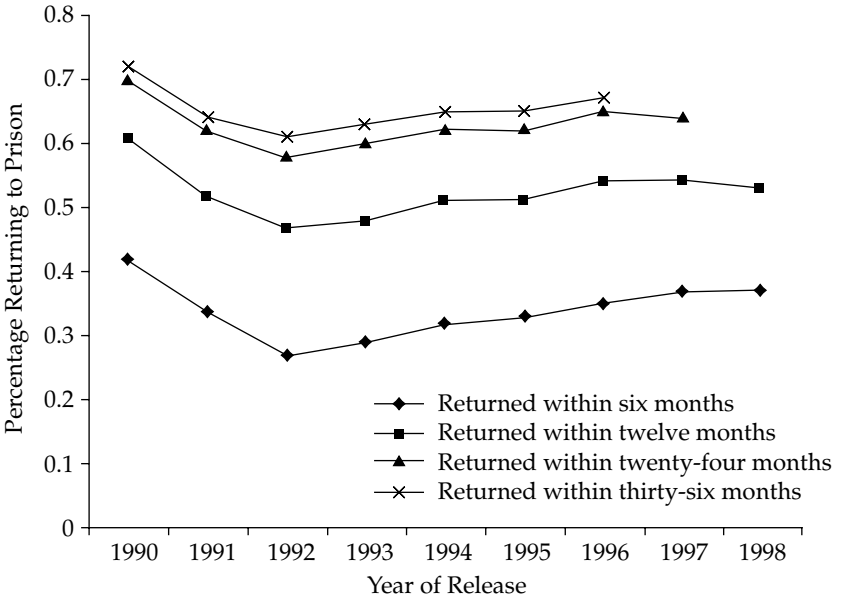


Source: Authors' tabulations of CDC administrative data.

Using this variable, we construct four dependent variables that are indicative of a parole violation resulting in a return to custody: dummy variables that indicate that the offender is returned to custody within six, twelve, twenty-four, and thirty-six months of release from the previous term.[10] For the six- and twelve-month return-to-custody variable, we restrict the sample to terms ending prior to 1999. This restriction ensures that we have at least one year post-release to observe whether the parolee is returned to custody. Similarly, for the twenty-four-month variable, we restrict the sample to terms with end dates prior to 1998, whereas for the thirty-six-month variable we restrict the sample to terms ending prior to 1997.

Figure 10.5 presents average values for the return-to-custody dummies, by year, for the period 1990 to 1998. The proportion of parolees returning within six months varies between 30 and 40 percent, and the proportion returning within one year varies from a low of 48 percent to a high of 61 percent. Between one and two years post-release, the proportion returning to prison on a parole violation increases by roughly ten percentage points, with 60 to 70 percent returning within

Figure 10.5 **The Proportion of Parolees Returning to Prison Within Six, Twelve, Twenty-Four, and Thirty-Six Months of Release, by Year of Release**



Source: Authors' tabulations of CDC administrative data.

two years. Finally, between two and three years, there are small increases in the proportion returning to custody on a parole violation. These California return-to-custody rates are exceptionally high when compared to those of other states. For example, John Tyler and Jeffrey Kling (chapter 8, this volume) report that roughly 16 percent of Florida prison releases recidivate within one year, and 26 percent recidivate within two years (these numbers are less than half of the estimates presented in figure 10.5).

The return-to-custody rates exhibit clear time trends. Between 1990 and 1993, all return rates decline by roughly ten percentage points. The Legislative Analyst's Office of California (1998) attributes this decrease to a standardization of parolee monitoring procedures and standards for parole revocation across the four geographic divisions of the Department of Corrections Parole Services Division. Furthermore, between 1993 and 1998 all return rates trend upwards, with increases on the order of five percentage points. This second trend is often attributed

to the increased influence of the California Board of Prison Terms in determining whether to revoke the parole of violators.

Table 10.1 presents average values for the parole violations measures for the entire period when the sample of terms is stratified by offender characteristics. There are several notable differences across the groups defined in the table. Male parolees are more likely to violate parole and be returned to prison than female parolees. White and black offenders have considerably higher return rates than Hispanic and Asian offenders. Concerning difference by offense committed, the lowest return rates are observed for convicted murderers, sex offenders, and inmates serving time for driving under the influence. The highest return rates occur for escapees and those convicted of a robbery, a burglary, a weapons-possession charge, a theft, fraud, or some other property crime.

Particularly large differences in return rates are observed for those released from their first term when compared to those released from a second or higher term. For example, the proportion of offenders who are returned within three years increases from 0.52 for first-time releases to 0.67 for second-time releases, to 0.73 for parolees being releases from their third or higher term.

Another notable characteristic shown in table 10.1 is the absence of a consistent relationship between age at time of release and the likelihood of returning to prison on a parole violation. Previous research on the relationship between age and criminal activity would predict that the likelihood of successfully completing one's term of parole should increase with age, and thus the likelihood of being returned to custody should decrease (Greenberg 1985; Grogger 1998). Although there is some evidence of such a relationship in table 10.1, the impact of age is not monotonic and the differences between younger and older parolees are small.

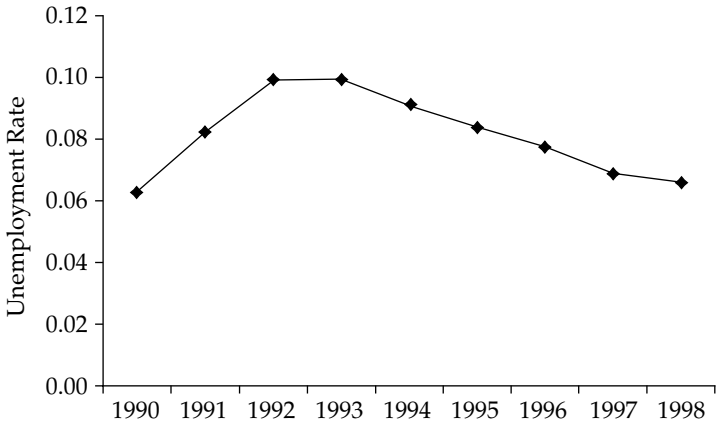
The figures reported in the first column can be used to characterize the average person released from prison during the 1990s in California.[11] Although these numbers do not provide averages for the state's incarcerated population at a point in time, they do reveal some of the differences between California and other states. For example, California releases are roughly evenly split between Hispanics, African Americans, and white offenders. This stands in stark contrast to the tabulations for Washington in Pettit and Lyons (Chapter 7, this volume), which reveal a predominantly white prison population, and Sabol's (chapter 9, this volume) for Ohio, which reveal a predominantly black population. Furthermore, only 36 percent of releases in California are being released from the first term on a commitment, compared with roughly 95 percent for Ohio (Sabol, chapter 9, in this volume).

Table 10.1 Proportion of Terms Where the Parolee is Returned to Custody Within Six, Twelve, Twenty-four, and Thirty-six Months of Release, by Offender Characteristics[a]

Offender Characteristics	Proportion of Terms	Returns to Prison Within . . . Six Months	Twelve Months	Twenty-four Months[b]	Thirty-six Months[c]
All terms	1.00	0.34	0.52	0.62	0.64
Age at time of release					
Eighteen to twenty	0.02	0.30	0.50	0.61	0.64
Twenty-one to twenty-five	0.16	0.32	0.51	0.62	0.64
Twenty-six to thirty	0.23	0.34	0.52	0.63	0.65
Thirty-one to thirty-five	0.23	0.35	0.54	0.64	0.66
Thirty-six to forty	0.18	0.35	0.54	0.63	0.65
Forty-one plus	0.18	0.32	0.58	0.58	0.60
Male	0.90	0.34	0.53	0.63	0.65
Female	0.10	0.27	0.45	0.56	0.59
White	0.33	0.35	0.54	0.64	0.66
Black	0.34	0.38	0.57	0.68	0.70
Hispanic	0.30	0.28	0.45	0.54	0.57
Asian	0.01	0.20	0.33	0.43	0.46
Other	0.02	0.29	0.45	0.54	0.56
Offense committed					
Murder or manslaughter	0.01	0.20	0.33	0.44	0.47
Robbery	0.08	0.31	0.49	0.59	0.61
Assault	0.07	0.31	0.49	0.60	0.63
Sex crimes	0.03	0.28	0.41	0.50	0.53
Kidnap	0.00	0.26	0.39	0.49	0.52
Burglary	0.14	0.38	0.56	0.66	0.68
Theft, Fraud, other property	0.22	0.38	0.58	0.68	0.70
Drug crimes	0.36	0.33	0.51	0.61	0.63
Escape	0.00	0.50	0.66	0.74	0.76
DUI	0.04	0.20	0.34	0.44	0.46
Arson	0.00	0.31	0.46	0.55	0.58
Weapons possession	0.04	0.34	0.54	0.66	0.69
Other	0.01	0.32	0.48	0.59	0.62
Term group					
First	0.36	0.21	0.37	0.49	0.52
Second	0.21	0.34	0.54	0.65	0.67
Third or higher	0.44	0.44	0.63	0.72	0.73

Source: Estimated using administration records from the California Department of Corrections.
[a]Data refer to all terms served in California beginning during the 1990s and with an outdate occurring prior to 1999.
[b]Sample is restricted to commitments with first terms ending prior to 1998.
[c]Sample is restricted to commitments with first terms ending prior to 1998.

Figure 10.6 Average Monthly Unemployment Rate in County of Release, by Year



Source: California Department of Finance.

Characterizing Local Labor-Market Conditions

Upon release from prison, the overwhelming majority of California parolees are returned to the controlling county—the county that prosecuted the parolee for the initial offense.[12] Paroled ex-offenders are required to remain in the county of commitment and to maintain contact with parole authorities. During the 1990s, local labor-market conditions varied considerably both within and between the state's 58 counties. We use this variation to identify the impact of local labor-market conditions on the likelihood that the offender's parole status is revoked.

Specifically, for each offender we attach the average monthly unemployment rate for the offender's controlling county for the six-month period beginning with the month that the offender is paroled into the community. We do so using county monthly unemployment rate data from the California Employment Development Department Labor Market Information Division. This average monthly unemployment rate, anchored to a county and a specific time period defined by the offender's date of release, is our key explanatory variables.

Figure 10.6 presents the average local unemployment rate in the county of release by year of release. Labor-market prospects diminished between 1990 and 1993 as the state economy slipped into a particularly deep recession and then improved between 1993 and 1998 with improvements in the national economy. The time path of average unemployment rates is such that local unemployment rates are increasing

when parole violation rates are decreasing, and are decreasing when parole violation rates are increasing. We have already noted that the changes over time in return-to-custody rates are being driven in large part by institutional forces internal to California corrections. Thus, the patterns in figures 10.5 and 10.6 may lead to the false conclusion that ex-offenders are more likely to fail on parole when the unemployment rate is low. To adjust for potentially confounding institutional influences, we include year effects in all models estimated below.

Empirical Strategy

We assess the impact of local labor-market conditions on the likelihood that an offender violates the conditions of parole and is returned to custody by regressing each of our four measures of parole failure on our measure of local unemployment rates. To the extent that local labor-market conditions impact the likelihood that an ex-offender finds a job, and to the extent that having a job impacts the likelihood of violating parole, local unemployment rates should impact the likelihood of a parole violation. Technically, the coefficient on the local unemployment rate in our models will equal the effect of local unemployment rates on the probability that a parolee finds employment, times the effect of being employed on the probability of violating parole and being returned to custody.[13] We hypothesize a priori that both effects are negative, and thus, that the reduced-form unemployment effect should be positive.

Concerning the magnitude of the empirical relationships that we estimate, a small unemployment effect is consistent with either a small effect of labor-market conditions on ex-offender employment prospects, a small effect of being employed on the likelihood of violating parole, or both. Absent offender-specific information on post-release employment status, we cannot disentangle these two structural parameters. However, in summarizing our results we will draw on estimates from existing labor-market research concerning the impact of local labor-market conditions on the employment rate of relatively marginalized workers to provide ballpark estimates of the impact of employment on the likelihood of being returned to custody that is implied by our reduced-form results.

To be sure, the population of paroled ex-offenders is heterogeneous, and as a result, one might suspect that the impact of local labor-market conditions on the likelihood of successfully completing one's parole term is heterogeneous as well. For instance, Holzer, Raphael, and Stoll (chapter 4, this volume) show that the demand for low-risk, nonviolent offenders is greater than employer demand for violent offenders. In terms of the impact of labor-market conditions, one might suspect that

in tight labor markets employers would be more likely to take a chance with such low-risk offenders. If this were the case, the effect of local conditions on the likelihood of finding a job would be greater for such offenders. Holding all else constant, this would translate into a larger reduced-form impact of local unemployment rates on the likelihood of violating parole. Moreover, one might also argue that the impact of employment on the likelihood that one commits a parole violation may be larger for certain offenders, thus also contributing to heterogeneity in the effect of labor-market conditions.

We explore such heterogeneity in the following manner. Our first strategy is based on the proposition that parolees at the highest risk of violating parole will be returned to custody relatively soon. Thus, as the time since release increases, the pool of remaining parolees is likely to be increasingly positively selected with respect to such characteristics as employability and adaptability to noninstitutional life. By estimating separate models for the likelihood of returning within a short period of time versus returning within a longer period of time, we can assess whether local labor-market conditions matter more or less for relatively high-risk offenders. For example, if the short-period unemployment effect is less than the long-period unemployment effect, one might infer that employment conditions have little impact on those who are quickly returned to custody, yet have larger impacts on those who are likely to survive the first few months of parole.

An alternative manner for testing whether the impact of labor-market conditions is heterogeneous would be to stratify the sample along dimensions correlated with the likelihood of being returned to custody and to estimate separate models for the subsamples. Below, we do this by using a simple imputation procedure to classify offenders into risk-of-subsequent-term quartiles and estimate separate models for each group. We discuss this imputation in detail in the next section.

Estimation of Impact of Local Labor-Market Conditions on Parolees

In this section we present our principal estimates of the impact of local labor-market conditions on the likelihood that paroled offenders are returned to custody in California. We begin with base estimates using the entire population of paroled ex-offenders. We then explore whether the effect of labor-market conditions varies with the relative risk of being returned to custody. Specifically, we impute the risk of being returned to custody among parolees and then estimate separate models for parolees in alternative risk groups.

Table 10.2 Linear Probability Models of the Likelihood of Returning to Prison Within Six, Twelve, Twenty-four, and Thirty-six Months of Release, All Terms (Standard Errors in Parentheses)

	Returns to Prison Within . . .			
	Six Months	Twelve Months	Twenty-four Months	Thirty-six Months
Unemployment Rate	0.017	0.025	0.059	0.055
	(0.018)	(0.019)	(0.020)	(0.022)
Female	–0.067	–0.077	–0.066	–0.057
	(0.002)	(0.001)	(0.002)	(0.002)
Black	0.025	0.035	0.042	0.044
	(0.001)	(0.001)	(0.001)	(0.002)
Hispanic	–0.043	–0.064	–0.072	–0.068
	(0.001)	(0.001)	(0.001)	(0.002)
Asian	–0.114	–0.171	–0.174	–0.158
	(0.007)	(0.007)	(0.008)	(0.008)
Other	–0.038	–0.060	–0.072	–0.070
	(0.003)	(0.003)	(0.003)	(0.004)
N	831,216	831,216	708,913	592,351

Source: Estimated using administrative records from the California Department of Corrections.
Note: Each regression includes 390 fixed effects, defined by the thirteen offense categories, six age categories, and five categories describing the terms of release (terms 1 through 4 and fifth or higher). The regressions also include a third-order polynomial of the spell length of the most recent term served, a complete set of year dummies, dummy variables for parole regions, and complete interactions between the parole regions and year dummies. For the twenty-four-month model, the sample is restricted to terms ending prior to 1998. For the thirty-six-month model, the sample is restricted to terms ending prior to 1997.

Base Estimates Using the Entire Population of Parolees

Table 10.2 presents parameter estimates from linear-probability regression models of the likelihood that a paroled ex-offender is returned to prison. The first column presents estimation results where the dependent variable is a dummy indicating a return to custody within six months, the next column presents the results for the twelve month dependent variable, and the third and fourth columns present the results for the twenty-four- and thirty-six-months dependent variables, respectively.

In addition to the explanatory variables shown in the table, each

regression model includes 390 fixed effects for all possible combinations of the thirteen possible offenses committed, listed in table 10.1, the six age categories (both listed in table 10.1), and five term-group possibilities (released from the first-, second-, third-, fourth-, or fifth- or higher term). The models also include a set of dummy variables for year of release, dummy variables for which state parole division the offender is released into, and a complete set of interaction terms between the year dummies and the parole division dummies.[14] Finally each model includes controls for a third-order polynomial of the length of the most recent term served. Again, the unemployment-rate variable equals the average monthly unemployment rate in the county of release for the six-month period beginning with the month in which the offender is paroled into the community.

Beginning with the impact of local labor-market conditions, there is no measurable effect of local unemployment rates on the likelihood of returning within six months, a small marginally significant effect on the likelihood of returning within twelve months, and larger and highly significant (at the 1 percent level of confidence) effects on the likelihood of returning to custody within twenty-four and thirty-six months. These effects, while significant, are extremely small. Converting these estimates into elasticities indicates that a 1 percent increase in the local unemployment rate would cause an increase in the likelihood of being returned to custody on a parole violation of between 0.004 and 0.008 percent, depending on the length of time analyzed. An alternative manner of characterizing the magnitudes is to calculate the change in the likelihood of returning to prison caused by a one-percentage-point increase in the local unemployment rate. The estimated effects suggest that a one-percentage-point increase in the unemployment rate results in a 0.00017 to 0.00059 percentage point increase in the likelihood of returning to custody. Again, these relatively small effects may be attributable to either a small impact of labor-market conditions on the employment prospects of ex-offenders, a small effect of employment on parole violations, or both.

Nonetheless, the effects are significant and suggest that employment policy may contribute to combating parole violations among ex-offenders. Moreover, the generally larger effects for longer time periods indicate that employment conditions at time of release are more important for offenders who survive the first few months on parole relative to offenders who are returned to custody within a short time of release. Concerning the patterns observed for the other explanatory variables listed in table 10.2, women are consistently less likely than men to be returned to custody, although the gender difference narrows as the time period analyzed increases. Blacks and whites (the omitted race category) are the most likely and Hispanics, Asians, and others are the

least likely to be returned to custody. The racial-ethnic differences in return rates tend to increase markedly after six months on parole.

A More General Stratification by Risk of Return

To reiterate, the impact of employment conditions is likely to vary by offender characteristics. Employers prefer those guilty of less serious offenses, so the demand for such ex-offenders should be particularly sensitive to labor-market conditions. Moreover, less serious offenders may be easier to divert from activities that result in parole violations and subsequent reincarceration. Hence, having a job may have a larger marginal effect for low-risk parolees on the likelihood of violating parole. Both factors would increase the reduced-form estimates of the impact of labor-market conditions that we are investigating here.

In this section we explore heterogeneity in the impact of local unemployment rates on the likelihood of being returned to custody. First, we impute the risk of returning to prison on a parole violation for each prison discharge, taking into account the relationship between all of the observed explanatory variables and the likelihood of being returned to custody. We then use this imputed risk measure to stratify the population of paroled offenders into risk quartiles and estimate separate models accordingly. Our imputation procedure is similar to that used in an alternative context by David Card (1996) and Raphael (2000). First, we estimate a flexibly specified linear-probability model, where the dependent variable is a dummy variable indicating a return to custody within twelve months and the explanatory variables include all those employed in the specifications in table 10.2 (with the exception of the unemployment rate which is omitted from this first stage regression). Next, we use the coefficient estimates from this model to calculate a predicted probability of returning within one year of release. We then stratify the sample into the quartiles of the empirical distribution of this imputed probability. We refer to parolees in the bottom quartile as low-risk parolees, those in the second quartile as low-to-medium risk, those in the third quartile as high-to-medium risk, and those in the top quartile as high-risk parolees.

Table 10.3 presents average return rates as well as average values for all of the variables listed in table 10.1 for each of the four risk groups. As can be seen, there are pronounced differences in return-to-custody rates across risk groups. For example, 16 percent of low-risk parolees are returned to custody for a parole violation within six months of release while the comparable figure for high-risk parolees is 50 percent. The corresponding figures for returning within three years are 46 percent and 79 percent. Concerning offender characteristics,

Table 10.3 Average Characteristics of Released Prisoners, by Predicted Risk of a Parole Violation and Subsequent Return to Custody[a]

	Low Risk	Low to Medium Risk	High to Medium Risk	High Risk
Returns within				
Six months	0.163	0.288	0.391	0.504
Twelve months	0.308	0.484	0.597	0.690
Twenty-four months	0.420	0.610	0.705	0.773
Thirty-six months	0.457	0.644	0.727	0.786
Age at end of term				
Eighteen to twenty	0.017	0.029	0.016	0.009
Twenty-one to twenty-five	0.170	0.198	0.148	0.138
Twenty-six to thirty	0.222	0.230	0.232	0.239
Thirty-one to thirty-five	0.200	0.224	0.241	0.269
Thirty-six to forty	0.155	0.165	0.187	0.202
Forty-one plus	0.236	0.154	0.176	0.143
Male	0.840	0.887	0.909	0.965
Female	0.160	0.113	0.091	0.035
White	0.271	0.328	0.339	0.373
Black	0.195	0.301	0.364	0.510
Hispanic	0.480	0.337	0.273	0.108
Asian	0.015	0.006	0.001	0.000
Other	0.039	0.028	0.023	0.009
Offense committed				
Murder or manslaughter	0.030	0.012	0.003	0.000
Robbery	0.083	0.103	0.085	0.032
Assault	0.086	0.089	0.082	0.039
Sex crimes	0.057	0.035	0.018	0.003
Kidnap	0.005	0.003	0.001	0.000
Burglary	0.065	0.152	0.162	0.175
Theft, fraud, or other	0.095	0.207	0.241	0.334
Drug crime	0.432	0.306	0.322	0.358
Escape	0.000	0.002	0.004	0.008
DUI	0.101	0.029	0.018	0.004
Arson	0.005	0.003	0.003	0.001
Weapons possession	0.019	0.046	0.046	0.034
Other	0.022	0.013	0.015	0.012
Term group				
First	0.895	0.458	0.066	0.004
Second	0.080	0.306	0.333	0.113
Third or higher	0.025	0.236	0.601	0.883

Source: Estimated using administrative records from the California Department of Corrections.

[a]Risk categories are defined by the quartiles of a predicted probability of returning to custody within twelve months. See the text (page 323) for a description of the model used to estimate the probability of returning to custody.

Table 10.4 Estimates of the Effect of Local Unemployment Rates on the Likelihood of Returning to Custody Within Six, Twelve, Twenty-four, and Thirty-six Months of Release, by Predicted Probability of Violating Parole (Standard Errors are in Parentheses)

	Returns to Custody Within . . .			
Predicted Risk of Violating Parole	Six Months	Twelve Months	Twenty-four Months	Thirty-six Months
Low risk	0.102	0.156	0.270	0.321
	(0.033)	(0.041)	(0.047)	(0.052)
Low-to-medium risk	0.024	0.052	0.128	0.113
	(0.037)	(0.040)	(0.044)	(0.047)
High-to-medium risk	0.080	0.073	0.053	0.032
	(0.037)	(0.037)	(0.038)	(0.041)
High risk	–0.109	–0.141	–0.154	–0.195
	(0.037)	(0.034)	(0.034)	(0.039)

Source: Estimated using administrative records from the California Department of Corrections.

Note: Each figure is the coefficient on the average monthly unemployment rate for the six-month period following release in the county of release. Each regression includes 390 fixed effects, defined by the thirteen offense categories, six age categories, and five categories describing the terms of release (terms 1 through 4 and fifth or higher). The regressions also include a third-order polynomial of the spell length of the most recent term served, a complete set of year dummies, dummy variables for parole regions, and complete interactions between the parole regions and year dummies. For the twenty-four-month model, the sample is restricted to terms ending prior to 1998. For the thirty-six-month model, the sample is restricted to terms ending prior to 1997.

there are no uniform patterns concerning age (other than that the oldest offenders are most represented in the low-risk group), but there are pronounced patterns for gender, race-ethnicity, offense, and term served. Female parolees are disproportionately represented in the low-risk group and male parolees are disproportionately represented in the high-risk group. Blacks and whites are disproportionately high-risk parolees, and Hispanics and Asians are disproportionately low-risk. Finally, parolees released from their first term are concentrated in the low-risk quartiles and offenders released from second or higher terms are concentrated in the high-risk quartiles.

We use these risk groupings to assess more generally whether the effect of local labor-market conditions on the likelihood of being returned to prison on a parole violation varies across offender types. Table 10.4 presents the results of this exercise. The rows of table 10.4 correspond to risk groups and the columns correspond to the four dif-

ferent dependent variables. Each figure in the table is the coefficient on the local unemployment rate from a separate regression for each risk group and for each dependent variable. The results clearly indicate that the impact of local labor-market conditions varies by risk group. For low-risk offenders, the coefficients on local unemployment rates are positive and statistically significant at the 1 percent level in all models. Moreover, the point estimates are anywhere from five to six times the average effects that we estimate for the population of paroled ex-offenders overall (the estimates in table 10.2).

For low-to-medium-risk offenders, the effects are positive for all models but are significant only for the twenty-four-month and thirty-six-month equations. The magnitudes of the effects for the two significant estimates are much smaller than those observed for low-risk offenders. Local labor conditions exert significant effects for the six-month and twelve-month outcome variables for high-to-medium risk parolees, but not for the longer periods analyzed. Finally, there is no evidence of an impact of local labor-market conditions for high-risk offenders. In fact, for this group the coefficients are the wrong sign and statistically significant.

Putting These Results into Perspective

The results of this study are several. To start, we find that the likelihood of being returned to custody on a parole violation is sensitive to variation in the local labor-market conditions into which a paroled offender is released. This result indicates that criminal behavior even among the most serious offenders in society (those who have been incarcerated in state prisons for their offenses) is responsive to economic incentives. Thus, there is clearly a role for employment policy interventions in smoothing the reentry of ex-offenders into the community. Moreover, our findings indicate that local labor-market conditions are particularly important for offenders who are at lower overall risk of being returned to custody. This suggests that the marginal product of employment interventions in terms of reducing the inflow into prison of parole violators would be greatest if such intervention were targeted at certain offenders. Such targeting may free up the time and effort of parole officers, who would then be able to concentrate their monitoring efforts on more high-risk parolees. Such efficiency gains are clearly needed in the state under study in light of the unusually high incidence of parole violations and the consequent reincarceration documented here.

One shortcoming of our research design is that we are unable to generate estimates of the impact of being employed on the likelihood of violating parole and being returned to prison. This follows from the

fact that we are unable to observe the employment status of paroled ex-offenders. Thus, our reduced-form estimates of the local-area unemployment effect represent the product of two structural effects: the effect of local unemployment rates on the probability that the parolee finds a job, and the effect of having a job on the likelihood of violating parole. Moreover, having reliable estimates of the second effect is particularly important, since a number of public-sector demand-side interventions, such as public-service employment, wage subsidies, or indemnifying employers against negligent-hiring lawsuits, could be tapped to augment employment among parolees.

With our data alone we cannot estimate the impact of being employed on the likelihood of being returned to prison, but by combining it with the findings from research on the effect of unemployment on employment rates, we can present ballpark estimates of the employment-parole violation effects that our estimates imply. For example, if we were to divide our reduced-form estimate of the unemployment effect by an external estimate of the effect of unemployment on the likelihood that an ex-offender is employed, the result would be an estimate of the structural effect of employment on parole violation and incarceration based on variation in employment associated with local labor-market conditions.[15]

To make this imputation, we employ the empirical estimates of the effect of local unemployment rates on employment probabilities from two studies. First, Sabol (chapter 9, this volume) estimates the effect of local unemployment rates and the likelihood that recently released offenders in the state of Ohio will show up in state unemployment insurance records as having earned income during a given calendar quarter. Sabol finds that a one-percentage-point increase in the unemployment rate decreases the likelihood of being employed among released offenders by five percentage points.

The second estimate comes from Holzer and Paul Offner (2002). Using cross-sectional and longitudinal variation in regional unemployment rates, the authors estimate that every one-percentage-point increase in the local-area unemployment rate decreases the probability that less-educated black males are employed by 2.7 percentage points. Given that less-educated black males are disproportionately represented among prison parolees, this parameter serves as an alternative.

Note, since the effect of employment on the likelihood of going to prison is imputed by dividing our reduced-form estimates by the estimated effect of local unemployment rates on the likelihood of having a job, the larger the employment-unemployment effect, the smaller the imputed employment–returned-to-custody effect. Thus, the parameter estimate from Sabol serves to provide our lower-bound estimate of the

Table 10.5 Predicted Effect of Being Employed on the Likelihood of Being Returned to Custody, Based on the Local Labor Market Conditions Effect Estimates in Tables 2 through 5

	Predicted Effect of Employment on Likelihood of Returning to Prison Within . . .			
Unemployment-Effect Estimates Used	Six Months	Twelve Months	Twenty-four Months	Thirty-six Months
Overall effects (table 10.2)				
Lower bound	–0.003	–0.005	–0.012	–0.011
Upper bound	–0.006	–0.009	–0.022	–0.020
Effects for first-term parolees (table 10.3)				
Lower bound	–0.008	–0.015	–0.036	–0.048
Upper bound	–0.014	–0.027	–0.067	–0.088
Effects for low-risk parolees (table 10.4)				
Lower bound	–0.020	–0.031	–0.054	–0.064
Upper bound	–0.038	–0.058	–0.100	–0.119

Source: Estimated using administrative records from the California Department of Corrections.

Note: The figures in the table are calculated as follows: The coefficient on local unemployment rates in the linear probability model is theoretically equal to the product of the effect of local unemployment rates on the probability of being employed times the effect of being employed on the probability of being returned to custody. To isolate the employment effect on parole violations, one needs to divide the point estimates in tables 10.2 through 10.4 by an estimate of the effect of unemployment rates on the probability of being employed. In linear probability models where the dependent variable is a dummy variable equal to one if a person is employed, Holzer and Offner (2002) find that the coefficient on unemployment for a regression restricted to less-educated black males is equal to –2.7. Sabol (Chapter 9, this volume) finds a marginal effect of a one-percentage-point change in the unemployment rate on the employment probabilities for recent released prisoners of five percentage points. We use this point estimate to calculate the figures in the table. We use the Holzer and Offner estimate to calculate the upper-bound employment-effect estimate and the Sabol parameter to compute the lower-bound estimates. The figures in the table should be interpreted as estimates of the effect of having a job on the likelihood of being returned to custody within the given time frame.

effect of having a job on the likelihood of being returned to prison, and the parameter estimate from Holzer and Offner is used to calculate the upper bound.[16]

Table 10.5 presents estimates of the effect of being employed on the likelihood of being returned to prison on a parole violation that are based on the reduced-form unemployment effects that we present here and on the employment–unemployment-rate effects borrowed from the

literature. The table presents employment-effect estimates for all parolees, parolees released from their first term, and low-risk parolees.

Finding a job reduces the likelihood that the average parolee is returned to custody within three years by only one to two percentage points. This amounts to at most 3 percent of the average probability of being returned within three years. This is a much smaller effect than the ten-percentage-point estimate that is commonly reported in nonexperimental evaluations of job programs reviewed above. Hence, our study suggests that the findings from existing evaluation research are biased upwards by the unobserved differences between program participants and nonparticipants.

However, for parolees who are at a lower risk of being returned to custody, the implied effects are quite substantial. For offenders being released from their first terms, our estimates imply that those with jobs are five to nine percentage points less likely to be returned to custody within three years. For parolees who are in the bottom quartile of the risk distribution, our estimates imply that employed parolees are six to twelve percentage points less likely to be returned to custody within three years. For these two low-risk groups, the implied reduction in the three-year return probability associated with having a job amounts to 10 to 17 percent of the proportion of first-term parolees who are returned on average and 12 to 26 percent of the proportion of low-risk parolees who are returned on average. These are clearly sizable effects.

Whether employment interventions are cost-effective will depend on the social saving associated with diverting parolees from future terms of incarceration as well as the cost saving associated with reduced criminal behavior. We have not attempted to quantify the relative costs and benefits of such interventions, but the large implied effects for low-risk offenders suggests that focusing public resources on employment aspects of prisoner reentry may very well be a cost-effective strategy, at least for low-risk parolees.

We would like to thank the California Department of Corrections for graciously providing the data integral to this research project and the Russell Sage Foundation for their generous financial support.

Notes

1. A small proportion of offenders are subjected to longer parole terms. In some cases such as ex-offenders paroled from a life sentence, parole terms may be indefinite.

   Parole and probation are different statuses of community supervision. Probation is generally an alternative to incarceration, so those on probation

are rarely ex-offenders discharged from state prisons. The probation population in 2001 was more than five times the parole population (Glaze 2002).

2. The Legislative Analyst's Office of California attributes the harsher punishment of parole violators and the relatively high return-to-custody rates to policy choices of the state Board of Prison Terms (BPT). During the 1990s, the BPT increased the number of parole infractions that must be reported to the BPT by parole officers, thus reducing the discretion of parole officers to fashion alternative sanctions to new prison terms. In addition, among those parole violations reviewed by the BPT, the proportion of reviews where parole was revoked and the parolee returned to prison increased. Specifically, in 1993, 65 percent of parole violators reviewed by the BPT were returned to custody and 35 percent were continued on parole. In 1997, by contrast, 90 percent of parole violators were returned to custody and 10 percent were continued on parole (Legislative Analyst's Office of California 1998).
3. An equivalent condition for responsiveness is that the supply of ex-offenders to criminal activity not be perfectly inelastic. For a thorough discussion of this economic model of crime see Richard Freeman (1996).
4. For detailed descriptions of three state level job training and placement programs, see Peter Finn (1998a, 1998b, and 1998c).
5. In the review of California's parole system, the Legislative Analyst's Office of California (1998) reports that local prosecutors often forgo prosecuting new offenses when the prison sanction associated with the parole violation is likely to exceed the sentence length of a newly committed felony. Hence, among the population of ex-offenders sent back to prison for subsequent terms based on parole violations, many will have committed new felony offenses. Nonetheless, surveys of incarcerated parole offenders in California indicate that a large fraction of such offenders are paroles for "public order offenses"—that is, technical violations of the conditions of parole—and nearly half of incarcerated parole violators are sent back to prison for a drug violation (Hughes, Wilson, and Beck 2001).
6. We were provided with a unique CDC offender identification code, Social Security numbers, and names.
7. These figures are tabulated by summing records within year by the beginning date of the term served.
8. Given that the term counter identifies the term number served within the commitment, we can identify the maximum number of terms served for commitments whose first terms began prior to the 1990s as well.
9. Our key dependent variables are whether the parolee is returned to custody within set time periods, the largest being thirty-six months. Thus, for releases that do not receive a subsequent term, we set the time between terms variables to a value greater than thirty-six. This ensures a value of zero for all returned-to-custody dummy variables.
10. Parole terms can last no longer than three years. Hence, if an offender has not been sent back within three years, in all likelihood he has successfully completed the parole term.
11. Note that the figures in the proportion-of-terms column should be interpreted as the distribution of offender characteristics across terms rather than

across offenders, given that many offenders serve multiple terms and that the unit of observation in the data set used to calculate the figures in table 10.1 is a prison term.

12. Approximately 10 percent of parolees are returned to other counties. We do not have information on the county of release for this group.
13. This can best be illustrated with a simple two-equation empirical model. Suppose that the likelihood of being returned to custody is determined according to the equation $RTC_i = \alpha_0 + \alpha_1 E_i + \alpha_2 X_i + \varepsilon_i$, where RTC is a dummy variable indicating being returned to custody, E is a dummy variable indicating whether one is employed, X is a vector of control variables, α_0 through α_2 are parameters, and ε is a mean-zero error term. Furthermore, assume that whether one is employed is determined by the equation $E_i = \beta_0 + \beta_1 U_i + \beta_2 X_i + \eta_i$, where U is the local area unemployment rate, β_0 through β_2 are parameters, and η is a mean-zero random disturbance. Substituting the equation for employment determination into the return-to-custody equation gives the reduced form, $RTC_i = (\alpha_0 + \alpha_1\beta_0) + \alpha_1\beta_1 U_i + (\alpha_2 + \alpha_1\beta_2)X_i + (\varepsilon_i + \alpha_1\eta_i)$. As can be seen, the coefficient on the local unemployment rate is equal to the effect of the unemployment rate on the likelihood of being employed times the effect of being employed on the likelihood of being returned to custody.
14. The state is divided into four parole divisions: two for Southern California (one for the county of Los Angeles and one for the remaining counties to the east and south of Los Angeles), and two for central and northern California; of the latter, one encompasses all counties along the coast to the north of Los Angeles and one takes in all remaining inland counties.
15. This is theoretically equivalent to a split-sample two-stage least-squares estimate of the employment-parole violation effect, using local unemployment rates as an instrument for predicting whether the offender is employed. For a discussion of such estimators, see Raphael and David Riker (1999).
16. To be sure, the effect of the local-area unemployment rate on the likelihood of being employed is likely to vary across released offenders, defined by the risk groups employed in this study. We are basically assigning a similar value for this elasticity to all risk groups (with an implicit assumption that is likely to be violated in practice). Unfortunately, in the absence of micro-level information on employment status among released offenders, we are constrained to assuming a constant employment-unemployment effect for all offenders.

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