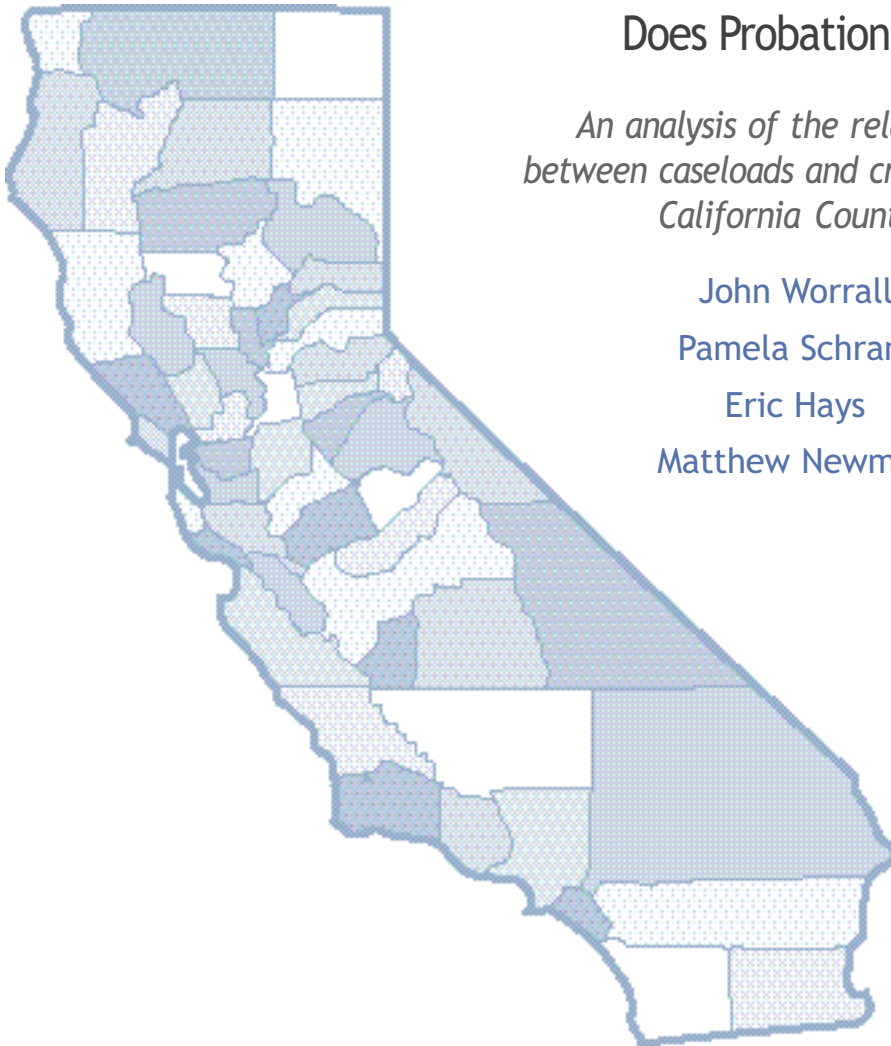


# CICG

## research brief

September 2001



### Does Probation Work?

*An analysis of the relationship  
between caseloads and crime rates in  
California Counties*

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## Letter from the Institute Director

This *CICG Research Brief* examines one of the most important components of the criminal justice system – probation. There are more offenders on probation than in prisons and jails combined. What’s more, modern probation is no longer just reserved for misdemeanants or first-time low-level offenders. Today’s probationers include many convicted of serious offenses.

In spite of the importance of probation programs, relatively little is known about their effectiveness. In order to start to address this important gap in the research, CICG sought to answer a fundamental question: does probation work? That is, we sought to determine if probation is effective in protecting public safety. We compared caseload data to crime rates reported by local law enforcement agencies in each county. Our results indicate that probation is in fact effective in protecting public safety.

It is our hope that this research can serve to improve probation programs in California. Furthermore, we hope to spur additional research into the effectiveness of probation.

This report is the product of a collaboration between CICG staff and two faculty from the California State University, San Bernardino, John Worrall and Pamela Schram. On behalf of my coauthors, I want to thank all of those who assisted with the publication of this report. William Davidson provided thoughtful comments from a practitioner’s perspective. Rubin Lopez and Elizabeth Howard applied their extensive experience with county criminal justice issues to improving the report. Craig Hemmens, Mary Stohr, Dale Sechrest, and Michael J. Gilbert all reviewed the draft from a more academic perspective, and their comments have improved our analysis and the presentation of results.

## Executive Summary

Each year more offenders are sentenced to probation than to any other sanction in the criminal justice system. There are more offenders on probation than in prisons and jails combined. What's more, modern probation is no longer just reserved for misdemeanants or first-time low-level offenders. Today's probationers include many convicted of serious offenses. The reasons for the increasing use of probation are clear enough: probation can be provided at more than five times less cost than jail and nearly 19 times less cost than state prison.

In spite of the importance of probation programs, relatively little is known about their effectiveness. Existing research hints at a connection between better probation programs and reduced recidivism, but the academic jury has not yet delivered its final verdict on the effectiveness of probation programs.

In order to start to address this important gap in the research, CICG sought to answer a fundamental question: does probation work? That is, we sought to determine if probation is effective in achieving one of its stated goals of protecting public safety.

In order to answer this important question, we analyzed probation services in each county in California as measured by the probation

caseload.<sup>1</sup> We compared the caseload data to crime rates reported by local law enforcement agencies. We then conducted a statistical analysis which allowed us to control for other factors known to influence the crime rate in order to isolate the impact of probation programs.

Our results confirm that lower probation caseloads are effective in reducing crime. We found a statistically significant relationship between the probation caseload and the property crime rate, indicating that as caseloads shrink, so does the crime rate. Our results also indicate that other law enforcement activities are important in reducing crime. We found a significant relationship between the overall level of law enforcement spending in a county and the crime rate, so that as spending increases, crime tends to decrease. Furthermore, we found that as the crime clearance rate (defined as the percentage of crimes for which an arrest is made) increases, the crime rate decreases.

While additional research into the effectiveness of probation is clearly needed, the results of our analysis nevertheless indicate that improvements in public safety can be expected if probation services are expanded.

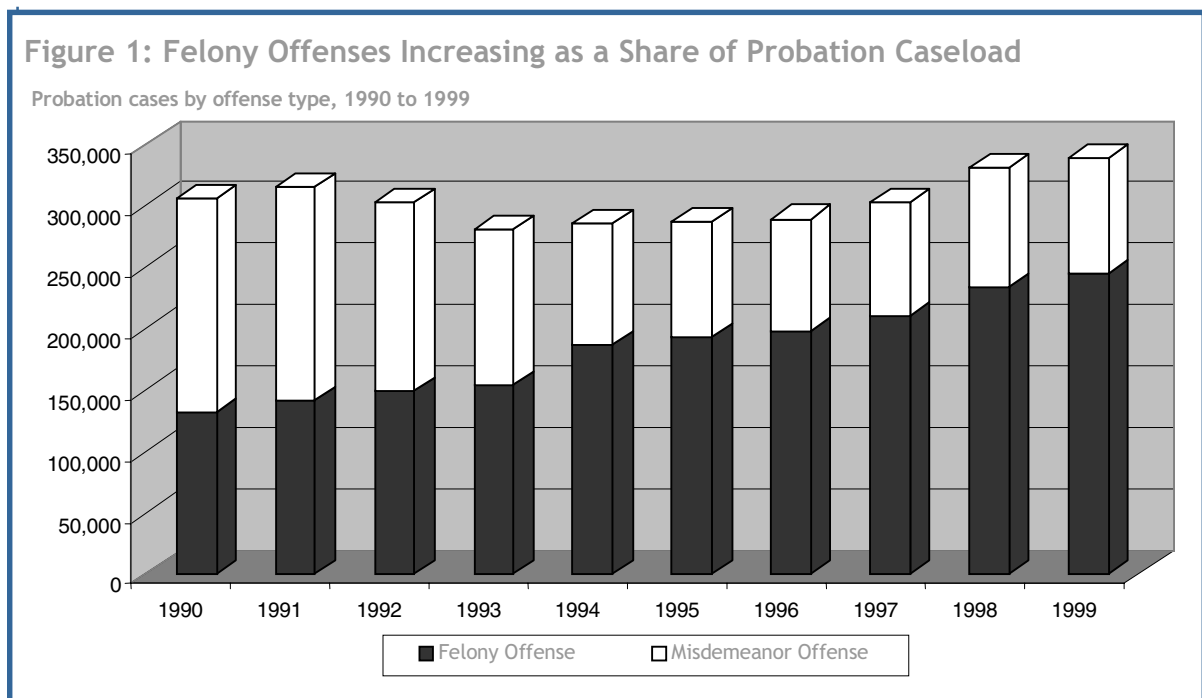
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<sup>1</sup> For purposes of our analysis, caseload was defined as the total number of probationers divided by the total number of probation officers in a county. Many counties define caseload somewhat differently, as the number of probationers divided by the number of active duty probation officers. Others define caseload as the number of probationers actively supervised (as opposed to on banked caseloads) divided by the number of active duty probation officers. Data to calculate caseloads according to these alternative definitions were not available. As a result, our results are primarily useful for measuring the effects of changes in overall workload as opposed to measuring the impact of active supervision caseload changes.

# Introduction

Probation is among the most common sentences in the criminal justice system. No longer just reserved for misdemeanants or first-time offenders, today’s probationers include many criminals convicted of serious felonies. Currently, there are almost twice as many people on probation nationally as there are in prisons and jails combined. California’s numbers mirror the nation’s, with nearly 340,000 offenders on probation as compared with an average daily jail population of just 82,000, and a state prison population of more than 161,000.<sup>2</sup> What’s more, the probation population has been increasing over time. During the past decade, the state’s probation population increased by 20 percent.

While the severity of probation offenses and the numbers of probationers may have increased over time, so too has the range of probation programs or “treatment” approaches. In addition to traditional in-person visits with probationers, modern probation departments employ a range of alternative forms of monitoring the probation caseload, including electronic monitoring and banked caseload programs (in which low-level offenders are tracked by computer or via mail, as opposed to more traditional in person meetings or visits with probation officers). Many probation departments also provide intensive supervision of offenders and make available social services such as drug treatment, job training, or counseling programs.



<sup>2</sup> California Department of Justice, 1999.

Probation can offer a cost-effective alternative to more traditional sentences such as jail or prison confinement. While it costs an average of \$21,495 to keep an inmate in jail,<sup>3</sup> probation costs approximately \$3,060 per probationer per year (although these costs are in part determined by available resources).

## Probation Services and Funding Over Time

Over the past decade, the severity of offenses among the probation population has increased significantly. As shown in Figure 1, the number of adult probationers sentenced for a felony has nearly doubled during the last decade, from about 130,000 in 1990 to nearly 245,000 in 1999. During this same period, the number of misdemeanants has decreased substantially, from about 175,000 in 1990 to a little more than 94,000 in 1999.

The past decade has also witnessed an increase in the number of adults on probation. Between 1989 and 1999, the total probation population increased by nearly 20 percent, from about 285,000 in 1989 to nearly 339,000 in 1999 (the most recent year for which figures are available).<sup>4</sup> The number of juveniles on probation also increased significantly over this period, from 172,000 to 210,000.

To accommodate the increases in probation caseloads, many counties have adopted new methods of supervising and providing services to probationers. Notably, many jurisdictions have implemented ‘banked’ probation caseloads. Banked

probation offers the potential to significantly reduce the cost of probation supervision. To be effective, however, adequate safeguards for assigning offenders to banked caseloads must be used and maintained in order to protect public safety.

Another important change in probation services has been the introduction of intensive supervision programs in which offenders are assigned to caseloads as small as 20 or 30 probationers per officer. Probationers in these intensive supervision caseloads often receive specialized counseling and other services, depending on their backgrounds, offenses, and court mandated conditions of probation. For example, many probation departments place probationers convicted of sexual crimes, domestic violence, or drug or alcohol abuse in specialized caseloads.

## Relatively Little Research Has Sought to Evaluate Probation Programs

In spite of the importance of probation, both in terms of providing a cost-effective means of protecting public safety and rehabilitating (rather than confining) offenders, probation remains largely unstudied. Surprisingly little information exists with respect to the efficacy of probation programs. At the most basic level, researchers still do not know the answer to a key question: does probation work? That is, does probation succeed in protecting public safety and rehabilitating offenders?

<sup>3</sup> State Board of Corrections *2000 Legislative Report*.

<sup>4</sup> According to the California Department of Justice, there were 338,735 people on probation in 1999, the most recent year for which figures are available.

## Purpose of the Report

In this report we seek to address one of these fundamental questions: is probation effective in protecting public safety. We rely on both a review of the existing literature on probation effectiveness and our own empirical analysis. Specifically, we sought to determine what the current research can tell us about the effectiveness of probation programs.

The report also contains the results of our empirical analysis of the effectiveness of probation. Our results indicate that smaller probation caseloads are in fact associated with lower crime rates. Based on the results of our statistical analysis, probation does appear to be effective in protecting public safety. Finally, we outline some directions for future research, specifically the need for evaluation of banked and specialized caseload programs and a review of the cost-effectiveness of probation services.

## Background

### Probation's Dual Role

Probation departments play a dual role in the criminal justice system. Probation officers are charged both with protecting public safety and rehabilitating offenders.

As protectors of public safety, probation officers act as law enforcement officers, responsible for monitoring probationers' activities and ensuring that probationers comply with court imposed conditions of probation. As representatives of the court,

probation officers are given the responsibility of enforcing these conditions and bringing violations to the attention of the court.

California probation departments employ a wide range of monitoring programs to supervise offenders. Monitoring programs include intensive supervision, electronic monitoring, day reporting, house arrest, halfway houses, and "banked supervision."

In seeking to rehabilitate offenders, probation officers act more like service brokers, attempting to help offenders address problems that may increase the likelihood of recidivism. Frequently problems with substance abuse, lack of necessary job skills, or inadequate or unstable housing and home life situations can contribute to probationers' future problems with the law. Many probation programs concentrate on addressing these needs as a means of preventing future probation violations and new offenses.

Probation officers seeking to rehabilitate offenders generally use one of two service delivery models: a) the caseworker model, or b) the resource broker model. In the caseworker model the probation officer (also referred to as a probation counselor) emphasizes treatment, counseling, and a one-to-one relationship with the offender. The resource broker model assumes that the probation officers and departments do not have the time or resources to directly provide offenders with necessary services and treatment. Thus, probation officers evaluate offenders' needs and subsequently refer probationers to the appropriate community

services.<sup>5</sup> Rehabilitation or treatment services include alcohol and substance abuse treatment, psychological and family counseling, educational services, vocational training, and job placement services.<sup>6</sup>

Probationers are assigned to specific programs and services based on either a probation officer's recommendation or court required conditions of probation. At the time an offender is sentenced to probation, a probation officer may make an initial risk and needs assessment designed to determine the likelihood of recidivism and the services needed to rehabilitate the offender. These assessments are used to assign offenders to supervision and treatment or rehabilitation services.

In addition to these assessments, courts often assign offenders to probation with certain conditions. For example, one researcher found that, among a national sample of adult probationers, drug or alcohol treatment was a sentence condition for 41 percent of offenders. Additional services included as a sentencing condition for probationers were counseling (11.6 percent) such as psychological/psychiatric, family, life skills/parenting, and victim impact panel; education (7.0 percent) such as basic educational/GED program and vocational/job training; and other treatment (11.4 percent) such as day and residential treatment as well as sex offender programs.<sup>7</sup> Many probationers also receive a jail or juvenile hall sentence as a condition of probation.

## How Can Research Inform Practice in Probation Programs?

In spite of increases in the probation population, the recent changes in probation programs, and the heightened public and media attention to criminal justice sanctions in general, there is a paucity of research on probation. One of California's foremost probation experts, Joan Petersilia, recently commented that probation has been the least studied component of the corrections system.<sup>8</sup> Policymakers interested in addressing basic questions—for instance, who receives probation, what services are provided, what are the costs—will have difficulty obtaining the information they need to address these issues.

The majority of the research that has been done in this area primarily has concentrated on how caseload size is related to recidivism. Relatively little research has been conducted on the cost-effectiveness of probation, the consequences of the growing use of banked caseloads, the effectiveness of specialized caseload programs, or enhanced access to rehabilitation services such as drug or alcohol treatment or job training programs.

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<sup>5</sup> Cunniff & Bergsmann, 1990 and California Research Bureau, 1996.

<sup>6</sup> Ibid.

<sup>7</sup> Bonczar, 1997.

<sup>8</sup> Petersilia, 1998.

## What does the research tell us?- overview of the research on the effectiveness of probation in reducing crime

Among the many questions about probation programs, perhaps the most fundamental is, does probation prevent recidivism? Over the years, probation officers, policy makers, and some probation researchers have argued that smaller caseloads would result in more contact between probation officers and probationers. Increasing this contact would in turn decrease the likelihood of recidivism by increasing the level of supervision and access to rehabilitative services.<sup>9</sup> To date, however, research has not consistently supported the claim that smaller caseloads are associated with improvements in public safety and rehabilitation of offenders.

Studies seeking to link caseload size and recidivism date back more than 30 years. One such study, termed the “San Francisco Project” was conducted in 1967.<sup>10</sup> In this study, federal probation authorities designated offenders into one of four supervision levels: “intensive” (caseloads of 20 to 25), “ideal” (caseloads of 40 to 50 offenders per officer), “normal” (caseloads of 70 to 130), and “minimum” (caseloads of several hundred). At the end of two years, the study revealed that there were no significant differences in the number of violations among the probationers placed in the minimum, normal, and ideal caseloads.

Each group had violation rates of approximately 23 percent. Those probationers in the intensive caseload, however, had a violation rate in an unexpected direction. This group had a higher violation rate of 38 percent. When technical violations were removed from the analysis, however, there were no significant differences between the four caseload types.

Ten years later, in 1977, researchers were still unable to say decisively whether probation programs were in fact effective in reducing recidivism.<sup>11</sup> After reviewing the previous work on probation, the researchers concluded that “the studies reviewed contained such poor research designs, and such unclear operational definitions of key variables, that the effect of reduced caseloads on offender recidivism remains unknown.”<sup>12</sup>

Since the late 1970s, at least five major studies seeking to identify the impact of caseload size on recidivism have been conducted. Among the five studies, three found evidence to support the contention that smaller caseloads are related to lower recidivism rates. Two, however, failed to decisively demonstrate that smaller caseloads are effective in reducing recidivism rates.

In 1987, two studies of the effectiveness of probation programs were published. Probation researchers Erwin and Bennett published an evaluation of a Georgia Department of Corrections program which

<sup>9</sup> Carter, Robinson, & Wilkins, 1967; Carter & Wilkins, 1984.

<sup>10</sup> Carter, Robinson, & Wilkins, 1967. These studies were reviewed by probation researcher Joan Petersilia in 1992.

<sup>11</sup> Banks, Porter, Rardin, Silver, & Unger, 1977.

<sup>12</sup> *ibid*, p. 7.

allowed offenders the option of being placed in an Intensive Supervision Program, or ISP, in lieu of a prison sentence. To determine program effectiveness, the researchers sampled ISP offenders, regular probationers, and prison releasees. After an 18 month follow-up period, the results revealed that ISP offenders committed fewer and less serious crimes than regular probationers and prison releasees, although they did commit more technical violations than regular probationers.

The second study, by Pearson, evaluated New Jersey's ISPs. One facet of the study compared the recidivism rates between two groups: a) ISP cases and b) a matched sample of about 100 felony offenders who were sentenced for ISP-eligible crimes (prior to ISP implementation) and who were subsequently released on parole. The results revealed that 12 percent of the ISP offenders were convicted of a new crime compared to 23 percent of the offenders in the matched group. Pearson noted, however, that since the study lacked random assignment, it is difficult to determine if the results are due to participation in the ISP program.

In 1989, Bryne and Kelly conducted an evaluation of Massachusetts' ISP. One major focus of the study was to compare recidivism rates associated with courts with and without ISPs before and after ISP program implementation. The results revealed there were no overall differences in recidivism rates between the experimental and control courts.

The study did find, however, that as the level of supervision increased, recidivism rates significantly decreased in both courts.

In 1986, RAND conducted a multi-site demonstration project for ISPs in California.<sup>13</sup> Three sites were selected: Contra Costa County, Ventura County, and Los Angeles County. Each site identified those offenders eligible to participate. Subsequently, RAND randomly assigned offenders to the ISP or control probation program. The study revealed that at the end of the one year follow-up period, about 40 percent of the ISP offenders in each site had technical violations and approximately one-third had new arrests. In this vein, the only significant difference between the experimental and control programs was in Ventura County. The offenders in the ISP program were less likely to be arrested than the offenders in the control program. When the average number of arrests per year of street time was used, however, there was no significant difference between these two groups.

Researchers Cunniff and Shilton conducted a study in 1991 on various issues related to felony probation. One focus of this study was to examine caseloads and case outcomes. The study consisted of over 12,000 cases in 32 large metropolitan and suburban jurisdictions. Caseloads were associated with supervision levels—higher supervision levels were indicative of smaller caseloads. The results revealed that the highest absconding

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<sup>13</sup> See Petersilia & Turner, 1990.

rates occurred for those offenders who were supervised by probation officers with caseloads of more than 150. There were no consistent variations, however, between those probationers who were supervised by probation officers with caseloads below 150. The researchers noted that twelve percent of the probationers who were supervised by probation officers whose caseloads range from 51 to 100 abscond. However, the absconding rate was actually lower for those who are supervised by probation officers whose caseload is between 101 to 150 (4%). Lower caseloads by themselves would appear to have no direct impact on lowering the absconding rate.<sup>14</sup>

After more than three decades of study, the effectiveness of lower caseloads in reducing recidivism remains uncertain. While the majority of the evidence supports the contention that more probation supervision results in lower rates of recidivism, the fact that several key studies have failed to find such a connection cannot be ignored.

One possible explanation has been offered by probation researchers Clear and Dammer.<sup>15</sup> These researchers argued that more supervision is not necessarily better supervision. Instead, one must also take into consideration the nature of the supervision as well as the classification of offenders, probation officers, and treatment programs.

Given these less than convincing results one may ask, why the continued interest in

ISPs? Probation researcher Joan Petersilia argued in a 1992 report that the newer programs do not necessarily rely on rehabilitation to ensure public safety. Rather, current programs emphasize control and community protection. In this vein, ISPs have rapidly spread during the last two decades, primarily due to research based on the Georgia ISPs.<sup>16</sup>

## Empirical Analysis

In order to address the gaps in the probation research, CICG conducted an empirical analysis designed to answer a basic question about probation: does it work? That is, our analysis sought to determine if there is a relationship between the level of probation services provided by a county and the level of public safety in that county.

Rather than look at recidivism rates for individual offenders as previous research has done, we sought to answer this question by examining the link between probation service levels (as measured by probation caseloads at the county level) and public safety itself (as measured by the property crime rate at the county level). Although there are myriad factors that influence the crime rate, we would nonetheless expect to find a relationship between probation programs and crime rates, if probation is effective in protecting public safety.

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<sup>14</sup> Cunniff and Shilton, 1991, (p. 64).

<sup>15</sup> See Clear and Dammer, 2000.

<sup>16</sup> McCarthy, McCarthy, & Leone, 2001.

## Description of Model

Because there are so many factors that influence the crime rate, we needed to develop an analytical method for determining the influence of probation programs on crime rates, while controlling for these other factors. Social scientists frequently use a technique known as regression analysis when seeking to determine the influence of a single factor on a variable influenced by multiple factors. We developed such a regression model to examine the influence of probation services on the crime rate while controlling for other factors known to influence crime rates.

As the first step in developing our regression model, we reviewed the previous research on the causes of crime in order to determine which variables – other than the level of probation services – are thought to influence the crime rate. Numerous studies have examined the link between crime rates and various social and economic factors, such as demographic characteristics of the population, economic conditions, and local law enforcement activities.

Based on these earlier studies, we constructed a regression model to estimate the impact of probation services on crime rates, while controlling for these other factors. The dependent variable (that which we sought to predict with our model) was the property crime rate.<sup>17</sup> The property crime rate was calculated as the number of property crimes reported to law enforcement agencies divided by county population.

Our key explanatory variable was the average probation caseload, calculated as the number of adult and juvenile offenders on probation divided by the number of probation officers.<sup>18</sup>

We also included six variables that, based on previous research, were theoretically associated with the property crime rate.<sup>19</sup> These control variables can be placed into two different categories: (1) deterrent variables and (2) socio-economic variables.

The deterrent variables were the property crime clearance rate (defined as the number of crimes “cleared” by arrest divided by county population), per capita law enforcement

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<sup>17</sup> We transformed the property crime rate into the natural log because the property crime rate is highly skewed in the positive direction.

<sup>18</sup> Our caseload measure is calculated as the total number of probationers divided by the total number of probation officers. It is important to note that using this measure of average caseloads can mask important differences across counties. For example, a county that relied extensively on specialized caseload or intensive supervision programs for high risk offenders and banked caseloads for all others could have the same average caseload as another county that simply used more conventional supervision means. Similarly, our measure does not distinguish the types of services provided by counties. Two counties with the same ratio of probationers to probation officers may deploy resources very differently. For example, one county may rely on probation officers to provide a range of counseling or rehabilitative services while another may provide more traditional probation supervision services. Nevertheless, data limitations prevent us from using more specific data in our analysis.

<sup>19</sup> We also included the (one year) lagged value of the natural log of the property crime rate to control for unobserved variables not specified in our model.

expenditures for each county (including both city and county expenditures for law enforcement), and the local jail population per capita. Each of these variables was expected to be inversely associated with the property crime rate (i.e. as enforcement activities increase, crime decreases).<sup>20</sup>

The socio-economic variables included in our model, all of which have a basis in macro-level criminological theory, were as follows: (1) the percent of the population that was male and between the ages of 13 and 25; (2) the unemployment rate (lagged by 1 year); (3) the per capita welfare rate, calculated as the number of families receiving welfare divided by county population (as a proxy for the extent of poverty in each county); and (4) per capita personal income (also lagged by 1 year).<sup>21</sup> <sup>22</sup>

<sup>23</sup>Based on previous research, we would expect that more young males would be associated with a rise in the crime rate, as would rising unemployment and poverty

levels. We would also expect that higher incomes would be associated with lower crime rates.

The data used for this project were provided by a range of government sources, including the state attorney general's office, the state controller's office, and the department of finance. Data were gathered for all 58 counties in California for the years 1990 to 1998. This yielded a total of 522 observations on which to estimate our statistical model (58 counties multiplied by 9 years).<sup>24</sup>

## Estimation Technique

We estimated a “dynamic two-way fixed effects multivariate linear regression model.” We describe this modeling technique more fully in Appendix 1, but a brief description is in order here. A multivariate linear regression model is simply a statistical model with one dependent variable and multiple independent

<sup>20</sup> Deterrent variables are not particularly common in most macro-level models of crime estimated by criminologists. However, economists generally include deterrent variables in many of their models (e.g., Cherry 1999; Cornwell and Trumbull 1994). We believe they are important to include because our independent variable of interest, probation caseload, is tied to county expenditures and apprehension rates.

<sup>21</sup> One independent variable conspicuously absent from our model is race. Usually, race (if measured as the proportion of black and/or Hispanic people in the population) is positively associated with crime. We chose not to include race in our model because of the level of diversity in the state of California. Hispanics in particular are no longer a “minority” in California, so the conventional reasons for including race in macro level models of crime do not apply. In fact, in preliminary analysis, the race variables we included in our models were consistently significant and in the negative direction. That is, as the percentage of blacks and Hispanics increased, the crime rate declined. The exclusion of race from the model reported below had no significant impact on the other coefficients.

<sup>22</sup> Some of the data included in our model were collected on a fiscal year basis and some were collected on a calendar year basis. Fiscal year variables were law enforcement expenditures and number of welfare recipients. All other variables are collected on a calendar year basis. Population figures are as of January 1 of each year.

<sup>23</sup> When conducting a statistical analysis such as this one, statisticians are careful to measure correlations between not only the dependent variable and the policy variable of interest, but also correlations among the explanatory variables. Such correlation is termed multicollinearity. In our model, there is a statistically significant correlation between the probation caseload and two other explanatory variables, the crime clearance rate and the per-capita welfare population. In order to determine the impact of the multicollinearity on our results, we performed the statistical analysis with and without these variables included. No significant change was observed to the coefficient on the policy variable of interest, the probation caseload.

<sup>24</sup> We restricted our model to counties with probation caseloads below 250. This excluded all observations more than two standard deviations from the mean. This cutoff point was somewhat arbitrary, but was based on the assumption

variables. The dependent variable is the outcome; the independent variables are those believed to influence the outcome variable. A “two-way fixed effects” model controls for the fact that we have panel data, or data collected for the same units – in our case counties – over several years, which can introduce bias into the results unless a statistical technique is used to correct these problems. Our model is “dynamic” because it includes a one-year lag of the dependent variable in the regression equation. This allows us to control for unobserved variables not included in our model.<sup>25</sup>

## Regression Results

The results of our statistical analysis of probation programs in California indicate that probation is effective in reducing crime.

As we hypothesized, probation caseload was positively and statistically significantly associated with the property crime rate. In other words, as probation caseloads decrease in size, property crime rates also decrease. Conversely, as probation caseloads increase, so do property crime rates. The results of our statistical analysis are presented in Table 1.

Our results confirm that, in addition to probation, other law enforcement activities are also effective in reducing crime. Per-capita law enforcement expenditures were negatively associated with property crime rates, indicating that as total law enforcement expenditures increase, crime rates decrease. Similarly, the property crime

**TABLE 1: EFFECTS REGRESSION RESULTS**

R-squared = .93			
Variables	Coefficients	Standard Error	T-Statistic
Probation Caseload	.0008	.0003	2.51*
Law Enforcement Expenditures	-1.7046	0.6342	-2.50**
Property Crime Clearance Rate	-.0078	.0017	-2.69**
Jail Population per capita	-15.4665	11.3547	-1.36
Unemployment Rate (1 yr lag)	.9441	.7916	1.19
Males from 13 to 25	4.4997	1.1127	4.04**
Welfare Recipients per capita	.00002	.00001	1.59
Income per capita (1 yr lag)	-1.65 (e)-6	6.11 e-6	-.25
Log of Crime Rate (1 yr lag)	.4475	.0420	10.65**

\* Significant at the 95% level  
 \*\* Significant at the 99% level

that changes in very high caseloads probably have a negligible impact on the crime rate. We believe it is safe to assume, for example, that a caseload change from 40 to 60 is more likely to have an effect on crime than a change from, say, 250 to 270. Our 250 cutoff point can also be viewed as a means for excluding “outliers” from the analysis. We also excluded observations with law enforcement expenditures more than two standard deviations from the mean on similar grounds.

<sup>25</sup> It could be, for example, that the property crime rate is affected by other variables which we either failed to include or could not measure. Including the one-year lag of the dependent variable indirectly accounts for all other *time-varying* variables that may influence the property crime rate. This approach does *not* control for omitted variables that do not vary over time (e.g., urban county versus non-urban county), but this is not a problem in the present context because we have estimated the effect of unobserved time-invariant variables with separate dummy variables for each county and time period (see Appendix 1).

clearance rate was negatively associated with the crime rate, so that when more crimes are cleared by arrest, the crime rate goes down. Finally, the jail population per capita was negatively associated with the property crime rate; this indicates that as the jail population increases, crime decreases, although the coefficient on jail population was not statistically significant.

The social factors identified by previous research as influencing the crime rate were also generally confirmed by our research. The percentage of males between the ages of 13 and 25 was found to be a positive, statistically significant predictor of the crime rate, indicating that as the number of young males increases, so does the crime rate. The unemployment rate was also positively associated with the crime rate as was the number of welfare recipients per capita, although these coefficients were not significant in our model. Finally, per capita income was negatively associated with the crime rate, although it was not statistically significant.<sup>26</sup>

## Conclusions and Policy Options

Probation is among the most important components of the criminal justice system. More offenders are sentenced to probation than to any other sanction. Recently, the probation caseload has been growing even faster than

the jail or prison populations. Coincident with the increase in the use of probation have come a series of new probation programs, from specialized caseload programs for offenders convicted of particular types of crimes to cost-saving banked caseload programs in which appropriately screened offenders are subject to little or no direct supervision from probation officers.

In spite of the importance of probation, it remains largely unstudied. Key questions about the efficacy and cost-effectiveness of probation programs remain unanswered. What research has been done has largely focused on the link between supervision levels and recidivism. This previous research has indicated that increased supervision (lower caseloads) is associated with reduced recidivism, although there is by no means a consensus among the researchers that such a relationship in fact exists.

In response to the importance of probation and the relative lack of research on probation programs, we sought to address a fundamental question: does probation work? That is, we sought to determine if probation succeeds in one of its stated goals of protecting public safety. The crime rate is the most widely recognized measure of public safety. Therefore, we sought to measure the link between the level of probation services and the property crime rate.

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<sup>26</sup> Though income, unemployment, and welfare rates were not significant in the reported specification of the model, we hypothesized that this was due to the high degree of co-linearity among the variables as well as the inclusion of dummy variables for each cross section and time series period. When models were run excluding one or more of these variables, the result was generally a significant coefficient on the other included variables. We left all three variables in the model as control variables.

Our findings indicate that higher caseloads are associated with an increase in property crime rates. We hypothesize that as supervision levels decrease, the *opportunities* to re-offend increase. In addition, very high caseloads are likely associated with diminished access to other probation related services, such as drug treatment and job training services. While we cannot conclusively prove that increases in probation services directly result in decreases in crime, nevertheless – when controlling for many other factors known to affect crime – caseloads and crime rates are positively associated.

While our results are preliminary, it nonetheless appears that California’s probation programs are effective in reducing crime. The logical implication for public policy is that probation caseloads ought to be reduced wherever possible.

## Directions for Future Research

Though our results take another step toward demonstrating the effectiveness of probation programs, significant work remains. More research on the cost-effectiveness of probation programs relative to other sanctions or rehabilitation programs could help policy makers to make informed decisions about the allocation of scarce resources. Additionally, research is still needed to determine the relative effectiveness of specialized caseload programs and the impact of large banked caseloads. Our analysis necessarily (given the nature of the data) relied on average caseloads, however,

two counties with the same average caseload may have very different probation systems if, for example, one uses specialized caseloads in combination with banked caseloads and the other does not. Research addressing these types of programs would provide probation departments with the tools necessary to allocate resources effectively and improve public safety and more effectively rehabilitate offenders.

Future researchers may also choose to explore the relationship between “types” of probationers and crime. We have implicitly assumed that all categories of probationers have the equal capacity to influence county-level crime rates. Obviously, certain probationers are higher risk than others, so future researchers may wish to study the influence of caseload on crime, controlling for specific types of probationers.

Finally, research has thus far not addressed the relative effectiveness of traditional probation supervision as compared with service broker or direct service delivery approaches to delivering probation services. More research into effectiveness of these alternative approaches to probation can help probation departments to chart a future course for their agencies.

# Appendix 1: Detailed discussion of the regression model(s)

CICG conducted an empirical analysis designed to determine if there is a relationship between the level of probation services provided by a county as measured by probation caseloads and public safety in that county as measured by the property crime rate.

## Estimation Technique

We estimated a “dynamic two-way fixed effects multivariate linear regression model.” A dynamic two-way fixed effects regression model is simply an extension of ordinary least squares (OLS) regression. It extends the simple OLS equation

$$y = \alpha + \beta x + \varepsilon \quad (1)$$

to

$$y_{i,t} = \phi y_{i,t-1} + \delta_i + \gamma_t + x_{i,t} \beta + \varepsilon_{i,t} \quad (2)$$

where the subscripts  $i$  and  $t$  refer to unit (county)  $i$  and time  $t$ . The coefficient  $\phi$  represents the lagged dependent variable. Note that the subscript  $t-1$  refers to the fact that values on  $y$  are substituted with  $y$  values from the previous time period. The coefficient  $\delta$  is a unit-specific effect represented by 57 dummy variables for each individual county (58 counties minus one). The coefficient  $\gamma$  is a time-specific effect represented by eight dummy variables for time (nine years minus one). Finally,  $\beta$  and  $\varepsilon$  have all the usual

properties. The intercept,  $\alpha$ , in equation (1) is not estimated in equation (2) because the dummy variables for unit (county) and time assign specific intercepts to each unit and time period. With the exception of the lagged dependent variable, equation (2) is commonly referred to as the least squared dummy variable (LSDV) model.

Why separate dummy variables for unit and time? The act of including dummy variables for unit and time controls for unobserved heterogeneity. In the case of the units (counties), for example, the addition of separate dummy variables for each county removes all between-individual difference in  $y$ , leaving only within-individual variation to be explained by the  $x$  variables. However, the addition of dummy variables for each time period then controls for within-individual variation over time, so the remaining coefficients represented by  $\beta$  in equation (2) facilitate explanation of  $y$  regardless of time and location. That is to say, the inclusion of time and unit dummies ensures that changes in  $y$  are explained only by  $\beta$ . This assumes, of course, that the effects of  $\beta$  are the same across all counties and time periods.

### The Lagged Dependent Variable

We added a one-year lagged dependent variable on the right-hand side of the equation to control for unobserved time-varying variables. This does nothing to improve the causal direction of our model; however, it helps us be assured that we are controlling (albeit indirectly) for variables not specified in our model.

### The Alternative: Random Effects

An alternative approach to equation (2) is the so-called random effects model. The simple random effects model, not taking the time dimension into account, looks something like

$$y_{i,t} = \alpha + x_{i,t}\beta + u_i + w_i + \varepsilon_{i,t} \quad (3)$$

where specific error terms are estimated for both unit and time. This model assumes that unobserved differences between units and time are random variables, compared with the assumption included in equation (2) that they are fixed. An important assumption underlying equation (3) is that the  $u_i$  and  $w_i$  are uncorrelated with the  $x$  variables. This is an assumption we are unwilling to make. There are steps to overcome this assumption, but they are not perfect by any means.

### Reasons for Fixed Effects

We estimated a two-way fixed effects regression model for two primary reasons. First, we had no time-invariant (i.e., dummy) variables in our model. A fixed effects model cannot be estimated with a dummy variable because of perfect collinearity between the county dummies and any other dummy included in the specification. We also chose a fixed effects model over a random effects model because a random effects model assumes the model is correctly specified, i.e., that it contains no omitted variables. We did not feel comfortable with this assumption. Indeed, a Hausman chi-square test for random

coefficients can be estimated in order to determine which is appropriate, random or fixed effects (Greene 1993; Hsiao 1986). It is a test of the overall difference between the coefficients in the random and fixed effects model. If the coefficients differ significantly between models, specification errors are likely and the fixed effects approach should be chosen. The Hausman statistic was highly significant, which led us to conclude that the fixed effects model was more appropriate.

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