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# COST-BENEFIT ANALYSIS OF DISPOSITIONS IN THE JUVENILE JUSTICE SYSTEM

Simon M. Fass, Ph.D.
Associate Professor of Political Economy
School of Social Sciences
University of Texas at Dallas

Chung-Ron Pi, Ph.D.
Data Analyst
Dallas County Juvenile Department
Dallas, Texas



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## PREFACE

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## Introduction

Real increases in reported delinquency and juvenile violence rates through 1995-1996, shown below, and predictions, such as those of Blumstein (1995), Dilulio (1995), and Snyder and Sickmund (1995), of a demographic "crime bomb" that may eventually rekindle further growth in these rates, have fueled growing public apprehension (Smith et. al., 1999). In this climate, increasingly-vocal critics complain that juvenile justice authorities, rather than addressing public safety concerns, are coddling offenders by continuing to operate mainly within the framework of treatment-rehabilitation aimed at serving the best interests of minors (Butterfield, 1997). As a result, juvenile crime and justice reforms have become a more frequent topic of public debate, with all manner of change being proposed, opposed, and implemented by governments across the country.

Estimated Arrest Rates Per 100,000 Individuals 10-17 Years of Age, United States, 1990-98

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| All Crime | 8,035 | 8,390 | 8,254 | 8,457 | 9,300 | 9,192 | 9,553 | 9,246 | 8,570 |
| Violent Crime | 421 | 444 | 458 | 484 | 510 | 512 | 465 | 407 | 370 |
| Property Crime | 2,612 | 2,632 | 2,508 | 2,435 | 2,542 | 2,463 | 2,395 | 2,289 | 1,960 |

Sources: adapted from Snyder, H., 1998; 1999.

In Texas, for instance, a policy of progressive sanctions set in motion by the State legislature in 1996 readjusts the balance between community protection, rehabilitation, and accountability of offenders for their behavior. Because the new law emphasizes accountability, substantially higher numbers of young people who previously would have been diverted to informal intervention and counseling are now exposed to formal sentencing with progressively restrictive sanctions. This change in priorities has led to exploding caseloads, especially residential placement (i.e., incarceration), and mounting fiscal pressure. Increasing pressure, in turn, has driven local authorities to adopt alternate programs which they hope will achieve outcomes comparable to placement but at lower cost, such as pre-sentencing intensive supervision instead of detention, and short-term boot camp instead of long-term placement.

Although caseload and fiscal impacts of the new policies are clear, not so clear is whether more punitive, more costly approaches, through deterrence or rehabilitation, can achieve significantly greater reduction in juvenile crime than less punitive, less costly ones. No surprise then that decision-makers, as fiscal impacts confront them, ask themselves a basic question: Is the more costly approach (or policy) "worth" it? Put another way: Are the hoped-for benefits of the approach sufficient to justify the costs of producing them?

Cost-benefit analysis (CBA), a procedure for systematically displaying and comparing favorable and unfavorable consequences of alternative courses of action, is designed to help answer such questions. By identifying and, where appropriate, quantifying and valuing the positive and negative consequences of policies and programs, it can often help administrators, elected officials, voters, and others engaged in the political process of democratic decision making better understand some of the more important economic and financial tradeoffs, distributional consequences (i.e., winners and losers), and other implications of their preferences and rulings (Arrow et. al., 1996; Campen, 1986; Schmid, 1989).

But CBA has not been called upon to aid adult and juvenile justice decision making to the same extent that it has in other social policy domains, such as health and education. Answers put forward in reply to the question of whether benefits of justice policies, or of specific treatments and sanctions, are sufficient in relation to their costs are few and far between. Further, because CBA is relatively rare in application to general and juvenile justice matters, it is not yet certain that the procedure can yield answers that decision makers will find useful in their deliberations.

Focusing on Dallas County, Texas, as a case study, the purpose of the research described in this report is to explore the extent to which CBA can provide insights that help local decision makers to better weigh the pros and cons of alternative juvenile dispositions. Broadly, we look at whether gains from more restrictive sanctions, in terms of reductions in re-offenses and corresponding re-dispositions, are worth their higher justice system costs. Simultaneously, we also look at the converse: whether losses from less restrictive sanctions, in terms of increases in re-offenses and re-dispositions, are worth the associated justice system cost savings.

We present our exploration through a sequence of seven steps, corresponding to the next seven sections of this report. The first, a review of the state of the art, highlights some of the major handicaps that accompany the procedure in practice, notably difficulty in isolating effects and in calculating monetary values for costs and benefits, and analytical subjectivity. If it is to prove useful in this circumstance, CBA must be clear and explicit about data, methods, assumptions, and results.

Guided by this principle, the six subsequent sections present:

- an outline of juvenile dispositions used by Dallas County and, in this setting, the specific CBA question that we ask (section 2);
- a description of the data we use as bases for estimating differences in re-offenses and re-dispositions that stem from shifting juveniles from one disposition to another (section 3);
- methods of estimating these differences and our results (section 4);
- estimates of justice system unit costs and benefits associated with initial dispositions, re-dispositions, and related activities (section 5);
- estimates of victim and other non-system unit costs and benefits associated with re-offenses (section 6); and, combining all the foregoing,
- our analysis findings (section 7).

At the very end of the report are appendices that contain a list of references, a note on methods of valuing human life, and a detailed technical note about the procedures we used to estimate juvenile justice system costs.

## 1. CBA in Practice: the State of the Art

Analysis of relationships between costs and benefits has accompanied examination of criminal and juvenile justice issues for the better part of four decades. Early on, works by Shoup (1964), Becker (1968), and others solicited by the President's Commission on Law Enforcement and the Administration of Justice during 1965-67, and later by Gunning (1970), Cobb (1979), Krohm (1979), and Wilson and Abrahamse (1992), helped to spread the idea that crime and delinquency are rational, not deviant behaviors. Policies that altered the balance between probable costs and benefits as perceived by prospective offenders might therefore be more effective in changing these behaviors indirectly than counseling or other programs that tried to change them directly. In parallel, Rodgers (1973), Anderson (1976), Votey and Philips (1980), Reynolds (1981), and others highlighted the utility of treating minimization of social costs (or maximization of social benefits) as a public objective no less important than other implicit or explicit justice goals, such as retribution, rehabilitation, incapacitation, deterrence, and compensation.

Closer to the matter of assessing impacts, Fort (1991), Haddix and Shaffer (1996), and Hellman and Alper (1997) shed useful light on conceptual considerations associated with application of CBA to an array of justice issues. More focused, Waites (1980) looks at the effect of crime reduction efforts on property values, Levitt (1997) at benefits of reduced crime from hiring more police, and Ayres and Levitt (1998) at benefits flowing from investment in anti-theft equipment. Analyses of adult offender drug and sex abuse treatment interventions are offered by Harwood et.al. (1988), Levy and Miller (1995), Prentky and Burgess (1990), and Rajkumar and French (1997). Investigations of the costs and benefits of adult sentencing options, the most frequent application of CBA, include Bloom and Singer (1979), Cavanaugh and Kleiman (1990), Collier (1982), Dilulio and Piehl (1991), Gray (1981, 1994), Gray and Olson (1989); Gray et. al. (1991), Greenwood et. al. (1996b), Hofler and Witte (1979), Holahan (1970), Levitt (1996), and Monkman (1974).

Concerning juveniles, Greenwood et. al. (1996a) and Karoly et. al. (1998) examine the longer term impacts of early childhood intervention programs on delinquency, and Lipsey (1984) at delinquency prevention. Hser and Anglin (1991) and Hubbard and French (1991) examine costs and benefits of drug treatment, while Colgan (1998), Gray et. al. (1978), Rasmussen and Yu (1996), and Roberts and Cammasso (1991) analyze various disposition options. Extending CBA across a broad array of programs, Aos et. al. (1999) apply it to multi-systemic and family therapy, aggression replacement training, diversion, multi-dimensional treatment foster care, intensive probation and parole supervision, boot camp, and institutional treatment.

Useful as they are in highlighting pros and cons of justice interventions, most of these and similar studies offer only limited policy and program guidance. This is because several overlapping circumstances cause CBA to yield findings that many people would consider too uncertain for purposes of justice decision making: difficulty in isolating effects, imprecision and ambiguity in calculating monetary values for costs and benefits, and analytical subjectivity.

Trouble in isolating policy or program effects, i.e., benefits, stems from scarcity of suitable data on which to base robust predictions. The ideal circumstance is to have performance data from justice system operations that involve consistent random assignment of substantial numbers of individuals to

"treatment" and "control" groups, and that follow the groups for extended periods to record their subsequent behavior, e.g., whether, when, and how they re-offend. Short of this ideal but still helpful are longitudinal data that, with help of rigorous statistical techniques to account for the influence of other factors, yield reasonable comparisons of outcomes between the groups. Without these kinds of data it is hard to say for certain that observed differences in outcomes, if any, result from a "treatment." They may occur without it.

This situation is not specific to CBA. It affects the whole research literature, fueling relentless debate about the effectiveness of juvenile justice interventions. Bailey (1966), Cook and Scioli (1975), Lab and Whitehead (1988), and Slaikeu (1973), for instance, claim that juvenile programs do not work. Extending from similar conclusions, Fagan and Deschenes (1990), Feld (1983), Hamparian et. al. (1982), and others say that rehabilitation cannot reduce serious crime and that the jurisdiction of juvenile courts should be narrowed. Flowing in the opposite direction are reviews, such as by Lipsey (1992), Lipton, Martinson, and Wilks (1975), Murray and Cox (1979), and Wilson (1985), arguing that at least some treatments sometimes have noticeable effects. It follows in recommendations, for example by Greenwood et. al. (1996a) and Halbert (1997), that such programs be expanded. Between these contrary views, Fagan and Forst (1996) and others contend that available data are simply not good enough to show whether interventions do or do not have measurable results, implying that more research and/or better data are required before judging effectiveness. By extension, another implication is that until quality of data improve, CBA's contribution to understanding is confined to building scenarios of what cost-benefit relationships "might" look like under different sets of assumptions. Indeed, most studies done are of this type.

Aos et. al. (1999), for example, rely on findings from what seem to be rigorous program evaluations in different parts of the country to estimate effects for Washington state. Because the evaluations involve small samples and short follow-up periods, e.g., less than 260 individuals and two years in the case of adolescent diversion studies from Michigan, Aos et. al. use Washington recidivism data to extend the CBA time horizon to seven years. Though probably coming closer to reality than prior studies, the product remains a CBA of a set of hypothetical scenarios.

Imprecision and ambiguity, a second circumstance that renders CBA findings uncertain, have to do with estimates of the monetary value of tangible costs and benefits, i.e., those that have market prices, as well as intangible costs and benefits, i.e., those that do not have such prices. As Diluilo and Piehl (1991) point out, slight alterations in calculation method can yield large changes in final numbers. This difficulty manifests itself as wide variation in dollar value figures for more or less the same things. To illustrate, Tables 1.1a and 1.1b show the dispersion of estimated unit costs across various documents for arrest, investigation, intake and assessment, detention, court processing, probation supervision, incarceration, services, and other justice system outlays. Differences may stem from use of different kinds of data, some studies relying on program information and others general administrative budget and expenditure data. They may also stem from cost and escalation differences across jurisdictions, or from other factors. Whatever may be the actual reasons, variation in values for justice system and other tangible items makes it hard to compare studies, and hard to tell whether they are far from or near their intended mark. CBA becomes uncertain because a difference of three dollars, though it might not affect overall results when raising estimates from, say, $89 to $92 dollars per day for juvenile detention (a 3% increase), may have a big effect when it raises them from $3 to $6 per day for probation (a 100% increase). One set of figures may point to a positive net benefit, another set to a negative net benefit (i.e., a net loss).

| Table 1.1 a: Adult and Juvenile Justice System Unit Cost Estimates, Various Sources | | | | | |
|---|---|---|---|---|---|
| Category | Unit | Estimated Cost | | | |
| | | $ current | year | $ 2000 | Source |
| Overall Cost | | | | | |
| drug violation | case | 19.00 | 1992 | 23.00 | French and Martin (1996) |
| robbery | case | 3,573.00 | 1992 | 4,320.00 | French and Martin (1996) |
| Arrest, Investigation | | | | | |
| arrest | arrest | 624.00 | 1993 | 735.00 | Greenwood et. al. (1996b) |
| arrest | arrest | 1,580.00 | 1992 | 1,910.00 | Olson (1993) |
| arrest, property crime | arrest | 1,890.00 | 1995 | 2,110.00 | Aos et. al. (1999) |
| arrest, violent crime | arrest | 12,551.00 | 1995 | 14,010.00 | Aos et. al. (1999) |
| arrest | case | 83.00 | 1981 | 152.00 | Gray et. al. (1991) |
| investigation | case | 150.00 | 1981 | 274.00 | Gray et. al. (1991) |
| law enforcement | case | 561.00 | 1992 | 679.00 | Olson (1993) |
| police services | case | 526.00 | 1969 | 2,390.00 | Holahan (1970) |
| juvenile arrest (habitual offender) | case | 1,437.00 | 1995 | 1,600.00 | Florida (1995) |
| juvenile investigation | case | 2,065.00 | 1991 | 2,570.00 | Roberts and Camasso (1991) |
| Intake, Assessment | | | | | |
| alcohol, drug, weight counseling | session | 12.42 | 1983 | 20.80 | Daro (1988) |
| crisis intervention during intake | contact | 22.36 | 1983 | 37.40 | Daro (1988) |
| single intake | case | 54.00 | 1985 | 84.40 | Blomberg et. al. (1986) |
| psychological and other tests | test | 60.03 | 1983 | 101.00 | Daro (1988) |
| multi-disciplinary review | review | 90.67 | 1983 | 152.00 | Daro (1988) |
| intake and initial diagnosis | intake | 130.41 | 1983 | 218.00 | Daro (1988) |
| Detention | | | | | |
| pre-trial incarceration, simple case | case | 251.00 | 1992 | 304.00 | Olson (1993) |
| pre-trial incarceration, complex case | case | 5,700.00 | 1992 | 6,900.00 | Olson (1993) |
| juvenile detention | person per day | 83.01 | 1995 | 92.70 | Aos et. al. (1999) |
| juvenile detention | person per day | 85.90 | 1998 | 89.40 | Fabelo (1999) |
| Court Processing | | | | | |
| adjudication | arrest | 1,300.00 | 1993 | 1,530.00 | Greenwood et. al. (1996b) |
| court case activities | case | 208.66 | 1983 | 349.00 | Daro (1988) |
| court processing | case | 296.00 | 1985 | 463.00 | Blomberg et. al. (1986) |
| simple case | case | 1,511.00 | 1992 | 1,830.00 | Olson (1993) |
| court | case | 1,315.00 | 1981 | 2,410.00 | Gray et. al. (1991) |
| complex case | case | 2,991.00 | 1992 | 3,620.00 | Olson (1993) |
| courts and prosecutors: property | conviction | 1,657.00 | 1995 | 1,850.00 | Aos et. al. (1999) |
| courts and prosecutors: rape, robbery | conviction | 18,399.00 | 1995 | 20,540.00 | Aos et. al. (1999) |
| courts and prosecutors: homicide | conviction | 97,034.00 | 1995 | 108,330.00 | Aos et. al. (1999) |
| court | trial | 4,000.00 | 1993 | 4,710.00 | Greenwood et. al. (1996) |
| prosecution | case | 135.38 | 1972 | 538.00 | Monkman (1974) |
| prosecution | case | 589.00 | 1981 | 1,080.00 | Gray et. al. (1991) |
| prosecution | filing | 1,610.00 | 1992 | 1,950.00 | Olson (1993) |
| public defense | case | 56.41 | 1972 | 224.00 | Monkman (1974) |
| public defense | case | 196.00 | 1982 | 338.00 | United States (1988) |
| public defense | case | 376.00 | 1981 | 688.00 | Gray et. al. (1991) |
| defense | filing | 460.00 | 1992 | 557.00 | Olson (1993) |
| juvenile court, Missouri | case | 749.00 | 1991 | 933.00 | Roberts and Camasso (1991) |
| juvenile court, Massachusetts | case | 2,525.00 | 1991 | 3,140.00 | Roberts and Camasso (1991) |
| juvenile adjudication | case | 5,749.00 | 1995 | 6,420.00 | Florida (1995) |

| Table 1.1b : Adult and Juvenile Justice System Unit Cost Estimates, Various Sources (continued) | | | | | |
|---|---|---|---|---|---|
| Category | Unit | Estimated Cost | | | |
| | | $ current | year | $ 2000 | Source |
| Adult Probation/Parole Supervision | | | | | |
| state probation and parole | person per day | 1.60 | 1985 | 2.50 | United States (1988) |
| probation | person per day | 0.65 | 1969 | 2.90 | Holahan (1970) |
| state supervision | person per day | 3.50 | 1998 | 3.60 | Fabelo (1999) |
| parole | person per day | 0.97 | 1969 | 4.40 | Holahan (1970) |
| local supervision | person per day | 4.90 | 1998 | 5.10 | Fabelo (1999) |
| adult supervision | person per day | 7.36 | 1995 | 8.20 | Aos et. al. (1999) |
| parole supervision | person per day | 8.80 | 1998 | 9.20 | Fabelo (1999) |
| intensive supervision | person per day | 16.10 | 1999 | 16.40 | Wren (1999) |
| Juvenile Probation/Parole Supervision | | | | | |
| juvenile aftercare supervision | person per day | 2.00 | 1996 | 2.20 | Bourque et. al. (1996) |
| juvenile probation/parole -Missouri | person per day | 2.36 | 1991 | 2.90 | Roberts and Camasso (1991) |
| juvenile local probation | person per day | 5.28 | 1995 | 5.90 | Aos et. al. (1999) |
| juvenile probation/parole -Mass | person per day | 5.37 | 1991 | 6.70 | Roberts and Camasso (1991) |
| juvenile probation, month to month | person per day | 3.33 | 1975 | 10.30 | Gray et. al. (1978) |
| juvenile probation, year to year | person per day | 4.26 | 1975 | 13.20 | Gray et. al. (1978) |
| juvenile rehabilitation parole | person per day | 21.92 | 1995 | 24.50 | Aos et. al. (1999) |
| Adult Institutions | | | | | |
| jail simple case | case | 1,724.00 | 1992 | 2,090.00 | Olson (1993) |
| jail operating costs | case | 10,000.00 | 1993 | 11,770.00 | Greenwood et. al. (1996) |
| jail | case | 9,360.00 | 1983 | 15,670.00 | United States (1988) |
| jail complex case | case | 36,060.00 | 1992 | 43,640.00 | Olson (1993) |
| prison | person per day | 50.41 | 1995 | 56.30 | Aos et. al. (1999) |
| prison | person per day | 30.96 | 1985 | 48.40 | United States (1988) |
| prison operating costs | person per day | 56.99 | 1997 | 60.50 | Greenwood et. al. (1996) |
| prison cell | day | 8.80 | 1989 | 12.00 | Cavanaugh and Kleiman (1990) |
| prison capital and operations | day | 51.58 | 1989 | 70.30 | Cavanaugh and Kleiman (1990) |
| Juvenile Institutions | | | | | |
| institutions, week to week | person per day | 3.27 | 1975 | 10.10 | Gray et. al. (1978) |
| placement, week to week | person per day | 5.96 | 1975 | 18.40 | Gray et. al. (1978) |
| placement, month to month | person per day | 6.74 | 1975 | 20.80 | Gray et. al. (1978) |
| incarceration, Missouri | person per day | 26.54 | 1991 | 33.00 | Roberts and Camasso (1991) |
| state placement | person per day | 35.30 | 1998 | 36.70 | Fabelo (1999) |
| institutions, month to month | person per day | 13.67 | 1975 | 42.20 | Gray et. al. (1978) |
| local placement | person per day | 53.40 | 1998 | 55.60 | Fabelo (1999) |
| incarceration, Massachusetts | person per day | 47.69 | 1991 | 59.40 | Roberts and Camasso (1991) |
| residential services | person per day | 75.00 | 1996 | 81.40 | Bourque et. al. (1996) |
| placement, year to year | person per day | 29.43 | 1975 | 90.90 | Gray et. al. (1978) |
| rehabilitation institutions | person per day | 98.63 | 1995 | 110.00 | Aos et. al. (1999) |
| residential placement | person per day | 69.04 | 1985 | 108.00 | United States (1988) |
| institutional facility | person per day | 110.10 | 1998 | 115.00 | Fabelo (1999) |
| placement contract services | person per day | 107.00 | 1998 | 111.00 | Fabelo (1999) |
| local placement | person per day | 62.51 | 1983 | 105.00 | Daro (1988) |
| residential treatment | person per day | 138.00 | 1998 | 144.00 | Zaehringer (1998) |
| institutions, year to year | person per day | 66.53 | 1975 | 206.00 | Gray et. al. (1978) |

Uncertainty amplifies considerably when CBA incorporates dollar figures for intangibles, such as lives saved or lost, pain and suffering incurred or avoided, and quality of life heightened or diminished. Things such as these are real and have true value for individuals and society. Because every decision about a policy or program takes at least some intangible elements into account through personal evaluation by the people engaged in decision making, CBA should try to identify and, to the extent feasible, quantify them. However, without market prices, intangibles do not easily lend themselves to monetary valuation. Lack of consensus on how to measure and monetize them, as discussed, among many others, by Adams (1996) Burgess, Clark, and Harrison (1995), Hildred and Beauvais (1995), and O'Neill (1996a), or even on whether money is the appropriate yardstick (O'Neill, 1996b; Wysham, 1994), makes findings of a CBA that contains priced intangibles especially uncertain and, at the limit, suspect.

Miller et. al. (1996), for example, estimate that tangible and intangible costs to victims of crime in the United States approach $450 billion annually, of which $345 billion, or 77%, are intangible losses. This last number includes $1.9 million as the estimated average value of a life lost. Table 1.2 shows that the range of such estimates across sixty studies done during the last thirty year runs from $7,500 to $18 million. If methods of deriving prices for intangibles give results that can vary by a factor of 2400, then it should be evident that strategic selection of a price for intangibles allows CBA to arrive any conclusion (Tolchin, 1984; Coy, 1996). Indeed, in a different context, the potential for conflicts of interest that might take advantage of this kind of discretion led The New England Journal of Medicine to introduce conditions that CBA-like articles must meet prior to publication, all of which aim at assuring independence of analysis (Kassirer and Angell, 1994). Given the array of intangibles usually associated with justice policies, and the even wider range of dollar values attached to them, it is not surprising that Gray et. al. (1991) conclude that CBA, unable to inform decision makers on optimum resource allocation, has yet to find a way to help them choose between sentencing options.

Too rarely acknowledged, a third circumstance, implied in the foregoing, is that CBA always adopts a particular point of view. It is a subjective procedure that offers latitude to decide, in addition to method of estimating dollar values, the list of costs and benefits to incorporate into analysis and the items on the list to receive monetary valuation. Besides raising more obstacles to comparison of findings when lists differ, this liberty to choose the mix of costs and benefits makes CBA a partial form of analysis which yields findings intelligible mainly or only within the framework of the perspective that produces them. For instance, studies sometimes report ratios of benefits to costs that seem high: 2.2 (Holahan, 1970), 4.1 (Karoly et. al., 1998), 4.3 (Harwood et. al., 1988), 5.8 (Collier, 1982), 13.6 (Aos et. al., 1999), 14.8 (DiIulio and Piehl,1991), 30 (Cavanaugh and Kleiman, 1990), and 270 (Roberts and Cammasso, 1991). It is conceivable for a program to produce $2.20 in real benefit for every $1.00 in real cost. But this kind of result, not to mention $270 in benefit of per dollar of cost, is highly unlikely in a society, such as the United States, where longer-term returns to investment rarely exceed 20% (i.e., a benefit-cost ratio of 1.2). Relative over- and under-valuation of benefits and costs included in a study can produce high ratios. Listing items without attaching dollar figures to them, because they are too hard to estimate or for other reasons, can have the same, inadvertent effect. A more common cause, however, is systematic exclusion of certain benefits and costs. Typically, studies include benefits and costs of those who have "standing" in the eyes of analysts, mainly taxpayers and victims, and exclude benefits and costs of those who do not have "standing," mainly offenders.

| Table 1.2: Estimates of the Value of Life, Various Sources | | | |
|---|---|---|---|
| Source | Method of Valuation [1] | Estimated Value | |
| | | $ thousands [2] | as reported and/or adjusted by: |
| Ghosh et. al. (1975) | cb | 70 - 1,340 | Fisher, et. al. (1989), Miller (1990), Viscusi (1993) |
| Dardis (1980) | cb | 190 - 600 | Dardis (1980), Fisher, et. al. (1989), Viscusi (1993) |
| Ippolito and Ippolito (1984) | cb | 240 - 1,360 | Fisher, et. al. (1989), Miller (1990), Viscusi (1993) |
| Blomquist (1979) | cb | 260 - 1,400 | Bailey (1980), Fisher, et. al. (1989), Miller (1990), Viscusi (1993) |
| Jondrow et. al. (1983) | cb | 770 | Miller (1990) |
| Portney (1981) | cb | 800 | Viscusi (1993) |
| Landefeld (1982) | cb | 960 - 2,400 | Miller (1990) |
| Melinek (1974) | cb | 1,270 - 2,070 | Miller (1990) |
| Winston and Mannering (1984) | cb | 1,510 - 2,470 | Miller (1990) |
| Blomquist and Miller (1990) | cb | 1,910 | Miller (1990) |
| Garbacz (1989) | cb | 2,000 - 2,640 | Garbacz (1989), Viscusi (1993) |
| Smith and Gilbert (1984) | cb | 2,190 - 4,060 | Miller (1990) |
| Atkinson and Halvorsen, (1990) | cb | 4,000 | Viscusi (1993) |
| Acton (1973) | s | 7.5 - 100 | Dorman (1996), Viscusi (1993) |
| Miller and Guria (1991) | s | 1,200 | Viscusi (1993) |
| Persson (1989) | s | 1,460 | Miller (1990) |
| Jones-Lee et. al. (1985) | s | 1,600 - 4,400 | Fisher, et. al. (1989), Miller (1990) |
| Gerking et. al. (1988) | s | 2,200 - 8,800 | Miller (1990), Viscusi (1993) |
| Landefeld and Seskin (1979) | s | 2,630 | Miller (1990) |
| Viscusi et. al. (1991) | s | 2,700 - 9,700 | Viscusi (1993) |
| Maclean (1979) | s | 3,600 | Miller (1990) |
| Jones-Lee (1989) | s | 3,800 | Viscusi (1993) |
| Jones-Lee (1976) | s | 15,600 | Viscusi (1993) |
| Levitt and Venkatesh (1998) | wr | 7.5 - 100 | Levitt and Venkatesh (1998) |
| Thaler and Rosen (1976) | wr | 170 - 920 | Bailey (1980), Fisher, et. al. (1989), Miller (1990), Viscusi (1983) |
| Dillingham (1979) | wr | 380 - 1,200 | Bailey (1980), Fisher, et. al. (1989) |
| Kneisner and Leeth (1991) | wr | 600 - 7,600 | Viscusi (1993) |
| Smith, R. (1974) | wr | 600 - 16,200 | Bailey (1980), Fisher, et. al. (1989), Miller (1990), Viscusi (1993) |
| Smith, V. (1984) | wr | 700 - 7,500 | Miller (1990), Viscusi (1993) |
| Arnould and Nichols (1983) | wr | 720 - 900 | Fisher, et. al. (1989), Miller (1990), Viscusi (1993) |
| Low and McPheters (1983) | wr | 900 | Fisher, et. al. (1989), |
| Butler (1983) | wr | 910 - 1,100 | Miller (1990), Viscusi (1993) |
| Viscusi (1978) | wr | 1,050 - 5,370 | Bailey (1980), Fisher, et. al. (1989), Miller (1990), Viscusi (1993) |
| Cousineau et. al. (1988) | wr | 1,090 - 3,600 | Miller (1990), Viscusi (1993) |
| Viscusi and Moore (1988) | wr | 1,300 - 1,600 | Miller (1990) |
| Dillingham (1985) | wr | 1,420 - 5,800 | Fisher, et. al. (1989), Miller (1990), Viscusi (1993) |
| Gegax et. al. (1991) | wr | 1,500 - 2,100 | Gegax et. al. (1991) |
| Brown (1980) | wr | 1,500 - 5,200 | Miller (1990), Viscusi (1993) |
| Moore and Viscusi (1988a) | wr | 1,900 - 7,300 | Fisher, et. al. (1989), Miller (1990), Viscusi (1993) |
| Dillingham and Smith (1984) | wr | 2,070 - 5,280 | Miller (1990) |
| Dillingham and Miller (1990) | wr | 2,370 - 3,870 | Miller (1990) |
| Moore and Viscusi (1990b) | wr | 2,400 - 16,200 | Viscusi (1993) |
| Dickens (1984) | wr | 2,420 - 2,840 | Miller (1990) |
| Smith, V. (1983) | wr | 2,480 - 7,430 | Fisher, et. al. (1989), Miller (1990) |
| Viscusi (1979) | wr | 2,500 - 4,100 | Viscusi (1983), Viscusi (1993) |
| Marin and Psacharopolous (1982) | wr | 2,700 - 9,000 | Fisher, et. al. (1989), Miller (1990), Viscusi (1993) |
| Smith, R. (1976) | wr | 2,800 - 6,400 | Fisher, et. al. (1989), Miller (1990), Viscusi (1983, 1993) |
| Viscusi (1980) | wr | 3,800 - 10,420 | Miller (1990) |
| Viscusi (1981) | wr | 4,000 - 13,400 | Fisher, et. al. (1989), Miller (1990), Viscusi (1983, 1993) |
| Leigh and Folsom (1984) | wr | 4,300 - 10,300 | Fisher, et. al. (1989), Miller (1990), Viscusi (1993) |
| Garen (1988) | wr | 5,200 - 13,500 | Miller (1990), Viscusi (1993) |
| Leigh (1995) | wr | 5,380 - 11,510 | Leigh (1995) |
| Leigh (1987) | wr | 5,610 - 10,550 | Miller (1990), Viscusi (1993) |
| Moore and Viscusi (1990a) | wr | 6,900 - 16,200 | Viscusi (1993) |
| Viscusi and Moore (1989) | wr | 7,200 - 15,650 | Miller (1990), Viscusi (1993) |
| Moore and Viscusi (1988b) | wr | 7,300 | Viscusi (1993) |
| Olson (1981) | wr | 8,000 - 8,800 | Fisher, et. al. (1989), Miller (1990) |
| Dorsey and Walzer (1983) | wr | 8,370 | Miller (1990) |
| Herzog and Schlottmann (1990) | wr | 9,100 | Viscusi (1993) |
| Lanoie et. al. (1995) | wr,s | 11,500 - 18,000 | Lanoie et. al. (1995) |

Notes: 1. wr = wage-risk method, s= survey method , and cb = consumer behavior method.
2. various years

Though not a big deal in most applications, "standing" is an issue worth at least noting when the subject is adult and juvenile justice. It is also an issue with no clean resolution because a CBA is damned by some people if it doesn't give equal standing to everyone and, for different reasons, damned by other people if it does (Trumbull, 1990; Whittington and MacRae, 1986; and Zerbe 1991, 1998).

Those who believe that analysis should be structured by close adherence to economic theory, that it be what Gittinger (1982) calls "economic" CBA, insist that costs and benefits incurred and received by all affected societal actors be counted. Because the theory offers no rigorous way to assign different weights to different members of society, losses to crime victims carry no more weight than benefits to offenders. A study that includes as a cost the "pain and suffering" of assault victims might also include, say, the perpetrators' "thrill of victory" or some such - an item that would not be too out of place in a CBA of duck hunting. Material and psychological losses resulting from theft, likewise, are balanced by material and psychological gains to the wrongdoer and others who may benefit from use of the stolen item. If analysis shows that net gains to offenders and others are greater than net losses to victims, then, all other things equal, this type of CBA should, in principle, conclude that the criminal act under study engenders more "efficient" allocation of resources than would be the case without the crime (i.e., because benefits are at least equal to costs). Whether the gain in efficiency is "good" is a question that economic CBA cannot answer.

In practice there is no clear way to determine whether offenders gain more or less than victims lose in the kinds of examples given. In any case, economic CBA would view them as a wash, treating theft as an involuntary transfer between members of society. With society itself losing nothing in the process, the value of stolen goods does not register either as a cost or benefit. Additional conditions for economic CBA include: use of actual or estimated "efficiency" or "economic" prices (i.e., those that would obtain in a perfectly competitive market); treating taxes, subsidies, loans, and loan repayment as transfers within rather than as costs or benefits to society; and a long list of other strictures. Suffice it to say that although economic CBA makes sense on its own terms and, maybe, for the rare decision maker that looks at the world in the same way, it makes little sense to most people who concern themselves with crime and justice. They do not view the world through the lens of economic theory, and have little patience with analyses that seem to elevate the status of criminals and ignore the hurt of victims. This may explain why few, perhaps none of the CBA studies mentioned earlier, even those by economists, are purely of this type. They are what Gittinger (1982) refers to as "financial" analyses, adopting perspectives that, even if they sometimes look like applied economics, are shaped by personal, cultural, occupational, political, bureaucratic, and other considerations.

It seems sensible to step away from a perspective shared by very few people engaged in justice decision making. But in the eyes of advocates of economic CBA, financial analysis has its own shortcomings. As noted, by giving "standing" only to some societal actors, it produces exaggerated numbers for benefit-cost ratios, net benefits and other indicators of efficiency used in CBA. If meant to imply what society might gain or lose from a particular justice intervention, the estimates are misleading. They indicate only what taxpayers, victims, and other "good" people gain or lose. When offenders do count a bit, as in studies that include rehabilitative effects, then decreases or increases in "good" aspects of their behavior, such as employment, earnings, civic participation, school attendance, and academic grades, might also register as costs or benefits. But no matter how inclusive, the result of financial analysis is ordinarily unsatisfactory to adherents of strict economic analysis.

To the extent that CBA, as Trumbull (1990) and Zerbe (1998) suggest, is not independent of its institutional context and remains useful only when there exists general consensus on the legitimacy of its implicit and explicit assumptions, unequal "standing" is not an intractable problem for CBA. One can regard it as just another messy fact of analytical life that adds to uncertainty of findings.

But there is a bigger issue here. Cumulative uncertainty that flows from difficulty in isolating effects, ambiguity in calculating monetary values, and analytical subjectivity weakens the pretense, more often insinuated than expressed, that application of CBA to crime and justice is somehow technically neutral (the word "objective" is not in the lexicon). CBA may aspire to this status, and in other policy areas may be close, but it still falls short in application to crime and justice. It is, in other words, a weak form of analysis. In the political arena of public policy this weakness makes CBA susceptible to manipulation by its producers as well as by its consumers. It can as readily serve as ammunition to bolster arguments for making juvenile justice harsh as it can for making it lenient. Or, coming at this another way, given the array of perspectives and opinions about juvenile justice that float in the ether of policy making, chances are very good that findings of any CBA will elicit positive and negative reactions at the same time.

Looking at the bureaucratic milieu, for example, Boardman et. al. (1993) note that public sector personnel and officials usually adopt one of three perspectives on CBA, each of which attaches very different meanings to the words benefits and costs. "Analysts," following what they think of as standard CBA, try to look at all items. "Guardians" of the public purse, such as budget directors, focus mainly or only on revenue-expenditure analysis. Victim losses, intangibles, and all else with no immediate fiscal import have little meaning. "Spenders," such as elected judges and other local and state officials, or department heads, focus on constituency support analysis, picking from the list of costs and benefits the tangible, intangible, monetized, and non-monetized items that help strengthen their positions.

Constituencies have varying perspectives. Gerber and Gerber's (1996) interpretation of findings from the National Opinion Survey on Crime and Justice (NOSCJ) suggests two broad groupings in the general public. One holds that the purpose of juvenile justice is retribution for bad behavior. This is reported by 32% of NOSCJ respondents (i.e., excluding those who said incarceration, which to our way of thinking is not an objective but a method to achieve one). The other grouping, representing 68% of NOSCJ respondents, holds that the purpose is behavior modification via deterrence and rehabilitation to prevent further instances of wrongdoing. A survey of 125 editorial articles in 100 national and regional newspapers that we conducted in 1998 revealed the same split, retribution (11%) and behavior change (89%).

Spenders who focus on building support from the first, punishment-oriented constituency, cannot but object to CBA findings that, say, lean in the direction of milder sanctions. This is because estimating benefits that stem from retribution requires ways to measure the suffering of young offenders, as well as ways to calculate dollar values for gradations of distress associated with various dispositions. The benefit to society of retribution for its own sake, equal to the dollar value of offenders' distress, can then be compared to the dollar cost to society of inflicting the punishment. Because CBA has not yet discovered techniques to do this kind of thing, these spenders can claim that analysis is incomplete, that it missed the important stuff.

Spenders who concentrate on the second grouping, the behavior modifiers, usually have to address one or both of two sub-constituencies: those who think mainly in terms of protecting society, and those who think mainly in terms of saving children. Table 1.3 shows this kind of division. It is based on responses of 86 individuals directly engaged in one or another aspect of juvenile justice in Dallas County to whom we asked an open-ended question in 1998: In your opinion, what is the purpose of juvenile justice? All agree that the immediate purpose is to dissuade individuals from offending again. They diverge, more or less down the middle, on the ultimate goal. Half, especially lawyers working in the District Attorney's office and law enforcement personnel, say that the prime goal is to protect society from harm caused by offenders. The other half, defense lawyers, armed forces recruiters, and most probation officers think that it is to save children from a lifetime of difficulty.

In a protection-oriented perspective, the basic gain is reduction in offenses, especially of the serious variety. A child-oriented perspective cannot ignore this, but it would emphasize other benefits to the child and community that may accompany behavioral change. A clean record might be just one manifestation of a deeper shift in attitude that also shows itself in school performance, civic participation, part-time employment, and so forth. Accordingly, a CBA which looks mainly at offenses and discounts child maturation effects, especially if it finds in favor of harshness, risks irking spenders who focus on the child-oriented constituency. Similarly, analysis that looks mainly at child maturation while discounting offenses, especially if it finds in favor of milder sanction, risks disturbing spenders who focus on the protection constituency.

These various circumstances make it hard for CBA to produce unambiguous answers to the basic question that many decision-makers ask themselves, i.e., Are the hoped-for benefits of an approach or policy sufficient to justify the costs of producing them? Difficulty, however, does not imply that CBA, elegant in theory, is useless in practice. Were that the case then there would be no gain in applying any social science method to throw light on juvenile justice issues. Rather, the implication is that a CBA which acknowledges the conditions under which it operates should be very clear and explicit about methods, assumptions, results, everything. Equally important, it should show respect for uncertainty, first by avoidance of spurious precision, i.e., showing exact results where none is possible, and second by embrace of a probabilistic approach to estimating ranges of likely effects, values, and outcomes. These are the things we do in the present analysis.

Table 1.3: Perceived Purpose of Juvenile Justice, by Occupation, Dallas County, 1998

| | *N* | Protect Society (%) | Rehabilitate, Deter (%) |
|---|---|---|---|
| all respondents | *86* | 51 | 49 |
| occupation: | | | |
| lawyer | *10* | 40 | 60 |
| armed forces recruiter | *6* | 0 | 100 |
| police | *28* | 100 | 0 |
| teacher | *8* | 50 | 50 |
| probation officer | *34* | 24 | 76 |

## 2. Juvenile Dispositions and the CBA Question

Most young people referred to the Dallas County Juvenile Department are subject to two informal and five formal dispositions that impose progressively tighter limits on freedom of action. Informal dispositions are "supervisory caution," where a child is counseled by department staff and then released, and "deferred prosecution." This last sends the child home with a warning to stay out of trouble. There is a supervision period, averaging six months, during which staff make periodic checks on the child at home or school. Non-compliance can lead the Department to file a case with the district attorney, at which point the child is subject to formal disposition by juvenile court.

"Probation" is the mildest formal disposition. A probation officer visits the child once every month or two during a probationary period set by the court, usually one year. In about 44% of cases the child also participates in counseling, education, or other court-ordered service provided in the community. The next level of formal disposition is "intensive supervision probation." This sanction involves more frequent, weekly monitoring of behavior for an initial period of six months followed, if the child does not re-offend, by six more months of regular probation. Some 65% of these cases involve participation in community services.

"Local Placement" in a residential facility operated directly by the Department or by private contractors is the third formal disposition. It is incarceration which, depending on the nature of the case, can be in a secure facility from which getting away is hard or an open facility which a child can leave with relative ease. The period of placement averages 270 days, followed by 72 days of counseling, education, and other aftercare services. Placement in a facility operated by the state through its "Texas Youth Commission" (TYC) or by private contractors acting for the TYC, is the fourth formal disposition. This level of incarceration, usually in a secure facility, averages 270 days (much longer in the case of the rarely-invoked determinate sentence), after which the child is paroled from the facility for 90 days on average. The final disposition, rare as well, is transfer to the adult system. Here a child is propelled beyond jurisdiction of the juvenile court and becomes subject to the treatment an adult can expect in criminal court.

Dallas County puts these dispositions to use progressively, milder sanctions imposed on individuals with few and/or relatively minor infractions and harsher sanctions imposed on those with many repeated and/or serious infractions. Juveniles sentenced to TYC placement during 1994-99, for example, had a mean of 2.4 years of prior contact with the justice system, during which they accumulated an average of 7.3 offenses, largely felonies for assaults and property crimes (Table 2.1). In contrast, those given deferred prosecution had a mean of 0.5 years of contact and an accumulation of 1.47 offenses, mainly misdemeanors.

By their nature, each disposition in the sequence demands progressively greater expenditure by juvenile justice systems of the county and state. The first question that presents itself for CBA is then: What is the purpose of these dispositions; what is the intended benefit that requires measure? Our earlier discussion of constituencies suggests three things: distress of punishment, child maturation gains, and offense prevention. Unfortunately the data we work with, described below, permit rigorous estimates only of offenses and the dispositions that follow them. Our analysis of benefits, by excluding

distress and broader dimensions of behavioral change, is necessarily incomplete. But this, as noted, is normal in practice.

Accordingly, the narrower question that we focus on is: What are the effects, in terms of changes in numbers of re-offenses and associated re-dispositions, of expending more resources on harsher dispositions or, flipping over, spending fewer resources on milder dispositions? More specific, in the direction of increasing severity we explore what might happen if offenders get regular probation rather than deferred prosecution, intensive supervision probation instead of regular probation, local placement rather than intensive supervision probation, and TYC rather than local placement. In the direction of milder sanction, we look at the same pairings inversely, e.g., deferred prosecution in lieu of probation.

We compare effects between neighboring dispositions rather than distant ones, such as deferred prosecution versus placement, for two reasons. First, as noted in Table 2.1, juvenile characteristics are similar between proximate dispositions. It is hard to predict what might happen if individuals get placement rather than deferred prosecution because individuals who receive such dispositions are very different from each other, especially with respect to their offense histories. Extending this, they are also different in terms of probable re-offense and re-adjudication trajectories. Table 2.2, for instance, shows that of those who got deferred prosecution during 1994-97, 18% were re-adjudicated during the following 48 months, and a bit more than 7% were placed. But among those who received local placement, more than half were re-adjudicated and 41% were placed again. Differences are much smaller between neighboring dispositions. Or, to say the same thing in the language of statistical analysis: omitted variables may present less of a problem of biased estimation in, say, a pooled sample of deferred prosecution and regular probation than a pooled sample comprising deferred prosecution and TYC placement.

Second, courts exercise decisions on the margin between dispositions. Judges do not choose harsher treatment unless milder ones have proven ineffective. To be useful, CBA should examine realistic alternatives.

Table 2.1: Juvenile Offense History by Type of Disposition, Dallas County, 1994-99

| | Deferred Prosecution | Probation | Intensive Supervision Probation | Placement | TYC Placement |
|---|---|---|---|---|---|
| Age at First Referral (years) | 14.7 | 14.4 | 14.1 | 13.7 | 13.8 |
| Age at Disposition (years) | 15.2 | 15.7 | 15.6 | 15.5 | 16.2 |
| Years of Contact With Justice System | 0.5 | 1.3 | 1.5 | 1.8 | 2.4 |
| Prior Referrals by Class of Offense | | | | | |
| technical offense | 0.00 | 0.09 | 0.24 | 0.67 | 1.11 |
| misdemeanor | 1.06 | 1.34 | 1.46 | 1.93 | 2.17 |
| felony | 0.31 | 1.41 | 2.03 | 2.22 | 3.17 |
| Prior Referrals by Type of Offense | | | | | |
| status | 0.09 | 0.25 | 0.27 | 0.80 | 0.77 |
| drug | 0.16 | 0.28 | 0.29 | 0.43 | 0.53 |
| assault | 0.17 | 0.56 | 0.70 | 0.82 | 1.16 |
| property | 0.89 | 1.40 | 1.86 | 2.30 | 2.72 |
| all offenses | 1.47 | 3.12 | 4.03 | 5.70 | 7.30 |

Table 2.2: Comparative Patterns of Juvenile Re-adjudication and Re-placement, Dallas County, 1994-97

| | cumulative number of juveniles re-adjudicated or re-placed per 100 initial dispositions | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | months from start of disposition | | | | | | | |
| | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 |
| Re-adjudication | | | | | | | | |
| Deferred Prosecution | 1.4 | 5.4 | 9.8 | 13.0 | 15.0 | 16.5 | 17.4 | 17.9 |
| Probation | 14.8 | 28.2 | 33.1 | 35.6 | 37.5 | 38.6 | 39.1 | 39.3 |
| difference | 13.4 | 22.8 | 23.2 | 22.7 | 22.5 | 22.1 | 21.7 | 21.4 |
| Probation | 14.8 | 28.2 | 33.1 | 35.6 | 37.5 | 38.6 | 39.1 | 39.3 |
| Intensive Supervision | 23.5 | 40.2 | 45.3 | 47.5 | 49.3 | 49.9 | 50.3 | 51.0 |
| difference | 8.7 | 12.0 | 12.3 | 11.9 | 11.8 | 11.3 | 11.2 | 11.7 |
| Intensive Supervision | 23.5 | 40.2 | 45.3 | 47.5 | 49.3 | 49.9 | 50.3 | 51.0 |
| Local Placement | 12.1 | 25.8 | 35.7 | 42.3 | 46.6 | 48.9 | 50.2 | 51.0 |
| difference | (11.4) | (14.3) | (9.6) | (5.2) | (2.6) | (1.0) | (0.1) | 0.0 |
| Local Placement | 12.1 | 25.8 | 35.7 | 42.3 | 46.6 | 48.9 | 50.2 | 51.0 |
| TYC Placement | 0.3 | 2.0 | 6.5 | 12.9 | 16.6 | 18.6 | 20.5 | 20.9 |
| difference | (11.8) | (23.8) | (29.2) | (29.5) | (30.0) | (30.3) | (29.7) | (30.1) |
| Re-placement (local or TYC) | | | | | | | | |
| Deferred Prosecution | 0.5 | 1.5 | 3.0 | 4.4 | 5.4 | 6.3 | 6.8 | 7.3 |
| Probation | 9.3 | 18.1 | 21.9 | 24.1 | 25.2 | 26.0 | 26.5 | 26.8 |
| difference | 8.8 | 16.6 | 18.9 | 19.7 | 19.8 | 19.7 | 19.6 | 19.4 |
| Probation | 9.3 | 18.1 | 21.9 | 24.1 | 25.2 | 26.0 | 26.5 | 26.8 |
| Intensive Supervision | 19.1 | 32.4 | 36.4 | 38.7 | 39.9 | 40.5 | 41.0 | 41.0 |
| difference | 9.8 | 14.3 | 14.4 | 14.7 | 14.7 | 14.5 | 14.5 | 14.2 |
| Intensive Supervision | 19.1 | 32.4 | 36.4 | 38.7 | 39.9 | 40.5 | 41.0 | 41.0 |
| Local Placement | 11.5 | 23.9 | 32.4 | 36.9 | 39.6 | 40.5 | 40.9 | 41.2 |
| difference | (7.7) | (8.4) | (4.0) | (1.8) | (0.4) | 0.0 | (0.1) | 0.2 |
| Local Placement | 11.5 | 23.9 | 32.4 | 36.9 | 39.6 | 40.5 | 40.9 | 41.2 |
| TYC Placement | 0.2 | 0.8 | 2.0 | 4.0 | 4.6 | 4.8 | 5.1 | 5.1 |
| difference | (11.3) | (23.1) | (30.3) | (32.9) | (34.9) | (35.7) | (35.8) | (36.1) |

## 3. Sources of Data

The data we use to try to answer the question about numbers of re-offenses and associated re-dispositions are taken from the records of 13,144 individuals referred to the Dallas County Juvenile Department during 1994-97. They committed more than 58,000 offenses between their first referral and November, 1999, the end date for our offense data, and received a total of 17,124 dispositions. Each of our observations is a disposition event, as already discussed, that ranges from the least restrictive sanction, deferred prosecution, to one of the most restrictive, TYC placement. We exclude the severest penalties, TYC determinate sentencing and transfer to the adult system, in part because the number of cases is very small and in part because most of these individuals, incarcerated during the whole follow-up period, have little or no opportunity to re-offend.

These data come from three sources. First is the Dallas County Juvenile Department's database on offenders arrested and referred between the ages of 10 and 17 years. It supplies all information on re-offenses and re-dispositions while individuals were under jurisdiction of the juvenile court. The second source is the Texas Department of Public Safety (DPS). It supplies data on arrests after individuals

reach adulthood. Third, necessary because DPS records do not provide reliable information on adult dispositions, is the County's criminal court database. To use this source we first drew a random sub-sample of 1,774 cases from the juvenile pool who received probation, intensive supervision, local placement and TYC placement during 1994-96. Most of these individuals reached adulthood by 1999. Then, after matching them with DPS offense records, we extracted from the court database the associated dispositions and length of sentence during the follow-up period. In all juvenile and adult cases we counted only the most serious offense, such as first-degree felony or misdemeanor A, whenever offenses were linked to multiple charges.

Table 3.1 shows the result of these labors. Of the 17,124 disposition observations in our data, 7,124 are deferred prosecution cases; 5,117 are regular probation, 1,317 are intensive supervision probation; 2,331 are local placement, and 1,235 are TYC placement. These are "initial" dispositions, meaning that each observation represents the first instance a juvenile receives the specific disposition. If the individual received a milder disposition before, then he or she would show up in the data as an initial disposition for that disposition as well. The same applies for a harsher disposition later on.

The table also indicates that sample size decreases with increasing length of follow-up. Although the tracking period covers five years, 1994-99, our analysis of offense and disposition data beyond the fourth year produced little useful result. There were no statistically significant differences in re-offense and re-disposition patterns among the four pairs of disposition cohorts during the fourth year. We also found no significant differences for the fifth year. However, the cause here, unlike the fourth year, was inadequate sample size. Our estimates of re-offenses, re-dispositions, and associated benefits and costs, therefore, are based on four years of follow-up.

Table 3.1: Sample Size by Initial Disposition and Length of Follow-Up, Dallas County

| Disposition | Length of Follow-Up from Start of Disposition | | | |
|---|---|---|---|---|
| | One Year | Two Years | Three Years | Four Years |
| Deferred Prosecution | 7,124 | 6,801 | 5,068 | 3,242 |
| Probation | 5,117 | 4,799 | 3,263 | 1,862 |
| Intensive Supervision Probation | 1,317 | 1,188 | 649 | 255 |
| Placement | 2,331 | 2,165 | 1,533 | 944 |
| Texas Youth Commission Placement | 1,235 | 1,136 | 842 | 548 |
| All Dispositions | 17,124 | 16,089 | 11,355 | 6,851 |

## 4. Patterns of Re-offense and Re-Disposition

We specify two sets of dependent variable in the statistical models (i.e., equations) that we use to estimate likely effects of substituting one disposition for another. For predicting differences in re-offenses between disposition pairs, the dependent variables are number of technical violations and status offenses, number of misdemeanors, and number of felonies committed during each year of follow-up. Separate estimates for each offense class allow us to account for different justice system and societal costs and benefits associated with infractions of varying severity. For predicting re-dispositions that result from the offenses, the dependent variable is total number of re-dispositions during each year of follow-up.

Applying a negative binomial regression procedure to the data, we model the expected number of re-offenses and re-dispositions ($y_i$), with co-variates $x_i$ as:

$$y_i \sim \text{Poisson}(\mu^*_i)$$
where $$\mu^*_i = \exp(\beta x_i + \mu_i)$$
and $$e^{\mu_i} \sim \text{gamma}(1/\alpha, 1/\alpha)$$

Here, $e^{\mu_i}$ represents the unknown heterogeneity across observations. It follows a gamma distribution with mean of 1 and variance $\alpha$.. The set of co-variates $x_i$ in the models include the basic demographic and offense history variables shown in Table 4.1.

We adopt the negative binomial regression procedure because number of re-offenses or re-dispositions is a non-negative integer with discrete distribution. As a result, we cannot use other statistical models, such as ordinary least squares regression, which assume a continuous distribution for the endogenous variable (Johnson et. al., 1992; Cameron and Trivedi, 1986). A common discrete distribution, used in several fields of analysis, is the Poisson count (Hausman et. al., 1984; Bartko, 1961; Greenwood, et. al., 1920). This model, however, is limited by its distribution assumptions, which lead to biased as well as inefficient estimates when applied to "over-dispersed" data, i.e., where the dependent variable has a variance that exceeds its expected value (Land, et. al.,1996; Johnson, et. al, 1992; Winkelmann et. al.,1995). The negative binomial regression model, commonly used to address over-dispersed data, allows for a less restrictive variance and, as a result, yields less biased estimates (Baron, 1992; Gardner, et. al, 1995). Diagnostic tests that we ran using the procedure confirm that the negative binomial regression is more appropriate than Poisson for count data.

The model serves two purposes. First, it controls statistically for other variables, many of which are sometimes called "criminogenic," that are presumed to affect rates of re-offense and re-disposition. By controlling for the influence of these variables, the model allows some isolation of the effect of sentencing. Second, model coefficients, or parameters, allow generation of re-offense and re-disposition predictions for different cohorts. For re-offenses, the model simulates what a typical individual's re-offense count would be if he or she received the alternate (harsher or milder) disposition. For re-dispositions, it simulates the probability of being re-adjudicated for additional offenses of one type or another under different initial dispositions.

With this statistical procedure we generate re-offense predictions or, to be more precise, predictions of differences in number of re-offenses between disposition pairs, through manipulation of "dummy" variables representing each disposition cohort. For example, in simulating probation versus deferred prosecution, the model specification is:

$$\mu^*_i = \exp(\beta_{1i} x_i + \beta_{2i} D_i + \mu_i)$$

Here, $D_i$ is the dummy variable for type of disposition. It is set to 1 if the child received probation, to 0 if the child received deferred prosecution. Other independent control variables are represented by $x_i$. The coefficient for the dummy variable, $\beta_{2i}$, is estimated from a pooled sample, i.e., containing individuals in both deferred prosecution and probation cohorts. This coefficient represents the estimated difference in number of re-offenses for the probation cohort relative to the deferred prosecution cohort.

| Table 4.1: Independent Variables Used to Estimate Re-offenses and Re-dispositions | | | |
|---|---|---|---|
| Variable Name | Description | Mean | Std. Dev. |
| RACE_W | caucasian = 1, african-american is the reference group | 0.2850 | 0.4514 |
| RACE_H | hispanic = 1, african-american is the reference group | 0.2913 | 0.4544 |
| RACE_O | other ethnic group = 1, african -american is the reference group | 0.0227 | 0.1488 |
| FEMALE | female = 1, male = 0 | 0.1820 | 0.3859 |
| AGEF1314 | age at first referral 13-14 = 1, ages under 12 is the reference group | 0.4362 | 0.4959 |
| AGEF15 | age at first referral 15 = 1, ages under 12 is the reference group | 0.2078 | 0.4057 |
| AGEF16M | age at first referral 16 and over = 1, ages under 12 is the reference group | 0.1616 | 0.3681 |
| AGED1314 | age at disposition 13-14 = 1, ages under 12 is the reference group | 0.2661 | 0.4419 |
| AGED15 | age at disposition 15 = 1, ages under 12 is the reference group | 0.2572 | 0.4371 |
| AGED16M | age at disposition 16 and over = 1, ages under 12 is the reference group | 0.4187 | 0.4934 |
| NUMFEL1 | one prior felony referral = 1, no prior felony referral is the reference group | 0.3273 | 0.4692 |
| NUMFEL2 | two prior felony referrals = 1, no prior felony referral is the reference group | 0.1462 | 0.3533 |
| NUMFEL3M | three prior felony referrals = 1, no prior felony referral is the reference group | 0.1517 | 0.3588 |
| NUMREF2 | two total prior referrals = 1, one prior referral is the reference group | 0.1880 | 0.3907 |
| NUMREF3 | three total prior referrals = 1, one prior referral is the reference group | 0.1156 | 0.3198 |
| NUMREF4M | four and more total prior referrals = 1, one prior referral is the reference group | 0.3179 | 0.4657 |
| DRUG_DUM | any prior drug referral = 1, otherwise = 0 | 0.2037 | 0.4028 |
| PERS_DUM | any prior assault referral = 1, otherwise = 0 | 0.3392 | 0.4734 |
| STAT_DUM | any prior status referral = 1, otherwise = 0 | 0.1679 | 0.3738 |
| PROP1 | one prior property referral = 1, none is the reference group | 0.3918 | 0.4882 |
| PROP2 | two prior property referrals = 1, none is the reference group | 0.1581 | 0.3649 |
| PROP3M | three prior property referrals = 1, none is the reference group | 0.1766 | 0.3813 |
| TVIOL1 | one prior technical violation = 1, none is the reference group | 0.0865 | 0.2811 |
| TVIOL2M | two or more prior technical violations = 1, none is the reference group | 0.0540 | 0.2259 |
| PRADJ_DU | any prior adjudication = 1, otherwise = 0 | 0.2001 | 0.4001 |
| PRPLM_DU | any prior residential placement = 1, otherwise = 0 | 0.0601 | 0.2378 |

Given the parameter estimates for x and $D$, shown in Tables 4.2 through 4.5, and the fact that $D$ is set to 0 for deferred prosecution, The predicted number of "actual" re-offenses for individuals who received deferred prosecution is then:

$$\mu^*_i = \exp(\beta_{1i}\, x_i + \mu_i)$$

By changing the value of $D$ for deferred prosecution cases from 0 to 1 and then applying the parameter estimates to these cases again, the model produces new re-offense predictions for the same deferred prosecution cases with the same offender characteristics. These new re-offense predictions, however, are what the model predicts would result from changing disposition from deferred prosecution to probation. The difference between the two predictions, one based on the actual disposition dummy value (i.e., $D = 0$) and the other on the modified dummy value (i.e., $D = 1$) while holding other offender characteristics constant (i.e., as represented by $x_i$), yields the predicted difference in number of re-offenses that our simulation model says would result from a change in disposition.

Although the model predicts differences for every disposition pair, many predicted differences are not statistically significant at a 95% probability level, i.e., where the probability that an observed difference stems from chance is more than 5% or, to say the same thing inversely, where the probability that the difference is not zero is less than 95%. The determining factor is the statistical significance of the

Table 4.2: Regression Results for Re-offenses, Deferred Prosecution vs. Probation

| | dependent variable = year 1 re-offenses | | | dependent variable = year 2 re-offenses | | | dependent variable = year 3 re-offenses | | | dependent variable = year 4 re-offenses | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Independent Variables | violation | misdem.. | felony | violation | misdem. | felony | violation | misdem. | felony | violation | misdem. | felony |
| 1995 disposition | 1.069 | 0.875 | 0.822 | 0.884 | 0.918 | 0.723 | 0.841 | 0.804 | 0.793 | 1.391 | 0.702 | 0.85 |
| | (0.88) | (-2.24)* | (-2.80)** | (-1.18) | (-1.33) | (-4.41)** | (-1.2) | (-3.25)** | (-3.09)** | (1.40) | (-4.32)** | (-1.75) |
| 1996 disposition | 1.386 | 0.813 | 0.741 | 0.979 | 0.901 | 0.773 | 0.843 | 0.727 | 0.656 | | | |
| | (4.31)** | (-3.42)** | (-4.14)** | (-0.2) | (-1.53) | (-3.41)** | (-1.13) | (-4.09)** | (-4.90)** | | | |
| 1997 disposition | 1.499 | 0.727 | 0.597 | 0.956 | 0.828 | 0.614 | | | | | | |
| | (5.39)** | (-5.13)** | (-6.87)** | (-0.41) | (-2.55)* | (-5.81)** | | | | | | |
| Probation | 4.388 | 0.755 | 0.92 | 1.365 | 0.823 | 0.785 | 0.917 | 0.914 | 1.332 | 0.592 | 1.052 | 0.934 |
| | (18.49)** | (-4.78)** | (-1.15) | (3.00)** | (-2.93)** | (-3.08)** | (-0.5) | (-1.09) | (3.25)** | (-1.66) | (0.45) | (-0.53) |
| caucasian | 0.789 | 0.837 | 0.542 | 0.711 | 0.869 | 0.544 | 0.56 | 0.81 | 0.56 | 0.58 | 0.803 | 0.595 |
| | (-3.84)** | (-3.21)** | (-8.77)** | (-3.47)** | (-2.34)* | (-8.56)** | (-3.71)** | (-2.86)** | (-6.76)** | (-1.95) | (-2.12)* | (-4.69)** |
| hispanic | 0.912 | 1.026 | 0.812 | 0.878 | 0.902 | 0.637 | 0.736 | 0.68 | 0.664 | 0.765 | 0.829 | 0.458 |
| | (-1.74) | (0.50) | (-3.51)** | (-1.46) | (-1.71) | (-6.49)** | (-2.06)* | (-5.02)** | (-4.87)** | (-0.98) | (-1.89) | (-6.50)** |
| other ethnic group | 0.667 | 1.09 | 0.615 | 0.8 | 0.687 | 0.761 | 0.561 | 0.598 | 0.681 | 1.024 | 0.454 | 0.266 |
| | (-2.44)* | (0.66) | (-2.38)* | (-0.89) | (-2.15)* | (-1.21) | (-1.43) | (-2.47)* | (-1.32) | (0.03) | (-2.09)* | (-1.9) |
| female | 0.839 | 0.449 | 0.244 | 0.699 | 0.4 | 0.217 | 0.379 | 0.45 | 0.348 | 0.341 | 0.378 | 0.345 |
| | (-2.55)* | (-11.30)** | (-12.82)** | (-3.26)** | (-11.17)** | (-11.62)** | (-4.88)** | (-8.10)** | (-8.28)** | (-2.71)** | (-6.70)** | (-6.32)** |
| age at 1st referral 13-14 | 0.901 | 1.044 | 1.002 | 0.982 | 0.982 | 0.999 | 0.633 | 0.859 | 0.996 | 0.308 | 0.94 | 0.637 |
| | (-1.57) | (0.64) | (0.02) | (-0.19) | (-0.22) | (-0.01) | (-2.77)** | (-1.59) | (-0.04) | (-4.49)** | (-0.47) | (-3.19)** |
| age at 1st referral 15 | 0.957 | 1.072 | 1.237 | 0.608 | 1.137 | 1.025 | 0.379 | 0.876 | 1.07 | 0 | 1.097 | 0.847 |
| | (-0.51) | (0.80) | (1.97)* | (-3.25)** | (1.21) | (0.21) | (-2.49)* | (-1.09) | (0.48) | (-13.39)** | (0.56) | (-0.88) |
| age at 1st referral >=16 | 0.681 | 1.152 | 1.176 | 0.268 | 0.896 | 0.725 | 0.574 | 0.844 | 1.044 | 0.08 | 0.938 | 0.609 |
| | (-3.36)** | (1.35) | (1.31) | (-3.51)** | (-0.9) | (-2.32)* | (-2.29)* | (-1.16) | (0.27) | (-9.06)** | (-0.31) | (-2.02)* |
| age at disposition 13-14 | 1.363 | 1.223 | 1.638 | 0.895 | 1.057 | 1.409 | 1.091 | 1.302 | 0.797 | 0.727 | 1.031 | 1.156 |
| | (2.18)* | (1.75) | (3.48)** | (-0.73) | (0.46) | (2.29)* | (0.44) | (1.83) | (-1.54) | (-1.13) | (0.16) | (0.75) |
| age at disposition 15 | 1.215 | 1.266 | 1.594 | 0.728 | 0.905 | 1.14 | 0.285 | 1.115 | 0.593 | 0.027 | 0.922 | 0.722 |
| | (1.30) | (1.89) | (3.08)** | (-1.85) | (-0.75) | (0.81) | (-4.36)** | (0.70) | (-3.19)** | (-3.43)** | (-0.4) | (-1.48) |
| age at disposition >=16 | 0.852 | 1.099 | 1.439 | 0.146 | 0.906 | 1.195 | 0 | 1.1 | 0.49 | 0 | 0.836 | 0.57 |
| | (-1.03) | (0.71) | (2.29)* | (-8.50)** | (-0.71) | (1.04) | (-63.97)** | (0.57) | (-3.99)** | (-48.49)** | (-0.8) | (-2.30)* |
| # of prior felonies = 1 | 1.032 | 1.017 | 0.997 | 0.991 | 1.051 | 1.124 | 0.919 | 1.044 | 0.937 | 1.317 | 1.184 | 1.251 |
| | (0.49) | (0.31) | (-0.04) | (-0.09) | (0.80) | (1.53) | (-0.57) | (0.56) | (-0.77) | (1.13) | (1.67) | (1.99)* |
| # of prior felonies = 2 | 0.944 | 0.878 | 1.142 | 0.919 | 0.992 | 1.129 | 1.303 | 0.913 | 1.014 | 0.99 | 1.218 | 0.976 |
| | (-0.74) | (-1.57) | (1.39) | (-0.62) | (-0.09) | (1.15) | (1.10) | (-0.75) | (0.10) | (-0.02) | (1.26) | (-0.12) |
| # of prior felonies >=3 | 0.78 | 0.806 | 1.317 | 0.683 | 1 | 1.03 | 0.692 | 0.897 | 1.072 | 0.312 | 0.929 | 1.061 |
| | (-2.66)** | (-2.04)* | (2.49)* | (-2.17)* | 0.00 | (0.22) | (-1.08) | (-0.74) | (0.45) | (-1.19) | (-0.36) | (0.26) |
| total # of prior referrals <=2 | 1.517 | 1.698 | 1.439 | 1.442 | 1.339 | 1.344 | 0.895 | 1.338 | 1.077 | 0.772 | 1.376 | 1.388 |
| | (5.16)** | (8.28)** | (4.68)** | (3.32)** | (4.06)** | (3.61)** | (-0.58) | (3.31)** | (0.76) | (-0.79) | (2.66)** | (2.40)* |
| total # of prior referrals =3 | 1.884 | 1.94 | 1.689 | 1.593 | 1.561 | 1.483 | 1 | 1.514 | 1.158 | 0.423 | 1.255 | 1.295 |
| | (6.67)** | (7.62)** | (5.08)** | (3.17)** | (4.39)** | (3.46)** | 0.00 | (3.03)** | (1.08) | (-1.47) | (1.35) | (1.27) |
| total # of prior referrals >=4 | 2.089 | 2.198 | 1.724 | 1.523 | 1.635 | 1.505 | 1.072 | 1.943 | 1.137 | 0.358 | 1.505 | 1.739 |
| | (6.49)** | (6.89)** | (4.23)** | (2.25)* | (3.82)** | (2.79)** | (0.19) | (3.83)** | (0.72) | (-1.3) | (1.88) | (2.22)* |
| any prior drug referral | 1.078 | 1.242 | 1.201 | 1.086 | 1.288 | 1.224 | 0.694 | 1.084 | 1.089 | 0.884 | 1.181 | 0.954 |
| | (1.23) | (3.67)** | (2.69)** | (0.77) | (3.66)** | (2.55)* | (-1.51) | (0.89) | (0.90) | (-0.27) | (1.37) | (-0.32) |
| any prior assault referral | 0.977 | 1.068 | 1.093 | 0.916 | 1.118 | 1.149 | 1.214 | 1.156 | 1.144 | 1.564 | 1.08 | 1.079 |
| | (-0.42) | (1.09) | (1.31) | (-0.87) | (1.67) | (1.83) | (1.10) | (1.75) | (1.51) | (1.34) | (0.71) | (0.61) |
| any prior status referral | 1.899 | 1.263 | 1.17 | 1.681 | 1.138 | 1.106 | 1.167 | 1.023 | 1.212 | 2.371 | 0.988 | 1.248 |
| | (10.63)** | (3.29)** | (1.94) | (4.66)** | (1.54) | (1.10) | (0.65) | (0.21) | (1.72) | (1.95) | (-0.08) | (1.34) |
| prior property referrals =1 | 1.14 | 1.137 | 1.273 | 1.069 | 1.102 | 1.088 | 1.006 | 1.04 | 1.249 | 0.73 | 1.051 | 1.11 |
| | (1.90) | (2.07)* | (3.19)** | (0.62) | (1.39) | (1.06) | (0.03) | (0.47) | (2.31)* | (-0.97) | (0.43) | (0.75) |
| prior property referrals =2 | 1.004 | 1.175 | 1.285 | 1.151 | 1.239 | 1.224 | 1.264 | 1.138 | 1.45 | 1.677 | 1.302 | 1.121 |
| | (0.04) | (1.82) | (2.45)* | (0.96) | (2.13)* | (1.79) | (0.92) | (1.04) | (2.68)** | (1.01) | (1.57) | (0.58) |
| prior property referrals >=3 | 1.301 | 1.67 | 1.884 | 1.37 | 1.381 | 1.495 | 1.254 | 1.092 | 1.776 | 2.605 | 1.417 | 1.525 |
| | (2.64)** | (4.58)** | (5.22)** | (1.77) | (2.57)* | (2.78)** | (0.67) | (0.56) | (3.33)** | (1.25) | (1.54) | (1.68) |
| prior technical violations =1 | 1.013 | 0.893 | 0.874 | 0.678 | 0.84 | 1.268 | 0.667 | 1.231 | 0.999 | 1.733 | 1.097 | 1.327 |
| | (0.14) | (-0.87) | (-0.92) | (-1.6) | (-0.93) | (1.30) | (-0.83) | (1.09) | (-0.01) | (0.63) | (0.35) | (1.00) |
| prior technical violations >=2 | 0.91 | 0.532 | 0.658 | 1.091 | 0.748 | 1.23 | 0.935 | 1.23 | 1.322 | 0 | 1.145 | 1.301 |
| | (-0.71) | (-2.71)** | (-1.85) | (0.20) | (-1.23) | (0.73) | (-0.09) | (0.89) | (0.99) | (-24.58)** | (0.38) | (0.59) |
| Number of observations | 12,241 | 12,241 | 12,241 | 11,600 | 11,600 | 11,600 | 8,331 | 8,331 | 8,331 | 5,104 | 5,104 | 5,104 |

Robust z-statistics are shown in parentheses; estimated coefficients are displayed in incidence rate ratios, i.e., as $e^b$ rather than $b$. * significant at 5% level; ** significant at 1% level

Table 4.3: Regression Results for Re-offenses, Probation vs. Intensive Supervision Probation

| Independent Variables | dependent variable = year 1 re-offenses | | | dependent variable = year 2 re-offenses | | | dependent variable = year 3 re-offenses | | | dependent variable = year 4 re-offenses | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | violation | misdem. | felony | violation | misdem. | felony | violation | misdem. | felony | violation | misdem. | felony |
| 1995 disposition | 1.211 | 0.919 | 0.822 | 0.869 | 0.977 | 0.806 | 1.028 | 0.837 | 0.76 | 1.961 | 0.835 | 0.935 |
| | (2.63)** | (-1.03) | (-2.39)* | (-1.02) | (-0.26) | (-2.05)* | (0.13) | (-1.91) | (-2.81)** | (1.55) | (-1.78) | (-0.53) |
| 1996 disposition | 1.503 | 0.883 | 0.757 | 1.096 | 0.893 | 0.779 | 1.017 | 0.734 | 0.654 | | | |
| | (5.71)** | (-1.57) | (-3.33)** | (0.70) | (-1.25) | (-2.55)* | (0.07) | (-2.90)** | (-4.07)** | | | |
| 1997 disposition | 1.652 | 0.725 | 0.631 | 1.015 | 0.809 | 0.726 | | | | | | |
| | (6.96)** | (-3.91)** | (-5.55)** | (0.11) | (-2.20)* | (-3.05)** | | | | | | |
| ISP disposition | 1.279 | 0.934 | 0.929 | 1.062 | 0.897 | 0.918 | 0.545 | 0.868 | 0.887 | 0.835 | 1.093 | 1.382 |
| | (5.46)** | (-0.93) | (-1.03) | (0.57) | (-1.37) | (-1.01) | (-2.33)* | (-1.27) | (-0.96) | (-0.28) | (0.54) | (1.73) |
| caucasian | 0.764 | 0.901 | 0.638 | 0.764 | 0.934 | 0.577 | 0.658 | 0.872 | 0.503 | 0.956 | 1.196 | 0.653 |
| | (-4.86)** | (-1.36) | (-5.40)** | (-2.27)* | (-0.81) | (-5.58)** | (-1.64) | (-1.25) | (-5.58)** | (-0.08) | (1.16) | (-2.50)* |
| hispanic | 0.895 | 1.017 | 0.778 | 0.742 | 0.888 | 0.647 | 0.891 | 0.675 | 0.596 | 1.19 | 0.896 | 0.376 |
| | (-2.38)* | (0.27) | (-3.83)** | (-2.83)** | (-1.56) | (-4.73)** | (-0.55) | (-3.99)** | (-5.16)** | (0.39) | (-0.91) | (-6.18)** |
| other ethnic group | 0.735 | 0.964 | 0.859 | 0.693 | 0.829 | 0.416 | 0.756 | 0.788 | 1.018 | 0 | 0.611 | 0.099 |
| | (-2.18)* | (-0.2) | (-0.66) | (-1.26) | (-0.91) | (-3.02)** | (-0.36) | (-0.91) | (0.04) | (-8.80)** | (-0.83) | (-2.91)** |
| female | 0.885 | 0.515 | 0.4 | 0.848 | 0.487 | 0.284 | 0.528 | 0.488 | 0.394 | 0.274 | 0.495 | 0.556 |
| | (-1.82) | (-5.87)** | (-6.58)** | (-1.2) | (-5.52)** | (-6.88)** | (-1.9) | (-4.86)** | (-5.40)** | (-1.74) | (-2.94)** | (-2.28)* |
| age at 1st referral 13-14 | 0.917 | 1.021 | 0.994 | 1.075 | 0.95 | 0.904 | 0.592 | 0.909 | 0.802 | 0.19 | 1.011 | 0.734 |
| | (-1.52) | (0.27) | (-0.08) | (0.67) | (-0.55) | (-1.02) | (-2.67)** | (-0.84) | (-1.9) | (-3.70)** | (0.08) | (-1.8) |
| age at 1st referral 15 | 0.954 | 1.085 | 1.266 | 0.825 | 1.198 | 0.91 | 0.62 | 0.866 | 0.85 | 0.085 | 0.999 | 0.74 |
| | (-0.61) | (0.80) | (2.14)* | (-0.99) | (1.49) | (-0.69) | (-0.8) | (-0.93) | (-1.04) | (-8.19)** | 0.00 | (-1.26) |
| age at 1st referral >=16 | 0.814 | 1.293 | 1.306 | 0.406 | 0.891 | 0.684 | 0.655 | 0.822 | 0.761 | 0.067 | 0.743 | 0.866 |
| | (-2.09)* | (2.07)* | (2.05)* | (-2.01)* | (-0.82) | (-2.34)* | (-1.34) | (-1.06) | (-1.48) | (-7.44)** | (-1.18) | (-0.5) |
| age at disposition 13-14 | 1.319 | 1 | 1.539 | 1.066 | 1.277 | 1.548 | 1.507 | 1.081 | 0.84 | 1.518 | 1.255 | 0.787 |
| | (2.07)* | 0.00 | (2.29)* | (0.35) | (1.32) | (1.99)* | (1.25) | (0.33) | (-0.81) | (0.86) | (0.71) | (-0.74) |
| age at disposition 15 | 1.335 | 1.02 | 1.439 | 0.816 | 1.085 | 1.195 | 0.301 | 1.007 | 0.815 | 0 | 0.993 | 0.476 |
| | (2.07)* | (0.12) | (1.87) | (-0.97) | (0.41) | (0.76) | (-2.88)** | (0.03) | (-0.91) | (-17.60)** | (-0.02) | (-2.14)* |
| age at disposition >=16 | 0.947 | 0.916 | 1.377 | 0.147 | 1.247 | 1.487 | 0 | 0.993 | 0.696 | 0 | 0.996 | 0.448 |
| | (-0.38) | (-0.52) | (1.63) | (-7.68)** | (1.09) | (1.67) | (-42.17)** | (-0.03) | (-1.55) | (-16.59)** | (-0.01) | (-2.27)* |
| # of prior felonies = 1 | 0.961 | 0.914 | 0.847 | 0.752 | 0.956 | 1.033 | 0.787 | 0.917 | 0.849 | 1.009 | 0.88 | 1.176 |
| | (-0.63) | (-1) | (-1.59) | (-2.17)* | (-0.43) | (0.25) | (-0.84) | (-0.61) | (-1.22) | (0.01) | (-0.64) | (0.68) |
| # of prior felonies = 2 | 0.892 | 0.827 | 1.026 | 0.74 | 0.901 | 1.053 | 1.036 | 0.809 | 1.048 | 0.972 | 1.097 | 0.854 |
| | (-1.63) | (-1.94) | (0.23) | (-1.98)* | (-0.91) | (0.36) | (0.12) | (-1.33) | (0.30) | (-0.03) | (0.43) | (-0.58) |
| # of prior felonies >=3 | 0.763 | 0.784 | 1.254 | 0.541 | 0.908 | 1.09 | 0.604 | 0.81 | 1.096 | 0.242 | 0.822 | 1.013 |
| | (-3.40)** | (-2.23)* | (1.90) | (-3.35)** | (-0.74) | (0.56) | (-1.41) | (-1.19) | (0.54) | (-1.17) | (-0.8) | (0.04) |
| total # of prior referrals <=2 | 1.245 | 1.502 | 1.005 | 1.099 | 1.1 | 1.395 | 0.92 | 1.529 | 1.033 | 0.4 | 0.978 | 1.507 |
| | (2.86)** | (3.84)** | (0.05) | (0.62) | (0.82) | (2.57)* | (-0.27) | (2.94)** | (0.21) | (-1.49) | (-0.11) | (1.73) |
| total # of prior referrals =3 | 1.518 | 1.731 | 1.281 | 1.363 | 1.427 | 1.458 | 1.181 | 1.577 | 1.09 | 0.297 | 1.136 | 1.211 |
| | (4.88)** | (4.56)** | (2.00)* | (1.81) | (2.83)** | (2.55)* | (0.47) | (2.62)** | (0.49) | (-1.05) | (0.54) | (0.67) |
| total # of prior referrals >=4 | 1.694 | 2.035 | 1.344 | 1.301 | 1.559 | 1.47 | 1.636 | 1.99 | 0.99 | 0.48 | 1.195 | 1.565 |
| | (5.38)** | (5.15)** | (2.07)* | (1.29) | (3.08)** | (2.26)* | (1.22) | (3.34)** | (-0.05) | (-0.57) | (0.66) | (1.46) |
| any prior drug referral | 1.063 | 1.066 | 1.193 | 0.987 | 1.238 | 1.208 | 0.394 | 1.03 | 1.015 | 0.001 | 1.157 | 0.981 |
| | (1.25) | (0.92) | (2.59)** | (-0.11) | (2.69)** | (2.13)* | (-2.43)* | (0.29) | (0.14) | (-16.71)** | (1.10) | (-0.12) |
| any prior assault referral | 1.004 | 1.067 | 1.144 | 0.911 | 1.125 | 1.06 | 0.972 | 1.228 | 1.053 | 1.603 | 1.058 | 0.945 |
| | (0.08) | (1.01) | (2.03)* | (-0.91) | (1.58) | (0.68) | (-0.14) | (2.21)* | (0.52) | (1.00) | (0.47) | (-0.4) |
| any prior status referral | 1.541 | 1.077 | 1.076 | 1.413 | 1.09 | 1.162 | 0.944 | 0.972 | 1.191 | 1.083 | 0.977 | 1.076 |
| | (8.90)** | (0.95) | (0.93) | (2.78)** | (0.97) | (1.56) | (-0.21) | (-0.24) | (1.54) | (0.10) | (-0.15) | (0.41) |
| prior property referrals =1 | 1.368 | 1.275 | 1.314 | 1.182 | 1.038 | 1.016 | 1.297 | 1.142 | 1.29 | 1.282 | 1.234 | 1.717 |
| | (5.01)** | (2.74)** | (2.86)** | (1.29) | (0.39) | (0.14) | (1.00) | (1.12) | (1.94) | (0.49) | (1.22) | (2.73)** |
| prior property referrals =2 | 1.297 | 1.387 | 1.466 | 1.376 | 1.282 | 1.271 | 1.446 | 1.22 | 1.442 | 1.829 | 1.466 | 1.61 |
| | (3.42)** | (3.08)** | (3.48)** | (1.97)* | (2.21)* | (1.74) | (1.30) | (1.37) | (2.30)* | (0.80) | (1.92) | (1.96)* |
| prior property referrals >=3 | 1.551 | 1.746 | 2.058 | 1.648 | 1.394 | 1.478 | 1.159 | 1.311 | 1.639 | 1.902 | 1.617 | 2.39 |
| | (5.22)** | (4.73)** | (5.92)** | (2.75)** | (2.57)* | (2.57)* | (0.44) | (1.66) | (2.74)** | (0.70) | (2.05)* | (3.24)** |
| prior technical violations =1 | 1.134 | 0.722 | 0.934 | 1.112 | 0.9 | 1.288 | 0.921 | 0.909 | 0.851 | 1.676 | 0.755 | 1.255 |
| | (1.56) | (-2.67)** | (-0.54) | (0.50) | (-0.67) | (1.61) | (-0.17) | (-0.45) | (-0.83) | (0.49) | (-1.07) | (0.75) |
| prior technical violations >=2 | 1.08 | 0.556 | 0.697 | 1.16 | 1.036 | 1.463 | 1.832 | 1.115 | 1.201 | 0.001 | 0.781 | 1.645 |
| | (0.70) | (-2.86)** | (-1.8) | (0.39) | (0.18) | (1.73) | (0.86) | (0.46) | (0.68) | (-8.07)** | (-0.67) | (1.06) |
| prior adjudications >= 1 | 0.878 | 1.192 | 0.889 | 0.781 | 0.959 | 0.906 | 0.587 | 1.101 | 0.955 | 0.555 | 1.319 | 0.831 |
| | (-2.07)* | (2.03)* | (-1.28) | (-1.64) | (-0.43) | (-0.92) | (-1.52) | (0.72) | (-0.34) | (-0.71) | (1.80) | (-0.88) |
| Number of observations | 6,434 | 6,434 | 6,434 | 5,987 | 5,987 | 5,987 | 3,912 | 3,912 | 3,912 | 2,117 | 2,117 | 2,117 |

Robust z-statistics are shown in parentheses; estimated coefficients are displayed in incidence rate ratios, i.e., as $e^b$ rather than $b$. * significant at 5% level; ** significant at 1% level

Table 4.4: Regression Results for Re-offenses, Intensive Supervision Probation vs. Placement

| | dependent variable = year 1 re-offenses | | | dependent variable = year 2 re-offenses | | | dependent variable = year 3 re-offenses | | | dependent variable = year 4 re-offenses | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Independent Variable | violation | misdem. | felony | violation | misdem. | felony | violation | misdem. | felony | violation | misdem. | felony |
| 1995 disposition | 0.889 | 1.127 | 0.977 | 1 | 0.922 | 0.901 | 1.038 | 1.036 | 0.875 | 0.832 | 1.132 | 1.075 |
| | (-1.35) | (0.78) | (-0.17) | 0.00 | (-0.76) | (-0.91) | (0.13) | (0.31) | (-1.15) | (-0.32) | (0.93) | (0.54) |
| 1996 disposition | 0.952 | 1.165 | 0.768 | 1.236 | 0.749 | 0.798 | 0.669 | 0.925 | 0.711 | | | |
| | (-0.63) | (1.06) | (-2.02)* | (1.31) | (-2.76)** | (-1.96) | (-1.35) | (-0.63) | (-2.83)** | | | |
| 1997 disposition | 0.991 | 0.862 | 0.705 | 1.171 | 0.608 | 0.832 | | | | | | |
| | (-0.12) | (-1) | (-2.53)* | (1.00) | (-4.27)** | (-1.5) | | | | | | |
| placement disposition | 0.494 | 0.392 | 0.399 | 0.983 | 1.09 | 1.336 | 1.191 | 1.635 | 1.365 | 1.173 | 1.079 | 1.087 |
| | (-14.45)** | (-9.27)** | (-9.34)** | (-0.14) | (0.98) | (3.07)** | (0.57) | (3.93)** | (2.59)** | (0.26) | (0.42) | (0.45) |
| caucasian | 1.021 | 0.882 | 0.702 | 1.01 | 0.769 | 0.627 | 0.846 | 0.645 | 0.666 | 2.163 | 1.048 | 0.543 |
| | (0.29) | (-0.94) | (-2.56)* | (0.07) | (-2.30)* | (-3.63)** | (-0.42) | (-3.03)** | (-2.52)* | (1.03) | (0.22) | (-2.69)** |
| hispanic | 0.89 | 0.869 | 0.728 | 0.946 | 0.945 | 0.766 | 0.971 | 0.859 | 0.669 | 4.242 | 1.042 | 0.683 |
| | (-2.02)* | (-1.3) | (-3.09)** | (-0.43) | (-0.6) | (-2.68)** | (-0.11) | (-1.35) | (-3.54)** | (1.72) | (0.27) | (-2.38)* |
| other ethnic group | 0.955 | 0.685 | 1.082 | 0.764 | 1.209 | 0.304 | 0.011 | 1.226 | 1.479 | 0.085 | 0.881 | 0.236 |
| | (-0.3) | (-0.88) | (0.28) | (-0.71) | (0.80) | (-3.39)** | (-7.87)** | (0.57) | (0.70) | (-1.93) | (-0.26) | (-1.54) |
| female | 1.049 | 0.461 | 0.465 | 0.821 | 0.579 | 0.28 | 0.81 | 0.482 | 0.368 | 0 | 0.329 | 0.267 |
| | (0.60) | (-4.08)** | (-3.49)** | (-1.12) | (-3.15)** | (-5.58)** | (-0.55) | (-3.72)** | (-3.71)** | (-24.77)** | (-3.40)** | (-3.24)** |
| age at 1st referral 13-14 | 1.006 | 1.03 | 1.046 | 0.914 | 0.973 | 0.902 | 1.018 | 0.936 | 0.762 | 0.153 | 1.208 | 0.931 |
| | (0.10) | (0.24) | (0.39) | (-0.72) | (-0.28) | (-0.98) | (0.07) | (-0.54) | (-2.21)* | (-2.26)* | (1.10) | (-0.43) |
| age at 1st referral 15 | 0.888 | 1.034 | 1.273 | 0.954 | 1.008 | 0.93 | 0.029 | 1.107 | 0.736 | 0.092 | 1.317 | 0.992 |
| | (-1.24) | (0.18) | (1.42) | (-0.19) | (0.06) | (-0.47) | (-7.71)** | (0.57) | (-1.64) | (-4.06)** | (1.14) | (-0.03) |
| age at 1st referral >=16 | 0.977 | 1.288 | 1.213 | 0.59 | 0.755 | 0.751 | 0.772 | 0.773 | 0.8 | 0.241 | 1.012 | 0.953 |
| | (-0.17) | (0.95) | (0.86) | (-1.07) | (-1.39) | (-1.25) | (-0.78) | (-0.94) | (-0.84) | (-2.25)* | (0.02) | (-0.13) |
| age at disposition 13-14 | 0.953 | 0.855 | 2.285 | 0.848 | 1.052 | 1.119 | 1.107 | 0.986 | 1.755 | 0.623 | 1.701 | 0.571 |
| | (-0.31) | (-0.55) | (2.44)* | (-0.88) | (0.21) | (0.44) | (0.23) | (-0.05) | (1.75) | (-0.63) | (1.04) | (-1.71) |
| age at disposition 15 | 0.912 | 0.99 | 2.667 | 0.552 | 1.08 | 1.182 | 0.186 | 1.075 | 2.115 | 0 | 1.195 | 0.638 |
| | (-0.56) | (-0.03) | (2.78)** | (-2.66)** | (0.30) | (0.64) | (-2.88)** | (0.25) | (2.28)* | (-24.55)** | (0.35) | (-1.33) |
| age at disposition >=16 | 0.643 | 0.976 | 2.35 | 0.118 | 1.189 | 1.247 | 0.001 | 1.015 | 1.675 | 0 | 1.122 | 0.629 |
| | (-2.57)* | (-0.08) | (2.36)* | (-7.51)** | (0.67) | (0.83) | (-13.30)** | (0.05) | (1.50) | (-21.92)** | (0.22) | (-1.35) |
| # of prior felonies = 1 | 0.84 | 0.946 | 0.849 | 0.596 | 0.942 | 1.196 | 1.516 | 0.987 | 1.893 | 16,733,376 | 0.648 | 1.856 |
| | (-1.86) | (-0.25) | (-0.76) | (-2.55)* | (-0.36) | (0.90) | (0.83) | (-0.05) | (1.99)* | (11.93)** | (-1.14) | (1.42) |
| # of prior felonies = 2 | 0.744 | 1.009 | 1.234 | 0.541 | 0.976 | 1.684 | 1.572 | 1.221 | 2.304 | 5,074,789 | 0.933 | 1.667 |
| | (-3.03)** | (0.04) | (0.98) | (-3.19)** | (-0.14) | (2.70)** | (0.80) | (0.83) | (2.67)** | (8.49)** | (-0.19) | (1.19) |
| # of prior felonies >=3 | 0.699 | 0.911 | 1.275 | 0.424 | 0.955 | 2.028 | 0.895 | 1.318 | 2.496 | 2,398,024 | 0.74 | 1.699 |
| | (-3.43)** | (-0.41) | (1.11) | (-3.96)** | (-0.26) | (3.54)** | (-0.19) | (1.10) | (2.90)** | (8.76)** | (-0.82) | (1.22) |
| total # of prior referrals <=2 | 1.488 | 1.245 | 0.939 | 0.958 | 1.236 | 1.195 | 2.23 | 1.563 | 1.186 | 1.766 | 0.751 | 4.212 |
| | (2.72)** | (0.83) | (-0.24) | (-0.17) | (0.87) | (0.66) | (1.11) | (1.60) | (0.52) | (0.52) | (-0.57) | (2.65)** |
| total # of prior referrals =3 | 1.557 | 1.484 | 1.099 | 1.089 | 1.653 | 1.2 | 4.015 | 1.113 | 0.935 | 3.759 | 0.685 | 2.791 |
| | (2.97)** | (1.41) | (0.37) | (0.31) | (2.14)* | (0.66) | (1.93) | (0.35) | (-0.2) | (1.04) | (-0.75) | (1.98)* |
| total # of prior referrals >=4 | 1.81 | 1.955 | 1.458 | 1.527 | 1.955 | 1.136 | 6.503 | 1.416 | 1.155 | 19.179 | 0.69 | 2.539 |
| | (3.75)** | (2.27)* | (1.42) | (1.33) | (2.80)** | (0.46) | (2.58)** | (1.15) | (0.43) | (2.26)* | (-0.71) | (1.76) |
| any prior drug referral | 1.073 | 1.032 | 1.22 | 0.754 | 1.278 | 1.093 | 1.227 | 1.09 | 1.124 | 0 | 1.139 | 0.933 |
| | (1.22) | (0.26) | (2.02)* | (-1.89) | (2.64)** | (1.00) | (0.71) | (0.75) | (1.08) | (-22.00)** | (0.84) | (-0.44) |
| any prior assault referral | 0.973 | 0.992 | 1.056 | 0.988 | 1.176 | 1.032 | 1.104 | 1.102 | 1.017 | 0.706 | 1.146 | 0.848 |
| | (-0.52) | (-0.08) | (0.55) | (-0.11) | (1.91) | (0.35) | (0.40) | (0.94) | (0.17) | (-0.56) | (1.00) | (-1.18) |
| any prior status referral | 1.247 | 1.042 | 1.159 | 1.302 | 1.085 | 1.289 | 0.796 | 1.009 | 1.015 | 0.408 | 1.057 | 1.279 |
| | (3.93)** | (0.37) | (1.39) | (1.95) | (0.85) | (2.68)** | (-0.82) | (0.07) | (0.14) | (-0.96) | (0.37) | (1.71) |
| prior property referrals =1 | 1.448 | 1.009 | 0.988 | 1.182 | 0.969 | 1.118 | 0.403 | 1.01 | 0.984 | 2.751 | 1.506 | 1.399 |
| | (4.15)** | (0.05) | (-0.07) | (0.82) | (-0.23) | (0.74) | (-2.17)* | (0.06) | (-0.08) | (1.48) | (1.70) | (1.31) |
| prior property referrals =2 | 1.503 | 1.173 | 1.206 | 1.069 | 1.135 | 1.476 | 0.624 | 0.912 | 1.376 | 0.861 | 1.151 | 1.283 |
| | (4.19)** | (0.90) | (1.03) | (0.28) | (0.82) | (2.37)* | (-1.08) | (-0.5) | (1.49) | (-0.16) | (0.50) | (0.87) |
| prior property referrals >=3 | 1.637 | 1.558 | 1.532 | 1.327 | 1.271 | 1.513 | 0.535 | 1.187 | 1.163 | 0.304 | 2.128 | 1.703 |
| | (4.86)** | (2.32)* | (2.20)* | (1.20) | (1.50) | (2.56)* | (-1.43) | (0.94) | (0.70) | (-1.26) | (2.81)** | (1.86) |
| prior technical violations =1 | 1.287 | 1.104 | 1.199 | 1.029 | 1.057 | 1.171 | 0.839 | 0.963 | 1.146 | 0.486 | 0.991 | 1.112 |
| | (3.32)** | (0.71) | (1.47) | (0.16) | (0.49) | (1.45) | (-0.44) | (-0.25) | (0.98) | (-0.86) | (-0.05) | (0.55) |
| prior technical violations >=2 | 1.21 | 0.835 | 1.184 | 0.903 | 1.088 | 1.001 | 0.814 | 0.92 | 0.965 | 0 | 1.129 | 0.993 |
| | (2.04)* | (-0.95) | (0.98) | (-0.47) | (0.57) | 0.00 | (-0.34) | (-0.41) | (-0.18) | (-14.57)** | (0.46) | (-0.03) |
| prior adjudications >= 1 | 0.758 | 0.897 | 0.853 | 0.681 | 0.841 | 0.919 | 1.249 | 0.957 | 0.775 | 1.181 | 1.04 | 0.73 |
| | (-3.79)** | (-0.82) | (-1.33) | (-2.40)* | (-1.65) | (-0.81) | (0.72) | (-0.32) | (-1.88) | (0.18) | (0.24) | (-1.64) |
| prior placement >=1 | 1.098 | 1.484 | 0.894 | 1.279 | 1.216 | 0.951 | 0.467 | 1.057 | 1.329 | 0 | 0.802 | 1.74 |
| | (1.21) | (2.49)* | (-0.7) | (1.39) | (1.61) | (-0.38) | (-1.58) | (0.33) | (1.84) | (-23.34)** | (-1) | (2.55)* |
| number of observations | 3,648 | 3,648 | 3,648 | 3,353 | 3,353 | 3,353 | 2,182 | 2,182 | 2,182 | 1,199 | 1,199 | 1,199 |

Robust z-statistics are shown in parentheses; estimated coefficients are displayed in incidence rate ratios, i.e., as $e^b$ rather than $b$. * significant at 5% level; ** significant at 1% level

Table 4.5: Regression Results for Re-offenses, Local vs. TYC Placement

| | dependent variable = year 1 re-offenses | | | dependent variable = year 2 re-offenses | | | dependent variable = year 3 re-offenses | | | dependent variable = year 4 re-offenses | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Independent Variable | violation | misdem. | felony | violation | misdem. | felony | violation | misdem. | felony | violation | misdem. | felony |
| 1995 disposition | 0.841 | 1.049 | 0.927 | 1.034 | 0.962 | 0.876 | 1.113 | 1.047 | 0.888 | 0.56 | 1.014 | 1.004 |
| | (-1.68) | (0.32) | (-0.56) | (0.21) | (-0.42) | (-1.43) | (0.35) | (0.46) | (-1.17) | (-0.74) | (0.12) | (0.03) |
| 1996 disposition | 0.839 | 0.895 | 0.66 | 1.099 | 0.72 | 0.749 | 0.526 | 0.963 | 0.718 | | | |
| | (-1.8) | (-0.69) | (-2.89)** | (0.51) | (-3.25)** | (-2.88)** | (-1.79) | (-0.33) | (-2.78)** | | | |
| 1997 disposition | 0.764 | 0.5 | 0.416 | 1.028 | 0.527 | 0.628 | | | | | | |
| | (-2.74)** | (-3.76)** | (-4.92)** | (0.15) | (-5.54)** | (-4.02)** | | | | | | |
| TYC disposition | 0.031 | 0.671 | 0.65 | 0.131 | 0.882 | 1.003 | 0.056 | 0.737 | 0.943 | 0 | 0.89 | 0.791 |
| | (-12.30)** | (-2.94)** | (-3.52)** | (-6.88)** | (-1.41) | (0.04) | (-2.81)** | (-2.98)** | (-0.58) | (-15.98)** | (-0.84) | (-1.64) |
| caucasian | 1.199 | 0.868 | 0.804 | 1.231 | 0.734 | 0.716 | 0.863 | 0.658 | 0.754 | 2.519 | 0.966 | 0.746 |
| | (1.96) | (-0.87) | (-1.24) | (1.17) | (-2.71)** | (-2.79)** | (-0.3) | (-2.94)** | (-1.75) | (1.09) | (-0.16) | (-1.45) |
| hispanic | 0.955 | 0.96 | 0.79 | 1.257 | 0.873 | 0.796 | 1.065 | 0.903 | 0.666 | 2.674 | 1.04 | 0.721 |
| | (-0.58) | (-0.31) | (-1.92) | (1.50) | (-1.5) | (-2.66)** | (0.21) | (-0.96) | (-3.94)** | (1.14) | (0.28) | (-2.18)* |
| other ethnic group | 1.142 | 1.043 | 0.663 | 0.887 | 1.062 | 0.719 | 0 | 0.899 | 0.478 | 0.035 | 0.536 | 0.343 |
| | (0.61) | (0.07) | (-0.87) | (-0.27) | (0.21) | (-0.87) | (-19.46)** | (-0.29) | (-1.34) | (-1.98)* | (-1.07) | (-1.11) |
| female | 1.011 | 0.463 | 0.263 | 0.813 | 0.572 | 0.283 | 0.821 | 0.466 | 0.361 | 0 | 0.329 | 0.31 |
| | (0.12) | (-3.46)** | (-4.22)** | (-0.99) | (-3.11)** | (-6.17)** | (-0.47) | (-3.97)** | (-3.94)** | (-15.55)** | (-3.82)** | (-3.12)** |
| age at 1st referral 13-14 | 0.988 | 0.953 | 1.083 | 0.873 | 1.01 | 0.947 | 1.119 | 0.979 | 0.923 | 0.185 | 1.057 | 0.882 |
| | (-0.14) | (-0.34) | (0.59) | (-0.98) | (0.10) | (-0.61) | (0.38) | (-0.2) | (-0.69) | (-2.11)* | (0.34) | (-0.85) |
| age at 1st referral 15 | 0.775 | 1.021 | 1.151 | 0.669 | 1.083 | 0.917 | 0 | 1.171 | 1.044 | 0.053 | 1.011 | 0.932 |
| | (-1.85) | (0.10) | (0.66) | (-1.37) | (0.54) | (-0.61) | (-24.26)** | (0.97) | (0.24) | (-3.76)** | (0.05) | (-0.28) |
| age at 1st referral >=16 | 0.882 | 0.96 | 1.149 | 0.742 | 0.759 | 0.684 | 0 | 0.826 | 1.164 | 0.205 | 0.803 | 0.528 |
| | (-0.61) | (-0.13) | (0.43) | (-0.48) | (-1.2) | (-1.69) | (-12.28)** | (-0.69) | (0.64) | (-1.65) | (-0.5) | (-1.47) |
| age at disposition 13-14 | 0.882 | 0.708 | 8.001 | 0.84 | 0.877 | 1.206 | 0.91 | 0.994 | 1.435 | 0.515 | 1.333 | 0.628 |
| | (-0.63) | (-0.97) | (2.19)* | (-0.75) | (-0.52) | (0.61) | (-0.18) | (-0.02) | (1.18) | (-0.93) | (0.49) | (-1.44) |
| age at disposition 15 | 0.81 | 0.739 | 10.57 | 0.571 | 0.864 | 1.419 | 0.176 | 1.135 | 1.457 | 0 | 1.035 | 0.661 |
| | (-1.02) | (-0.84) | (2.48)* | (-2.00)* | (-0.56) | (1.13) | (-2.51)* | (0.37) | (1.21) | (-24.61)** | (0.06) | (-1.22) |
| age at disposition >=16 | 0.612 | 0.987 | 10.169 | 0.11 | 1.008 | 1.374 | 0.019 | 1.021 | 1.229 | 0 | 0.912 | 0.71 |
| | (-2.29)* | (-0.03) | (2.43)* | (-6.48)** | (0.03) | (1.01) | (-3.47)** | (0.06) | (0.65) | (-22.38)** | (-0.16) | (-0.99) |
| # of prior felonies = 1 | 0.876 | 0.897 | 0.905 | 0.598 | 0.928 | 1.144 | 1.117 | 0.952 | 1.734 | 11,763,180 | 0.681 | 1.672 |
| | (-1.14) | (-0.41) | (-0.33) | (-2.20)* | (-0.43) | (0.65) | (0.21) | (-0.2) | (1.74) | (14.90)** | (-0.96) | (1.09) |
| # of prior felonies = 2 | 0.754 | 0.925 | 1.426 | 0.488 | 0.895 | 1.539 | 1.32 | 1.044 | 2.006 | 2,893,378 | 0.931 | 1.618 |
| | (-2.23)* | (-0.29) | (1.21) | (-3.27)** | (-0.59) | (2.11)* | (0.44) | (0.18) | (2.27)* | (8.89)** | (-0.2) | (1.01) |
| # of prior felonies >=3 | 0.757 | 0.848 | 1.303 | 0.429 | 0.991 | 1.784 | 0.729 | 1.206 | 2.136 | 1,782,571 | 0.795 | 1.653 |
| | (-2.02)* | (-0.58) | (0.88) | (-3.69)** | (-0.05) | (2.77)** | (-0.49) | (0.75) | (2.44)* | (7.03)** | (-0.63) | (1.05) |
| total # of prior referrals <=2 | 1.727 | 2.19 | 2.099 | 0.629 | 1.187 | 0.931 | 4.14 | 1.182 | 0.971 | 1.313 | 0.921 | 2.281 |
| | (1.88) | (0.99) | (1.10) | (-1.21) | (0.59) | (-0.2) | (1.32) | (0.48) | (-0.09) | (0.24) | (-0.15) | (1.45) |
| total # of prior referrals =3 | 1.85 | 2.61 | 1.994 | 0.918 | 1.446 | 1.179 | 4.665 | 1.073 | 1.008 | 4.31 | 1.142 | 2.663 |
| | (2.19)* | (1.21) | (1.06) | (-0.23) | (1.36) | (0.50) | (1.33) | (0.20) | (0.03) | (0.98) | (0.24) | (1.91) |
| total # of prior referrals >=4 | 2.02 | 4.587 | 3.029 | 1.288 | 1.796 | 1.062 | 10.604 | 1.257 | 1.2 | 38.862 | 1.156 | 2.058 |
| | (2.40)* | (1.95) | (1.71) | (0.58) | (2.16)* | (0.18) | (2.17)* | (0.65) | (0.55) | (2.25)* | (0.25) | (1.40) |
| any prior drug referral | 1.012 | 0.908 | 1.033 | 0.719 | 1.315 | 1.072 | 1.423 | 1.109 | 1.193 | 0 | 1.033 | 0.986 |
| | (0.16) | (-0.72) | (0.28) | (-1.89) | (3.15)** | (0.88) | (1.19) | (1.03) | (1.79) | (-15.85)** | (0.22) | (-0.1) |
| any prior assault referral | 0.935 | 0.935 | 0.991 | 1.125 | 1.263 | 1.159 | 1.351 | 1.193 | 1.067 | 0.314 | 1.175 | 0.978 |
| | (-0.97) | (-0.57) | (-0.08) | (0.94) | (2.76)** | (1.84) | (1.11) | (1.82) | (0.66) | (-1.92) | (1.22) | (-0.17) |
| any prior status referral | 1.314 | 1.087 | 1.185 | 1.336 | 1.047 | 1.164 | 0.709 | 1.025 | 1.075 | 0.284 | 1.108 | 1.542 |
| | (3.69)** | (0.68) | (1.46) | (1.99)* | (0.52) | (1.93) | (-1.14) | (0.25) | (0.76) | (-0.92) | (0.74) | (3.27)** |
| prior property referrals =1 | 1.326 | 1.086 | 1.011 | 1.172 | 0.982 | 0.969 | 0.311 | 0.984 | 1.05 | 0.942 | 1.524 | 1.198 |
| | (2.44)* | (0.35) | (0.05) | (0.59) | (-0.13) | (-0.21) | (-2.27)* | (-0.1) | (0.28) | (-0.09) | (1.80) | (0.72) |
| prior property referrals =2 | 1.269 | 1.088 | 1.203 | 0.923 | 1.21 | 1.463 | 0.424 | 1.053 | 1.266 | 0.638 | 1.12 | 1.177 |
| | (1.81) | (0.35) | (0.74) | (-0.27) | (1.22) | (2.48)* | (-1.8) | (0.30) | (1.23) | (-0.44) | (0.42) | (0.62) |
| prior property referrals >=3 | 1.448 | 1.756 | 1.58 | 1.329 | 1.385 | 1.54 | 0.456 | 1.192 | 1.318 | 0.13 | 1.648 | 1.549 |
| | (2.78)** | (2.35)* | (1.87) | (0.98) | (2.10)* | (2.91)** | (-1.63) | (1.03) | (1.45) | (-2.00)* | (1.93) | (1.70) |
| prior technical violations =1 | 1.53 | 1.464 | 1.222 | 0.914 | 1.017 | 1.133 | 0.947 | 0.938 | 1.016 | 1.686 | 1.125 | 0.993 |
| | (4.10)** | (2.51)* | (1.35) | (-0.51) | (0.16) | (1.29) | (-0.13) | (-0.51) | (0.13) | (0.98) | (0.73) | (-0.04) |
| prior technical violations >=2 | 1.503 | 1.175 | 1.416 | 0.969 | 1.127 | 1.068 | 0.752 | 0.905 | 0.987 | 0 | 1.165 | 0.968 |
| | (3.30)** | (0.89) | (1.99)* | (-0.14) | (0.95) | (0.58) | (-0.44) | (-0.62) | (-0.09) | (-10.71)** | (0.74) | (-0.16) |
| prior adjudications >= 1 | 0.633 | 0.851 | 1.043 | 0.668 | 0.871 | 0.908 | 1.076 | 0.942 | 0.875 | 0.238 | 1.057 | 0.949 |
| | (-4.19)** | (-0.89) | (0.24) | (-2.08)* | (-1.23) | (-0.91) | (0.21) | (-0.49) | (-1.04) | (-2.05)* | (0.34) | (-0.29) |
| prior placement >=1 | 1.123 | 1.409 | 1.022 | 1.308 | 1.187 | 1.034 | 0.495 | 1.119 | 1.137 | 0 | 0.833 | 1.32 |
| | (1.33) | (2.38)* | (0.16) | (1.49) | (1.72) | (0.37) | (-1.5) | (0.89) | (1.07) | (-25.94)** | (-1.07) | (1.62) |
| number of observations | 3,566 | 3,566 | 3,566 | 3,301 | 3,301 | 3,301 | 2,375 | 2,375 | 2,375 | 1,492 | 1,492 | 1,492 |

Robust z-statistics are shown in parentheses; estimated coefficients are displayed in incidence rate ratios, i.e., as $e^b$ rather than $b$. * significant at 5% level; ** significant at 1% level

disposition dummy variable. In turn, statistical significance of the dummy determines whether predicted differences fall within a narrow or wide range. If the range is wide enough to include, at a 95% probability level, the possibility of change in sign, i.e., from an increase to decrease in re-offenses or vice versa, then the result is not statistically significant at that level.

Table 4.6, produced by running the model for each disposition pair and year (i.e., 48 times, as detailed in the 48 columns of Tables 4.2 through 4.5), gives the results of our re-offense simulations. Statistically significant ones are highlighted in bold typeface. For instance, a change in disposition from deferred prosecution to probation for 100 juveniles produces an estimated increase of 20.9 technical violation and status re-offenses in the first year, with a 95% probability that the true figure lies between 17.1 and 24.9, and 1.5 such re-offenses in the second year (in a range of 0.0 to 3.7). There are no differences in years three and four. This increase results from the combination of scrutiny that offenders receive from probation officers and imposition of court orders that they must follow. Juveniles do not necessarily behave differently under probation than under deferred prosecution. It is just that their misbehavior is spotted.

As a result of being picked up for technical violation and status re-offenses in the first two years, the number of misdemeanors declines, by 5.4 offenses in the first year and 3.6 in the second year. The table shows figures for third and fourth year misdemeanors, but they are statistically insignificant because the disposition dummy is insignificant and/or because the change in sign between their upper and lower bounds, implying that there is a non-negligible chance of a zero (i.e., no) difference, renders them insignificant. The same applies to felonies in all but the third year, for which the model predicts an increase of 3.9 offenses.

Additional monitoring imposed by shifting to intensive supervision from regular probation yields only one significant result, a rise of 11.7 technical violation and status re-offenses in the first year. Wider impacts show up with the offense suppression effect of incarceration, as when local placement substitutes for intensive supervision. There are large first-year declines in violations (31.8), misdemeanors (16.4), and felonies (15.2). These are followed by increases: 6.5 felonies in year two, and 14.4 misdemeanors and 6.7 felonies in year three. Similarly, when more secure TYC substitutes for local placement, significant drops in violations appear during the initial three years, in misdemeanors during the first and third years, and in felonies during the first year.

The right-most column of the Table, showing the net number of all re-offenses (mid-points only), gives a sense of the aggregate effect. Probation in lieu of deferred prosecution produces a rise of 14.4 re-offenses in the first year, followed by a decline of 4.8 in the second, and small increases in the third and fourth. Intensive Supervision Probation (ISP) in lieu of regular probation yields effects similar to the preceding in the first two years, followed by a rise in the third and decline in the fourth. Local placement in lieu of ISP produces a big decline in the first year, a drop of 63.4 re-offenses, followed by increases in subsequent periods. TYC in lieu of local placement produces systematic declines in all four years.

Table 4.6: Estimated Difference in Number of Re-offenses Resulting from Change in Initial Disposition, per 100 juveniles, by offense class and year

| Initial Disposition | year | violations | | | misdemeanors | | | felonies | | | *total (mid-points)* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | lower bound | mid-point | upper bound | lower bound | mid-point | upper bound | lower bound | mid-point | upper bound | |
| Probation rather than Deferred Prosecution | 1 | **17.1** | **20.9** | **24.9** | **(8.5)** | **(5.4)** | **(2.2)** | (4.0) | (1.1) | 1.9 | *14.4* |
| | 2 | **0.0** | **1.5** | **3.7** | **(6.9)** | **(3.6)** | **(0.1)** | (5.3) | (2.7) | 0.0 | *(4.8)* |
| | 3 | 0.0 | 0.0 | 0.0 | (5.6) | (1.6) | 2.6 | **0.3** | **3.9** | **7.7** | *2.3* |
| | 4 | 0.0 | 0.0 | 0.0 | (4.1) | 0.8 | 6.2 | (4.2) | (0.7) | 3.2 | *0.1* |
| Intensive Supervision rather than Probation | 1 | **5.3** | **11.7** | **18.5** | (6.8) | (1.8) | 3.5 | (6.4) | (1.8) | 3.2 | *8.1* |
| | 2 | (2.3) | 0.4 | 3.4 | (7.6) | (2.6) | 2.7 | (5.9) | (1.6) | 3.1 | *(3.8)* |
| | 3 | 0.0 | 0.0 | 0.0 | (9.9) | (3.4) | 3.8 | (8.1) | (2.3) | 4.3 | *(5.7)* |
| | 4 | 0.0 | 0.0 | 0.0 | (8.0) | 2.3 | 15.0 | (2.7) | 5.7 | 16.2 | *8.0* |
| Local Placement rather than Intensive Supervision | 1 | **(39.0)** | **(31.8)** | **(24.6)** | **(21.8)** | **(16.4)** | **(11.1)** | **(20.2)** | **(15.2)** | **(10.2)** | *(63.4)* |
| | 2 | (3.6) | (0.1) | 3.3 | (4.7) | 2.1 | 8.9 | **0.0** | **6.5** | **13.2** | *8.5* |
| | 3 | (0.1) | 0.0 | 0.1 | **3.9** | **14.4** | **25.2** | **0.0** | **6.7** | **14.7** | *21.1* |
| | 4 | 0.0 | 0.0 | 0.0 | (13.3) | 2.1 | 16.7 | (10.6) | 1.8 | 13.2 | *3.9* |
| TYC Placement rather than Local Placement | 1 | **(40.8)** | **(37.5)** | **(34.1)** | **(7.1)** | **(3.6)** | **0.0** | **(7.4)** | **(3.8)** | **(0.1)** | *(44.9)* |
| | 2 | **(10.1)** | **(7.8)** | **(5.4)** | (11.6) | (3.9) | 4.2 | (7.3) | 0.1 | 7.8 | *(11.6)* |
| | 3 | **(0.2)** | **(0.1)** | **0.0** | **(20.0)** | **(10.5)** | **(0.6)** | (10.4) | (1.7) | 7.5 | *(12.3)* |
| | 4 | 0.0 | 0.0 | 0.0 | (14.8) | (3.4) | 8.9 | (14.8) | (5.5) | 4.5 | *(8.9)* |

Notes: 1. Figures highlighted in **bold typeface** are statistically significant at a 5% probability level
2 . Numbers in parentheses are negative, indicating fewer re-offenses compared to the milder sanction.

Figures in Table 4.6 are for shifts from milder to harsher dispositions. Movement in the opposite direction, from harsher to milder, involve change of sign. Thus, assigning 100 juveniles to deferred prosecution in lieu of probation would result in a first year decrease of 20.9 violations, mainly because there are no court orders to follow and because wrongdoing is undetected. Likewise, intensive supervision in lieu of local placement, according to the model, would result in a first year rise of 31.8 violations, 16.4 misdemeanors, and 15.2 felonies. And local in lieu of TYC placement, shifting away from stringent incarceration, would yield systematic increases in re-offenses during all years.

The foregoing estimates of differences in re-offenses are largely the result of and run together with differences in predicted re-dispositions. We estimated these using a procedure similar to that for offenses, with two modifications. One is that there is no manipulation of disposition dummy variables. Instead, we derive them from estimated coefficients of re-offense variables in re-disposition models. That is, rather than using actual numbers of re-dispositions for re-offenders, we apply statistical models to generate expected numbers of re-dispositions for a given number of predicted re-offenses. We do this because, given that the first step in our analytical procedure is simulation of differences in numbers of re-offenses of various kinds between pairs of disposition cohorts, subsequent steps involving re-dispositions must maintain the same underlying assumptions.

Thus in our re-disposition model we try to account for relationships that are likely to exist between a juvenile's initial disposition, his or her offense and other characteristics, re-offense pattern, and the probability of being re-adjudicated in each year of the follow-up period. Setting number of re-dispositions as the dependent variable, and re-offense counts and other offender characteristics as the independent variables, we estimate coefficients for re-offenses. These coefficients represent the estimated number of re-dispositions for each re-offense. We then use them to generate re-disposition predictions for each cohort.

Turning to the second modification, whereas the re-offense prediction models involve separate estimates for each of three offense classes for every year of follow-up, we estimate type of re-disposition by applying the County's actual disposition distribution pattern to total re-disposition counts. Our re-disposition models thus consist of only five equations. Three equations, shown in Table 4.7, are for first and second year re-dispositions in the juvenile system, the third equation capturing a time-lag effect in our data of large numbers of first-year offenses adjudicated during the second year. We do not apply the equations to juvenile data for the third and fourth years because the number of juvenile re-dispositions in these years is small and because results are statistically insignificant. For these later years we apply two equations to the sub-sample of adult data (see Table 4.8).

Because the re-disposition models use only cases that have at least one re-offense during the follow-up period, resulting in a smaller number of valid cases, we impose another restriction. Instead of predicting re-dispositions for each offense class, feasible only for first and second year juvenile data, our estimates for years three and four predict re-dispositions for all offenses combined.

To clarify, the procedure is as follows. First, regression equations in Tables 4.7 and 4.8 produce the re-disposition estimates in Table 4.9, which shows predicted number of re-dispositions that result from 100 new technical and status violations, misdemeanors, or felonies committed in every year of follow-up by the initial disposition cohorts. Each prediction is a mid-point estimate, situated between lower and upper bounds set at the 95% probability level. Thus our model predicts that for every 100 misdemeanors by individuals who initially receive ISP in lieu of regular probation, there will be 50.3 re-dispositions (in a range of 46.0 to 55.1) during the first year, and 12.0 (in a range of 10.0 to 14.3) in the second year. Note that probability ranges, narrow in the first two years, are often wide in subsequent years; for example, less than 2 to nearly 200 in the third year for local placement in lieu of ISP. This is mainly the effect of small sample size.

Second, to arrive at estimated differences in total re-dispositions, given in Table 4.10 (mid-points only), that result from a change in the initial disposition of 100 juveniles, we multiply the figures in Table 4.9 by the corresponding number of re-offenses in Table 4.6. For example, here using only mid-points to simplify presentation, Table 4.6 indicates that there will be 6.5 additional felonies in the second year if 100 offenders are given placement rather than ISP, and Table 4.9 indicates that there will be 16.1 re-dispositions for every 100 felonies committed by this cohort. Multiplication of the two figures yields the prediction, contained in Table 4.10, that there will be one additional re-disposition in the second year (or, conversely, one less redisposition if 100 offenders are initially given ISP rather than placement).

Table 4.7: Regression Results for Juvenile Re-dispositions

| Independent Variables | dependent variable = 1st year re-dispositions | dependent variable = 2nd yr. re-dispositions for year 2 re-offenses | dependent variable = 2nd yr. re-dispositions for year 1 re-offenses |
|---|---|---|---|
| caucasian | 0.953 | 0.884 | 0.906 |
| | (-1.21) | (-2.17)* | (1.56) |
| hispanic | 1.125 | 1.03 | 0.958 |
| | (3.73)** | (0.62) | (-0.76) |
| other ethnic group | 1.071 | 0.919 | 0.882 |
| | (0.62) | (0.56) | (-0.69) |
| female | 0.846 | 0.7 | 0.701 |
| | (-3.68)** | (-4.25)** | (-4.00)** |
| age at 1st referral 13-14 | 0.987 | 0.929 | 0.943 |
| | (-0.36) | (1.44) | (-0.92) |
| age at 1st referral 15 | 0.896 | 0.863 | 0.763 |
| | (-1.99)* | (1.54) | (-2.58)** |
| age at 1st referral >=16 | 0.693 | 0.309 | 0.239 |
| | (-4.27)** | (-2.82)** | (-4.79)** |
| age at disposition 13-14 | 0.961 | 1.078 | 1.021 |
| | (-0.51) | (0.89) | (0.21) |
| age at disposition 15 | 0.911 | 0.864 | 0.857 |
| | (-1.13) | (1.46) | (1.39) |
| age at disposition >=16 | 0.673 | 0.107 | 0.181 |
| | (-4.46)** | (-12.56)** | (-11.03)** |
| no. of prior felonies = 1 | 1.171 | 0.987 | 0.939 |
| | (3.53)** | (-0.23) | (-1.0) |
| no. of prior felonies = 2 | 1.083 | 1.054 | 0.955 |
| | (1.55) | (0.73) | (-0.54) |
| no. of prior felonies >=3 | 1.131 | 1.024 | 0.81 |
| | (2.18)* | (0.26) | (-1.95) |
| total no. of prior referrals <=2 | 1.281 | 1.127 | 1.015 |
| | (4.48)** | (1.85) | (0.2) |
| total no. of prior referrals =3 | 1.264 | 1.173 | 1.064 |
| | (3.83)** | (1.91) | (0.67) |
| total no. of prior referrals >=4 | 1.398 | 1.023 | 0.993 |
| | (4.95)** | (0.21) | (-0.06) |
| any prior drug referral | 0.976 | 0.998 | 0.915 |
| | (-0.7) | (-0.04) | (-1.29) |
| any prior assault referral | 0.999 | 0.985 | 0.946 |
| | (-0.03) | (-0.29) | (-0.92) |
| any prior status referral | 1.124 | 1.001 | 0.997 |
| | (3.44)** | (0.02) | (-0.04) |
| prior property referrals =1 | 0.968 | 1.042 | 1.064 |
| | (-0.77) | (0.64) | (0.88) |

| Independent Variables (continued) | dependent variable = 1st year re-dispositions | dependent variable = 2nd yr. re-dispositions for year 2 re-offenses | dependent variable = 2nd yr. re-dispositions for year 1 re-offenses |
|---|---|---|---|
| prior property referrals =2 | 0.901 | 1.098 | 1.073 |
| | (-1.99)* | (1.15) | (0.77) |
| prior property referrals >=3 | 0.907 | 0.865 | 0.851 |
| | (-1.73) | (1.43) | (1.42) |
| prior technical violations =1 | 0.951 | 1.033 | 0.897 |
| | (-1.03) | (0.34) | (-0.96) |
| prior technical violations >=2 | 0.974 | 0.975 | 0.803 |
| | (-0.42) | (0.19) | (-1.26) |
| prior adjudications >= 1 | 1.015 | 0.87 | 0.867 |
| | (0.35) | (1.68) | (-1.49) |
| prior placements >=1 | 1.026 | 1.156 | 1.156 |
| | (0.38) | (1.36) | (1.04) |
| probation cohort | 1.967 | 1.18 | 1.061 |
| | (11.06)** | (2.58)** | (0.78) |
| ISP cohort | 2.024 | 1.221 | 1.085 |
| | (10.21)** | (2.26)* | (0.8) |
| placement cohort | 1.857 | 1.164 | 1.06 |
| | (8.95)** | (1.82) | (0.55) |
| TYC cohort | 0.297 | 0.654 | 0.716 |
| | (-4.66)** | (-2.83)** | (-1.52) |
| 1995 disposition | 1.033 | 0.993 | 0.963 |
| | (0.75) | (0.13) | (-0.56) |
| 1996 disposition | 1.078 | 0.972 | 0.95 |
| | (1.78) | (0.48) | (-0.75) |
| 1997 disposition | 1.058 | 0.939 | 0.909 |
| | (1.3) | (0.99) | (-1.3) |
| no. of 1st yr felonies | 1.19 | | 1.093 |
| | (11.48)** | | (3.89)** |
| no. of 1st yr tech. violations | 1.455 | | 1.146 |
| | (26.35)** | | (5.48)** |
| no. of 1st yr misdemeanors | 1.027 | | 1.13 |
| | (1.45) | | (5.10)** |
| no. of 2nd yr. felonies | | 1.102 | |
| | | (4.53)** | |
| no. of 2nd yr. tech. violations | | 1.505 | |
| | | (9.52)** | |
| no. of 2nd yr. misdemeanors | | 0.941 | |
| | | (-2.34)* | |
| no. of all 2nd yr. offenses | | | 1.287 |
| | | | (18.33)** |
| no. of all 1st yr. offenses | | 1.15 | |
| | | (11.67)** | |
| number of observations | 6,651 | 5,279 | 6,234 |

Robust z-statistics in parentheses. * significant at 5% level, ** at 1% level.

Table 4.8: Regression Results for Adult Re-dispositions

| Independent Variables | dependent variable = 3rd yr. re-dispositions | dependent variable = 4th yr. re-dispositions |
|---|---|---|
| total prior assault offenses | 1.017 | 1.086 |
| | (0.23) | (0.74) |
| total prior property offenses | 1.031 | 1.095 |
| | (0.76) | (1.58) |
| total prior status offenses | 1.059 | 0.901 |
| | (0.64) | (-0.73) |
| total prior drug offenses | 0.964 | 1.005 |
| | (-0.38) | (0.04) |
| total prior adjudications | 0.998 | 0.982 |
| | (-0.03) | (-0.16) |
| hispanic | 0.622 | 1.125 |
| | (-2.67)** | (0.45) |
| other ethnic group | 0.641 | 0.174 |
| | (-0.85) | (-0.46) |
| caucasian | 0.929 | 1.183 |
| | (-0.39) | (0.59) |
| male | 1.23 | 8.797 |
| | (0.63) | (1.19) |
| age at disposition under 16 | 2,120.26 | 2.555 |
| | (0.86) | (1.81) |
| age at disposition 16 | 2,642.25 | 3.363 |
| | (0.89) | (2.24)* |
| age at disposition 17 and over | 2,918.62 | 2.11 |
| | (0.9) | (1.23) |
| year of initial disposition 1995 | 1.004 | |
| | (0.03) | |
| initial disposition placement | 1.213 | 1.042 |
| | (0.66) | (0.1) |
| initial disposition probation | 1.113 | 0.887 |
| | (0.38) | (-0.30) |
| initial disposition TYC | 0.994 | 1.022 |
| | (-0.02) | (0.04) |
| second year total re-offenses | 1.116 | |
| | (1.94) | |
| third year total re-offenses | 1.499 | 1.322 |
| | (6.85)** | (3.25)** |
| fourth year total re-offenses | | 1.141 |
| | | (1.36) |
| number of observations | 353 | 142 |

Absolute value of z-statistics in brackets. * significant at 5% level; ** at 1% level

Table 4.9: Estimated Number of Re-dispositions per 100 Re-offenses, by type of initial disposition, offense class and year

| | | juvenile | | | | | | adult | |
|---|---|---|---|---|---|---|---|---|---|
| | | violations | | misdemeanors | | felonies | | felonies + misdemeanors | |
| Initial Disposition | estimate range | year 1 | year 2 | year 1 | year 2 | year 1 | year 2 | year 3 | year 4 |
| Probation rather than Deferred Prosecution | lower bound | 58.3 | 16.0 | 43.2 | 10.1 | 48.6 | 11.8 | 2.3 | 25.3 |
| | **mid-point** | **61.8** | **18.5** | **46.5** | **11.6** | **51.9** | **13.5** | **19.5** | **38.5** |
| | upper bound | 65.5 | 21.4 | 49.9 | 13.2 | 55.5 | 15.6 | 163.6 | 58.6 |
| Intensive Supervision rather than Probation | lower bound | 62.2 | 15.9 | 46.0 | 10.0 | 51.7 | 11.7 | 12.3 | 23.1 |
| | **mid-point** | **67.1** | **19.2** | **50.3** | **12.0** | **56.3** | **14.0** | **32.3** | **51.0** |
| | upper bound | 72.6 | 23.1 | 55.1 | 14.3 | 61.4 | 16.8 | 85.0 | 112.3 |
| Local Placement rather than Intensive Supervision | lower bound | 62.7 | 18.9 | 46.7 | 12.1 | 52.4 | 14.1 | 1.9 | 36.0 |
| | **mid-point** | **67.4** | **21.9** | **50.8** | **13.7** | **56.7** | **16.1** | **19.4** | **53.9** |
| | upper bound | 72.4 | 25.4 | 55.4 | 15.5 | 61.4 | 18.2 | 197.9 | 80.8 |
| TYC Placement rather than Local Placement | lower bound | 8.2 | 5.0 | 6.6 | 3.2 | 7.1 | 3.7 | 10.8 | 42.6 |
| | **mid-point** | **12.9** | **6.6** | **10.4** | **4.1** | **11.2** | **4.8** | **30.4** | **70.9** |
| | upper bound | 20.5 | 8.7 | 16.3 | 5.4 | 17.7 | 6.3 | 85.3 | 117.8 |

Table 4.10: Estimated Difference in Total Number of Re-dispositions Resulting From Change in Initial Disposition per 100 initial juveniles, by offense class and year (mid-points only)

| | | Number of Re-dispositions | | | |
|---|---|---|---|---|---|
| Initial Disposition | year | violation (juvenile) | misdemeanor (juvenile) | felony (juvenile) | misdemeanor + felony (adult) |
| Probation rather than Deferred Prosecution | 1 | 12.9 | (2.5) | (0.6) | |
| | 2 | 0.3 | (0.4) | (0.4) | |
| | 3 | | | | 0.4 |
| | 4 | | | | 0.1 |
| Intensive Supervision rather than Probation | 1 | 7.9 | (0.9) | (1.0) | |
| | 2 | 0.1 | (0.3) | (0.2) | |
| | 3 | | | | (1.8) |
| | 4 | | | | 4.1 |
| Local Placement rather than Intensive Supervision | 1 | (21.4) | (8.3) | (8.6) | |
| | 2 | (0.0) | 0.3 | 1.0 | |
| | 3 | | | | 4.1 |
| | 4 | | | | 2.1 |
| TYC Placement rather than Local Placement | 1 | (4.2) | (0.4) | (0.5) | |
| | 2 | (0.4) | (0.2) | 0.0 | |
| | 3 | | | | (3.7) |
| | 4 | | | | (6.3) |

Numbers in parentheses are negative, indicating fewer re-dispositions compared to the milder disposition.

Third, to allocate these predicted differences across juvenile and adult sentencing possibilities, we multiply the predictions in Table 4.10 by the distribution of re-dispositions across disposition types in Table 4.11 which, as indicated earlier, we derived from County's actual disposition pattern. The result of this calculation, an estimate of the difference in various types of re-disposition that result from change in the initial disposition of 100 juveniles, is laid out (for mid-points) in Table 4.12.

Table 4.11: Estimated Distribution of Re-dispositions Across Disposition Types, by type of initial disposition and year

| | | Type of Redisposition | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Juvenile | | | | Adult | | | | Total |
| Initial Disposition | year | probation | ISP | placement | TYC | probation | county jail | state jail | prison | |
| Probation rather than Deferred Prosecution | 1 | 20% | 20% | 44% | 16% | | | | | 100% |
| | 2 | 22% | 18% | 30% | 27% | | | | | 100% |
| | 3 | | | | | 28% | 47% | 11% | 14% | 100% |
| | 4 | | | | | 17% | 54% | 13% | 17% | 100% |
| Intensive Supervision rather than Probation | 1 | 6% | 17% | 54% | 22% | | | | | 100% |
| | 2 | 9% | 17% | 28% | 45% | | | | | 100% |
| | 3 | | | | | 22% | 55% | 8% | 15% | 100% |
| | 4 | | | | | 8% | 15% | 31% | 46% | 100% |
| Local Placement rather than Intensive Supervision | 1 | 5% | 2% | 36% | 58% | | | | | 100% |
| | 2 | 6% | 6% | 18% | 67% | | | | | 100% |
| | 3 | | | | | 19% | 45% | 14% | 22% | 100% |
| | 4 | | | | | 20% | 48% | 13% | 19% | 100% |
| TYC Placement rather than Local Placement | 1 | 9% | 0% | 0% | 91% | | | | | 100% |
| | 2 | 0% | 0% | 0% | 100% | | | | | 100% |
| | 3 | | | | | 11% | 47% | 17% | 25% | 100% |
| | 4 | | | | | 15% | 50% | 15% | 21% | 100% |

Table 4.12: Estimated Difference in Number of Re-dispositions, by Type, Resulting From Change in Initial Disposition per 100 initial juveniles, by year (mid-points only)

| | | Number of Re-dispositions | | | | | | | | | *Total re-offenses (mid-points)* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Juvenile | | | | Adult | | | | Total | |
| Initial Disposition | year | probation | ISP | placement | TYC | probation | county jail | state jail | prison | | |
| Probation rather than Deferred Prosecution | 1 | 1.9 | 1.9 | 4.3 | 1.6 | | | | | 9.8 | *14.4* |
| | 2 | (0.1) | (0.1) | (0.2) | (0.1) | | | | | (0.5) | *(4.8)* |
| | 3 | | | | | 0.1 | 0.2 | 0.1 | 0.1 | 0.4 | *2.3* |
| | 4 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | *0.1* |
| Intensive Supervision rather than Probation | 1 | 0.4 | 1.0 | 3.3 | 1.3 | | | | | 6.0 | *8.1* |
| | 2 | (0.0) | (0.1) | (0.1) | (0.2) | | | | | (0.4) | *(3.8)* |
| | 3 | | | | | (0.4) | (1.0) | (0.1) | (0.3) | (1.8) | *(5.7)* |
| | 4 | | | | | 0.3 | 0.6 | 1.2 | 1.9 | 4.1 | *8.0* |
| Local Placement rather than Intensive Supervision | 1 | (1.8) | (0.7) | (13.6) | (22.2) | | | | | (38.3) | *(63.4)* |
| | 2 | 0.1 | 0.1 | 0.2 | 0.9 | | | | | 1.3 | *8.5* |
| | 3 | | | | | 0.8 | 1.8 | 0.6 | 0.9 | 4.1 | *21.1* |
| | 4 | | | | | 0.4 | 1.0 | 0.3 | 0.4 | 2.1 | *3.9* |
| TYC rather than Local Placement | 1 | (0.5) | 0.0 | 0.0 | (4.6) | | | | | (5.1) | *(44.9)* |
| | 2 | 0.0 | 0.0 | 0.0 | (0.5) | | | | | (0.5) | *(11.6)* |
| | 3 | | | | | (0.4) | (1.8) | (0.6) | (0.9) | (3.7) | *(12.3)* |
| | 4 | | | | | (0.9) | (3.2) | (0.9) | (1.3) | (6.3) | *(2.2)* |

Note: Numbers in parentheses are negative, indicating fewer re-offenses and re-dispositions compared to the less severe sanction.

This Table indicates that re-dispositions follow the pattern of re-offenses, with numbers necessarily less, in part because many re-offenses are not serious enough to warrant prosecution and in part because re-dispositions often follow a string of offenses rather than each one. Together with Table 4.11, it also highlights that most re-dispositions are harsh, reflecting the County's emphasis on accountability in treatment of re-offenders. In the first and second years, roughly 60% of all re-dispositions for the probation cohort are local and TYC residential placements. These shares rise

progressively toward 100% for the other three cohorts. For adults, likewise, incarceration in jail or prison, given in 70% or more of all cases, is the dominant disposition.

Severity of sanction helps to explain, in part, the re-offense patterns described above. Probation in lieu of deferred prosecution, for example, produces a first-year increase in re-offenses. Because a substantial proportion of these re-offenders are then placed in local or TYC facilities for extended periods, re-offenses in the second year are constrained. Had they received deferred prosecution in the first place, their subsequent re-offenses would have been met with probation, a disposition that begets a rise in re-offenses. In other words, decreases in re-offenses and re-dispositions in the second year stem from an offense-suppression effect of placement that overshadows the offense-aggravating effect of probation. Similar combinations of offense-suppression and offense-aggravating effects explain differences for the other cohorts too.

## 5. Justice System Costs and Benefits

These differences in predicted re-offenses and re-dispositions are paralleled by differences in costs and benefits. Dispositions are directly connected to juvenile justice system costs and cost-saving benefits, all tangible. Offenses, discussed in the next section, are directly connected to victim and other societal losses and loss-prevention benefits, both tangible and intangible.

To estimate unit costs and benefits for the justice system, i.e., cost or benefit per disposition, we followed the activity-based costing procedure described in Wayson and Funke (1989), adopting a few shortcuts due to time and resource limitations. The first step in this procedure is to trace the processes through which individuals move for each type of disposition. The next step identifies all component activities that take place under each disposition, and all resources consumed in producing each activity: direct and indirect, labor and capital. Table 5.1 displays the core activities for each disposition and the average costs we estimate for them in 1997 base year and year 2000 dollar terms.

As detailed in Appendix C, arriving at these figures required that we do repeat interviews with staff of the city of Dallas Police Department (DPD) and the County's juvenile probation unit, public defender's office, district attorney's office, and other pertinent individuals to derive estimates of personnel time allocated to the various activities (e.g., hours or days per week or month per client). Multiplying staff time by wages and salaries yielded estimates of the human resources cost of each activity for each disposition. We then multiplied this cost by factors that we derived separately for departmental overhead (e.g., personnel benefits, support staffing, equipment and vehicle usage, etc.), overhead of the County's central administration, and capital. This yielded estimates for each activity and disposition.

In some instances, such as court processing, we found it essential to observe activities directly. In other instances, such as for police overhead, we examined budget and expenditure reports in detail. As standard procedure, however, we relied on a combination of these approaches. That is, working from the specific to the general, we aggregated detailed activity data at the individual staff level to build a picture of the whole. At the same time, working from the general to the specific, we took line item expenditures and workload measures at the aggregate organizational level and then broke them down to arrive at figures for individual activities.

The most difficult item to analyze using the activity-based costing procedure, now turning to specifics, was police activities. These encompass all actions associated with an offense from apprehension through court appearance. Depending on offense severity and type, police work may involve few or many sub-activities, and therefore less or more expenditure. Also, because arrest procedures and paper work requirements for juveniles are more extensive than for adults, costs are higher for similar offense types. And then there are variations in procedure and associated costs across different police jurisdictions within the county. Given resource limitations and the fact that nearly half of all referrals come from one jurisdiction, the City of Dallas, we derived all our cost estimates from DPD data.

"Direct service" activities, for which we held interviews to estimate labor hours involved, include: arrest, transport to police department youth division, preparation of arrest and prosecution reports, transport to juvenile detention center, follow-up investigation, and court testimony. A relatively simple case starts with arrest and ends at either the writing of an arrest report or transport to the juvenile detention center. Procedures for handling a simple case are routine. We estimated the direct service staff cost for this type of case at $135 (in $1997). A fully-loaded resource cost, including overhead and capital, raises the figure to $205.

Beyond the simple case, the complexity and associated range of costs depends on the extent to which a particular offense requires extensive follow-up investigation and court testimony. These tend to be closely associated with offense type. To establish a reasonable range of costs involved in investigation and testimony, we conducted interviews with five investigation units at the DPD: auto theft, robbery, assault other than sexual, sexual assault, and homicide. There were substantial differences in the amount of time these units spent in handling typical cases. Averages for direct service costs were $200 for auto theft, $314 for robbery, $518 for assault, $940 for sexual assault, and $12,043 for homicide. Combining costs for a simple case and with those for each type of investigation, we estimated a police cost for each offense class, i.e., status offense and technical violation, misdemeanor and felony. We then calculated the proportions of each class under each disposition to arrive at the weighted average cost figures shown in the Table.

Though there are differences between cases that follow different disposition tracks, especially between deferred prosecution and all others, after police activities are done most go through a standard procedure that starts at intake assessment and ends at final disposition. Main differences between dispositions tend to involve ancillary activities that are part of one process but not another, such as matching the child with an appropriate placement facility. There are also variations in intensity or duration for the same activities, such as length of stay in detention pending court appearance, duration of supervision in the community, or time spent in out-of-home placement. Another difference that can affect cost is type of court hearing, e.g., plea and disposition, trial before court, trial before jury, etc., but we found no systematic variation across dispositions on this score. Large cost differentials between dispositions result mainly from what happens after a disposition decision, i.e., short-term community supervision at one end versus long-term placement in an out-of-home treatment facility at the other end. These post-decision outlays represent between 43% of total costs in the case of probation and 77% in the case of TYC placement.

Table 5.1: Juvenile Justice System Costs in Dallas County, by Type of Disposition, 2000

| Disposition and Associated Activity | unit | Direct Cost ($) per unit | Direct Cost ($) subtotal | Indirect Cost ($) | Total Cost ($1997) | Total Cost ($2000) |
|---|---|---|---|---|---|---|
| **Deferred Prosecution** | | | | | | |
| police | case | 260 | 260 | 140 | 390 | 420 |
| detention screening | case | 20 | 20 | 30 | 50 | 50 |
| case review | case | 20 | 20 | 20 | 40 | 40 |
| six-month supervision (180 days) | day | 1 | 180 | 320 | 510 | 540 |
| | Total | | 480 | 510 | 990 | 1,050 |
| **Probation** | | | | | | |
| police | case | 380 | 380 | 200 | 580 | 610 |
| detention screening | case | 50 | 50 | 70 | 110 | 120 |
| detention (6.93 days) | day | 80 | 560 | 620 | 1,180 | 1,250 |
| intake, assessment | case | 240 | 240 | 340 | 580 | 610 |
| district attorney | case | 80 | 80 | 120 | 200 | 210 |
| district court | case | 200 | 200 | 280 | 480 | 510 |
| court liaison | case | 80 | 80 | 110 | 190 | 200 |
| defense counsel, public defender | case | 260 | 260 | 370 | 630 | 670 |
| supervision (365 days) | day | 2 | 870 | 1,210 | 2,080 | 2,200 |
| community services (44% of cases for 80 days) | day | 10 | 420 | 590 | 1,010 | 1,070 |
| | Total | | 3,150 | 3,890 | 7,040 | 7,460 |
| **Intensive Supervision Probation (ISP)** | | | | | | |
| police | case | 460 | 460 | 240 | 700 | 750 |
| detention screening | case | 50 | 50 | 70 | 110 | 120 |
| detention (12.6 days) | day | 80 | 970 | 1,080 | 2,040 | 2,170 |
| intake, assessment | case | 240 | 240 | 340 | 580 | 610 |
| district attorney | case | 80 | 80 | 120 | 200 | 210 |
| district court | case | 200 | 200 | 280 | 480 | 510 |
| court liaison | case | 80 | 80 | 110 | 190 | 200 |
| defense counsel, public defender | case | 260 | 260 | 370 | 630 | 670 |
| ISP supervision (182.5 days) | day | 6 | 1,010 | 1,410 | 2,430 | 2,570 |
| probation supervision (182.5 days) | day | 2 | 430 | 600 | 1,040 | 1,100 |
| community services (65% of cases for 80 days) | day | 10 | 620 | 870 | 1,490 | 1,580 |
| | Total | | 3,790 | 4,610 | 9,900 | 10,490 |
| **Local Placement** | | | | | | |
| police | case | 430 | 430 | 230 | 660 | 700 |
| detention screening | case | 50 | 50 | 70 | 110 | 120 |
| detention (41 days) | day | 70 | 2,980 | 3,320 | 6,290 | 6,670 |
| intake, assessment | case | 240 | 240 | 340 | 580 | 610 |
| district attorney | case | 80 | 80 | 120 | 200 | 210 |
| district court | case | 200 | 200 | 280 | 480 | 510 |
| court liaison | case | 80 | 80 | 110 | 190 | 200 |
| defense counsel, public defender | case | 260 | 260 | 370 | 630 | 670 |
| placement matching and case preparation | case | 160 | 160 | 220 | 370 | 400 |
| contract, department facility (270 days) | day | 90 | 24,010 | 0 | 24,010 | 25,450 |
| aftercare services (72 days) | day | 3 | 240 | 330 | 570 | 600 |
| | Total | | 28,730 | 5,370 | 34,100 | 36,140 |
| **TYC Placement** | | | | | | |
| police | case | 660 | 660 | 340 | 1,000 | 1,060 |
| detention screening | case | 50 | 50 | 70 | 110 | 120 |
| detention (39.6 days) | day | 70 | 2,900 | 3,230 | 6,130 | 6,500 |
| intake, assessment | case | 240 | 240 | 340 | 580 | 610 |
| district attorney | case | 80 | 80 | 120 | 200 | 210 |
| district court | case | 200 | 200 | 280 | 480 | 510 |
| court liaison | case | 80 | 80 | 110 | 190 | 200 |
| defense counsel, public defender | case | 260 | 260 | 370 | 630 | 670 |
| TYC facility (270 days) | day | 110 | 29,730 | 0 | 29,730 | 31,510 |
| TYC parole (90 days) | day | 9 | 800 | 0 | 800 | 840 |
| | Total | | 35,000 | 4,850 | 39,850 | 42,240 |

Note: Columns and rows may not sum exactly due to rounding.

To estimate costs for these activities (i.e., that follow on the heels of police contact), we focused on four units of the County's juvenile justice system: probation department, district attorney's office, public defender's office, and court. Core activities implemented by these units are: review for deferred prosecution, detention screening, detention, intake assessment, district attorney, defense counsel, court liaison, juvenile court, supervision, community services, placement facility matching, residential placement, and aftercare. For TYC placement and parole we used cost figures from Fabelo (1999) and updates to these that we obtained directly from the Texas Criminal Justice Policy Council.

Adhering to the activity-based costing procedure, we found that dis-aggregating activities here was more straightforward than for police, a discovery that allowed us to use a combination of different estimation methods. For one thing, organizational structure in these units tends to be more in line with core activities that we identified for each disposition. For example, although the district attorney's office and court handle delinquency cases as well as others, such as adoption and child abuse, the division of labor is not nearly as entangled as it is for police activities. Likewise, core activities in the probation department are devoted exclusively to the processing of delinquency cases, thus eliminating the need to dissect activities into further, discrete actions. We also had access to more reliable caseload figures for each unit that we could use to estimate costs, either alone or in combination with information obtained by other means, such as per activity time estimates from staff interviews and direct observation of cases in progress.

Some activities take place only once while others, with variation across dispositions, stretch over extended periods. One-time activities, for which our unit of analysis is per case, include detention screening, intake assessment, court liaison, defense attorney, district attorney, and court hearing. For these activities we multiplied the estimated time devoted to each activity by direct service personnel, obtained through interviews, by hourly wage. Working the other way, we divided total salary of direct service personnel by total caseload. Because the two methods should yield similar cost estimates, the aggregate time required for an activity cannot be too far removed from total staff hours available, we used both methods for all activities as a means to check accuracy.

For activities that extend over time, the unit of analysis is daily cost. Examples include detention, the various levels of supervision (e.g., deferred prosecution, regular probation, ISP, aftercare services, and TYC parole), local residential placement facility, and TYC placement facility. Here there is variation between disposition cohorts not only in duration, but also in the proportion of cohorts that are detained or referred to community-based services. Total costs for these kinds of activities required multiplying the per day cost by the average duration of each disposition.

Finally, there is the matter of indirect cost. For this we multiplied direct cost subtotals by three indirect cost factors representing department overhead, central administration overhead, and capital equipment and facilities. Department overhead includes salary and wage benefits, salaries and benefits of support and supervisory staff, supplies, and materials. Central administration overhead represents the proportion of supporting activities provided by other agencies within the same jurisdiction that contribute to the operation of direct units. Major items for Dallas County on this score are building maintenance and utilities, central administrative personnel, and budget control and management. For capital equipment and facilities, analysis of Juvenile Department and DPD expenditures indicated that depreciation of structures over forty years, and vehicles and equipment over three years, yields an

annualized capital expenditure equal to less than 3% of annual operating budgets. To be safe, we adopted a 5% cost factor for these items.

For adult costs, as we did for TYC, we relied mainly on Fabelo (1999) and on updates from more recent analyses obtained directly from the Texas Criminal Justice Policy Council. The cost figures here are: probation, $3,068; county jail, $836; state jail, $18,499; and prison followed by parole, $55,907. We made our own estimates of adult arrest and related police costs ($561) and court costs ($2,000).

The forgoing are average figures. Accuracy, however, demands that CBA use marginal costs and benefits, which can be the same as the average or quite different. This is because the additional system cost or cost-saving benefit that results from substituting one disposition for another varies with number of cases, with point of view (i.e., economic or financial), and with institutional circumstance.

As regards number of cases, it should be clear that shifting one juvenile between dispositions does not engender the same unit cost or benefit as shifting a thousand. The margin may be close to zero for one or a handful of individuals. Law enforcement and probation officers, departmental staff, and other personnel remain fixed, as do their salaries and benefits, whether they have a few more or a few less cases to deal with. When caseload changes are such as to require big adjustments in staff and capital requirements, average and marginal costs may be the same.

For present purposes we imagine shifts between dispositions of about 100 juveniles, representing a range of roughly 50 to 150. In recent times Dallas County has averaged 1,780 deferred prosecution cases per year, 1,280 probation, 330 ISP, 580 local placement, and 310 TYC placement. With the spirit of realism that guided us to compare adjacent rather than distant dispositions also directing us to take a realistic view of the magnitude of feasible shifts between dispositions in any one period, we think that a scale of 100 juveniles is reasonable. It is small relative to the frequency of deferred prosecution and probation cases, but big compared to other dispositions. Moving 100 juveniles into local placement is a 17% increase at the county level, 35% in the case of TYC placement.

At a scale of 100 juveniles, average values are satisfactory for establishing the initial incremental, or additional, cost or benefit of switching between dispositions, i.e., by subtracting the average cost of one from the average cost of the other. But because differences in number of re-dispositions are small when starting off with 100 juveniles - as detailed in the previous section, they are close to one in all disposition pairs except that between local placement and ISP - average values may or may not be satisfactory for them. This is where point of view and circumstance kick in.

In economic CBA the presumed point of view is the community or society as a whole. The marginal cost to society of adding one or a few more juveniles to a public or private counseling service or to a public or private placement facility, if these are not operating at capacity, is small. Because the fee that a private contractor charges to provide for the juvenile is usually based on the average, not the actual marginal cost of supplying the service, economic CBA ignores the fee.

In financial CBA, where the point of view is that of actors within society, marginal cost may be the same as for economic CBA. This happens when, say, a public agency with spare capacity absorbs the additional juveniles in its own facilities. But if the agency pays a fixed fee to private contractors for the

services and facilities because its own are full, then the marginal cost to the agency is the fee, more or less equal to the contractor's average, not marginal cost per child. An agency in this circumstance wanting to estimate how much more it would need to spend or how much cost-saving it might expect from shifting juveniles from one disposition to another cannot ignore the fee.

Dallas County Juvenile Department, like other jurisdictions acutely aware of the difference between its own and contractor costs, confronts this circumstance. At one any time about half of juveniles in local placement are in its facilities, the other half in contract facilities. Similarly, while it supplies aftercare services internally, all other community services are provided by contractors. Departmental policy, logically, is to first fill its own facilities and services and, in the opposite direction, to first drain contractor facilities and services. On the margin, therefore, movement of juveniles into or out of placement, and into or out of community services associated with this and other dispositions, are now and for the immediate future shifts toward and away from contractors. The situation, in the State's perspective, is the same for TYC placement. In both instances the marginal cost of services and of placement (i.e., excluding disposition-related activities done in house), equal to the contractor fee, is close to the average cost.

None of this indicates the marginal values of costs or benefits for re-disposition activities carried out internally. Unfortunately, these are very difficult to estimate accurately. We therefore made assumptions - more like guesses - about the relationship between the average and the margin. Seeking reasonable low-high limits, we selected 10% and 25% of average costs. This bracket may not be exactly on the mark, but it is unlikely to be too far off. In any event, we use it to set two cost assumption frameworks, one for economic CBA and the other for financial CBA, that we will show in section 7, after detailing our estimates of victim and other non-system losses and gains.

### 6. Victim and Other Non-System Costs and Benefits

In addition to justice system outlays and savings associated with initial and subsequent re-dispositions, there are costs and benefits to victims, offenders, and others in society associated with offenses, both tangible and intangible. Table 6.1, taken from Miller et. al. (1996), shows an extensive list of such costs, the prevention of which would register as benefits. If there is an inclination to do it, one could add items, as discussed earlier, such as the benefits of crime to offenders. Also, one could remove some items, such as fear of crime and related preventive outlays, if one prefers to think that these are less the consequence of crime and more the effect of movies, television documentaries and dramas, and the tendency of news media to emphasize reporting of "bad" tidings on the public's mental image of reality. Indeed, main factors that drive what is or is not on such a list are point of view and quality of imagination.

For our (practical) purposes, however, we focus on a much narrower set of items which, according to Miller, et. al., seem to be most important in the eyes of victims and others in the community. These are: property losses from damage, theft, fraud, etc.; outlays for emergency responses by fire, ambulance, and police services; medical expenses for injuries; social services (mainly for child victims); mental health outlays to redress psychological harm; and foregone output due to death, injury, court appearances, or other factors causing loss of time that might otherwise be engaged in productive activity. To examine the way in which it can affect and, in our opinion compromise the usefulness of

CBA, we also include losses and gains in "quality of life" associated with pain and suffering of victims and/or their families (but not of offenders and their kin).

The procedure we used to estimate values for these things followed a sequence of five steps. First was decomposition of the three broad classes of offense, i.e., status and technical violations, misdemeanors, and felonies, into their constituent elements. For this purpose we drew from the records of our sample of 13,144 individuals, described earlier, which yielded a total of 58,650 juvenile and adult offenses: 9,710 status violations, 24,790 misdemeanors; and 24,150 felonies.

Second, relying on judgement of Juvenile Department staff, was to distinguish between infractions that do and that do not incur victim and other non-justice system losses. The first two columns of Table 6.2, covering status violations and misdemeanors, show the result of this exercise. Only one type of violation, intoxicated driving, may engender losses. There were 53 such infractions during the reference period, or about 0.6 % of the total of 9,710 violations. For misdemeanors, we estimated that 14,630 offenses, or 59 % of the total of 24,150, incurred losses. For felonies, in Table 6.3, the share is 86 %: 20,630 out of a total of 24,150 offenses.

The third step was to assign baseline dollar values for victim and other losses to each type of offense that incurs them. Our estimates of the value of property loss from theft and/or material damage, as detailed in Tables 6.2 and 6.3, draw from several sources. For damage incurred during the course of infractions, such as household items broken during assaults, we used figures from the 1996-97 National Crime Victimization Survey (NCVS). For theft and vandalism losses, we mainly relied on Dallas County offense records. These assign a dollar range for specific infractions, such as theft of more than $20 but less than $200. To pinpoint a value to represent each range we use 85% of the midpoint of the bracket - deriving this adjustment from analysis of relationships between the mean and midpoint for similar ranges in the NCVS. Where county records did not give values, as in most instances of burglary and robbery, we again relied on NCVS figures. Hall (1997) provided values for arson-related losses, Maguire and Pastore (1999) for burglary of vehicles, and Miller et. al. (1996) for the remaining items.

Values for fire, ambulance, and police services not already included in disposition costs are based on analysis of detailed expenditure data for the City of Dallas. Police and fire department data are organized in a way that allows straightforward calculation of basic response costs (including or excluding transport to hospital), false alarms, and so on, and of a factor to account for central administrative overhead and capital.

Miller et. al. (1996), who have done much research on the subject, is our source for baseline medical service costs, as well for valuations of social and victim services, mental health services, and lost output and earnings (which Miller et. al. refer to as "productivity"). With respect to this last item, our own estimate of the present value of lifetime output losses resulting from premature death, following methods described by Hartunian et. al. (1981) and Rice et. al. (1989), yielded a figure of $880,000, about the same as would obtain after converting the Hartunian and Rice estimates into year 2000 dollar terms. But because Miller et. al. account for certain details that earlier work and our estimates overlook, we borrow their figure of $1 million (at 1993 prices), as well as their estimates for shorter-term output losses associated with lesser offenses.

## Table 6.1: Costs and Consequences of Crime

| I. Costs of Crime | | II. Cost of Society's Response to Crime | |
|---|---|---|---|
| Item | Entity Directly Bearing Cost | Item | Entity Directly Bearing Cost |
| Direct Property Loss | | Precautionary Expenditures/Effort | potential victim |
| 1. loss not reimbursed by insurance | victim | Fear of Crime | potential victim |
| 2. loss reimbursed by insurance | society | Criminal Justice System | |
| 3. administrative cost of insurance reimbursement | society | 1. police and investigative costs | society |
| 4. recovery by police | society | 2. prosecutors | society |
| Medical and Mental Health Care | | 3. courts | society |
| 1. cost not reimbursed by insurance | victim/family/society | 4. Legal fees | |
| 2. cost reimbursed by insurance | society | a. public defenders | society |
| 3. administrative overhead of insurance in 2, above | society | b. private defenders | offenders |
| Victim Services | | 5. Incarceration costs | society |
| 1. expenses charged to victim | victim | 6. Non-incarceration sanctions | society |
| 2. expenses paid by agency | society | 7. Victim time | victim |
| 3. temporary labor and training of replacements | society | 8. Jury and witness time | jury/witness |
| Lost workdays | | Victim services | |
| 1. lost wages for unpaid workday | victim | 1. victim service organizations | society |
| 2. lost productivity | society/employer | 2. victim service volunteer time | volunteers |
| Lost School Days | | 3. victim compensation programs | society/offender |
| 1. foregone earnings due to reduced education | victim | 4. victim time | victim |
| 2. forgone non-pecuniary benefits of more education | victim | Other Non-criminal programs | |
| 3. foregone social benefits due to reduced education | society | 1. hotlines and public service announcements | society |
| Lost Housework | victim | 2. community treatment programs | society |
| Pain and Suffering/Quality of Life | victim | 3. private therapy/counseling | society/offender |
| Loss of Affection/Enjoyment | victim's family | Incarcerated Offender Costs | |
| Death | | 1. lost wages | offender/family |
| 1. lost Quality of Life | victim | 2. lost tax revenue and productivity | society |
| 2. loss of affection/enjoyment | victim's family | 3. value of lost freedom | offender |
| 3. funeral and burial expenses | victim's family | 4. psychological cost to family/loss of consortium | family of offender |
| 4. psychological injury/treatment | victim's family | Over-deterrence Costs | |
| Legal Costs Associated with Tort Claims | victim/victim's family | 1. innocent individuals accused of offense | innocent individuals |
| Second Generation Costs | | 2. restriction of legitimate activity | innocent individuals |
| 1. future crimes committed by earlier victims | future victims | 3. offender actions against victims to avoid detection | society/offender/victim |
| 2. future social costs associated with 1, above | society, future victims | Justice Costs | |
| | | 1. constitutional protections to avoid false accusations | society |
| | | 2. cost of increasing detection rate to avoid differential punishment | society |

Source: Miller, Cohen, and Wiersema, 1996

Table 6.2: Sources and Values of Baseline Unit Costs: Victim and Other Losses From Status/Technical Violations and Misdemeanors

| Class and Type of Offense | Offenses | | Property Loss, Damage | | Police, Fire, Ambulance | | Medical Services | | Social, Victim Services | | Mental Health Services | | Output | | Quality of Life | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | all | with losses | $ value | source | $ value | source | $ value | source | $ value | source | $ value | source | $ value | source | $ value | source |
| **STATUS/TECHNICAL VIOLATIONS** | | | | | | | | | | | | | | | | |
| driving while intoxicated | | 53 | | | | | | | | | 82 | c | | | | |
| **ALL STATUS/TECHNICAL VIOLATIONS** | 9,708 | 53 | | | | | | | | | | | | | | |
| **MISDEMEANORS** | | | | | | | | | | | | | | | | |
| **Assault, Injury** | 2,688 | | | | | | | | | | | | | | | |
| assault causing bodily injury | | 2,676 | 18 | a | | | 310 | c | | | 97 | c | 760 | c | 10,000 | c |
| injury to child, bodily injury | | 12 | 18 | a | | | 310 | c | 46 | c | 100 | c | 760 | c | 10,000 | c |
| **Assault, No Injury** | 387 | 387 | 12 | a | | | | | 9 | c | 65 | c | 70 | c | 1,700 | c |
| **Criminal Mischief and Other Damage** | 1,712 | | | | | | | | | | | | | | | |
| criminal mischief <$20 | | 10 | 11 | b | | | | | | | 6 | c | | | | |
| criminal mischief < $50 | | 4 | 23 | b | | | | | | | 6 | c | | | | |
| criminal mischief >$20<$200 | | 513 | 94 | b | | | | | | | 6 | c | | | | |
| criminal mischief >$20<$500 | | 597 | 221 | b | | | | | | | 6 | c | | | | |
| criminal mischief, > $200<$750 | | 330 | 404 | b | | | | | | | 6 | c | | | | |
| criminal mischief <$1,500 | | 3 | 640 | b | | | | | | | 6 | c | | | | |
| criminal mischief >$500<$1,500 | | 223 | 850 | b | | | | | | | 6 | c | | | | |
| reckless damage or destruction | | 8 | 20 | c | | | | | | | | | | | | |
| desecration of venerated object | | 2 | 10 | d | | | | | | | 6 | c | | | | |
| fail to give notice, striking highway fixture >$2 | | 3 | 10 | b | | | | | | | | | | | | |
| fail to give notice upon striking unattended vehicle >$20 | | 1 | 50 | b | | | | | | | | | | | | |
| fail to stop and render aid >$200 damage | | 14 | 300 | b | | | | | | | | | | | | |
| graffiti, pecuniary loss < $500 | | 4 | 400 | b | | | | | | | | | | | | |
| **Possession/delivery of drugs, other illegal items** | 5,911 | | | | | | | | | | | | | | | |
| **Theft, Burglary, Forgery, etc.** | 8,153 | | | | | | | | | | | | | | | |
| theft <$20 | | 38 | 11 | b | | | | | | | 5 | c | | | | |
| theft <$50 | | 139 | 23 | b | | | | | | | 5 | c | | | | |
| theft >$20 < $200 | | 2,545 | 94 | b | | | | | | | 5 | c | | | | |
| theft >$20 <$500 | | 289 | 221 | b | | | | | | | 5 | c | | | | |
| theft >$50 < $500 | | 2,308 | 234 | b | | | | | | | 5 | c | | | | |
| theft >$200 < $750 | | 519 | 327 | b | | | | | | | 5 | c | | | | |
| theft >$500 < $1,500 | | 328 | 850 | b | | | | | | | 5 | c | | | | |
| burglary of coin operated/collection machine | | 178 | 33 | a | | | | | | | 5 | c | 12 | c | 300 | c |
| burglary of vehicle | | 1,752 | 518 | e | | | | | | | 5 | c | 12 | c | 300 | c |
| forgery | | 57 | 270 | c | | | | | | | | | | | | |
| **Escape/Evasion** | 2,265 | | | | | | | | | | | | | | | |
| **Criminal Trespass** | 1,251 | 1,251 | 33 | a | | | | | | | | | | | | |
| **False Alarms** | 538 | | | | | | | | | | | | | | | |
| false alarm or report | | 31 | | | 1,023 | d | | | | | | | | | | |
| **Obstruction** | 491 | | | | | | | | | | | | | | | |
| **Disruption** | 179 | | | | | | | | | | | | | | | |
| deadly conduct | | 112 | | | | | | | | | 6 | c | | | | |
| **Administrative** | 801 | | | | | | | | | | | | | | | |
| violation of protective order | | 4 | | | | | | | | | 65 | c | | | | |
| **Other Misdemeanors** | 414 | | | | | | | | | | | | | | | |
| abuse of corpse | | 3 | 50 | d | | | | | | | | | | | | |
| cruelty to animals | | 29 | 10 | d | | | 155 | c | | | 6 | c | | | | |
| driving while intoxicated | | 129 | | | | | | | | | 82 | c | | | | |
| harassment | | 63 | | | | | | | | | 65 | c | | | | |
| lewd/immoral/indecent conduct | | 66 | | | | | | | | | 6 | c | | | | |
| **ALL MISDEMEANORS** | 24,790 | 14,628 | | | | | | | | | | | | | | |

Sources: a. National Crime Victimization Survey (NCVS), 1996-97; b. Dallas County Juvenile Department, 1999; c. Miller et. al., 1996; d. authors' estimates from expenditure data of the City of Dallas police and fire departments, and other local sources, 1999; e. Maguire and Pastore, 1999; f. Hall, 1997.

Table 6.3 : Sources and Values of Baseline Unit Costs: Victim and Other Losses From Felonies

| Type of Felony Offense | Offenses | | Property Loss, Damage | | Police, Fire, Ambulance | | Medical Services | | Social, Victim Services | | Mental Health Services | | Output | | Quality of Life | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | all | with losses | $ value | source | $ value | source | $ value | source | $ value | source | $ value | source | $ value | source | $ value | source |
| **FELONIES** | | | | | | | | | | | | | | | | |
| **Assault, Injury** | 2,433 | | | | | | | | | | | | | | | |
| injury to elderly or disabled, serious bodily injury | | 7 | 18 | a | 150 | d | 1,470 | c | 46 | c | 97 | c | 3,100 | c | 19,300 | c |
| injury to a child, serious bodily injury | | 116 | 18 | a | 150 | d | 1,470 | c | 1,800 | c | 100 | c | 2,800 | c | 28,100 | c |
| injury to elderly or disabled | | 6 | 18 | a | | | 310 | c | 46 | c | 97 | c | 3,100 | c | 19,300 | c |
| injury to a child, bodily injury | | 72 | 18 | a | | | 310 | c | 1,800 | c | 100 | c | 2,800 | c | 28,100 | c |
| aggravated assault, serious bodily injury | | 1,536 | 75 | a | 150 | d | 1,470 | c | 46 | c | 97 | c | 3,100 | c | 19,300 | c |
| sexual assault | | 130 | 24 | a | | | 500 | c | 27 | c | 2,200 | c | 2,200 | c | 81,400 | c |
| sexual assault of a child | | 10 | 24 | a | | | 500 | c | 1,800 | c | 5,800 | c | 2,100 | c | 89,800 | c |
| aggravated sexual assault | | 489 | 75 | a | | | 500 | c | 27 | c | 2,200 | c | 2,200 | c | 81,400 | c |
| aggravated sexual assault of a child | | 47 | 75 | a | | | 500 | c | 1,800 | c | 5,800 | c | 2,100 | c | 89,800 | c |
| escape causing bodily injury | | 9 | 75 | a | | | 310 | c | 46 | c | 97 | c | 3,100 | c | 19,300 | c |
| arson, bodily injury or death | | 6 | 5,000 | f | 1,239 | d | 10,000 | c | 46 | c | 24 | c | 15,400 | c | 153,000 | c |
| fail to stop and render aid, injury or death | | 5 | 9,700 | c | 1,239 | d | 6,400 | c | 46 | c | | | 12,100 | c | 48,400 | c |
| **Assault, No Injury** | 1,210 | | | | | | | | | | | | | | | |
| assault and aggravated assault | | 891 | 12 | a | | | | | 9 | c | 65 | c | 70 | c | 1,700 | c |
| kidnaping | | 53 | 12 | a | | | | | 9 | c | 2,700 | c | 70 | c | 1,700 | c |
| indecency with child | | 266 | | | | | | | 1,800 | c | 5,800 | c | 900 | c | 21,100 | c |
| **Child Neglect** | 13 | 13 | | | 120 | d | 3 | c | 840 | c | 910 | c | 25 | c | 7,900 | |
| **Criminal Mischief and Other Damage** | 743 | | | | | | | | | | | | | | | |
| criminal mischief >$750<$20,000 | | 162 | 8,811 | b | | | | | | | 6 | c | | | | |
| criminal mischief >$1,500<$20,000 | | 134 | 9,138 | b | | | | | | | 6 | c | | | | |
| criminal mischief >$20,000 <$100,000 | | 22 | 42,509 | b | | | | | | | 6 | c | | | | |
| criminal mischief >$100,000 < $200,000 | | 4 | 127,500 | b | | | | | | | 6 | c | | | | |
| deadly conduct | | 175 | 75 | a | | | | | | | 65 | c | | | | |
| arson | | 242 | 5,000 | f | 1,023 | d | | | | | 18 | c | 8 | c | 500 | |
| **Possession/delivery of drugs, other illegal items** | 3,204 | | | | | | | | | | | | | | | |
| **Theft, Burglary, Forgery, etc.** | 15,705 | | | | | | | | | | | | | | | |
| theft <$1,500 | | 34 | 640 | b | | | | | | | 5 | c | 75 | c | | |
| theft >$750 < $20,000 | | 1,097 | 8,819 | b | | | | | | | 5 | c | 75 | c | | |
| theft >$1,500 < $20,000 | | 1,627 | 9,138 | b | | | | | | | 5 | c | 75 | c | | |
| theft > $20,000 < $100,000 | | 91 | 51,000 | b | | | | | | | 5 | c | 75 | c | | |
| theft >$100,000 < $200,000 | | 9 | 127,500 | b | | | | | | | 5 | c | 75 | c | | |
| theft > $200,000 | | 2 | 212,500 | b | | | | | | | 5 | c | 75 | c | | |
| theft of firearm | | 30 | 300 | d | | | | | | | 5 | c | 75 | c | | |
| theft, other | | 276 | 37 | a | | | | | | | 5 | c | 75 | c | | |
| burglary of habitation | | 1,927 | 691 | a | 120 | d | | | 5 | c | 5 | c | 12 | c | 300 | c |
| burglary of building | | 2,372 | 2,146 | a | 120 | d | | | 5 | c | 5 | c | 12 | c | 300 | c |
| burglary of vehicle | | 1,192 | 518 | e | 120 | d | | | 5 | c | 5 | c | 12 | c | 300 | c |
| robbery | | 1,293 | 487 | a | 120 | d | | | 15 | c | 5 | c | 75 | c | 1,300 | c |
| aggravated robbery | | 1,206 | 343 | a | 120 | d | | | 15 | c | 65 | c | 75 | c | 1,300 | c |
| unauthorized use of motor vehicle | | 4,297 | 3,834 | a | | | | | | | 5 | c | 45 | c | 300 | c |
| forgery, credit card abuse | | 347 | 270 | c | | | | | | | | | 8 | c | | |
| **Escape/Evasion** | 83 | | | | | | | | | | | | | | | |
| escape from arrest/confinement | | 32 | 12 | a | 120 | d | | | | | | | | | | |
| evading arrest/detection | | 4 | 12 | a | | | | | | | | | | | | |
| evading arrest/detection, causes serious bodily injury | | 39 | | | 150 | d | 310 | c | | | | | | | | |
| **False Alarms** | 10 | 10 | | | 1,023 | d | | | | | 65 | c | | | | |
| **Obstruct/Disrupt of Public Service, Administrative Offence** | 324 | | | | | | | | | | | | | | | |
| **Homicide** | 375 | | | | | | | | | | | | | | | |
| intoxicated manslaughter with vehicle | | 5 | 9,700 | c | 1,239 | d | 17,000 | c | | | 4,800 | c | 1,000,000 | c | 1,900,000 | c |
| manslaughter, murder, criminally negligent homicide | | 370 | 75 | a | 1,239 | d | 17,000 | c | | | 4,800 | c | 1,000,000 | c | 1,900,000 | c |
| **Other Felonies** | 50 | | | | | | | | | | | | | | | |
| **ALL FELONIES** | 24,150 | 20,655 | | | | | | | | | | | | | | |

Sources: a. National Crime Victimization Survey (NCVS), 1996-97; b. Dallas County Juvenile Department, 1999; c. Miller et. al., 1996; d. authors' estimates from expenditure data of the City of Dallas police and fire departments, and other local sources, 1999; e. Maguire and Pastore, 1999; f. Hall, 1997.

We also use Miller et. al. for valuation of losses and gains in "quality of life." As noted at the outset and in Appendix B, we have misgivings about monetization of this item, especially when based on jury awards. But because their numbers are as good or bad as any other for exploring impact on analysis, we adopt Miller et. al.'s $1.9 million ($1993) for death, and their lesser sums for injury.

In step four, after applying the consumer price index to adjust all figures to year 2000 dollar terms, we derived weighted average values for each category of loss by type of offense, with variations for different analytical assumptions. Table 6.4 reveals the result. It indicates, for instance, that the average value of property loss and damage from a misdemeanor is $126 when stolen items are included, i.e., when viewed from victims' "financial" perspective. When these items are excluded, i.e., when they are viewed in the "economic" perspective as a transfer within society, the value is $32. This figure includes the value of physical damage incurred during burglaries or vehicle theft, which we assume equal to 10 percent of total values from these two offenses. For felonies, respective figures are $2,795 and $365.

Table 6.4 also shows two columns for social and victim services, mental health services, and lost output, with one column labeled "high" estimate and the other labeled "low". The "high" columns for social and victim, and mental health services contain figures that we borrow from Miller et. al. (1996). The basis for these figures is weak, however. Miller et. al. may exaggerate the frequency at which victims avail themselves of the services. But we have no better basis. Accordingly, to see how lower figures affect analysis, we take "low" estimates as 10% of the high ones.

Likewise, the "high" column for lost output shows figures borrowed from Miller et. al. The "low" estimates are half these figures. We incorporate a low estimate here to account for the fact that victims of juvenile crime, by and large, have characteristics similar to those of offenders, notably lower than average earnings potential and shorter than average life expectancies.

The fifth and final step was consolidation of the figures in Table 6.4 into a schedule of estimated losses for each of the three offense classes under eight sets of assumptions. Table 6.5 shows this. It indicates that averages for victim and other non-system losses vary widely, depending on whether one includes or excludes the value of stolen items, whether one chooses higher or lower estimates for victim and mental health services and lost output, and whether one includes or excludes dollar figures for "quality of life." Across these different assumptions, the average baseline loss engendered by a misdemeanor ranges from $200 to $1,450, and a felony from $10,290 to $56,920.

Figures in Table 6.5 would be somewhat lower with use of marginal rather than average values for applicable items, i.e., police, medical, social, and mental health services. But given the small difference that it makes in the larger scheme of things when values range by multiples of more than five for misdemeanors to more than seven for felonies, we disregard marginal pricing for victim and other non-system costs and benefits. The important thing is that CBA results will differ, sometimes markedly, depending on which set of assumptions analysis adopts. In the event, as detailed in the next, concluding section, we apply and compare results using five of the sets, shown as boldface type in Table 6.5: two for economic cost-benefit analysis, and three for financial cost-benefit analysis.

Table 6.4: Estimated Value of Victim and Other Losses per offense, by type of offense, $2000 (weighted average)

| Class and Type of Offense | Property Loss, Damage | | Police, Fire, Ambulance (b) | Medical Services | Social, Victim Services | | Mental Health Services | | Output | | Quality of Life |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | incl. theft | excl. theft (a) | | | *high* | *low* | *high* | *low* | *high* | *low* | |
| **STATUS/TECHNICAL VIOLATIONS** | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| **MISDEMEANORS** | | | | | | | | | | | |
| assault, injury | 19 | 19 | 0 | 366 | 54 | 5 | 114 | 11 | 897 | 449 | 10,200 |
| assault, no injury | 14 | 14 | 0 | 0 | 10 | 1 | 77 | 8 | 83 | 41 | 1,734 |
| criminal mischief and other damage | 335 | 335 | 0 | 0 | 0 | 0 | 7 | 1 | 0 | 0 | 0 |
| possession/delivery of drugs, other illegal items | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| theft, burglary, forgery, etc. | 302 | 12 | 0 | 0 | 0 | 0 | 6 | 1 | 3 | 2 | 72 |
| escape/evasion | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| criminal trespass | 36 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| false alarms | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| obstruction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| disruption | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 |
| administrative | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| other misdemeanors | 1 | 1 | 0 | 13 | 0 | 0 | 44 | 4 | 0 | 0 | 0 |
| **ALL MISDEMEANORS** | 126 | 32 | 1 | 40 | 6 | 1 | 17 | 2 | 100 | 50 | 1,157 |
| **FELONIES** | | | | | | | | | | | |
| assault, injury | 109 | 109 | 67 | 1,405 | 257 | 26 | 903 | 91 | 3,390 | 1,695 | 38,577 |
| assault, no injury | 20 | 20 | 0 | 0 | 475 | 48 | 1,577 | 158 | 298 | 149 | 6,084 |
| child neglect | 0 | 0 | 122 | 4 | 991 | 99 | 1,074 | 107 | 30 | 14 | 8,058 |
| criminal mischief and other damage | 7,900 | 7,900 | 342 | 0 | 0 | 0 | 29 | 3 | 3 | 2 | 167 |
| possession/delivery of drugs, other illegal items | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| theft, burglary, forgery, etc. | 3,900 | 165 | 61 | 0 | 5 | 0 | 11 | 1 | 51 | 26 | 394 |
| escape/evasion | 6 | 6 | 119 | 172 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| false alarms | 0 | 0 | 1,043 | 0 | 0 | 0 | 77 | 8 | 0 | 0 | 0 |
| obstruction/disruption/administrative offence | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| homicide | 234 | 234 | 1,264 | 20,062 | 0 | 0 | 5,665 | 566 | 1,180,140 | 590,070 | 1,938,000 |
| other felonies | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **ALL FELONIES** | 2,795 | 365 | 78 | 454 | 53 | 5 | 267 | 27 | 18,718 | 9,360 | 34,556 |

Notes: a. Includes value of damage caused during robbery and vehicle theft.
b. Covers non-disposition activities at time of offense, e.g., traffic control, backup police, fire fighting, transport to hospital, etc.

Table : 6.5 Estimated Average Value of Victim and Other Losses per offense, by offense class, $2000

| Offense Class | excluding Quality of Life | | including Quality of Life | |
|---|---|---|---|---|
| | services, output low | services, output high | services, output low | services, output high |
| excluding value of stolen items (for economic analysis) | | | | |
| status/technical violation | **0** | **1** | **0** | **1** |
| misdemeanor | **130** | **200** | **1,280** | **1,350** |
| felony | **10,290** | **19,540** | **44,850** | **54,490** |
| including value of stolen items (for financial analysis) | | | | |
| status/technical violation | **0** | **1** | **0** | **1** |
| misdemeanor | **220** | **290** | **1,380** | **1,450** |
| felony | **12,720** | **22,370** | **47,280** | **56,920** |

Note: Values in **boldface** type are used for the analysis presented in Section 7 of this report.

## 7. Analysis Findings

The CBA question that we address, stated early on, is: What are the effects, in terms of changes in numbers of re-offenses and associated re-dispositions, of expending more resources on harsher dispositions or, flipping over, spending fewer resources on milder dispositions? We've presented our answers to this question in terms of predicted numbers in Section 4. Now we translate these answers into money terms. We do this in two steps: first by applying estimated values for justice system costs and cost-saving benefits to predicted numbers of re-dispositions and, second, by applying estimated values for victim and other non-system costs and cost-saving benefits to predicted numbers of re-offenses. The product of this exercise is an indicator, we use the "net present worth" of all benefits (NPW), which among other important things signals whether actual or proposed policy actions use resources "efficiently." Actions are efficient when benefits exceed costs (i.e., a positive NPW), inefficient when costs exceed benefits (i.e, a negative NPW).

Given the range of uncertainty in our predictions of re-offenses and re-dispositions, there is necessarily a corresponding range of uncertainty for the NPW. At the same time, there is considerable variation in the assumptions that underlie our dollar value estimates (i.e., marginal at 10% versus 25% of average costs, excluding versus including value of theft, high estimate for services and output versus low, inclusion versus exclusion of quality of life). This means that there exists a particular range of probable values for the NPW for each particular combination of dollar value assumptions. In other words, CBA can generate a lot of NPWs, some positive others negative, that may send contradictory signals about efficiency. It is therefore essential, if CBA is to be useful, to pay as close attention to assumptions and methods that produce the NPW as to its numerical values.

With respect to dollar value estimates for economic CBA, we take the difference in average costs between disposition pairs as the incremental, or additional cost or cost-saving benefit of moving from one disposition to the other. For subsequent re-dispositions, we set marginal costs equal to 10% and to 25% of average justice system costs, across the board. As regards victim and other non-system costs and cost-saving benefits, we adopt average values, excluding stolen items and QOL

For purposes of financial CBA, we again take the difference in average costs between disposition pairs as the incremental cost or benefit of shifting between dispositions. For subsequent re-dispositions, however, we equate marginal costs of contractor-supplied community services (in all dispositions where they occur), and contractor-supplied local and TYC placement activities, with average costs. In the case of services and other disposition activities carried out internally, we use 10% and 25% of their average costs. We also use average values for victim and other non-system costs and benefits, but now include stolen items and, separately, QOL.

We do two things regarding uncertainty in our predictions of re-offenses and re-dispositions. First, we treat all estimates that are not statistically significant as equal to zero. Accordingly, they have no effect on results. Second, for both kinds of CBA we adopt a Monte Carlo simulation procedure to generate probable ranges for the NPW under the different dollar value assumptions. With this technique we randomly sample predicted differences in re-offenses and re-dispositions from their respective 95% probability distributions, i.e., between the lower and upper bounds described earlier. Every run of the simulation selects one re-offense and one re-disposition figure for each disposition pair and year of follow up.

Simultaneously, the procedure multiplies these figures by the relevant unit values for justice system costs and benefits, and for each of the five sets of assumptions about victim and other costs and benefits (i.e., excluding or including stolen items, high or low service and output estimates, with or without QOL), all discounted at an annual rate of 5% to bring them to present, year 2000 dollar terms. Summed across four years, the operation yields one NPW for justice system net benefits and, after adding victim and other net benefits, five NPWs for total net benefits (two for economic and three for financial CBA). Repetition of the procedure 1000 times for every disposition pair produces 1000 estimates for each of the six NPWs, distributed as 95% probability distributions between lower and upper bounds on either side of a mid-point.

Table 7.1 illustrates the Monte Carlo simulation for financial CBA. It gives results of one of the 1000 runs in the procedure, in this case with the assumption that marginal costs of all re-dispositions are equal to average costs for contractor-supplied services and to 10% of average costs for all other disposition activities. In the quadrant for probation rather than deferred prosecution, for example, the initial disposition is a negative net benefit, or cost, of $6,410 per juvenile. It is the difference between the average cost of deferred prosecution, $1,050, and probation, $7,460 (see Table 5.1 ). Because probation generates more re-offenses in the first year than deferred prosecution, there are additional re-arrest and re-disposition costs in that year. Priced at 10% of average costs, the amounts are respectively $2 and $1,846 per juvenile. Summing these, justice system net benefits in the first year come to a negative $8,262 for the specific combination of re-offenses and re-dispositions selected in this run.

Although total re-offenses are higher under probation than under deferred prosecution, most are status offenses and technical violations. Re-dispositions in the first year that result from them have the effect of reducing numbers of other offenses, misdemeanors in particular, compared to what they might be under deferred prosecution (see Table 4.6). This reduction engenders cost savings, or positive net benefits, for victims and others. Depending on dollar value assumption, these savings range from $12 per juvenile assuming a low value for services and output, to $78 per juvenile assuming a high value for services and output and adding QOL. Because the gains are small, they do little to offset the big increase in justice system costs. Thus the total net benefit in year 1, combining system, victim and other costs and benefits, varies from a negative $8,250 to a negative $8,184, depending on value assumption.

The second year presents net savings in re-arrest and re-disposition costs of $24 per juvenile in year 2000 dollars, and in victim and other costs of between $8 and $50, to yield a total positive net benefit range of $31 to $73. Year 3 sees negative net benefits for both system and non-system costs. In year 4 all figures are zero because there are no statistically significant differences in re-offenses in that year, neither here nor in the three other disposition pairs.

Summing across the four years yields a negative NPW of $8,255 per juvenile for the justice system. Combining this with gains and losses to victims and others produces a negative total NPW of between $8,425 and $8,980 per juvenile. In general, the figures imply that for the re-offense and re-disposition figures selected in this run, shifting from deferred prosecution to probation is not an efficient use of resources. The additional justice system outlay to make the shift is not offset by subsequent savings from fewer re-dispositions. Indeed, higher re-dispositions cause the outlay to rise from $6,410 to $8,255. At the same time, this cost is also not offset by net gains to victims and others from reduction in more serious re-offenses which, depending on assumption, are valued at $169 to $723 per juvenile. That is, victims and others do gain from the shift, but at a high cost to the justice system. The structure of outcomes, if not the dollar amounts, is similar in the shift from probation to intensive supervision.

For local placement in lieu of intensive supervision, the initial incremental expenditure is partially offset by gains in lower first-year re-arrests and re-dispositions, reducing net justice system costs from $25,650 at the outset to $15,150 at the end of four years. Net benefits to victims and others are positive in the first year, but negative benefits thereafter yield a net loss over the four-year period. Something similar applies in the shift from local to TYC placement. Here, total four-year gains to victims and others of $512 to $2,353 per juvenile, the highest in the table, are offset by the additional justice system expenditure required to produce the gains, $4,417. As a result, the net benefit of shifting from local to TYC ranges from negative $3,908 to negative $2,067.

Table 7.2 gives the results of running the simulation 1000 times for economic CBA, and Table 7.3 for financial CBA - with a graphic to help visualize financial outcomes in Chart 1. Our economic analysis, recalling that it ignores theft and QOL and equates marginal re-arrest, adult court processing, and re-disposition costs at 10% and 25% of average costs, suggests that all shifts from milder to harsher dispositions have a high probability of being inefficient. Whether narrow or wide, probability distributions for justice system NPWs and for total NPWs are consistently negative. Initial outlays are not matched by reductions in re-disposition costs and/or by gains to victims and others.

Table 7.1: Example of One Run of Monte Carlo Procedure to Estimate NPW of Financial Benefits Resulting from Change in Disposition, per juvenile ($2000)[1]

| Item | year 1 | year 2 | year 3 | year 4 | NPW/*Total* | year 1 | year 2 | year 3 | year 4 | NPW/*Total* |
|---|---|---|---|---|---|---|---|---|---|---|
| Justice System Net Benefits[2] | **Probation rather than Deferred Prosecution** | | | | | **Local Placement rather than Intensive Supervision** | | | | |
| initial disposition (incremental) | (6,413) | 0 | 0 | 0 | *(6,413)* | (25,651) | 0 | 0 | 0 | *(25,651)* |
| re-arrest | (2) | 1 | (2) | 0 | *(3)* | 24 | (5) | (11) | 0 | *8* |
| adult court processing | 0 | 0 | (7) | 0 | *(7)* | 0 | 0 | (38) | 0 | *(38)* |
| redisposition | (1,846) | 23 | (8) | 0 | *(1,831)* | 10,853 | (265) | (58) | 0 | *10,530* |
| Sub-Total Justice System | (8,262) | 24 | (17) | 0 | **(8,255)** | (14,774) | (269) | (107) | 0 | **(15,150)** |
| Victim and Other Net Benefits[3] | | | | | | | | | | |
| including theft, low estimate for services, output | 12 | 8 | (189) | 0 | *(169)* | 1,964 | (786) | (1,021) | 0 | *157* |
| including theft, high estimate for services, output | 15 | 10 | (330) | 0 | *(305)* | 3,439 | (1,383) | (1,787) | 0 | *269* |
| including theft, high estimate for services, output+QOL | 78 | 50 | (851) | 0 | *(723)* | 8,866 | (3,518) | (4,606) | 0 | *742* |
| Total Net Benefits | | | | | | | | | | |
| including theft, low estimate for services, output | (8,250) | 31 | (206) | 0 | **(8,425)** | (12,810) | (1055) | (1,128) | 0 | **(14,993)** |
| including theft, high estimate for services, output | (8,246) | 33 | (347) | 0 | **(8,560)** | (11,335) | (1,652) | (1,894) | 0 | **(14,881)** |
| including theft, high estimate for services, output+QOL | (8,184) | 73 | (869) | 0 | **(8,980)** | (5,908) | (3,787) | (4,714) | 0 | **(14,409)** |
| Justice System Net Benefits[2] | **Intensive Supervision rather than Probation** | | | | | **TYC rather than Local Placement** | | | | |
| initial disposition (incremental) | (3,032) | 0 | 0 | 0 | *(3,032)* | (6,097) | 0 | 0 | 0 | *(6,097)* |
| re-arrest | (2) | 0 | 0 | 0 | *(2)* | 12 | 1 | 5 | 0 | *18* |
| adult court processing | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 19 | 0 | *19* |
| redisposition | (1,746) | 0 | 0 | 0 | *(1,746)* | 1,507 | 81 | 55 | 0 | *1,643* |
| Sub-Total Justice System | (4,780) | 0 | 0 | 0 | **(4,780)** | (4,578) | 83 | 80 | 0 | **(4,417)** |
| Victim and Other Net Benefits[3] | | | | | | | | | | |
| including theft, low estimate for services, output | 0 | 0 | 0 | 0 | *0* | 492 | 0 | 21 | 0 | *512* |
| including theft, high estimate for services, output | 0 | 0 | 0 | 0 | *0* | 861 | 0 | 28 | 0 | *888* |
| including theft, high estimate for services, output+QOL | 0 | 0 | 0 | 0 | *0* | 2,217 | 0 | 138 | 0 | *2,353* |
| Total Net Benefits | | | | | | | | | | |
| including theft, low estimate for services, output | (4,780) | 0 | 0 | 0 | **(4,780)** | (4,086) | 83 | 101 | 0 | **(3,908)** |
| including theft, high estimate for services, output | (4,480) | 0 | 0 | 0 | **(4,780)** | (3,717) | 83 | 108 | 0 | **(3,532)** |
| including theft, high estimate for services, output+QOL | (4,780) | 0 | 0 | 0 | **(4,780)** | (2,361) | 83 | 218 | 0 | **(2.067)** |

Notes: 1. Figures for years 2 through 4 are discounted to year1value at a rate of 5%. Numbers in parentheses are negative, indicating net costs.

2. Initial disposition, or incremental cost is the difference in average costs between paired dispositions. Marginal re-disposition costs are equal to average costs for contractor-supplied services, and equal to 10% of average costs for non-contractor services.

3. Victim and other non-system unit costs are set equal to their average values. QOL refers to value for "quality of life."

In this economic perspective, here focusing on the mid-points of Table 7.2 for ease of discussion, society as a whole would lose roughly $7,070 to $7,860 per juvenile by substituting probation for deferred prosecution, $3,280 to $3,640 in substituting intensive supervision for probation, $22,230 to $24,210 by substituting local placement for intensive supervision, and $4,420 to $5,340 in substituting TYC for local placement. Or, looking at this another way, society has a high probability of obtaining substantial economic benefits by shifting from harsher to milder sanction.

The economic point of view, however, is not the pertinent perspective for county and state decision makers. For them it is the financial point of view, in part because this kind of CBA shows justice system net benefits that are closer to what public agencies can expect to actually spend or save, and in part because including losses and gains from theft and its prevention make more sense to officials than excluding them. Results here, as shown in Table 7.3, generally mirror those of economic CBA. Our use of average values for marginal re-disposition costs of contractor-supplied services does, however, produce a small change. Net justice system and total outlays associated with moving to harsher sanctions, or cost-saving benefits of moving to milder ones, are greater for probation in lieu of deferred prosecution and intensive supervision in lieu of probation; less for local placement in lieu of intensive supervision and TYC in lieu of local placement.

Depending on the direction selected between probation and deferred prosecution, Dallas County, the State, the Federal government, and municipal police departments could collectively expect to spend or save around $8,310-$8,510 per juvenile over four years. The probable range is $4,770-$4,910 for the choice between intensive supervision and probation, $15,120-$15,290 between local placement and intensive supervision, and $3,810-$4,070 between local and TYC placement.

Because county, state, and federal agencies finance different portions of total expenditure on each juvenile or adult disposition, these dollar amounts distribute themselves across jurisdictions in different ways. Table 7.4 shows that the effects of shifting 100 juveniles from deferred prosecution to probation would result in a negative total net benefit, or cost, of $831,000 over four years (when marginal re-disposition costs equal 10% of average costs). The distribution of this total is: $616,000 to the County, $206,000 to the State, $7,000 to the Federal government (which supports some local placement activities), and $1,000 to police departments. The pattern is roughly similar for the shift between probation and intensive supervision.

Things change a lot in the shift between intensive supervision and local placement, where the cost or benefit, collectively, is $1,530,000 for 100 juveniles. Effects of moving youth to the harsher disposition yield a $1,663,000 loss to the county and a $135,000 loss to the Federal government. But because the shift produces a substantial reduction in TYC placements during the first year (see Table 4.12), the State gains $235,000 and police departments, benefitting from fewer referrals and arrests, save $3,000 (see Table 4.6).

As one might expect, moving young people between local and TYC placement, involving a collective cost or benefit of $407,000, produces the largest transfers of fiscal burden. Shifting 100 juveniles to TYC results in savings to the County of $1,935,000, to the Federal government of $217,000, and to the police of $5,000. The State, on the other hand, is saddled with a four-year cost of $2,564,000. The size of this fiscal burden helps to explain why the State puts strict conditions on accepting juveniles into TYC placement, why Texas counties that do not emphasize progressive sanctions, such as Tarrant (Fort Worth) and Travis (Austin), avoid local placement, and why counties that stress the policy, such as Dallas, suffer incessant fiscal pressure.

Table 7.2: Economic Net Benefit Resulting from Change in Disposition, per Juvenile ($2000)

| Initial Disposition | estimate range | Net Present Worth of Benefits: Re-dispositions = 10% Average Costs [1] — Justice System only | Total services and output valued [2] — low | high | Re-dispositions = 25% Average Costs [1] — Justice System only | Total services and output valued [2] — low | high |
|---|---|---|---|---|---|---|---|
| Probation rather than Deferred Prosecution | lower bound | (6,780) | (7,210) | (7,640) | (7,330) | (7,750) | (8,180) |
| | **mid-point** | **(6,720)** | **(7,070)** | **(7,410)** | **(7,180)** | **(7,530)** | **(7,860)** |
| | upper bound | (6,660) | (6,930) | (7,170) | (7,030) | (7,320) | (7,570) |
| Intensive Supervision rather than Probation | lower bound | (3,370) | (3,370) | (3,370) | (3,880) | (3,870) | (3,870) |
| | **mid-point** | **(3,280)** | **(3,280)** | **(3,280)** | **(3,640)** | **(3,640)** | **(3,640)** |
| | upper bound | (3,190) | (3,190) | (3,190) | (3,410) | (3,410) | (3,410) |
| Local Placement rather than Intensive Supervision | lower bound | (24,850) | (25,020) | (25,280) | (23,690) | (23,840) | (24,030) |
| | **mid-point** | **(24,520)** | **(24,210)** | **(23,920)** | **(22,830)** | **(22,520)** | **(22,230)** |
| | upper bound | (24,260) | (23,420) | (22,600) | (22,140) | (21,420) | (20,640) |
| TYC rather than Local Placement | lower bound | (5,830) | (5,790) | (5,850) | (5,410) | (5,360) | (5,460) |
| | **mid-point** | **(5,740)** | **(5,340)** | **(4,960)** | **(5,200)** | **(4,790)** | **(4,420)** |
| | upper bound | (5,640) | (4,860) | (4,050) | (4,960) | (4,220) | (3,410) |

Notes: 1. Assumes that marginal costs of re-dispositions are equal to 10%, or to 25%, of their average costs. 2. Excludes value of stolen items.

Table 7.3: Financial Net Benefit Resulting from Change in Disposition, per Juvenile ($2000)

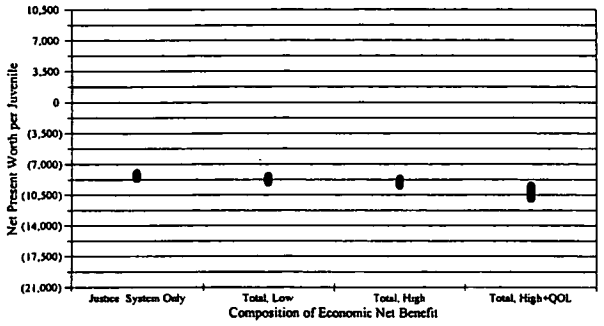
| Initial Disposition | estimate range | Net Present Worth of Benefits: Re-dispositions=Contract Avg. +10% Other Costs [1] — Justice System Only | Total services and output valued [2] — Low | High | High+QOL | Re-dispositions=Contract Avg. +25% Other Costs [1] — Justice System Only | Total services and output valued [2] — Low | High | High+QOL |
|---|---|---|---|---|---|---|---|---|---|
| Probation rather than Deferred Prosecution | lower bound | (8,660) | (9,120) | (9,490) | (10,960) | (8,890) | (9,360) | (9,760) | (11,160) |
| | **mid-point** | **(8,310)** | **(8,740)** | **(9,080)** | **(10,200)** | **(8,510)** | **(8,940)** | **(9,270)** | **(10,390)** |
| | upper bound | (7,970) | (8,360) | (8,650) | (9,460) | (8,140) | (8,510) | (8,790) | (9,610) |
| Intensive Supervision rather than Probation | lower bound | (5,460) | (5,460) | (5,460) | (5,430) | (5,640) | (5,640) | (5,640) | (5,680) |
| | **mid-point** | **(4,770)** | **(4,770)** | **(4,770)** | **(4,770)** | **(4,910)** | **(4,910)** | **(4,910)** | **(4,910)** |
| | upper bound | (4,110) | (4,110) | (4,110) | (4,100) | (4,210) | (4,210) | (4,210) | (4,170) |
| Local Placement rather than Intensive Supervision | lower bound | (16,510) | (16,560) | (16,730) | (17,750) | (16,570) | (16,600) | (16,770) | (17,620) |
| | **mid-point** | **(15,290)** | **(14,910)** | **(14,630)** | **(13,580)** | **(15,120)** | **(14,740)** | **(14,450)** | **(13,400)** |
| | upper bound | (14,090) | (13,180) | (12,490) | (9,440) | (13,700) | (12,860) | (12,100) | (9,280) |
| TYC rather than Local Placement | lower bound | (4,440) | (4,340) | (4,490) | (4,610) | (4,250) | (4,210) | (4,450) | (4,560) |
| | **mid-point** | **(4,070)** | **(3,560)** | **(3,180)** | **(1,720)** | **(3,820)** | **(3,310)** | **(2,930)** | **(1,460)** |
| | upper bound | (3,660) | (2,780) | (1,920) | 1,090 | (3,370) | (2,410) | (1,460) | 1,760 |

Notes: 1. Assumes that marginal costs of re-dispositions are equal to their average costs for contractor-supplied services, and to 10%, or to 25%, of average costs for other disposition activities. 2. Includes value of stolen items.

# Chart 1: Financial Net Benefit Resulting from Change in Disposition, per juvenile ($2000)

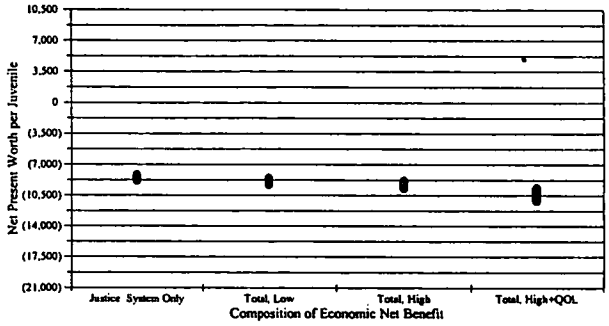
Financial NPW, Marginal=10% Avg. Costs

**Deferred Prosecution to Probation**

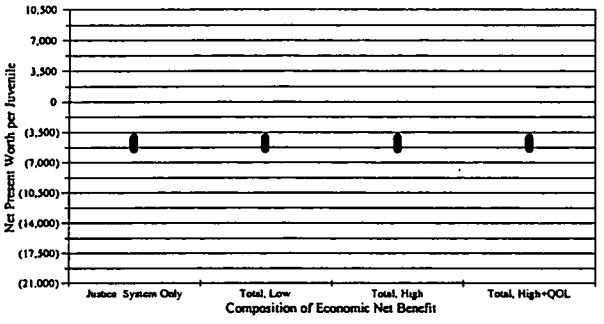



Financial NPW, Marginal=25% Avg. Costs

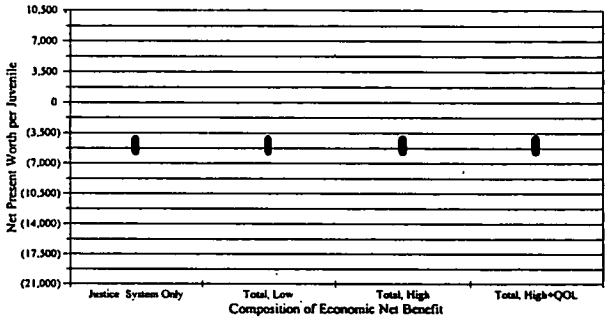
**Deferred Prosecution to Probation**



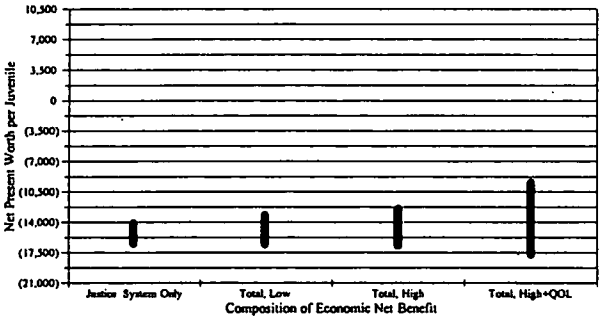

**Probation to Intensive Supervision**



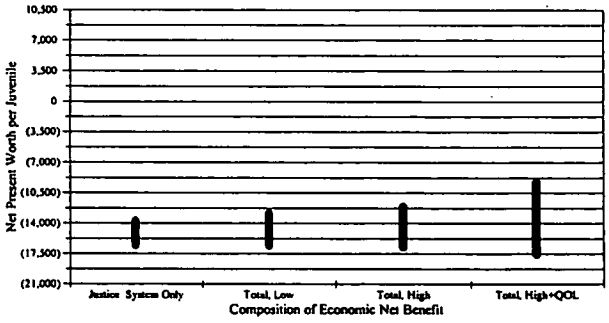

**Probation to Intensive Supervision**



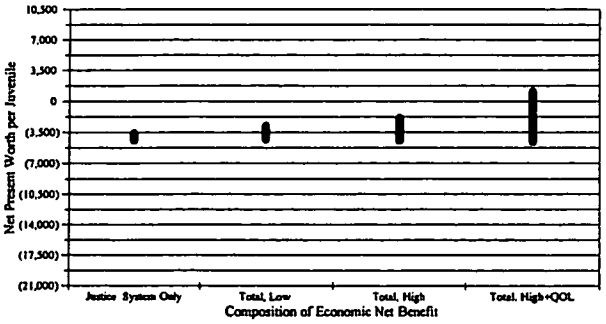

**Intensive Supervision to Placement**



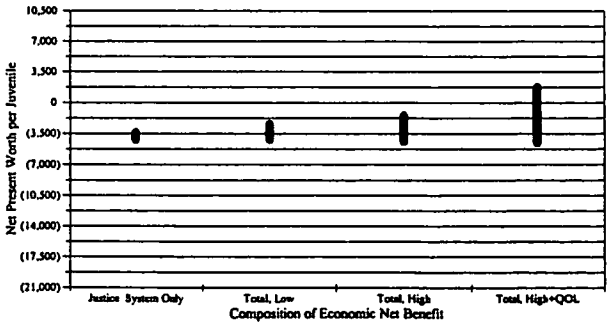

**Intensive Supervision to Placement**




**Local to TYC Placement**




**Local to TYC Placement**



In any event, Table 7.4 suggests that moving from harsher to milder sanction offers prospects for substantial fiscal benefits only in three of the four disposition pairs: deferred prosecution-probation, probation-intensive supervision, and intensive supervision-placement. Although a shift from TYC to local placement promises a non-negligible collective benefit, this gain is immaterial to the jurisdictions involved. In one direction the County spends a lot on placement; in the other direction, the State.

But the issue at hand is not just about spending or saving public resources via changes in disposition policy. It is also about the effects of such changes on victims and others impacted by juvenile and adult offenses. We lay these out for mid-points in Table 7.5. It shows that probation in lieu of deferred prosecution produces negative net benefits over four years. These total $76,575 per 100 juveniles, or $188,600 with QOL included. This disposition shift does suppress misdemeanors in years 1 and 2, as shown earlier in Table 4.16, and does provide positive benefits to victims and others during those years. However, the rise in felonies in year 3 imposes high costs on victims and others, mainly in the form of property and output losses (and QOL if it is included), high enough to wipe out earlier gains and produce the negative net benefit given in the table. And because net benefit is negative, distributions of total NPWs in Table 7.3 are lower than NPWs for the justice system alone.

Analysis of this disposition pair thus presents an unusual outcome. Net justice system expenditures of $831,000 or $851,000 per 100 juveniles - depending on whether marginal costs are valued at 10% or at 25% of average costs - are associated with a net increase, not a decrease, in re-offenses and associated losses to victims and others. This is a net "lose-lose" situation. Here a shift of juveniles in the opposite direction, from probation to deferred prosecution, would result in substantial savings, not only to the justice system but also to potential victims and to others: a "win-win" situation.

Results for intensive supervision in lieu of probation are somewhat different. Net justice system expenditures of $477,000 or $491,000 per 100 juveniles yield.....nothing (which is why justice system and total NPWs in Table 7.3 are identical). Though numbers of status offenses and technical violations increase in year one as a result of harsher sanction, these have negligible victim impacts. So the gain to victims and others is zero in both disposition directions. The implication is clear: intensive supervision, relative to regular probation, is a sanction that produces no benefit.

Unlike the two previous pairings, shifting juveniles from intensive supervision to local placement produces results that, in general, move in an expected direction. Net justice system expenditures of about $1.5 million per 100 juveniles reduce misdemeanors and felonies in year 1 in a substantial way. However, these reductions are followed in years 2 and 3 by substantial increases in delinquent offenses. As consequence, gains to victims and others in year 1 are largely offset by losses in subsequent years. The net effect over four years is a modest gain of $66,580 per 100 juveniles or, with QOL, $171,755. This gain is small compared to the $1.5 million in net justice system costs, borne mainly by the County, required produce it.

Very much the same thing applies from the State's point of view when shifting juveniles from local to TYC placement, i.e., small net gains from very large system expenditures. However, from the perspective of the "justice system," where we treat the County, State, and other entities as joint actors in practice that draw from a common pool of taxpayer resources, things look better. In this view net additional system expenditures of $382,000 or $407,000 per 100 juveniles are associated with net gains to victims and others of $88,840 over four years or, with QOL, $235,535. At these mid-points it appears that benefits do not outweigh costs. This is not the case at the upper bounds of our estimates.

Table 7.3 shows that a high estimate for the dollar value of services and output combined with costs and cost-saving benefits associated with QOL produce positive total NPWs: $1,090 per juvenile at 10% marginal cost; and $1,760 at 25%.

This outcome stems from use of $56,920 as the average loss or gain to victims and others associated with a felony (see Table 6.5), and reflects an assumption that the value of QOL is about $2 million per life. A doubling or tripling of these figures, to $114,000-171,000 per felony and $4-$6 million per life, can push the whole distribution of total NPWs into positive territory. This result would imply that moving juveniles into TYC from local placement is an efficient use of resources, and moving in the opposite direction is inefficient. Or, to state this plainly, the probability distribution of total NPWs for this disposition pair, when the NPW includes a value for QOL is quite arbitrary.

Table 7.4: Financial Net Benefit for Justice System from Change in Disposition, by Jurisdiction ($2000) (mid-point estimates)

| Initial Disposition | County | State | Police | Federal | Total[2] |
|---|---|---|---|---|---|
| per Juvenile | | | | | |
| Marginal Re-disposition Cost =10% of Avg. Cost [1] | | | | | |
| Probation rather than Deferred Prosecution | (6,160) | (2,060) | (10) | (70) | (8,310) |
| Intensive Supervision rather than Probation | (3,320) | (1,380) | (10) | (70) | (4,770) |
| Local Placement rather than Intensive Supervision | (16,630) | 2,650 | 30 | (1,350) | (15,290) |
| TYC Placement rather than Local Placement | 19,350 | (25,640) | 50 | 2,170 | (4,070) |
| Marginal Re-disposition Cost=25% of Avg. Cost [1] | | | | | |
| Probation rather than Deferred Prosecution | (6,290) | (2,110) | (30) | (80) | (8,510) |
| Intensive Supervision rather than Probation | (3,410) | (1,400) | (20) | (70) | (4,910) |
| Local Placement rather than Intensive Supervision | (16,540) | 2,700 | 90 | (1,360) | (15,120) |
| TYC Placement rather than Local Placement | 19,250 | (25,330) | 110 | 2,150 | (3,820) |
| per 100 Juveniles | | | | | |
| Marginal Re-disposition Cost =10% of Avg. Cost [1] | | | | | |
| Probation rather than Deferred Prosecution | (616,000) | (206,000) | (1,000) | (7,000) | (831,000) |
| Intensive Supervision rather than Probation | (332,000) | (138,000) | (1,000) | (7,000) | (477,000) |
| Local Placement rather than Intensive Supervision | (1,663,000) | 265,000 | 3,000 | (135,000) | (1,530,000) |
| TYC Placement rather than Local Placement | 1,935,000 | (2,564,000) | 5,000 | 217,000 | (407,000) |
| Marginal Re-disposition Cost=25% of Avg. Cost [1] | | | | | |
| Probation rather than Deferred Prosecution | (629,000) | (211,000) | (3,000) | (8,000) | (851,000) |
| Intensive Supervision rather than Probation | (341,000) | (140,000) | (2,000) | (7,000) | (491,000) |
| Local Placement rather than Intensive Supervision | (1,654,000) | 270,000 | 9,000 | (136,000) | (1,512,000) |
| TYC Placement rather than Local Placement | 1,925,000 | (2,533,000) | 11,000 | 215,000 | (382,000) |

Notes: 1. Assumes that marginal costs of re-dispositions are equal to their average costs for contractor-supplied services, and to 10%, or to 25%, of average costs for other disposition activities.
2. Totals may not sum exactly due to rounding.

Table 7.5: Financial Net Benefit for Victims and Others from Change in Disposition ($2000)
(mid-point estimates, assumes high value for services and output )

| Initial Disposition | Justice System Net Benefit $ per 100 juveniles | Net Benefit for Victims and Others $ per 100 juveniles | | | | | | | | | Total Net Benefit for Victims and Others $ per juvenile | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Property Loss, Damage | Police, Fire Ambulance | Medical Services | Social, Victim Services | Mental Health Services | Output | Quality of Life (QOL) | Total excluding QOL | Total including QOL | excluding QOL | including QOL |
| Probation rather than Deferred Prosecution | (831,000) - (851,000) | (8,775) | (265) | (1,255) | (135) | (815) | (65,330) | (112,025) | (76,575) | (188,600) | (766) | (1,886) |
| Intensive Supervision rather than Probation | (477,000) - (491,000) | 0.00 | 0.00 | 0.00 | 0.00 | (12) | 0.00 | 0.00 | (12) | (12) | 0 | 0 |
| Local Placement rather than Intensive Supervision | (1,512,000) - (1,530,000) | 8,615 | 230 | 1,465 | 175 | 870 | 55,225 | 105,195 | 66,580 | 171,775 | 666 | 1,718 |
| TYC Placement rather than Local Placement | (382,000) - (407,000) | 12,275 | 310 | 2,250 | 280 | 1,285 | 72,440 | 146,495 | 88,840 | 235,335 | 888 | 2,353 |

Note: Totals may not sum exactly due to rounding.

The basic conclusion of our CBA is that shifts from milder to harsher disposition are likely to be inefficient, across the board. Unless assumed QOL values are several multiples higher than the numbers we use (which would improve results only for the local-TYC placement pair), benefits rarely exceed costs. Further, to the extent that our analysis has captured the effects of Dallas County's decision to embrace progressive sanctions in 1996, i.e., to shift, on the margin, from milder to harsher dispositions, we also conclude that the additional material benefits to victims and others of this policy change have been far less than the additional fiscal expenditures necessary to produce the benefits.

These conclusions depend, among other things, on the accuracy of our valuations of costs and benefits to victims and others. Because these are largely borrowed figures, we have less confidence in them than in our direct estimates of re-offenses, re-dispositions and justice system costs. It may be useful, therefore, to also look at the situation through the lens of "cost-effectiveness" analysis. This method differs from CBA by not putting dollar values on offenses. Rather, it looks at "bang for the buck" in terms of net justice system dollars expended per net offense prevented (or incurred). One advantage of this approach is that it sometimes reveals things that CBA conceals. Another advantage is that it leaves to decision makers the business of putting values on offenses and associated costs and benefits to victims and others. Or, if decision makers do not put explicit values on these things, the method suggests their implicit valuations when they make decisions.

Table 7.6 conveys this information. It suggests, as does CBA, that substituting probation for deferred prosecution or intensive supervision for probation is pointless if the objective is to reduce offenses in general. Total offenses rise by 17 over four years after shifting 100 juveniles to probation from deferred prosecution, and by 11.7 after shifting them to intensive supervision from probation. In other words, at marginal costs equal to 10% of average costs, the justice system expends a net of $48,880 to "incur" an additional offense in the first disposition pair, and $40,770 to do the same in the second. This stems from the nature of regular and intensive supervision probation. They pick up a lot of kids for status offenses and technical violations that go undetected under milder dispositions.

Table 7.6: Effect of Change in Disposition on Justice System Cost Effectiveness ($2000)
(mid-point estimates)

| Initial Disposition | Justice System Net Benefit ($ per 100 juveniles) | Change in Number of Offenses [2] | | | | Net System Outlay per Offense Incurred or Prevented | |
|---|---|---|---|---|---|---|---|
| | | violations | delinquencies | | NetTotal Offenses | all offenses $ | delinquencies $ |
| | | | misdem. | felonies | | | |
| Marginal Re-disposition Cost =10% of Avg. Cost [1] | | | | | | | |
| Probation rather than Deferred Prosecution | (831,000) | 22.4 | (9.0) | 3.9 | 17.0 | *(48,880)* | 162,940 |
| Intensive Supervision rather than Probation | (477,000) | 11.7 | 0.0 | 0.0 | 11.7 | *(40,770)* | n/a |
| Local Placement rather than Intensive Supervision | (1,530,000) | (31.8) | (2.0) | (2.0) | (35.8) | 42,740 | 382,500 |
| TYC Placement rather than Local Placement | (407,000) | 2.3 | (11.0) | 1.9 | (7.1) | 57,320 | 44,730 |
| Marginal Re-disposition Cost=25% of Avg. Cost [1] | | | | | | | |
| Probation rather than Deferred Prosecution | (851,000) | 22.4 | (9.0) | 3.9 | 17.0 | *(50,060)* | 166,860 |
| Intensive Supervision rather than Probation | (491,000) | 11.7 | 0.0 | 0.0 | 11.7 | *(41,970)* | n/a |
| Local Placement rather than Intensive Supervision | (1,512,000) | (31.8) | (2.0) | (2.0) | (35.8) | 42,230 | 378,000 |
| TYC Placement rather than Local Placement | (382,000) | 2.3 | (11.0) | 1.9 | (7.1) | 53,800 | 41,980 |

Notes: 1. Assumes that marginal costs of re-dispositions are equal to their average costs for contractor-supplied services, and to 10%, or to 25%, of average costs for other disposition activities.
2. Numbers in parentheses indicate decrease in offenses. Others indicate increase in offenses.

Probation in lieu of deferred prosecution does somewhat better in regard to delinquencies. With an increase of 3.9 felonies offset by a decrease of 9.0 misdemeanors, the combined effect suggests that it would cost the justice system $162,940 to prevent one delinquency. This is a lot of money. Still, it is better than intensive supervision in lieu of probation, which prevents no delinquencies. Local placement instead of intensive supervision, and TYC instead of local placement, reduce offenses at system costs, respectively, of $42,740 and $57,320 per occurrence. For delinquencies, the respective figures are $382,500 and $44,730.

Looking at this another way, analysis of cost-effectiveness suggests that decision makers who lean in the direction of harsher sanction as a method to protect society from serious offenses, and/or to punish very bad behavior, put high value on delinquencies and their effects. If these decision makers insist on probation rather than deferred prosecution, then by this action they implicitly say that the cost to the community of one delinquency is at least $162,940. If worth less, then there would be no gain from spending this amount of tax dollars to prevent it. Likewise, a delinquency must cost the community at least $382,500 if the way to prevent it is by substituting local placement for intensive supervision, and at least $44,730 if TYC is preferred to local placement.

So, what are the effects in dollar terms of expending more resources on harsher dispositions? Our "bottom line" answer is that it is highly probable that the additional benefits to victims and others of this approach are significantly less than the additional fiscal costs required to produce these benefits. Working the other way, concerning the effects of expending fewer resources on milder dispositions, our answer is that is it highly probable that the additional fiscal benefits are significantly greater than the additional costs to victims and others.

In should go without saying that these findings, which are specific to Dallas County and generalizable only to jurisdictions with comparable juvenile justice policies and socio-demographic characteristics, are only as good and as accurate and as useful as our data and methods permit. However, we can say with confidence that CBA, as a method to flesh out the economic and financial flows that accompany the administration of juvenile justice, is able to give decision-makers useful insights about the implications of their decisions and, through this, to also help them answer the basic question that they often ask themselves: Is it worth it?

Appendix A
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Appendix B

## Overview of Methods for Estimating the Value of Human Life

There are several formal methods by which to estimate a dollar value for human life. One of the earliest used is the "human capital" approach. It sets the figure equal to the value of lost lifetime output from paid and/or unpaid work that results from premature death. Controversies, such as whether to use gross output or value-added (i.e., net of the costs of education, food, clothing, housing, and other consumption inputs required to produce the output) and, more importantly, whether actual or imputed labor income is an appropriate determinant, have curtailed application of this method. It nevertheless retains a place in CBA as a way to estimate the material loss to society that results from the premature death of its members.

The "revealed preference" approach assumes that individuals, implicitly or explicitly by the choices they make in the market, express their beliefs as to what their own lives are worth. Studies done under this rubric follow one of two tracks, wage-risk or consumer-market, both of which look at the trade-offs between wealth and safety. Wage-risk analyses look at the balance between wages and higher risk of death on the job while consumer-market studies focus on observable trade-offs that individuals make between wealth and risk in their consumption decisions (e.g., purchase of smoke detectors).

Wage-risk studies, the more common of the two tracks, usually rely on statistical regression models to estimate the role that risk plays after controlling for all other factors that might account for variation in earnings. These studies sometimes adopt what is called a "hedonic" wage method, which looks simultaneously at the labor supply and demand decisions made by both consumers and firms. Here the basic idea is that safety improvement is a cost to the firm. If it wishes to protect profits, then it must decrease wages in step with investment in increased safety measures. By fitting a line through different wage offer curves, workers' willingness to accept risk in return for wealth is determined.

The survey method, also called "contingent valuation," presumes that one can arrive at a value for life by asking people what they think it is rather than trying to deduce it from their market behavior. This approach involves asking individuals a series of carefully crafted questions designed to get them to say exactly the value that they would place on avoiding certain hazards. Answers are then summed across individuals. It is a demanding exercise, requiring that the same questions be asked in different ways to assure that answers are the same; that questions are posed to a representative population sample; and that queries are clear and understandable.

One of the supposed attractions of this method is that, at the very least, it consults the relevant experts, the public, rather than depending on unilateral valuations of statistical technicians (Hanemann, 1994). It nevertheless remains a hotly debated method. Advocates, such as Portney (1994), insist that, like or not, contingent valuation will play a role in policy formation. Opponents, such as Diamond and Hausman (1994), insist with equal fervor that it is too flawed a method for use in CBA, and that it is unlikely to improve in the future.

Then there is the "jury award" method. It presumes that juries are representative samples of the community populations from which they are drawn, and that the awards they make in different types of cases represent the values that the communities attach to the pain and suffering involved in these cases. Estimates of the value of life or, more precisely, of reduction in "quality of life" then flow from using coefficients derived from regression analysis to assign values for different kinds of situations. Use of this method in CBA is much rarer than for the others, among other reasons because most analysts share

Zimring and Hawkins' (1995) view that it yields estimates that "...are opportunistic, arbitrary, inconsistent, and too high" (p. 138).

Table 1.2, in the main text of this report, shows 60 estimates for the value of life that have been made during the last quarter century using wage-risk, consumer behavior, and survey methods. There is wide dispersion in the results: $70,000 to $4 million under consumer behavior; $7,500 to $15.6 million by the survey method; and $7,500 to $18 million by the wage-risk method. As one might expect, there is unending debate about the best method to use, and the best dollar figure to draw from each method.

These arguments, however, are between analysts. Although some might style themselves as "experts," modern society has yet to accept the notion that there is an expertise, such as real estate or jewelry appraisal, associated with assessing the value of life. Accordingly, any figure within (or even outside) Table 1.2's range of $7,500 to $18 million is just as valid as any other. When all is said and done, the decision to choose a particular dollar valuation for purposes of CBA is subjective, based more on the particular circumstances at hand than on expert opinions of what human life is worth.

Thus firms that seek a balance between the cost of improving product safety and the added cost of jury awards that might result from not making improvements, must keep a watchful eye on award size. Governments, though less subject to the capriciousness of the jury award process, must nevertheless also adopt one or another figure in certain circumstances in order to avoid excessive wastage of resources. The 1984 introduction of national seat belt standards in the U.S., for instance, could have been justified in CBA terms with a value of $100,000 per life saved. In contrast, the 1988 ban on hazardous waste land disposal would have needed a value of $4,200,000 per life to justify itself in CBA terms; and the 1990 requirement that wood-preserving chemicals be listed as hazardous waste would have needed $5,700,000,000,000 (Economist, 1992).

So the situation is this. Today there is no agreed-upon figure for the value of a human life. At the same time, there is recognition that it is sometimes useful for certain applications of CBA to have a figure to work with - especially when one of the important objectives of the policy or program being analyzed is to save lives. CBA of some spheres within the broad area of criminal justice may warrant inclusion of a value of life. It is not obvious that juvenile justice, given its main objectives, is one of these spheres.