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The location of women's prisons and the deterrence effect of "harder" time

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Abstract

Most studies of the deterrence effect of incarceration treat a year in prison as having the same deterrence effect regardless of the conditions of incarceration. In contrast, we are interested in the deterrence effect of punitiveness that is unrelated to sentence length. We focus on the punitiveness of reduced visitation associated with incarceration in institutions far from one's city of residence. Our estimation strategy takes advantage of the natural experiment created by recent expansions in the female penal system. The physical expansion of the penal system decreased the distance to prisons for some cities while increasing it for others. Our results suggest that incarceration location has a sizable deterrence effect. Increasing the average distance to a woman's prison by 40 miles reduces the female violent crime rate by approximately 6%.
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1. Introduction

Hard time, to paraphrase a *New Yorker* article, is getting harder.[1] Many states have increased sentence lengths, others have instituted mandatory sentences, and still others have moved to "three-strikes" rules. In addition too longer sentences, inmates are being

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[1] "Lockdown: Life inside is getting harder," *The New Yorker*, February 24 and March 3, 1997.

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denied air conditioning,[2] weight sets, exercise time, visitation, phone calls and television. Alabama, Arizona, Florida, Iowa, Massachusetts (*Charleston Daily Mail*. June 17 1999) and Wisconsin (*Milwaukee Journal Sentinel* November 14, 1997) have even reintroduced chain gangs. And in Georgia prisoners are again forced to wear striped uniforms.

There are two standard arguments for making prison time more punitive: retribution and deterrence. The case for retribution rests on the presumption that punishing criminals increases the utility of victims, and perhaps other members of society as well. Stated somewhat differently, it is punishment as consumption. In fact, punishment has a long history as a consumption good. Romans staged elaborate games in which condemned criminals fought to the death for the entertainment of the populace; medieval executions were festival days; and in colonial America, criminals were placed in stocks for public ridicule. Despite current demonstrations of support during executions, consumption arguments for punishment have fallen out of favor with politicians and policy makers.

The deterrence argument is consistent with Becker's (1968) economic model of crime. The decision to commit a crime is determined by the marginal benefit that the perpetrator expects to receive from the crime relative to its expected marginal cost. In this simple model marginal cost is a function of the likelihood and severity of punishment (Becker, 1968; Stigler, 1970; Polinsky & Shavel, 1984). Several studies have tested the prediction that more severe sanctions, traditionally measured by the likelihood and duration of incarceration, deter crime (examples include Tauchen, Witte and Griesinger (1994) and Levitt (1997, 1998), see Avio (1998) for review of the literature). There have also been several attempts to estimate the cost of punishment, in terms of subsequently lower wages and employment probabilities, across individuals with different attributes (Lott, 1992a, 1992b; Waldfogel, 1994; Grogger, 1992, 1995).

To the best of our knowledge, there has been no systematic attempt to estimate the deterrence effect of punitiveness other than incarceration length.[3] It is this void that we seek to fill.[4] Testing the deterrence effect of "harder" time is hampered by the difficulties inherent to measuring the punitiveness of sanctions. Casual perusal of the 1997 Survey of Inmates (conducted by the Bureau of Justice Statistics) suggests that there is very little within institution variation in the treatment of prisoners. For example, if there are televisions in the facility all or most inmates seem to have access. Similarly, access to education programs, air conditioning, sunlight, prisons jobs and exposure to violence do not differ systematically across inmates in a given institution. The only systematic difference lies in access family and friends. Inmates serving their sentence more than 50 miles from their city of residence are much less likely to receive phone calls and/or be visited by children, family and friends.

We use the systematic variation in visitation associated with prison location to estimate the deterrence effect of punitiveness. More specifically, we take advantage of the natural

[2] The Virginia Poverty Law Center recently deemed Virginia prisons unsafe and unhealthy. Lack of air conditioning was one of the stated reasons (*The Washington Post*, July 10, 1999).

[3] Previous studies have treated a year of imprisonment as having the same deterrence effect regardless of the conditions of incarceration (Ehrlich, 1973; Marvell & Moody, 1994; Levitt, 1996). In one sense, Ehrlich's (1975) paper on the death penalty is an exception. Unless you believe that there truly is a "fate worse than death," the death penalty is an upper bound on how punitive the state can make sanctions.

[4] It is also worth noting female crime has been largely ignored (exceptions include Bartel (1979) and Phillips and Votey (1984)).

experiment created by recent expansions in the female penal system. These expansions simultaneously decreased the distance to prisons for some cities while increasing it for others. For example, the building of a new prison closer to San Francisco means building it further from Los Angeles. Movement in both directions is particularly helpful because it ensures that we are not identifying effects on crime rates off coincidental one-directional trends. We find a sizeable deterrence effect for punitiveness (distance) changes. Increasing the average prison distance by 40 miles reduces female violent crime by approximately 6%.[5] These results suggest that visitation is an important punishment cost for women.[6]

The remainder of the paper proceeds as follows. Section 2 presents the crime and distance data used in the analysis. Section 3 discusses the punitiveness of incarceration location. Section 4 discusses the expansion of the female penal system and the exogeneity of prison distance. Section 5 presents the panel estimates of the effect of punishment on female crime rates. Section 6 concludes and discusses possible policy implications.

2. Crime data

Our primary data source is the Federal Bureau of Investigation's 1980–1995 Unified Crime Reports (UCR) that contain data on all crimes reported to the police and all crimes cleared by arrest. Crimes are classified into seven categories known as index crimes and two broad aggregates (violent and property crimes).[7] One important limitation in all crime data is that the personal characteristics of criminals, such as gender, race and age, are only observed for those crimes cleared by arrest. Similar to Levitt (1999), we use the UCR arrest data to estimate the female crime rate. The female crime rate is therefore the fraction of female arrests for a city and year multiplied by the number of reported crimes.

$$\text{Crime}_{ijt}^{f} = \frac{\text{Arrests}_{ijt}^{f}}{\text{Arrests}_{ijt}^{m} + \text{Arrests}_{ijt}^{f}} \times \text{Crime}_{ijt} \tag{1}$$

where i denotes the type of offence (violent or property), j is the city, t is the year, m denotes male and f denotes female. For comparability across cities, Crime_{ijt}^{f} is translated into the rate per 1000 women, $\text{CR}_{ijt}^{f} = (1000 \times \text{Crime}_{ijt}^{f})/(\text{female population})$. The natural log of the crime rate, $\ln(\text{CR}_{ijt}^{f})$, is the dependent variable throughout the analysis.

[5] It is important to note that we are focusing on the first-round deterrence effects. It is certainly possible that the indirect effects on children lead to quite different long-run general equilibrium outcomes.

[6] We are not suggesting that prison location does not affect men, in fact distance from family, friends, and gangs is likely punitive for men. The difficulty with examining the deterrence effect of distance for men is that there is no corresponding natural experiment for men between 1981 and 1995. Although a substantial number of men's prisons were built during this period, the vast majority of states already contained many male penitentiaries at the beginning of the period. While an increase from one to two female prisons clearly changes a woman's perception about where she expects to be imprisoned, it is much less clear how a change from 15 to 16 male prisons changes a man's perception about where he expects to be incarcerated.

[7] The Unified Crime Report lists seven crime categories: murder, non-negligent manslaughter, forcible rape, robbery, assault, burglary, larceny and motor vehicle theft. The first four are cateorized as violent crime and the latter three are listed as property crimes (see Appendix II of *Crime in the United States*).

We supplement the crime rate data with murder rate information from the UCR Supplementary Homicide Report. These reports provide incident-level details on the date, location, victim characteristics and offender characteristics for over 90% of all murders in the United States. Using this data we can identify murders committed by women in each city in each year, MR^f_{ijt}. As it is very common to observe zero murders in a given year, even in cities with populations in excess of 100,000 people,[8] we do not convert murders into a rate or take natural logs. In contrast with violent and property crime rates, all female murder equations are estimated using a Poisson model rather than weighted least squares.

Expected prison distance is defined as the average distance from a given city of residence to each possible prison weighted by the prisons relative population. City to prison distance is approximated by the straight-line distance.[9] A complete list of prisons are available for 1980, 1985, 1992 and 1995 in the Census of State and Federal Correctional Facilities produced by the Census Bureau for the Department of Justice. We supplement this information with opening and closing dates for prisons that appear or disappear between census years.[10] To avoid creating an artificial trend in distance, 1995 prison populations are used as weights for all years.[11] In the few cases where a prison closed prior to 1995, the most recent population available is used as the weight.

An alternative, and some might argue preferable, distance measure might weight distance by space relative to capacity at each prison since convicts are most likely sent to institutions with the space to accommodate them. Unfortunately, reported capacity rarely reflects actual capacity. In fact, in recent years population more frequently exceeds capacity than the other way around. Since prisons are more likely to have excess capacity in the first few years of operation, and hence be an above average destination, we rerun the regressions removing first the year after an opening or closing and then removing the first two years after an opening or closing. Even if average distance is an imperfect measure of expected distance in years directly surrounding facility changes, by year three most prisons are full making average distance a good measure of expectation on the part of potential criminals.

If, for some years, a state has no women's penitentiary we assume that women are sent to local jails. More precisely, we assign zero distance to these observations. As a robustness check we also run regressions including a dummy variable for those state-years with no

[8] This of course means that our estimates are for the population of cities with 100,000 or more residents rather than for the U.S. as a whole. However, given the huge fraction of crimes committed in cities, as opposed to rural areas, cities are the primary group of interest. Further, these are the units for which we can define reasonable experiments and comparisons groups—cities that have significant female crime rates that have women's prisons move closer to them or farther away from them compared to cities where there is no change in distance to women's prisons (see Meyer, 1995).

[9] While it may be conceptually appealing to differentiate between prison locations for violent/property offenders (maximum versus medium/minimum security facilities) we do not do this because most female penitentiaries serve all security levels. It is therefore more meaningful to calculate average distance based on all facilities. However, changing the average distance measure definition does not qualitatively alter the results. For example, the results for violent crime are very similar if average distance is measured as the average distance to maximum-security facilities if one or more exist in the state and to medium security facilities otherwise.

[10] Opening and closing dates are from data provided by corrections departments on the web and from the *Juvenile and Adult Correctional Departments, Institutions, Agencies and Paroling Authorities Directory* (1999). Combining these data sources gives us a complete list of all prison opening and closing dates.

[11] All results are similar if distance is weighted by population interpolated between census years.

Table 1
Descriptive statistics

	Mean	S.D.	Minimum	Maximum
Female violent crime rate (per 1000 women)	3.68	2.72	0.05	17.90
Female property crime rate (per 1000 women)	19.73	7.66	0.79	55.76
Female murder rate (per 1000 Women)	0.02	0.02	0.00	0.13
Average distance	122.67	94.62	0.00	542.78
Arrest rate	11.98	4.54	0.01	39.05
City population	301879.80	608444.20	25803.00	7375097.00
Percent of population aged 18–24	11.24	1.29	8.17	14.46
Unemployment rate	6.63	2.49	1.80	25.50
Income per capita	20728.14	3050.85	12283.60	30315.98
Percent Black	11.03	6.62	0.28	35.68
Percent Below the poverty line	13.95	3.34	2.90	27.20
Female labor force participation rate	56.40	3.64	46.30	69.80
Average monthly welfare payment	439.18	193.81	119.00	789.04
Live births per 100,000 population	16.43	1.96	12.60	27.30

Sample covers 1981–1995 and includes 196 cities with populations of 100,000 or more at some point during the sample period, the sample size is 2824 due to occassional non-reporting. Crime and arrest rates are resticted to women aged 18–34. All values reported in 1995 dollars.

prison and excluding states that do not contain at least one prison throughout the sample period (see Section 5.2).

Since female crime rates tend to be low, and hence volatile for small communities, we restrict our analysis to cities with populations of at least 100,000 at some point between 1981 and 1995. To control for other socioeconomic and law enforcement factors we include controls for city level unemployment rates, population sizes and arrest rates, and state level measures for the percent black, average income, the birth rate, the female labor force participation rate, poverty rates and the average welfare payment.[12] The arrest rate is included to capture the law enforcement effort in each city. To mitigate possible endogeneity the arrest rate is lagged by one year. As a result, the panel runs from 1981 to 1995 instead of from 1980 to 1995. The birth rate, percent of the population aged 18–24, and the percent black are included to capture demographic changes. To control for the economic model of crime's prediction that as the return to legitimate activity increases individuals respond by spending less time in criminal activities, we include unemployment, average income and welfare payments.[13] Finally, female labor force participation is included to capture the increased opportunities for criminal activity that labor market participation affords women (Witt & Witte, 1998). Summary statistics for the variables described above are provided in Table 1.

[12] The city level unemployment data are from the *Employment and Earnings* report produced by the Bureau of Labor Statistics. The remaining data is from the *Statistical Abstract of the United States*. All currency values are reported in 1995 dollars.

[13] Higher returns to legitimate activities have a theoretically ambiguous impact on criminal participation (Block & Heineke, 1975; Witte, 1980; Grogger, 1998). There is, however, a substantial empirical literature exploring the relative importance of labor market opportunities and deterrence (Witte, 1980; Myers, 1983; Cook & Zarkin, 1985). These studies suggest that there is a substitution effect between legitimate labor market activity and crime, but the case is far from settled (see Freeman, 1996 for a review of the literature). It should be noted that none of these studies examine the effect of legitimate income changes for women separately.

3. The punitiveness of prison location

There are two crucial issues. First, does distance reduce visitation? Second, is reduced visitation punitive? This section provides evidence to show that the answer to both questions is yes. This is not to say that reduced visitation is the only, or even the major source of punishment; the threat of violence, reduced freedom, the physical environment and so on are clearly punitive. What we are arguing is that reduced access to the outside world is the one form of punishment that varies systematically across individuals within institutions.

3.1. Does distance reduce visitation?

Many studies have shown that inmates incarcerated farther from their city of residence are less likely to receive visits and phone calls from family and friends. For example, according to Baunach (1985):

The most direct way to retain ties with children during incarceration is through visits. However, slightly less than half (47 percent) of the children visited their mothers regularly, once a month or more. The most frequently given reasons for few visits were the distance from the children's placement or the lack of transportation.

The National Council on Crime and Delinquency similarly reports that 60% of mothers in prison are incarcerated more than 100 miles from their children, making visitation financially prohibitive. The Bureau of Justice Statistics (1994) also reports that 52% of women with children receive no visits from their children and that the cost of traveling to distant prisons is the most commonly stated reason for the lack of contact.

Anecdotal evidence supporting this view is easy to find. An Ohio sixth grader recently brought a gun to school in an effort to be sent to prison with his mother who had been moved from a local jail to the Ohio Reformatory for Women in Marysville located 150 miles away (Salon, March 29, 2000). In a recent Los Angeles Times article Alice Sanchez, a custodial grandmother, explains that her granddaughter has not visited her incarcerated mother in eight years because the distance to the prison, the ordeal of entering the penitentiary as a visitor and the cost of the trip are prohibitive (Los Angels Times, May 22, 2000). *No Safe Haven: Stories of Women in Prison* (Girshick, 1999) chronicles the experience of forty women at the Black Mountain Correctional Center for Women in North Carolina. Again the burden imposed by distance is a recurring theme. Many inmates claim that transportation costs limit visitation with their children. As outgoing phone calls at Black Mountain are limited to local and collect calls, many inmates also find the cost of telephone communication prohibitive.

To more fully explore the relationship between distance and visitation, we estimate the frequency of visitation and phone calls using data from the 1997 Survey of Inmates. This survey contains substantial information about the conditions of confinement for a nationally representative sample of state prisoners, including 57 institutions housing female inmates.[14] In addition to the conditions of confinement, the 1997 Survey of Inmates also reports the distance from where the inmate was living at the time of her arrest to the prison in which

[14] There are similar surveys for 1974, 1979, 1986 and 1991. Unfortunately, these surveys are useless for our purposes because they do not include prison identifiers.

Table 2
Prison visitation and phone calls

	"Near" defined as 50 miles or less			"Near" defined as 100 miles or less		
	Visits by children	Visits by anyone	Phone calls	Visits by children	Visits by anyone	Phone calls
Residence near to prison						
Never	0.37	0.22	0.20	0.41	0.30	0.24
Rarely	0.17	0.37	0.11	0.18	0.36	0.12
Occasionally	0.20	0.26	0.14	0.22	0.22	0.16
Often	0.27	0.14	0.55	0.19	0.12	0.49
Residence far from prison						
Never	0.53	0.48	0.27	0.56	0.54	0.27
Rarely	0.23	0.31	0.17	0.24	0.28	0.18
Occasionally	0.16	0.14	0.15	0.13	0.12	0.15
Often	0.08	0.07	0.41	0.06	0.06	0.41

she is presently incarcerated. The distance information is reported by category: less than 50 miles, 50–100 miles, 100–500 miles, and more than 500 miles. To ensure that the results presented below are not an artifact of the distance measure chosen, all analyses are preformed designating the prison as 'near' to the inmate's home if it is less than 50 miles away and again defining 'near' as within 100 miles. In all cases the results are similar.

Table 2 reports the raw frequency distribution of visitation for women who live both near and far from the prison in which they are incarcerated. Columns 1, 2, 4 and 5 report the fraction of inmates who are never visited, rarely visited (less than once per month), occasionally visited (more than once per month but less than once per week) and often visited (at least once per week). Columns 3 and 6 report the proportion of inmates receiving no phone calls last week, one call (rarely), two calls (occasionally) and three or more calls (often). Whether 'near' is defined as the inmate's city of residence being less than 50 or within 100 miles from the prison, those with residences closer to the prison receive more visitors and phone calls. For example, 47% of women whose city of residence is less than 50 miles of the prison see their children at least once a month compared to only 24% of women whose city of residence is fifty miles or more from the prison.[15]

One might be concerned that inmates incarcerated at greater distance from their home are systematically different from other inmates. For example, they may be disproportionately convicted of violent crimes, unmarried, serving a longer sentence and so on. Descriptive statistics for the sample of female inmates in the 1997 Survey of Inmates are provided in Table 3. To the extent that these types of attributes also reduce visitation, we may be con-

[15] In contrast to the systematic differences in visitation, the data in the 1997 Survey of Inmates reveal that all other amenities tend to be institution-wide, with access differing very little across inmates within an institution. For example, in 33, 25 and 28 of the 57 institutions either all or none of the respondents report having sunlight in the room in which they sleep, air conditioning, and access to a television, respectively. Further, even in institutions where there is some heterogeneity in access, there appears to be no systematic variation across inmates. Reduced access to exercise is another possibly punitive action. While some institutions do allow more access, and while younger and more educated inmates are more likely to lift weights, run, use an exercise machine or take part in sports, there appear to be no other systematic differences.

Table 3
Descriptive statistics for the sample from the survey of inmates

	Visits by children		Visits by children		Phone calls	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
"Near" defined as less than 50 miles						
Residence near the prison	0.160	0.367	0.239	0.427	0.165	0.371
Age	35.652	8.824	35.531	9.072	35.817	8.836
Highest grade	10.653	2.392	10.906	2.477	10.645	2.389
Married	0.189	0.391	0.225	0.418	0.191	0.393
Number of children	2.661	1.611	2.633	1.554	2.664	1.649
Has child younger than 16	0.734	0.442	0.716	0.452	0.728	0.445
Black	0.484	0.500	0.475	0.500	0.484	0.500
Hispanic	0.139	0.346	0.118	0.323	0.134	0.341
Native American	0.036	0.186	0.027	0.162	0.037	0.188
Maximum sentence (in years)	10.710	12.574	11.909	14.351	10.917	12.795
Life sentence	0.074	0.262	0.088	0.284	0.077	0.267
Years already served	2.314	3.248	2.697	3.637	2.403	3.314
Non-violent offense	0.257	0.437	0.271	0.445	0.252	0.435
Drug offense	0.330	0.470	0.287	0.453	0.329	0.470
Sample size	864		373		923	
"Near" defined as 100 miles or less						
Residence near the prison	0.366	0.482	0.491	0.501	0.369	0.483
Age	35.652	8.824	35.531	9.072	35.817	8.836
Highest grade	10.653	2.392	10.906	2.477	10.645	2.389
Married	0.189	0.391	0.225	0.418	0.191	0.393
Number of children	2.661	1.611	2.633	1.554	2.664	1.649
Has child younger than 16	0.734	0.442	0.716	0.452	0.728	0.445
Black	0.484	0.500	0.475	0.500	0.484	0.500
Hispanic	0.139	0.346	0.118	0.323	0.134	0.341
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founding visitation with personal characteristics. To ensure that this is not the case, Table 4 presents order probit estimates that include controls for socioeconomic characteristics, offense and sentence. All models are of the following form:

$$y_i^* = \delta D_i + X_i\beta + \varepsilon_i \tag{2}$$

where $D_i = 1$ if the inmate's home is 'near' the prison and 0 otherwise, X_i is a vector of control variables, and ε is the error component. X_i includes the inmate's age, highest grade, number of children, maximum sentence, years of sentence already served, and indicator variables for married, having a child under the age of sixteen, Black, Hispanic, Native American, primary conviction for a non-violent offence, primary conviction for a drug offence, and serving a life (or death) sentence. The omitted indicator variables include marital status

Table 4
Ordered probit models of prison visitation and phone calls

	"Near" defined as 50 miles or less			"Near" defined as 100 miles or less		
	Visits by children	Visits by anyone	Phone anyone	Visits by children	Visits by anyone	Phone calls
Residence near to prison	0.532 (0.127)	0.578 (0.168)	0.336 (0.126)	0.628 (0.103)	0.685 (0.156)	0.185 (0.099)
Age	0.001 (0.007)	0.013 (0.010)	−0.016 (0.006)	0.000 (0.007)	0.013 (0.011)	−0.015 (0.006)
Highest grade	0.062 (0.018)	0.037 (0.029)	0.025 (0.017)	0.069 (0.018)	0.049 (0.029)	0.026 (0.017)
Married	0.044 (0.110)	0.349 (0.166)	0.000 (0.103)	0.051 (0.110)	0.378 (0.167)	−0.004 (0.103)
Number of children	−0.004 (0.028)	0.011 (0.046)	0.025 (0.025)	0.003 (0.028)	0.028 (0.047)	0.025 (0.025)
Has child younger than 16	0.230 (0.126)	0.490 (0.205)	−0.071 (0.118)	0.206 (0.126)	0.467 (0.207)	−0.078 (0.118)
Black	−0.079 (0.096)	−0.017 (0.152)	−0.137 (0.092)	−0.054 (0.096)	0.033 (0.153)	−0.129 (0.092)
Hispanic	0.292 (0.140)	0.178 (0.243)	0.017 (0.134)	0.306 (0.141)	0.174 (0.244)	0.016 (0.134)
Native American	−0.203 (0.238)	1.045 (0.409)	−0.097 (0.207)	−0.192 (0.237)	1.044 (0.414)	−0.111 (0.206)
Maximum sentence (in years)	0.004 (0.004)	0.002 (0.006)	0.000 (0.004)	0.006 (0.004)	0.004 (0.006)	0.000 (0.004)
Life sentence	0.122 (0.195)	−0.257 (0.291)	0.153 (0.189)	0.173 (0.196)	−0.107 (0.293)	0.161 (0.189)
Years already served	0.054 (0.016)	0.022 (0.023)	−0.009 (0.015)	0.054 (0.016)	0.023 (0.023)	−0.010 (0.015)
Non-violent offense	−0.092 (0.115)	−0.014 (0.184)	0.131 (0.113)	−0.100 (0.115)	0.036 (0.186)	0.125 (0.112)
Drug offense	−0.355 (0.113)	−0.182 (0.192)	−0.010 (0.106)	−0.385 (0.113)	−0.159 (0.193)	−0.022 (0.106)
Cut-off 1	0.536 (0.549)	0.596 (0.701)	−1.738 (0.599)	0.826 (0.550)	0.940 (0.714)	−1.689 (0.593)
Cut-off 2	1.197 (0.550)	1.732 (0.704)	−1.235 (0.598)	1.498 (0.551)	2.087 (0.719)	−1.187 (0.592)
Cut-off 3	1.896 (0.552)	2.661 (0.710)	−0.840 (0.598)	2.210 (0.553)	3.027 (0.725)	−0.791 (0.591)
Sample size	864	373	923	864	373	923
Log-likelihood	−969.4	−381.5	−1113.1	−959.3	−377.7	−1114.9
Predicted probabilities						
Residence near to prison						
Never	0.31	0.23	0.13	0.36	0.27	0.18
Rarely	0.23	0.34	0.12	0.24	0.34	0.14
Occasionally	0.23	0.26	0.12	0.22	0.24	0.13
Often	0.23	0.17	0.63	0.19	0.14	0.54
Residence far from prison						
Never	0.53	0.46	0.36	0.57	0.52	0.27
Rarely	0.22	0.33	0.16	0.21	0.3	0.16
Occasionally	0.16	0.16	0.14	0.14	0.13	0.14
Often	0.10	0.06	0.44	0.08	0.04	0.43

All models also include prison indicators. Heteroskedastic consistent standard errors in parentheses.

being single, no child under the age of 16, White, non-life sentence and primary conviction being for a violent offense. While y_i^* is unobserved, we do observe:

$$\begin{aligned} y_i &= 0 \quad \text{if} \quad y_i^* \leq \kappa_1 \\ &= 1 \quad \text{if} \quad \kappa_1 < y_i^* \leq \kappa_2 \\ &= 2 \quad \text{if} \quad \kappa_2 < y_i^* \leq \kappa_3 \\ &= 3 \quad \text{if} \quad y_i^* > \kappa_3 \end{aligned} \tag{3}$$

where the κ's are unknown parameters (cut points) to be estimated. $y_i = 0$ corresponds to never receiving visits (calls), $y_i = 1$ corresponds to rarely receiving visits (calls), $y_i = 2$ corresponds to occasionally receiving visits (calls) and $y_i = 3$ corresponds to often receiving visits (calls).

Proximity of the correctional facility to the inmate's home is statistically significant at conventional levels for all models and prison distance measures. Inmates with nearby homes are more likely to receive visits and phone calls. For ease of description, the bottom panel of Table 4 reports the predicted probability of visitation (phone calls) by geographic proximity evaluated at sample means. For example, women with homes less than 50 miles from the prison are 22% points less likely to receive no visits from their children compared to other women. These women are also 17% points more likely to receive phone calls at least once per month.

3.2. Is reduced visitation punitive?

The Bureau of Justice Statistics reports that 78.1% of female prisoners had children in 1994.[16] Of those prisoners with children, 71.7% were primary caregivers prior to incarceration. The majority of these women must rely on grandparents or relatives, other than the father, to care for the children while in prison.

For women, the main concern upon being arrested remains, "Where are my children?" The majority of women in prison are mothers. The loss of self-esteem and identity of women in prison is associated closely with loss of contact with children and family. (Conklin, 2000)

Van Wormer (1981), Koban (1983), Baunach (1985), Clark (1995) and Lord (1995) all echo the same view. They all point to the separation of mother from child as the most punitive aspect of incarceration.

At least since Becker (1973), economic models of the family allow children to constitute a consumption component for parents. There is no reason to suppose that prisoners, like other parents, do not derive utility from interacting with their children. It is also widely accepted that parents have altruistic feelings toward their children and derive utility from raising their children. Despite their criminal activity, there is again no reason to suppose that this is not true of prisoners as well. To the extent that inmates' value child visitation and parental control, prison custody reduces their utility. Since women incarcerated farther from their home receive fewer visits and phone calls they necessarily pay a bigger parental penalty.

While we have focused on children, the evidence presented in the previous section clearly shows that all visitation is reduced by distance, both by children and other friends and family.

[16] The numbers are comparable for black (79.6%) and white (73.9%) women.

Table 5
Prisons per state

Year	Average	CA	TX	NY	FL
1981	1.3	2	3	3	2
1982	1.3	2	3	3	2
1983	1.3	2	2	3	2
1984	1.3	2	2	3	2
1985	1.4	2	2	3	3
1986	1.5	2	2	3	3
1987	1.5	4	2	3	3
1988	1.6	4	2	3	3
1989	1.7	4	2	3	3
1990	1.8	5	2	4	3
1991	1.9	5	2	4	3
1992	1.9	5	2	4	3
1993	2.0	4	2	4	3
1994	2.2	4	6	4	3
1995	2.2	4	6	4	3

To the extent that prisoners derive utility from contact with friends and family, reduced visitation and phone calls from these sources are also punitive. Again, we are not arguing that reduced visitation is the only, or even the major punishment associated with prison, rather that it is the only form of punishment, other than sentence length, that varies systematically.

4. Expansion of the female prison system

Between 1981 and 1995 many states increased their female prison capacity by as much as 50–150% with the construction of one or two institutions. As shown in Table 5, the average number of prisons per state rose from 1.3 in 1981 to 2.2 in 1995. To give a few examples, during this period California built two prisons, Texas three, New York one and Florida one. This prison building translates into a wide variety of changes in the distance between major cities and female penitentiaries. The expected, or prison-population-weighted straight-line distance between Los Angeles and a women's prison was 42 miles in 1981 and 174 miles in 1995 compared to a reduction from 380 to 215 miles for San Francisco over the same time frame. In contrast, the average distance between New York City and a female prison fell from 170 to 150 miles between 1981 and 1995, while it rose from 148 to 170 miles for Buffalo.

These examples reflect considerable changes in the geographic distribution of punitiveness between 1981 and 1995 (see Table 6). During this period, 45 cities experienced substantial decreases in average prison distance: 19 cities experienced a 30 mile or greater decrease, and 26 cities saw a decrease of 10–29 miles. Eighty-three cities saw small changes; a distance change of −9 to 10 miles. Finally, 68 cities witnessed an increase in the average distance to a women's penitentiary: it increased between 11 and 30 miles for 24 cities and by more than 30 miles for 44 cities.[17]

[17] Table 6 reports the distribution of overall changes from 1981 to 1995. It should be noted, however, that several states experienced two or three changes during this period.

Table 6
Prison distance changes from 1981 to 1995

Change in average distance	Number of cities
30 mile or more decrease	19
10–29 mile decrease	26
−9 to 10 mile change	83
11 to 30 mile increase	24
Greater than 30 increase	44

In addition to differences in the magnitude and direction of distance changes, the timing of changes also varies substantially across states. California, for example, opened two new penitentiaries in 1987, another in 1990 and closed a female prison in 1993. In contrast, Texas closed a prison in 1983 and did not open a new facility until 1994, when it opened four in a single year.

The large discrete distance changes between cities and female penitentiaries between 1981 and 1995 form a natural experiment for evaluating the harshness of punishment. Most efforts to increase the punitiveness of incarceration suffer from the usual endogeneity problems inherent in anti-crime policies. For example, Levitt (1996, 1997) discuss the endogeneity issues associated with expanded prison capacity and policing, respectively. The problem arises because an increased police presence may be caused by, or causing, changes in the crime rate. The location of women's prisons does not suffer from this problem when the analysis is conducted at the city level.

While the building of new prisons may be endogenous, the location is not. First, prison location decisions are made at the state, not the city level. Second, locating a prison farther from one metropolitan area often means locating it nearer to another. Third, although most large cities do not want prisons located in close proximity, many small communities have actively sought prisons to reap economic benefits. For example, the most recent addition to the Missouri corrections system is being built in Charleston, which "won" the prison in competition over more than two dozen other communities. Charleston's fight to win the prison was fueled by economic impact studies predicting that the maximum-security prison will bring 400 new jobs and US$ 10 million in annual payroll (*St. Louis Post-Dispatch*, June 15, 1999). Fourth, since few new penitentiaries are built in major metropolitan areas, it is unlikely that female criminals are moving to small towns/cities with nearby prisons to reduce potential incarceration costs.

5. Estimation and results

This section presents the panel estimates for the response of female crime to judicial sanction. The basic specification is

$$\ln(\mathrm{CR}^{f}_{ijt}) = \beta_1 D_{jt} + \beta_2 D^2_{jt} + X_{jt}\gamma + \lambda_t + \theta_j + \varepsilon_{jt} \tag{4}$$

where D denotes distance, X includes the demographic and law enforcement variables described in the previous section, λ_t are census division specific year dummies, and θ_j are

city fixed effects. Eq. (4) is estimated separately for violent and property crimes by least squares weighted by city population.

As with most violent crimes, the female murder rate is about 10% of the male murder rate. As such, approximately 40% of all city/year observations are 0 with another 40% ranging from 1–3 murders. The very large proportion of zeros clearly suggests a substantial mass points at 0 even for many moderate sized cities. We therefore follow standard procedure and re-estimate Eq. (4) with the number of murders (MR^{f}_{ijt}) as the dependent variable using a Poisson model.[18]

Distance enters all models as a quadratic to allow for the possibility that ever-greater increases have a relatively lesser impact. The year controls are census division specific to capture regional changes in crime rates. The crack epidemic is a good example of a regional effect. According to Grogger and Willis (2000) the date of crack's introduction varies considerably across regions.

5.1. Prison location and crime

Given our interest in the deterrence effects associated with child rearing, we initially restrict our sample to women aged 18–34. The results for the weighted least squares estimates for the violent and property crime rates as well as the Poisson estimates for the murder rate are reported in Table 7. For all dependent variables column 1 includes city fixed effects, census division specific year indicators and a quadratic in average prison distance. Column 2 adds the lagged arrest rate and the full set of socioeconomic controls.

Distance is statistically significant at the 1% level under both specifications for violent and property crime and at the 10% level for murder. The lower statistical precision for murder is not surprising given the enormous proportion of observation massed below 3. When the full set of controls are included, the results suggest that a 40-mile increase in the average distance to a women's prison reduces the female violent crime rate by 6.4%, the property crime rate by 2.7% and the murder rate by 13.4%.[19] The smaller deterrence effect of distance for property crime relative murder and violent crime may result from a lower incarceration probability, lesser sentences, a propensity for judges or corrections officials to place non-violent criminals in facilities located closer to home, or a substitution from violent to property crimes as prison distance rises.

Our results are consistent with the view that increasing the average distance between home city and prison location increases the severity of punishment for female inmates. We interpret this deterrence effect as resulting from the reduction in visitation caused by the increased cost of transportation. The implications, however, go far beyond the optimal location for a prison. Recent efforts to make hard time "harder" are in effect raising the opportunity cost of a year in prison to the offender. While distance is one way to lower the utility of mothers in prison, many of the measures currently employed by states affect a far broader class of prisoners. It is also important to remember that we are measuring

[18] All results are similar if a negative binomial is used instead.

[19] These results are similar if state specific female prison custody rates and city specific police per capita measures are included. The results are also similar when the standard errors are adjusted for clustering; grouping years with identical average distance within cities or just by city.

Table 7
Female crime panel models

	Violent crime		Property crime		Murder	
	(1)	(2)	(1)	(2)	(1)	(2)
Average distance	−0.001835 (0.000665)	−0.001997 (0.000582)	−0.001053 (0.000466)	−0.000789 (0.000458)	−0.003728 (0.001625)	−0.004006 (0.001862)
(Average distance)^2	0.000006 (0.000002)	0.000007 (0.000001)	0.000004 (0.000001)	0.000003 (0.000001)	0.000011 (0.000004)	0.000011 (0.000005)
Arrest rate		0.019237 (0.003295)		0.002088 (0.002587)		−0.020184 (0.005599)
Ln(population)		0.215331 (0.094595)		−0.203208 (0.075779)		−0.481956 (0.271883)
Percent of population aged 18–24		0.072845 (0.030317)		−0.043480 (0.029418)		−0.328328 (0.106749)
Unemployment rate		−0.001049 (0.007323)		−0.006096 (0.005694)		0.011281 (0.017307)
Income per capita		−0.000029 (0.000010)		−0.000018 (0.000009)		0.000013 (0.000033)
Percent below the poverty line		−0.001599 (0.005793)		−0.003186 (0.004457)		0.014474 (0.020437)
Percent Black		−0.055133 (0.026394)		−0.098621 (0.019993)		−0.053285 (0.049584)
Labor force participation		0.032933 (0.007001)		0.029259 (0.005954)		0.047472 (0.022682)
Monthly welfare payment		−0.000726 (0.000240)		0.000554 (0.000243)		0.000139 (0.000936)
Births per 100,000 population		0.046032 (0.017940)		0.017976 (0.014380)		−0.099483 (0.063074)
P-value: joint significance of distance	0.0000	0.0000	0.0001	0.0001	0.0489	0.0969
Percent change in crime rate implied by 40 mile increase in average prison distance	−0.0636	−0.0694	−0.0363	−0.0267	−0.1239	−0.1336

Sample covers 1981–1995 and includes 196 cities with populations of at least 100,000 at some point during the sample period, the sample size is 2824 due to occassional non-reporting. Crime and arrest rates are resticted to women aged 18–34. The dependent variables are defined as the log of the relevant female crimes per 1000 women in columns 1–4 and the number of female murders in columns 5–6. Columns 1–4 are estimated by OLS weighted by city population. Columns 5–6 are estimated as a Poisson model weighted by city population. All models also include city indicators and census division specific year controls.

first round deterrence effects and that indirect effects on children may lead to very different general equilibrium crime rates in the long-run.

While our focus is on the impact of changes in prison distance on female crime rates, it is also interesting to examine the impact of other law enforcement and socioeconomic factors. Several findings warrant comment. First, population growth is associated with higher overall female violent crime rates, but lower female property crime and murder rates. Second, the three crime rates fall as the percentage black residents' rises, although the estimate is rather imprecise for the murder rate. Thirdly, higher female labor force participation is associated with higher crime. A one standard deviation increase in female labor force participation (3.6% points) increases the female violent crime, property crime and murder rates by 11.8, 10.5 and 17.1%, respectively. Finally, higher arrest rates are associated with higher overall violent crime rates but lower murder rates. There is no statistically significant relationship between arrest rates and property crime. This may reflect a tendency to 'crack-down' on crime when violent crime rises.

5.2. Alternative samples and specifications

Four states in our sample have a span of time with no female penitentiary: Iowa prior to 1982, Mississippi prior to 1986, New Mexico prior to 1989 and South Carolina prior to 1990. Thus far we have assumed that female prisoners in these states were held in local jails. Since the cities used in the analysis are major population centers, assigning zero distance to these observations is a reasonable solution. However, it is likely that these states used a combination of local jails and out of state facilities. To ensure that our results are not driven by the assumption that female convicts were held in local jails prior to the opening of a state penitentiary, we re-estimate all three models adding a dummy variable for states with no female prison and then excluding Iowa, Mississippi, New Mexico and South Carolina altogether (columns 1 and 2 in Table 8). Under both specification, distance retains statistical significance in the violent and property crime models but becomes statistically insignificant at conventional levels in the murder equation.

The second issue is the importance of any one state, or small group of states. As can be seen from columns 3–6 in Table 8, excluding Texas, New York or Florida has little effect on the estimated impact of distance, while excluding California leads to somewhat larger point estimates. This further means that neither New York City nor Los Angles are driving the results. Finally, several states do not build (or close) any women's prisons during our sample period. Column 7 presents the results when these states are excluded. The elimination of these states reduces the point estimates of the impact of distance for violent and property crimes so that a 40-mile increase in average prison distance reduces female violent crime by 4% and property crime by 0.3%. Not surprisingly, given the sample size reduction, the point estimate for distance in the murder equation becomes rather imprecise, but retains the same sign and falls in magnitude by an amount similar to the violent crime equation.

To ensure that we are not simply picking up spurious correlation between new construction far from metropolitan areas and rising crime rates, we split the sample into cities, and time spans, where average distance rose and those where average prison distance fell. More specifically, a city-year observation is included in the 'farther' sample if it either precedes or follows a prison opening/closing that increases average distance and is included

Table 8
Sensitivity analysis – various sample exclusions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: violent crime							
Average distance	−0.002493 (0.000598)	−0.002745 (0.000607)	−0.003786 (0.001101)	−0.002277 (0.000603)	−0.002038 (0.000582)	−0.002030 (0.000582)	−0.001179 (0.000595)
(Average distance)^2	0.000008 (0.000002)	0.000008 (0.000002)	0.000015 (0.000004)	0.000007 (0.000002)	0.000007 (0.000001)	0.000007 (0.000001)	0.000005 (0.000002)
P-value: joint significance of distance	0.0000	0.0000	0.0006	0.0000	0.0000	0.0000	0.0000
Percent change in crime rate implied by 40 mile increase in average prison distance	−0.0873	−0.0964	−0.1276	−0.0793	−0.0711	−0.0706	−0.0399
Panel B: property crime							
Average distance	−0.000595 (0.000488)	−0.000479 (0.000495)	−0.002854 (0.000876)	−0.000873 (0.000475)	−0.000858 (0.000445)	−0.000796 (0.000457)	−0.000133 (0.000481)
(Average distance)^2	0.000003 (0.000001)	0.000002 (0.000001)	0.000009 (0.000003)	0.000003 (0.000001)	0.000003 (0.000001)	0.000003 (0.000001)	0.000001 (0.000001)
P-value: joint significance of distance	0.0002	0.0002	0.0050	0.0001	0.0011	0.0001	0.0018
Percent change in crime rate implied by 40 mile increase in average prison distance	−0.0197	−0.0155	−0.0990	−0.0296	−0.0295	−0.0269	−0.0033
Panel C: murder							
Average distance	−0.003876 (0.002016)	−0.003433 (0.002055)	−0.004293 (0.002664)	−0.005467 (0.001874)	−0.005310 (0.001686)	−0.003247 (0.001855)	−0.002773 (0.002039)
(Average distance)^2	0.000010 (0.000005)	0.000009 (0.000005)	0.000010 (0.000009)	0.000014 (0.000005)	0.000014 (0.000005)	0.000009 (0.000005)	0.000008 (0.000005)
P-value: joint significance of distance	0.1520	0.2329	0.1258	0.0134	0.0068	0.2017	0.3204
Percent change in crime rate implied by 40 miles increase in average prison distance	−0.1295	−0.1155	−0.1438	−0.1785	−0.1736	−0.1095	−0.0938
Controls for states with no prisons	Yes	No	No	No	No	No	No
State(s) excluded	None	Those with no prisons	CA	TX	NY	FL	No prison changes
Sample size	2824	2772	2171	2468	2719	2719	2329

Sample covers 1981–1995 and includes 196 cities with populations of at least 100,000 at some point during the sample period, the sample size is 2824 due to occasional non-reporting. Crime and arrest rates are resticted to women aged 18–34. The dependent variables are defined as the log of the relevant female crimes per 1000 women in Panels A and B and the number of female murders in Panel C. Panels A and B are estimated OLS weighted by city population. Panel C is estimated as a Poisson model weighted by city population. All models also include the control variables reported in Table 7.

Table 9
Sensitivity analysis – prison openings and closings

	(1)	(2)	(3)	(4)
Panel A: violent crime				
Average distance	−0.007543 (0.001187)	−0.004777 (0.000008)	−0.002490 (0.000636)	−0.002989 (0.000795)
(Average distance)^2	0.000013 (0.000002)	0.000008 (0.000001)	0.000008 (0.000002)	0.000009 (0.000002)
P-value: joint significance of distance	0.0000	0.0000	0.0000	0.0000
Percent change in crime rate implied by 40 mile increase in average prison distance	−0.2816	−0.1781	−0.0870	−0.1055
Panel B: property crime				
Average distance	−0.000663 (0.000557)	−0.001457 (0.000406)	−0.000745 (0.000502)	−0.000812 (0.000626)
(Average distance)^2	0.000000 (0.000001)	0.000002 (0.000001)	0.000003 (0.000001)	0.000003 (0.000002)
P-value: joint significance of distance	0.0001	0.0000	0.0003	0.0024
Percent change in crime rate implied by 40 miles increase in average prison distance	−0.0261	−0.0558	−0.0250	−0.0271
Panel C: murder				
Average distance	−0.008845 (0.002897)	−0.002356 (0.001350)	−0.004913 (0.002099)	−0.002629 (0.002633)
(Average distance)^2	0.000013 (0.000005)	0.000000 (0.000002)	0.000013 (0.000005)	0.000008 (0.000007)
P-value: joint significance of distance	0.0055	0.0000	0.0631	0.4322
Percent change in crime rate implied by 40 mile increase in average prison distance	−0.2831	−0.0893	−0.1615	−0.0886
Restricted to reduced average distance	Yes	No	No	No
Restricted to increased average distance	No	Yes	No	No
First year after prison openning/closing omitted	No	No	Yes	No
First two years after prison openning/closing omitted	No	No	No	Yes
Sample size	1061	1366	2538	2264

Sample covers 1981–1995 and includes 196 cities with populations of at least 100,000 at some point during the sample period. Crime and arrest rates are resticted to women aged 18–34. The dependent variables are defined as the log of the relevant female crimes per 1000 women in Panels A and B and the number of female murders in Panel C. Panels A and B are estimated by OLS weighted by city population. Panel C is estimated as a Poisson model weighted by city population. All models also include the control variables reported in Table 7.

Table 10
Sensitivity analysis – no age restrictions

	Violent crime		Property crime		Murder	
	(1)	(2)	(1)	(2)	(1)	(2)
Average distance	−0.00172 (0.00057)	−0.00194 (0.00052)	−0.00068 (0.00035)	−0.00045 (0.00035)	−0.002013 (0.001334)	−0.001699 (0.001579)
(Average distance)^2	0.00001 (0.00000)	0.00001 (0.00000)	0.00000 (0.00000)	0.00000 (0.00000)	0.000005 (0.000003)	0.000004 (0.000004)
Arrest rate		0.00528 (0.00241)		−0.00786 (0.00176)		−0.013255 (0.004737)
Ln(population)		0.08033 (0.07723)		−0.20033 (0.05617)		−0.514984 (0.239176)
Percent of population aged 18–24		0.03512 (0.02532)		−0.01974 (0.02263)		−0.251094 (0.084695)
Unemployment rate		−0.00653 (0.00633)		−0.00468 (0.00415)		0.003286 (0.015543)
Income per capita		−0.00003 (0.00001)		−0.00001 (0.00001)		0.000023 (0.000024)
Percent below the poverty line		−0.00572 (0.00479)		−0.00368 (0.00336)		−0.005482 (0.012615)
Percent Black		−0.04314 (0.02473)		−0.07566 (0.01493)		−0.044752 (0.037739)
Labor force participation		0.02714 (0.00588)		0.01569 (0.00440)		0.016891 (0.017490)
Monthly welfare payment		−0.00022 (0.00021)		0.00026 (0.00017)		0.000926 (0.000726)
Births per 100,000 population		0.04966 (0.01570)		−0.00738 (0.01054)		−0.116781 (0.050212)
P-value: joint significance of distance	0.0000	0.0000	0.0008	0.0011	0.3067	0.5446
Percent change in crime rate implied by 40 mile increase in average prison distance	−0.0597	−0.0675	−0.0234	−0.0148	−0.0697	−0.0597

Sample covers 1981–1995 and includes 196 cities with populations of at least 100,000 at some point during the sample period, the sample size is 2829 due to occassional non-reporting. Crime and arrest rates are resticted to women aged 18–34. The dependent variables are defined as the log of the relevant female crimes per 1000 women in columns 1–4 and the number of female murders in columns 5–6. Columns 1–4 are estimated by OLS weighted by city population. Columns 5–6 are estimated as a Poisson model weighted by city population. All models also include city indicators and census division specific year controls.

in the 'closer' sample if it precedes or follows an opening/closing that decreases average distance.[20] Columns 1 and 2 in Table 9 report the estimates for these sub-samples. Similar to other specifications, decreases in distance are associated with higher crime rates while increases in distance are associated with lower crime rates.

To check that the results are not driven by possible imperfections in our expected distance measure, columns 3 and 4 in Table 9 report the distance estimates for samples excluding the year of prison opening/closings and the first two years after opening/closings, respectively. Removing these observations ensures that excess capacity in the first few years of operation, and hence above average destination years, are not driving the results. The results are again similar.

All results presented to this point have been restricted to crime rates for women aged 18–34. Table 10 replicates Table 7 including crimes committed by women of all ages. When the full set of law enforcement and socioeconomic variables are included, the estimates imply a 6.8% reduction in violent crime and a 1.5 reduction in property crime for a 40-mile increase in average prison distance. While the point estimates for the murder equation also suggest that greater prison distance is associated with less murder, the point estimates are quite imprecise.

The most notable difference between the results in Table 10 and those in Table 7, is the smaller impact of distance when the crimes of all women are included in the crime rate. There are several possible reasons for these lesser effects. First, fewer women over the age of 34 or under the age of 18 have small children. Secondly, it is unlikely that women under the age of 18 will be sent to prison; they are more likely to be placed on probation or sent to a juvenile facility. As a result distance to female penitentiaries may not affect their behavior.

6. Conclusion

This paper is one of the first attempts to estimate the impact of increasing the severity of a given year of punishment rather than the amount of punishment. Our results support the economic model of crime's prediction that higher punishment costs deter crime. The evidence suggests that an increase in average prison distance leads to a decrease in crime. A 40-mile increase in the average distance to a female penitentiary reduces female violent crime, property crime and murder rates by 6.9, 2.3 and 13.3%, respectively.

The relative cheapness of the policy prescription suggested by the distance results is a key difference between our findings and those of Levitt (1996, 1997). For example, using Levitt's (1997) estimate that each police officer comes at an average annual cost of US$ 41,000, President Clinton's program to put 100,000 new police on the streets would have a national bill of US$ 4.1 billion per year.[21] Doubling the female custody rate by incarcerating approximately 75,000 new prisoners at a cost of approximately US$ 23,000 each (Levitt, 1999) for a total cost of US$ 1.7 billion. While a policy of remote prison building might entail somewhat higher transportation and operational costs, it seems very unlikely that

[20] States with no distance changes as well as those with no prison at the beginning of the sample are excluded. The sample is also restricted to distance changes that are stable for at least two years.

[21] This policy will also of course reduce property crimes committed by men.

the annual cost increase would be anywhere near that of police force expansion or higher custody rates. It should also be noted that doubling the incarceration rate would certainly involve building new prisons. Our results suggest that building these prisons farther from metropolitan areas would increase the deterrence effect of any prison expansion.

The evidence presented in this paper suggests remote prison locations and/or restricted visitation as low cost crime deterrence mechanisms. However, our estimates do not quantify the welfare implications of this change. Increasing the distance to women's prisons (or an outright ban on visitation) has clear externalities. There is ample evidence that a mother's incarceration has adverse effects on her children (Baunach, 1985). It therefore seems quite likely, although not certain, that even more severe restrictions on maternal visitation would exacerbate an already bad situation for the children of female inmates. As such, the secondary effects therefore render the long-run general equilibrium effects of prison location on crime rates ambiguous. In contrast, other forms of hardening hard time do not suffer from the same types of externalities. Chain gangs, prison stripes, and loss of recreational privileges generally do not lower the utility of anyone but the convict.

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