

MALE INCARCERATION, THE MARRIAGE MARKET, AND FEMALE OUTCOMES

Kerwin Kofi Charles and Ming Ching Luoh*

Abstract—This paper studies how rising male incarceration has affected women through its effect on the marriage market. Variation in marriage-market shocks arising from incarceration is isolated using two facts: the tendency of people to marry within marriage markets defined by the interaction of race, location, and age and the fact that increases in incarceration have been very different across these three characteristics. Using a variety of estimation strategies, including difference and fixed effects models and TSLS models in which we use policy parameters to instrument for within-marriage market changes in incarceration, we find evidence that is, on the whole, consistent with the implications of the standard marriage-market model. In particular, higher male imprisonment appears to have lowered the likelihood that women marry, modestly reduced the quality of their spouses when they do marry, and shifted the gains from marriage away from women and toward men. The evidence suggests that women in affected markets have increased their schooling and labor supply in response to these changes.

I. Introduction

THE fraction of persons entering traditional marriages has fallen consistently over the past half-century and today is at historic lows (Stevenson & Wolfers, 2007). Several explanations for these patterns have been proposed in the literature, including changes in reproductive technology such as the introduction of the birth control pill (Goldin & Katz, 2002), improving relative labor market opportunities for women (Blau, Kahn, & Waldfogel, 2000), legal changes such as the 1973 Supreme Court ruling in *Gomez v. Perez* mandating that men be financially responsible for their illegitimate children (409 U.S. 535), and changes in household technology, which, by rendering household chores less onerous, may have reduced the cost of remaining single (Greenwood, Seshadri, & Yorukoglu, 2005). While all of these factors may be important, we study another possibility: the role of rising male incarceration.

Whether measured in totals or as a fraction of the population, more Americans are incarcerated than in all but a few other countries in the world.¹ The remarkably high levels of incarceration observed today are mainly the results of

changes over the past three decades, when the number of Americans behind bars more than tripled (Maguire & Pastore, 2000). High levels of incarceration lower the number of men freely interacting in society. Rising incarceration rates may thus lower women's marriage probabilities simply because there are fewer potential husbands to go around.

The seminal work of Becker (1973, 1974, 1981) on marriage markets suggests more subtle effects as well. In particular, a reduction in the number of men should shift the gains from marriage away from wives and toward husbands, and from women to men more generally. Women should thus be more likely to marry men whose marital advances they would have previously rejected, when they do marry at all. These effects tend to lower women's economic well-being. Women confronting high male incarceration rates might thus be expected to take actions, such as working more or investing in additional schooling, that augment their earning power and economic independence.²

Have recent increases in incarceration produced these effects? Although rising incarceration levels have coincided with a nationwide reduction in marriage, it is not clear that the two phenomena are causally linked. Higher incarceration might partly reflect unobserved changes in male behavior that could have independently affected marriage outcomes. Alternatively, changes in social conventions about marriage might have coincidentally occurred at the same time as rising incarceration levels, rendering any connection between incarceration and marriage outcomes spurious. Without some way of controlling for various confounding factors of this sort, it is difficult to say anything about the possible causal effects of incarceration.

Our main innovation for dealing with these difficulties is to exploit the fact that the overwhelming majority of marriages occur between men and women in distinct "markets," defined by the interaction of race, age, and geographic region. Because the increase in incarceration has varied tremendously over these three categories, rising incarceration has lowered the relative presence of men by very different amounts in different marriage markets. We are therefore able to use variation across different markets at a point in time and within markets over time to identify the effect of interest.

Standard panel data models account for the contaminating effect of latent factors that are fixed over time but cannot account for changes in unobserved factors within marriage

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* Charles: University of Chicago and NBER; Luoh: National Taiwan University.

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¹ The U.S. Department of Justice (2003) reports that more than 2.1 million Americans were held in jails or prisons in 2003. This reflects a total rate of incarceration of about 715 Americans per 100,000: a rate of more than 1,300 per 100,000 for men, and one of about 113 per 100,000 women. These rates are higher than comparable rates in all OECD countries (see OECD, 2001).

² This paper is interested in the effect of male incarceration on women's outcomes. Using the standard marriage market model to understand the impact of higher incarceration on unincarcerated men does not lead to the same sharp empirical predictions, for reasons discussed later in the paper.

markets over time. Moreover, their application can be expected to magnify measurement problems associated with the fact that the incarceration rates we observe are noisy indicators of the true relative supply shocks experienced by particular marriage markets.³ Using nationally representative data from the National Judicial Reporting Program on the actual sentences felons convicted in state courts receive, we show that the state- and race-specific adjudication of drug cases and their relative prevalence in state caseloads explain much of the within-marriage market changes in incarceration.⁴ We perform a series of two-stage least-squares regressions, in which we use these policy variables as instruments for within-marriage market changes in incarceration, finding results that are quite similar to, if a bit larger than, the basic panel model estimates.

On the whole, our results strongly support the idea that rising male incarceration causally affected women's outcomes in precisely the manner predicted by the standard marriage market model. Our confidence in these results is bolstered by the similarity of the results under alternative estimation strategies, including the addition of a variety of controls and the use of an alternative definition of marriage markets, and by the range of outcomes for which we find effects consistent with the causal interpretation.

The paper contributes to several different literatures. One connection is to the literature studying the relationship between the number of men relative to women in a market and marriage market outcomes.⁵ We estimate effects similar to these papers, but unlike previous work, we study how marriage markets are affected by a policy, incarceration, that is of ongoing, controversial interest, and we also study a broader range of outcomes. Other authors have been interested in how the characteristics of men in a marriage market affect women's mean marriage rates. One important strand of this literature originates with Wilson's (1987) conjecture that low marriage rates among black women might be because of a small supply of "marriageable" men—young men with high, stable earnings. Wood (1995) finds only weak evidence in support of the notion, but, more important, we illustrate that incarceration is concentrated among men whose labor markets earnings would likely have been low and unstable. The phenomenon we study thus cannot be the

source of the disappearance of high-earning men that is the focus of that literature. However, to the degree that men's presence in the market is an important aspect of what makes them "marriageable," the paper's connection to that other literature is obvious. Although it focuses on a distinct question and studies a broader range of outcomes, the paper is also related to work by Gould and Paserman (2003) and Loughran (2002), who both study the effect of male wage inequality, and Blau et al. (2000), who study the effect of men's and women's average labor force outcomes on marriage rates.

The remainder of the paper is organized as follows. Section II summarizes changes in incarceration over the past few decades, with particular attention paid to how these patterns have differed for different types of men. We then discuss marriage markets and briefly review the predictions from the theoretical literature on marriage that guide the empirical work. Section III presents the basic empirical framework and describes the empirical methods we use. Section IV presents the results, extensions, and robustness tests. Section V concludes.

II. Basic Facts about Incarceration and Marriage Markets and Predicted Theoretical Effects

A. Imprisonment over the Past Thirty Years

Most of the analysis in the paper is conducted on data from the various census IPUMS from 1970 to 2000. The 1970 and 1980 censuses identify inmates in jails or prisons.⁶ However, in 1990 and 2000, the census indicates only whether a respondent is institutionalized. We treat the young men characterized as institutionalized as being incarcerated. Several things justify this decision. One is that given the set of institutions used by the census to define the institutionalized population, mental institutions are the only other kind of institutions in which young men could logically be located.⁷ Work by Grob (2000) shows that the number of persons in mental institutions has plummeted in the past few decades, meaning that in later years, "institutionalized" effectively means "incarcerated." Reassuringly, the patterns of incarceration from the definitions we use are consistent with the aggregate information on incarceration from the Bureau of Justice Statistics (BJS).⁸

⁶ Jails in the United States are institutions that generally house individuals with incarceration terms a year or less. Prisons house persons with longer terms of imprisonment. We will not distinguish between these terms in the paper.

⁷ In 1990 and 2000, institutionalized persons are in jails and prisons, mental institutions, institutions for the elderly handicapped and poor, nursing and convalescent homes, homes for neglected, or dependent children; other institutions for children; deaf/blind schools; schools for "feeble-minded," sanatoria, poorhouses and almshouses; poor farm houses and workhouses; homes for unmarried mothers, widows, and single women; and detention homes.

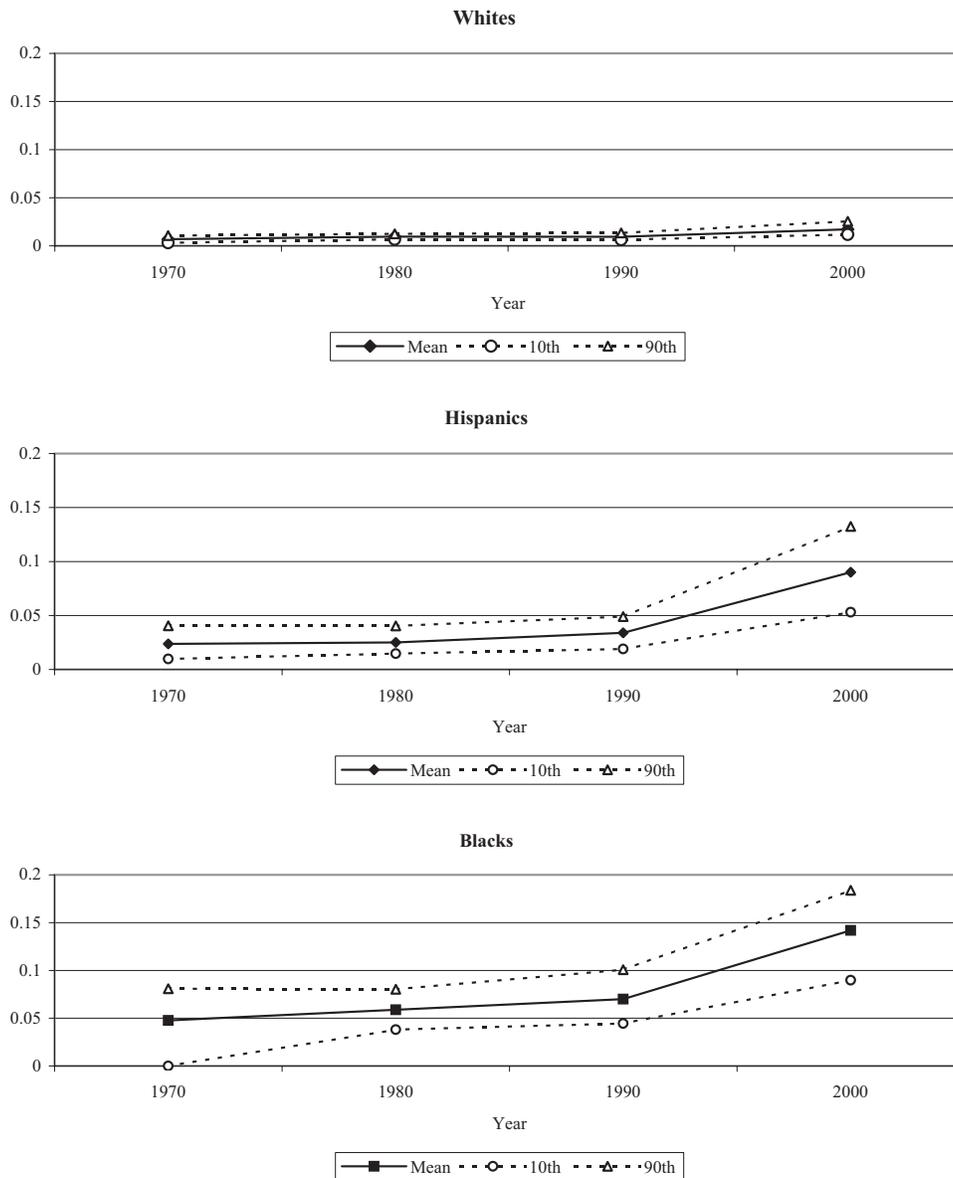
⁸ We do not use these data in our analysis because it is not possible with these data to do the disaggregations so central to our analysis.

³ This measurement problem arises both because the "markets" we define only imperfectly measure the pools within which men and women date and marry and because it is not possible to say with certainty what spatial market an incarcerated man would have belonged to were he not in jail.

⁴ This is consistent with the commonly held notion that the "war on drugs" accounts for much of the run-up in incarceration. We examine but ultimately do not use variation associated with announced sentencing guidelines within states, as the data from actual sentences received and time served within states do not line up at all well with these announced guidelines.

⁵ Examples include Gutentag and Secord (1983), Cox (1940), Freiden (1974), Chiappori, Fortin, and Lacroix (2001), South and Trent (1988), South and Lloyd (1992), Brien (1997), Fosset and Kiecolt (1993), and Angrist (2002).

FIGURE 1.—FRACTION OF MEN AGED 20–35 OF DIFFERENT RACES AND BORN IN DIFFERENT STATES WHO ARE INCARCERATED IN CENSUS YEAR: MEAN, 10TH, AND 90TH PERCENTILE ACROSS ALL STATES OF BIRTH



The paper studies men aged 20 to 35. In the analysis to follow, we split these men into younger (20 to 27) and older (28 to 35) groups, but in this initial section, we present average incarceration figures for the all men ages 20 to 35. Census respondents report not only their age but also their race and state of birth. We focus on three race categories: whites, blacks, and nonblack, nonwhite Hispanics. For each state of birth, we compute the proportion of men of a given race who are incarcerated in a given census year.⁹ Figure 1 graphically summarizes these numbers.¹⁰

⁹ Later we discuss the choice of state of birth rather than state of residence.

¹⁰ The numbers on which the graph is based are presented in table A.1 in the appendix. Throughout the paper, the incarceration rate is the rate

The middle line in each graph shows the mean, across all states of birth, of the incarceration rates for men on the type indicated in the graph heading. The top line in each figure shows the 90th percentile (the fifth highest state) of the distribution of incarceration rates across states. The bottom line shows the 10th percentile (the fifth lowest state) of the same distribution. We exclude from these graphs race and state cells for which the number of observations in the census was too small to compute mean estimates. So, for

among men in the marriage market, including any married men who might be incarcerated. The correlation between the male and female incarceration rates across all markets is 0.36. In all years, incarceration rates for men vastly exceed those for women; in 2000, for example, the male rate of 3.58% is more than ten times larger than the female rate of 0.35%.

example, the graphs do not include values for young Hispanics born in North Dakota, or young blacks born in New Hampshire, as these cells are vanishingly small. In the analysis that follows, we weight all regressions by the cell size for which the incarceration rate is measured. Although the basic patterns documented above accurately reflect changes in incarceration over time, there is likely to be error in the measured rate for any particular type of men (and especially racial minorities from some states).¹¹

These figures, all drawn with the same scale, reveal several interesting facts. First, for all races, most of the increase in incarceration between 1970 and 2000 occurred after 1980, and especially after 1990. The trends in the mean, and for the 90th and 10th percentiles, indicate that this post-1980 increase occurred across the country rather than in a select set of states, although cross-state differences for men of a given race tended to widen over time. For example, the difference in incarceration rates among blacks in the high- versus low-incarceration states was 6 percentage points in 1990 and grew to 10 percentage points in 2000. Finally, and most dramatic, the graphs reveal how markedly the incarceration experience of young men has differed across races, both over time and in any particular year. Most notably, the mean incarceration rate of young black men across the various states reached a staggering 18% in 2000, while the comparable rate for Hispanics was 10%. These numbers completely dwarf the comparable numbers for whites.¹² Finally, although we do not show it in this figure, we find that the distribution of education is very different from that observed among men who are not in prison, suggesting that incarceration draws disproportionately from the lower portion of the schooling distribution for all races.¹³

B. Theoretical Overview: Incarceration and Standard Marriage Market Model

What are the predicted effects of the incarceration “shocks” for women? Becker’s (1973) seminal and widely known model of the marriage market suggests some possible answers. In Becker’s model, there are gains from marriage, meaning that married households produce more than

the sum of the output of an unmarried man and unmarried woman.¹⁴ Equilibrium in the marriage market satisfies two conditions. First, the marital sorting of men and women in equilibrium is such that total societal output is maximized. Second, the law of one price holds in equilibrium—meaning that persons of the same type or quality consume the same output in equilibrium.¹⁵ If male and female qualities are complements in the production of household output, as is usually assumed, these conditions imply positive assortative mating in equilibrium.¹⁶

Becker’s original model summarizes the predicted theoretical effect of a change in the relative number of men using the example of a hypothetical large-scale immigration. Angrist (2002) focuses on the same predictions in his study of actual nineteenth-century immigration to the United States. In the context of incarceration, the marriage-market model yields several predictions. Since higher incarceration lowers the number of men relative to women, its first and most obvious marriage-related effect should be to lower the incidence of marriage among women overall. Second, because the men withdrawn from the marriage market would have tended disproportionately to marry lower-quality women, higher incarceration should raise the likelihood of nonmarriage more for them than it does for their higher-quality counterparts. Third, the male scarcity arising from incarceration should raise the odds that high-quality women “marry down” when they do marry, or lower the probability odds that lower-quality women “marry-up,” conditional on them marrying at all.

Increased male scarcity should have other implications for women. Women who do not marry when men are scarce are hurt because they do not receive the production benefits associated with marriage. Women who do marry when men are scarce are hurt as well; the law of one price implies that their gains within marriages should have fallen.¹⁷ By lowering female economic well-being, greater male scarcity should thus raise women’s incentives to increase their economic independence by means such as investing in additional schooling or working for pay. As far as we are aware, these secondary predictions of the marriage market model have not previously been tested.

¹¹ We compute but do not present incarceration rates by census division—collections of roughly five or six states apiece. Reassuringly, the basic patterns of incarceration, by race, are quite consistent with the state numbers.

¹² These numbers reflect the raw means of the incarceration rate of particular kinds of men across the fifty states and thus do not reflect the fraction of those men in the national population who are incarcerated. This latter is the weighted mean of the state incarceration rates and shows the same basic trends over time, although the levels are lower. For example, around 12.5% of young black men in the country were incarcerated in 2000.

¹³ For example, among black incarcerated men, 48% have less than a high school education, and only 15.5% have a year or more of college education. The comparable numbers for unincarcerated black men over the same time period are 19.8% and 37%, respectively. Similar differences exist for white and Hispanic men.

¹⁴ Also see Becker (1974, 1981) for discussions and extensions of this model.

¹⁵ Strictly speaking, this implication of the standard model requires that there be no rents. Since the various gains from marriage likely produce rents, it might thus be more accurate to say that each spouse does in a marriage at least as well as he or she could fare outside it.

¹⁶ Equilibrium would exhibit negative assortative mating in the unlikely event that male and female quality were substitutes rather than complements in household production. Various authors have shown that in the United States, there is positive assortative mating along the dimension of schooling—the index of quality we study in this paper.

¹⁷ This is represented in the theory as women having to make greater transfers to husbands. This notion of transfers likely subsumes both very serious concerns, like the distribution of work effort in the family or sexual fidelity, and less serious matters, like which spouse washes dishes or whose entertainment choices will be honored.

III. Empirical Framework

A. Basic Setup

The analysis seeks to estimate the causal effect of the incarceration rate of men in a marriage market on marital and other outcomes for the women in those marriage markets, holding all other factors constant. To a first approximation, marriages in the United States occur within specific race, regional, and age cells.¹⁸ In what follows, we focus on markets consisting of men and women of a specific race, born in a given state, and who are aged either 18 to 25 for women and 20 to 27 for men or 26 to 33 for women and 28 to 35 for men. Although we have millions of individual-level observations from the IPUMS, all of the variation in the analysis occurs at the race, state, and age level across census years. To make our estimation approach transparent, we therefore collapse all of the data down to the marriage market (race, state, age) and time level, yielding a total of around 1,200 observations—300 marriage markets across four census years.

We assume that the structural relationship between outcome $Y_{m,t}$ for women in marriage market m in time t , and the male incarceration $J_{m,t}^*$ for men in that market is given by

$$Y_{m,t} = \beta_0 + \beta_1 X_{m,t} + \beta_2 J_{m,t}^* + \Gamma_m + \varepsilon_{m,t}. \quad (1)$$

In equation (1), $X_{m,t}$ is a set of observed characteristics about the marriage market in census year t . The vector Γ_m reflects fixed features of the marriage market that affect marriage market outcomes, and the error term $\varepsilon_{m,t}$ represents all unobserved determinants of outcomes Y . We are interested in estimating the parameter β_2 .

B. Instrumental Variables for Dealing with Endogeneity and Measurement Error Concerns

Two problems frustrate the straightforward estimation of the parameter β_2 . The first is the endogeneity bias caused by possible correlation between the incarceration rate in a marriage market and some unobserved feature of the market, perhaps related to general social breakdown. For example, high levels of criminality among men of a certain type would lead to higher incarceration rates for those men but would also increase women's reluctance to marry them whether they were in jail or not. The other problem is that we do not observe a marriage market's actual incarceration rate $J_{m,t}^*$, only an error-ridden version $J_{m,t}$.¹⁹ Estimates of β_2 will thus, in general, also suffer from attenuation bias.

¹⁸ Using data from several census years we confirm this familiar pattern. For example, we find that more than 90% of black (white) marriages are to other blacks (whites) of a closely related age. The numbers for Hispanics are less dramatic, but the basic pattern is evident for this group as well.

¹⁹ As noted earlier, this mismeasurement arises because the marriage markets we define only imperfectly characterize the dimensions along

We first estimate the fixed effects model, equation (1), including marriage-market fixed effects, and a full set of time and marriage-market fixed effects. The estimates of β_2 from these models, as well as those simple difference models we also run, account for unobserved features of a marriage market that are fixed or change relatively slowly over time. However, these estimates do not account for latent determinants of females outcomes that change over time within marriage markets. More important, panel data methods tend to exacerbate any attenuation bias caused by the fact that we do not observe a marriage market's actual incarceration rate $J_{m,t}^*$, only an error-ridden version $J_{m,t}$.²⁰

To attempt to deal with these problems—endogeneity bias that survives the application of standard panel data methods and attenuation bias likely magnified by the application of those methods—we also present two-stage least-squares (TSLS) estimates. An appropriate instrument is something that is strongly correlated with the change in a marriage market's incarceration rate and conditional on observables, independent of latent behavioral factors operating differentially over time across various marriage markets. In our view, these conditions are likely satisfied by the various policy changes associated with the criminalization and greater punishment of drug offenses: the war on drugs.

The late 1980s saw the launching of the "Just Say No" campaign and the creation of the Office of the Drug Czar. Around the same time, a series of laws was passed at the federal and state levels designed to decrease the variance and increase the severity of sentencing for drug offenders and other felons. The fact that most of the increases in incarceration occurred after 1980, and especially after 1990, strongly suggests that these policy changes had a significant effect on the number of people behind bars.²¹

To formally assess the importance of policy changes related to the War on Drugs, we focus directly on the actual composition and adjudication of cases in state criminal caseloads because it is the actual sentences that guidelines and other measures were designed to affect. We use data from the National Judicial Reporting Program Series (NJPRS), a data series put together by the Bureau of Justice Statistics division of the U.S. Justice Department, with the first wave of data collected in the late 1980s. Every two years, the series tabulates data about persons tried in state courts—the overwhelming majority of all criminal cases.

which men and women date and marry, and also because of issues such as how the census defines and measures institutionalized populations.

²⁰ See Freeman (1984) for discussion of panel methods and measurement error.

²¹ At the federal level, the Sentencing Reform Act and the Violent Crime Control and Law Enforcement Act were passed by Congress in 1984 and 1994, respectively. Shortly after, various state laws were enacted with features like mandatory minima, limitations on parole, and so-called three-strikes rules. There is some debate about whether the mere passage of laws affected incarceration; state-specific implementation likely mattered importantly. For example, work by Johnson (2005) and others shows that prosecutors have considerable discretion with respect to the precise charge a defendant faces and over the plea-bargaining process.

The data are collected from prosecutors' offices and state court records from 100 of the largest counties in the country. The survey collects information race, age, and sex of defendants; the crimes with which they were charged; and the ultimate dispensation of their cases. We focus on data from 1990, since data on drug possession charged were not collected separately in the first two waves of the study. Fortunately, as was shown earlier, the period from 1990 to 2000 represents nearly 60% of the increase in incarceration since 1970 for all of the marriage markets we study.

As we show in table A.1 in the appendix, we find that across all counties and states, the fraction of all state prosecutions that were for drug charges rose dramatically over the 1990s, while that for every other type of serious charge either remained constant or fell substantially. At the beginning of the decade, about 21% of men facing trial in state court were being tried on some type of drug charge. By 2000, the number had risen to 38%—23% of all cases being for drug trafficking charges and 15% for drug possession. The data indicate that conviction probabilities for all offenses remained relatively constant over the decade. The facts together meant that by 2000, almost 38% of men in prison had been convicted of some drug offense—nearly a doubling in that fraction over the decade. The share of prisoners convicted of every other kind of offense fell dramatically over the same period.

To gauge how the increased criminalization of drugs associated with the war on drugs affected male incarceration within marriage markets, we relate the change in a market's male incarceration rate to the average of the drug caseload measure between 1990 and 2000. Importantly, in addition to other observables about marriage markets, the regressions control for changes in the levels of personal and property crime in the state. This ensures that what we estimate is purely the effect of state and race differences in how drug offenses are treated within a particular state rather than anything having to do with criminal activity (behavior) in the state. As shown in table A.1 the evidence that drug caseloads positively affected the 1990–2000 change in male incarceration is strong. The effects are large and strongly statistically significant, and the associated partial *F*-statistics pass recommended “weak instrument” thresholds (see Stock, Wright, & Yogo, 2002).²²

For drug caseload measures over the 1990s to be valid instruments for marriage market changes in incarceration over the 1990s, it must be the case that they are correlated with incarceration only through the policy channel of the criminalization of drugs. Correlation between the caseload policy measures and increases in, for example, drug use changes within marriage markets threatens the validity of

the instrument. We cannot be sure that rising criminalization of drugs within marriage markets is not correlated at all with changes in behavior. Indeed, states that raised the penalties for drug use were likely responding to some changes in behavior within the states. However, two considerations suggest that this correlation is not a large concern in the context of our TSLS estimates. First, recall that our first-stage results control directly for changes in personal and property crime—factors likely correlated with rising drug use.²³ Second, self-reported drug use shows little evidence of higher drug use among the cohorts of men facing higher incarceration risk for drugs.

Perhaps the best available age- and race-specific data on offending are those for self-reported drug use in the Monitoring the Future study (MTF).²⁴ Since 1975, the MTF has inquired about drug use among a nationally representative sample of high school juniors and seniors. Of course, there is not a perfect relationship between high school drug use and criminal behavior. Nonetheless, the notion that adolescent drug use is a pathway into more serious crime is widely established in the social science literature.²⁵ If changes in incarceration patterns derived principally from changes in behavior, we would expect some sort of positive association between the incidence of imprisonment for particular types of men and their self-reported drug use. In fact, as graphically summarized in figure A.1 in the appendix, we find that incarceration rates for the different cohorts of men of a particular region and race type have been rising at the same time that high school drug use for those men has been flat or falling. The same pattern is evident for all groups of men, and across the country.²⁶ This evidence strongly supports the notion that the increases in incarceration arising from the criminalization of drugs in the War on Drugs principally reflect the effect of criminalization policy rather than behavioral changes.

IV. Results

A. Female Marital Outcomes

Table 1 presents various estimates of the effect of male incarceration on female marital outcomes. The results in the first row are for the basic fixed-effects model given by equation (1). This specification includes a vector of fixed

²³ Indeed, why drug use changes across different cohorts remains an open question. See Charles and Stephens (2006).

²⁴ In the 1984 wave and in a more limited follow-up in the 1988 wave, the NLSY-79 also asked questions about current and historical drug use. The MTF drug use data are widely considered the most reliable information on drug use and cover several cohorts of young persons. But in the NLSY data also, we find that levels of incarceration for drug offenses are only weakly correlated with reported drug use.

²⁵ See, for example, Markowitz (2000), Parker and Auerhahan (1998), and Baumer et al. (1998).

²⁶ Note that we cannot obtain reliable drug use information for Hispanics from the MTF.

²² A variety of alternative specifications, using other measures of the adjudication of drug cases over the ten-year period, yield very similar results.

TABLE 1.—FIXED EFFECTS, FIRST DIFFERENCE AND TSLS ESTIMATES OF EFFECT ON MALE INCARCERATION ON WOMEN'S MARITAL OUTCOMES (ROBUST STANDARD ERRORS IN PARENTHESES)

	Ever Married?			Wife's Education > Husband's Education?	Wife's Education < Husband's Education?
	All Women	Women with No College	Women with Any College	All Wives	All Wives
Mean of dependent variable	0.58	-0.084	-0.03	0.18	0.19
Fixed effects model: 1970, 1980, 1990, 2000					
Controls: Marriage market fixed effects, Time, Time × Race, Time × Age, Time × State	-0.0111 [0.0016]**	-0.0131 [0.0020]**	-0.0081 [0.0012]**	0.00219 [0.00070]**	-0.00934 [0.00155]**
Observations	1,195	1,191	1,187	1,177	1,177
R ²	0.98	0.97	0.99	0.88	0.83
Mean of dependent variable	-0.059	-0.084	-0.03	0.012	-0.045
Difference model: 1990–2000					
Controls: Maximum state welfare payment, total property and personal crime, median male wage	-0.0038 [0.0005]**	-0.0039 [0.0008]**	-0.0037 [0.0004]**	0.0006 [0.0006]	0.0003 [0.0005]
Observations	306	303	306	300	300
R ²	0.79	0.71	0.68	0.3	0.9
TSLS model of 1990–2000 difference					
Controls: Same as in difference model instrument: 1990–2000 drug caseload	-0.0122 [0.0023]**	—	—	0.0019 [0.0013]	-0.0014 [0.0011]

Note. Robust standard errors are in parentheses. Regression are performed at the level of the marriage market: individual-level census data are aggregated to race, state, age cells. Fixed effects specification corresponds to equation (1) in text. Difference models to 2000–1990 differenced version of equation (1). For any particular outcome, mean is taken over all women on indicated sample in race, state, age cell. If there are no women of particular type in market, the cell is dropped. See text for additional details.

effects for each marriage market and a full set of interactions between time, age, state, and race. This model is estimated over the four census years. (For graphical illustration of marriage market strategy, see the supplemental material available online at http://www.mitpressjournals.org/doi/suppl/10.1162/rest_a_00022.)

Two sets of estimates are presented in the bottom panel of the table. The results in the second row are for a simple difference model over the 1990–2000 period, the decade with the largest increase in male incarceration. We relate the 1990–2000 change in the relevant outcome variable for women in a marriage market to the change in the market's male incarceration rate over the decade. This regression includes controls for changes in the welfare payments, total property crime, and total personal crime in the state.²⁷ In this and later regressions, we also control for the labor market conditions men in the marriage market face. One obvious problem here is that we do not observe what the wages (or employment) would have been for men who are incarcerated. To get around this problem, we follow a strategy used by Neal and Johnson (1996). Specifically, we assume that in a given market, incarcerated men are likely drawn from the left tail of the offer-wage distribution. Under this assumption, the median offered wage of men in the market, a measure of men's labor market opportunities in the market, is simply

²⁷ We get property and personal crime numbers for each state in each of the four census years from the Bureau of Justice Statistics (<http://www.ojp.usdoj.gov/bjs>). The specific welfare measure we use is the amount of welfare payments a woman with two children, who did not work in the market, would receive in welfare transfers. These figures have been calculated for all the years from 1970 to the late 1990s by Rebecca Blank and Robert Schoeni. We thank them for providing us with these data.

the median wage of all men in the market, with the wages of men in the market set to 0.²⁸

We have estimated versions of the difference model over the 1980–2000 period, and a version in which we use all the intercensal year changes in the data (1970–1980, 1980–1990, and 1990–2000), and find results that in every case are very similar to those we show for model restricted to the 1990–2000 change only. We present the results of this particular difference model because our final results, shown in the third row of the tables, are TSLS estimates that instrument for the 1990–2000 change in male incarceration using the marriage market's drug caseloads between 1990 and 2000. As noted above, this information on criminal cases is available after 1990. In all regressions, the incarceration rate variable is measured in percentage points.

Reading across the first row of table 1 reveals that the point estimates from a standard fixed-effects specification imply that male incarceration affects women's marital outcomes precisely as the marriage market model would suggest. The strongly statistically significant estimate of -0.011 in the first column implies that a 1 percentage point increase in male incarceration in a given marriage market is associated with a reduction in the probability of a woman ever having married by 1.1 percentage points. The standard deviation of male incarceration rates across all markets is 2.8 percentage points. The point estimate in the first column of -0.011 therefore implies that a 1 standard deviation increase in a marriage market's male incarceration rate is associated with a reduction in the likelihood of a woman in

²⁸ If $x\%$ of men in a market are incarcerated, our measure of the median offered male wage in the market is simply the $(50 - x)$ th percentile of the observed wage distribution.

that market ever having married of about 3.1 percentage points. This represents slightly more than a 5% reduction in the likelihood of marriage, relative to the mean of 58%.

We showed earlier that because incarceration tends to be concentrated among men in the lower part of the education distribution, ever-married rates should be most affected for lower-skilled women than for their higher-skilled counterparts when incarceration is high.²⁹ The two entries in the second and third columns of the first row bear out this prediction. The second and third estimates in the first panel, of -0.013 for the fraction of women with only high school training who have ever been married is larger than (although only weakly statistically different from) the estimated association of -0.0081 for the fraction of women with any college training who have ever been married. There is some evidence that higher incarceration is associated with larger reductions in ever-married probabilities for lower-skilled women.

The final two entries in the first panel investigate the association across markets between male incarceration and the sorting patterns of women and men who do marry. In these regressions, people are sorted into three education attainment categories: less than high school graduate, high school graduate, and a person with any college training. We estimate two sets of models to assess sorting. The first, shown in the fourth column, measures how incarceration rates affect women's propensity to "marry down." That is, this regression asks what fraction of wives have spouses with schooling less than theirs. The model in the fifth column measures wives' propensity to "marry up" and asks, What fraction of wives in a marriage market have a husband whose schooling is greater than theirs? If the insights from the standard marriage market model are correct, the shift in bargaining power from women to men associated with a reduction in the number of men in the market should have a nonnegative effect on the incidence of marrying down. Furthermore, it should either lower or leave unchanged the likelihood of marrying down among women who do marry. The strongly statistically significant results in the last two columns are consistent with these predictions. These associations imply that a 1 standard deviation higher level of incarceration is associated with a 4% increase in the incidence in marrying down and a 5% decrease in the incidence of women marrying up, relative to the means of these outcomes.

We do not present these numbers in the table but estimate the propensity to marry up or marry down among women with different levels of schooling. We find that marrying down is especially pronounced among women with exactly

twelve years of schooling, who marry dropouts, and of women with two or fewer years of college, who marry men with exactly a high school diploma. Interestingly, we find no changes in the propensity to marry down among women who are college graduates. This result is reassuring, as this is the group that theory suggests should be least affected by changes in male incarceration.

All of the results in the top row are consistent with the predictions of the marriage-market model. The second row in the table presents results for 1990–2000 difference models. Recall that unlike the baseline specification in the first row, these regressions control for changes in observable features of a marriage market such as state welfare payments, property and personal crime, and the median male wage. The most noteworthy point about the difference results is that they are of much smaller magnitude than the baseline results in the top row. Most of the results remain statistically significant and of the expected sign, but the sorting results are now statistically indistinguishable from 0.

Why are these difference estimates so small? One possibility is the role of the various control variables. We examine the results with the variables added one by one and find that it is the addition of controls for the median male wages that most appreciably lowers the point estimates. This suggests that some of the marriage-related outcomes for women derive not from the fact that men are incarcerated, but rather from the fact that men in markets with rising incarceration would not make good spouses because of their poor labor market prospects. Another, and we believe more important, reason for the smaller estimates in the second row is what we earlier discussed about the measurement error associated with linking people to marriage markets.

The third row of the table presents the TSLS estimates discussed above. In these regressions, the change in a marriage market's incarceration rate is instrumented for using the market's drug caseload. In principle, these results account for any endogeneity bias that survives the application of the panel data methods in the first two rows of the table, as well as the effect of any attenuation bias associated with the mismeasurement of the marriage markets and the incidence of male incarceration within them.

Overall, all of the TSLS estimates of the effects of incarceration on women's marital outcomes are of the predicted sign. They are generally larger than the difference results in the second row and closer in magnitude to the baseline fixed-effects estimates in the top row. The sorting results in this specification are now of the expected sign but are not statistically significant. This pattern of results suggests that the conclusions one would draw about the effects of incarceration on women's marital outcomes based on the results of simple associational relationships are probably upward biased, most likely because of the influence of unmeasured factors specific to markets. However, this bias appears to have been relatively small. Panel data estimates,

²⁹ Indeed, positive assortative mating implies that we should expect the same effect even if only high-skilled men were removed from the market by incarceration, since such men as remained who wished to be married would remain in the marriage market should always wish to marry the highest-quality woman they can get.

TABLE 2.—ESTIMATED EFFECT OF MALE INCARCERATION RATE ON WOMEN EVER MARRIED, AND IMPLIED FRACTION OF 1980–2000 CHANGE IN MARRIAGE EXPLAINED BY INCARCERATION

	Percentage Point Change Between 1980 and 2000 in Share of:		Fixed Effects		Difference Model		TSLS Specification	
	Men Incarcerated	Women Married	Point Estimate	Fraction of	Point Estimate	Fraction of	Point Estimate	Fraction of
				Change Explained		Change Explained		
All races	2.057	–12.95	–0.0111	18%	–0.0038	6%	–0.0122	19%
Whites	0.742	–11.31	–0.0694	46%	–0.0325	21%	–0.1108	73%
Blacks	7.362	–17.22	–0.0064	27%	–0.0031	13%	–0.0043	18%
Hispanics	3.637	–16.49	–0.0124	27%	–0.0042	9%	–0.0045	10%

Note. Estimates are race-specific results from the alternative. All point estimates in the table are statistically significant at the 5% level. Implied effects equal: $100 \times \text{Point Estimate} \times (\text{Change in incarceration rate/change in marriage rate})$. See text for additional details.

from either fixed-effects or difference models, account for much of this bias, but the estimates they yield seem to be significantly attenuated because of measurement error in classifying men to marriage markets.

In table 2, we ask how much of the changes in female ever-married rates between 1980 and 2000 can be explained by estimates from the various models. Because the effect might differ sharply by race, we estimate the various model separately by race. The first two columns of the table depict the change in male incarceration and female ever-married rates between 1980 and 2000, overall and for each race separately. In all cases, incarceration has risen, and marriage for women fallen sharply. The next three sets of columns in the table show that for all models and for each race, the point estimate for male incarceration is negative but very different in magnitude across races. More striking are the differences across races and across specifications in the implied fraction of the change in marriage accounted for by the change in male incarceration. These implied effects equal the relevant point estimate multiplied by the ratio of the change in incarceration to the change in the marriage rate, all times 100.

In all three models, somewhere between 10% and 25% of the changes in marriage for blacks and Hispanics is accounted for by male incarceration. Strangely, two of the three models yield much larger effects for whites. Precisely why the estimates for whites—and especially that for the TSLS estimates—are so large is not at all clear. One possibility is that white marriage markets with rising incarceration, or markets in which the war on drugs hit especially hard, differ from other marriage markets in some fundamental way that we do not capture. The apparent implausibility of some of results for whites notwithstanding, we find the rest of the results (for groups in which incarceration rates have risen the most sharply) credible across specifications. Overall, taking the mean across races and across specifications, it appears that somewhere around 13% of the decline in marriage across the population appears to the result of male incarceration.

B. Other Female Outcomes

Table 3, which has the same layout as table 1, presents the results for the other female outcomes. We earlier argued that

TABLE 3.—FIXED EFFECTS, FIRST DIFFERENCE, AND TSLS ESTIMATES OF EFFECT ON MALE INCARCERATION ON WOMEN'S MARITAL OUTCOMES

	Years Schooling All Women	Any College? All Women	Work for Pay? All Women	Labor Force Participant? All Women	Child Out of Wedlock? All Women	Divorce? All Women
Mean of dependent variable	12.92	0.48	0.64	0.69	0.18	0.16
Fixed-effects Model: 1970–2000 data						
Controls: Marriage market fixed effects, time, time \times race, time \times age, time \times state	0.0524 [0.0069]**	0.0122 [0.0017]**	0.0062 [0.0006]**	0.0059 [0.0007]**	0.0752 [0.0074]**	–0.0042 [0.0007]**
Observations	1,195	1,195	1,195	1,191	1,191	1,187
R^2	0.9	0.91	0.83	0.75	0.58	0.89
Mean of dependent variable	0.291	0.073	0.017	0.016	0.415	–0.01
Difference model: 1990–2000						
Controls: Maximum state welfare payment, total property and personal crime, median male wage	0.0119 [0.0021]**	0.0023 [0.0006]**	0.0043 [0.0007]**	0.0035 [0.0005]**	0.0396 [0.0039]**	–0.0064 [0.0007]**
Observations	306	306	306	306	306	302
R^2	0.9	0.9	0.47	0.42	0.58	0.43
TSLS model of 1990–2000 difference						
Controls: Same as in difference model instrument: 1990–2000 drug caseload	0.0182 [0.0044]**	0.0067 [0.0016]**	0.0031 [0.0011]**	0.0057 [0.0008]**	0.1555 [0.0251]**	–0.0102 [0.0013]**

Note. Robust standard errors are in parentheses. Regressions are performed at the level of the marriage market: individual-level census data are aggregated to race/state/age cells. Fixed-effects specification corresponds to equation 1 in text. Difference models to 2000–1990 differenced version of equation (1). For any particular outcome, mean is taken over all women on indicated sample in race/state/age cell. If there are no women of a particular type in market, the cell is dropped. See text for additional details.

TABLE 4.—TWO STAGE LEAST-SQUARES ESTIMATES OF EFFECT OF 1990–2000 CHANGE IN MALE INCARCERATION RATE, FOR SPECIFIC ALTERNATIVE SPECIFICATIONS INDICATED IN TABLE

Extension/Alternative Specification	Dependent Variable: 1990 to 2000 Mean Difference among Women in Marriage Market:								
	Ever Married	Wife's Education > Husband's Education?	Wife's Education < Husband's Education?	Years School	Any College?	Work for Pay?	Labor Force Participant	Child Out of Wedlock	Divorce
Marriage market measured by state of residence	-0.0114 [0.0023]**	0.0019 [0.0014]	-0.0017 [0.0010]	0.0199 [0.0052]**	0.007 [0.0018]**	0.0029 [0.0013]*	0.0042 [0.0011]**	0.1469 [0.0249]**	-0.0102 [0.0016]**
Controls for total number of men and women in market	-0.0135 [0.0026]**	0.0012 [0.0018]	-0.0018 [0.0012]	0.0215 [0.0045]**	0.0081 [0.0018]**	0.0036 [0.0012]**	0.0064 [0.0008]**	0.1695 [0.0291]**	-0.0103 [0.0015]**

Note. The instrument is the same as in previous tables in the relevant market. Robust standard errors are in brackets. Each point estimate represents results from a separate TSLS specification. Each regression contains controls for the change in maximum welfare payments, the level of property crime, the level of personal crime in the state, and the median offered male wage between 1990 and 2000. See text for additional details.

because higher male incarceration produced negative marriage outcomes for women, there should be increased incentive among women to undertake actions that raise their levels of economic independence.

We find that increases over time within a marriage market are associated with increases in female schooling and employment.³⁰ For example, the strongly significant point estimate of 0.012 from the fixed-effects model implies that a standard deviation increase in the incarceration rate of 2.8 percentage points raises the fraction of women in the market with any college training by about 7%. This effect, like that for the fraction of women who work for pay and for the share of women who are in the labor force, is relatively modest. But it is still very consistent with the notion that higher male incarceration, by virtue of its negative effect on marriage outcomes, induced women to engage in behaviors that raised their levels of economic independence. The first row also presents fixed-effects estimates for the share of women in a marriage market who have had an out-of-wedlock birth. A decline in the number of available men should raise the bargaining power of men who are not incarcerated. One consequence of this change, we reason, might be an increase in less committed relationships. The results about out-of-wedlock birth bear out this prediction. The last entry in the table shows the results for divorce—the share of women who were married at some point but no longer are. We find that higher incarceration is systematically associated with a lower incidence of divorce. This result too is consistent with the marriage-market model: the presence of fewer men means that fewer women marry at all, but those who do are more selective and their marriages are more stable as a result.

³⁰ We study female schooling and labor force participation as outcomes. We also investigate how the estimated effects for the share of women ever marrying are affected by adding these measures as controls in the ever-married regressions. We find that the point estimates for male incarceration in these models are either unchanged or slightly larger.

As in table 1, the TSLS estimates are of the sign predicted by theory for all of the outcomes, but they are much larger than those from the simple panel data methods. We argue throughout that this pattern is precisely what one would expect if the instrumental variables methods corrected for attenuation bias in the standard estimates. An alternative explanation is, of course, that the instrumental variables method induces some positive bias into the estimates, probably because drug caseloads are correlated with some unobserved behavioral change in the relevant markets. We are dubious that this explains our results, partly because all of the estimated effects are of the sign predicted by theory and also because one would expect that the sorts of biases that come readily to mind should, for some of these outcomes, have produced biases going in the opposite direction. For example, areas with rising drug caseloads may be places where there is a general increase in social dysfunction. But such dysfunction should cause women in those markets to work less or be less likely to obtain schooling. That we find results that override this bias suggest that the relationships we have documented are real.

C. *Some Extensions and Robustness Tests*

Before concluding, we present two extensions to our main results above.³¹ The first extension concerns the spatial definition of marriage markets. In all of the analysis conducted thus far, we characterize markets by respondents' states of birth rather than their state of residence at the time

³¹ Although our focus in this paper is on how women are affected by rising male incarceration, for completeness, table A.3 in the appendix shows some results for unincarcerated men. These estimates cannot be taken as a test of the marriage model since observed outcomes for unincarcerated men are mechanically affected by the share of men incarcerated. For example, rising incarceration leads necessarily to an observed higher incidence of schooling among men who are not in prison since incarceration draws more less educated men out of the market. Moreover, all experience suggests that men who are especially scarce in a marriage market may be loath to marry even though they could.

of the survey. We earlier noted that our main reason for making this choice was that inmates might be systematically misclassified with respect to the marriage market to which they would belong were they free. How sensitive are our results to using state of birth rather than state of residence? The first row of table 4 presents the results from the TSLS regression of the effect of the change in incarceration on various outcomes for women, but with the marriage market measured by state of residence rather than state of birth as in the earlier tables. To conserve space, we report only the estimated coefficient and (robust) standard error on the incarceration rate term from each of the twenty regressions.

The results indicate that for all outcomes, the estimated effects when measuring marriage markets by state of residence are very close to those from the preferred state of birth estimates. For example, for the fraction of women-ever-married outcome, the preferred estimate from this instrument set for state-of-birth marriage markets is -0.018 , while that from using state-of-birth marriage markets is -0.011 . Our results appear quite robust to the next most obvious alternative spatial definition of marriage markets.

In the second row of table 4, we control directly for the number of men and women in a market. All of the main results are weighted by the size of the marriage market, but the previous regressions did not control directly for these two measures of marriage market size. A concern might be that the estimated effect of incarceration rate could in fact be due to changes in cohort size. Men tend to marry younger women, so population growth or decline can have independent effects on women's marriage outcomes. For example, if there is population growth, women confront a situation where men of the sort they are likely to marry (older men) are scarce. If this growth coincides with rising incarceration and we did not control for population, our analysis would incorrectly attribute all of the reduction in marriage to the increase in imprisonment. Controlling for marriage-market size also accounts for any differential trends in large and small markets. Finally, controlling separately for the total number of men and number of women represents a more flexible formulation of a single control for the sex ratio, which some of the previous literature on marriage emphasizes.

Our results suggest that controlling for the (the change in) marriage-market size, the results in the second row all remain of the predicted signs and are roughly of the same size and significance level as the results in table 1. On the whole, these results are qualitatively quite similar to those presented earlier in the paper and in no way change our main conclusions.

V. Conclusion

In this paper we study how women have been affected by rising male incarceration levels over the past thirty years.

Our various empirical strategies for breaking the possible endogenous relationship between marriage market outcomes and incarceration make use of two facts. First, we show that the increase in incarceration has not been uniform across all types of men. Instead, there has been tremendous variation in rates of incarceration across men of different races, locations, and ages, and also great variation within each of these categories. Second, we show that most marriages occur within relatively narrow marriage markets, defined by the interaction of race, age, and location. Taken together, these two facts imply that different types of women have been exposed to dramatically different shocks relating to the relative presence of men in their respective marriage markets. Using data on marriage markets over time, we estimate a series of panel data models that exploit variation in marriage markets over time. These models have two possible shortcomings: changes in incarceration might be associated with changes in unobserved factors within markets, and panel methods likely exacerbate any measurement error problems that confound our estimate.

With self-reported data on drug offending, we find suggestive evidence that changes in incarceration over time appear to be due not to changes in male behavior but rather to changes in policy. We then isolate variation in the change in incarceration rates within marriage markets attributable to a specific policy: the handling of drug cases following the initiation of the war on drugs. In a series of TSLS regressions, we then use these policy measures to account for any endogeneity associated with the change in incarceration, as well as for the effect of measurement error.

Our results show strongly that higher levels of male incarceration lower female marriage. Our findings regarding marital sorting are less definitive; whereas many of the point estimates indicate a tendency for women to marry men of inferior quality when they do marry, as implied by the standard marriage-market model, the effects are either not statistically significant or only weakly so. Evidence for divorce does show that marriages that do form in the face of rising male scarcity from incarceration are more durable, presumably of greater initial selectivity. We find that women increase both their schooling and labor supply in the face of higher male incarceration, actions that we argue represent rational reactions to negative marriage-market shocks. Finally, whereas observable controls for market characteristics such as state welfare payments have little effect on our estimates, the evidence strongly suggests that declining male labor market opportunities in markets with rising male incarceration play an important role in explaining recent female marriage market outcomes. The results are stable across a variety of specifications and robust to alternative spatial definitions of marriage markets, but we nonetheless note that some sort of generalized social dysfunction in marriage markets may partially explain our results.

Our results identify an important unintended effect of increased incarceration. Whether this policy is socially beneficial also depends, of course, on the degree to which imprisonment achieves its direct aim of lowering crime and punishing criminals, and the relative societal valuations of these ends. Our work has nothing to say about either of these, but we argue that the results presented here should be part of the debate about the societal wisdom of increased incarceration.

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APPENDIX

TABLE A.1.—PROSECUTIONS AND ULTIMATE DISPENSATION OF ALL CRIMINAL CASES BROUGHT IN STATE COURT

	Homicide	Rape	Robbery	Aggravated Assault	Burglary	Larceny	Drug Trafficking	Drug Possession	All Other Felonies
<i>A. Distribution of All Felony Cases Brought in State Court, by Main Charge Faced by Defendant</i>									
1990	4.4%	6.5%	9.5%	10.4%	12.5%	10.7%	13.0%	8.4%	24.5%
1992	5.1%	7.0%	9.6%	11.0%	11.6%	9.6%	11.4%	8.2%	26.4%
1994	4.9%	6.7%	8.0%	11.8%	9.4%	8.7%	11.9%	7.7%	30.8%
1996	1.5%	3.3%	6.3%	7.7%	10.4%	10.5%	23.6%	13.6%	23.2%
1998	1.3%	3.1%	5.5%	7.7%	9.4%	10.3%	23.6%	15.2%	24.0%
2000	1.1%	3.4%	5.6%	8.6%	9.0%	10.0%	22.8%	15.0%	24.5%
<i>B. Fraction of Cases in Which Defendant Convicted, by Main Charge Faced at Trial and Year</i>									
1990	92.1%	66.0%	73.4%	46.8%	55.7%	43.0%	50.4%	39.1%	39.6%
1992	92.8%	67.3%	74.2%	45.8%	54.3%	41.0%	50.5%	36.7%	37.9%
1994	95.8%	73.2%	77.7%	54.0%	54.7%	42.3%	49.6%	37.1%	42.6%
1996	93.6%	63.5%	73.8%	43.5%	49.0%	35.2%	42.6%	32.2%	34.5%
1998	93.3%	67.4%	76.3%	48.3%	56.1%	43.3%	46.2%	38.5%	39.1%
2000	92.0%	65.4%	74.6%	45.9%	55.0%	38.9%	45.6%	39.8%	37.8%
<i>C. Fraction of Convicted Defendants Sentenced to Prison/Jail Term, by Charge at Trial and Year</i>									
1990	96.6%	88.3%	93.2%	79.5%	81.6%	75.7%	79.8%	71.4%	73.3%
1992	97.1%	89.1%	91.7%	78.6%	80.2%	75.1%	81.5%	69.2%	71.4%
1994	99.2%	90.7%	93.2%	84.6%	82.8%	78.3%	80.9%	74.7%	77.8%
1996	96.4%	85.3%	92.5%	81.1%	78.7%	73.9%	81.2%	80.1%	72.3%
1998	97.9%	83.9%	91.2%	78.2%	80.6%	72.2%	75.4%	74.7%	69.9%
2000	97.6%	85.4%	92.8%	78.2%	81.2%	70.8%	74.2%	73.2%	71.9%
<i>D. Distribution of Main Charge at Trial, of All Persons Convicted and Sentenced to Prison/Jail</i>									
1990	5.2%	6.4%	11.4%	10.4%	14.1%	10.4%	13.8%	8.0%	20.3%
1992	6.2%	7.3%	11.6%	10.9%	12.5%	9.1%	12.4%	7.2%	22.8%
1994	5.7%	6.7%	9.1%	11.8%	9.7%	8.2%	12.1%	7.9%	28.8%
1996	2.0%	3.2%	6.9%	8.0%	10.8%	10.0%	25.3%	13.8%	20.1%
1998	1.7%	3.0%	6.5%	8.2%	10.1%	10.0%	25.0%	14.3%	21.2%
2000	1.5%	3.4%	6.9%	9.0%	9.9%	9.1%	24.2%	13.4%	22.7%
<i>E. Mean Maximum Sentence (Months), of All Persons Convicted and Sentenced to Prison/Jail</i>									
1990	244.8	160.6	117.3	73.5	78.6	51.2	72.2	48.8	52.2
1992	247.9	141.3	116.7	81.2	75.7	53.7	69.3	47.3	50.3
1994	277.2	141.7	112.7	84.1	67.1	43.3	62.1	40.6	45.3
1996	269.6	104.7	96.3	67.8	55.0	37.7	50.7	34.9	40.7
1998	281.8	108.9	106.4	66.2	50.5	34.5	49.2	31.7	36.9
2000	255.3	96.1	97.6	60.4	50.3	31.9	48.8	32.5	35.2

Note. Data are from multiple years of the National Judicial Reporting Program Series (NCJRPS). See text for details.

TABLE A.2.—EFFECT OF INCIDENCE DRUG CRIMES IN OVERALL STATE CASELOADS BETWEEN 1990 AND 2000 ON 1990–2000 CHANGE IN MALE INCARCERATION RATES FOR RACE/STATE/AGE CELLS (ROBUST STANDARD ERRORS IN PARENTHESES)

Constant	0.2339 [0.2776]	–0.0022 [0.2818]	2.6014 [0.4575]**
Drug caseload	0.0915 [0.0206]**	0.1032 [0.0223]**	0.0674 [0.0191]**
Violent crime		25.4442 [10.6321]*	23.8031 [11.1887]*
Property crime		–4.0293 [2.0044]*	–2.8992 [2.0882]
Welfare payment		–0.8129 [0.6261]	–0.6311 [0.5884]
Median wage			–0.3586 [0.0600]**
Observations	222	222	222
R ²	0.45	0.47	0.57
F-statistics: drug caseload = 0	19.80	21.33	12.50

Note. Regressions are performed at the level of the marriage market: individual-level census data are aggregated to race, state, age cells. For any particular outcome, mean is taken over unincarcerated men in race/state/age cell. Robust standard errors are in brackets. See text for discussion.

* Significance at the 5% level. ** Significance at the 1% level.

TABLE A.3.—TSLS ESTIMATES OF RELATIONSHIP BETWEEN MALE MARRIAGE RATE AND OUTCOMES FOR UNINCARCERATED MEN IN MARRIAGE MARKET

	Ever Married?	Years Schooling	Any College?	Work for Pay?	Labor Force Participant?	Child Out of Wedlock?	Divorce?
Estimated effect of male incarceration rate	–0.0099 [0.0021]**	0.0383 [0.0068]**	0.0111 [0.0023]**	–0.0111 [0.0016]**	–0.0184 [0.0012]**	0.0034 [0.0020]	–0.008 [0.0011]**

Note. Regressions are performed at the level of the marriage market: individual-level census data are aggregated to race, state, age cells. For any particular outcome, mean is taken over unincarcerated men in race, state, age cell. See text for discussion.

FIGURE A.1.—RELATIONSHIP BETWEEN ADOLESCENT DRUG USE AND RATE OF ADULT INCARCERATION, BY RACE AND CENSUS REGION, FOR DIFFERENT GENERATIONS OF AMERICAN MEN

