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# THE ECONOMICS OF BAIL JUMPING

SAMUEL L. MYERS, JR.\*

## I. INTRODUCTION

WHY do some defendants, released on personal or property bond or cash bail, fail to appear for their scheduled trial or hearing? This question, considered in this paper, diverges somewhat from the kind of question typically posed within the context of the heated debate over bail reform in America. A frequent query raised in the debate has been: should the bail system be employed to assure appearance at trial or to prevent the defendant's commission of further crimes?<sup>1</sup> Another question has been whether the poor, the disadvantaged, the uneducated, or the innocent are punished under a system of bail based on alternative measures of either ability to pay or presumption of guilt.<sup>2</sup>

Recently researchers have begun to address the problem of determinants of bond-forfeiture rates, bail risk, and failure to appear for trial. Paul Wice summarized evidence suggesting that cities that not only actively supervise pretrial release but also base releases on criteria related to a defendant's record of past appearances tend to experience lower rates of bond forfeiture.<sup>3</sup> Stephen Clarke *et al.*, who find demographic variables and characteristics of the offense to be insignificant determinants of combined failure to appear at trial and rearrest, observe nevertheless a strong positive correlation of court delay with bail risk.<sup>4</sup> William Landes, finding

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<sup>1</sup> See, e.g., Ronald L. Goldfarb, *Ransom: A Critique of the American Bail System* (1965).

<sup>2</sup> The former alternative is discussed fully by William M. Landes, *An Economic Analysis of the Courts*, 14 *J. Law & Econ.* 61 (1971).

<sup>3</sup> Paul B. Wice, *Bail and Its Reform: A National Survey* (Nat'l Inst. Law Enforcement & Crim. Just. 1973).

<sup>4</sup> Steven H. Clarke, Jean K. Freeman, & Gary B. Koch, *Bail Risk: A Multivariate Analysis*, 5 *J. Legal Stud.* 341 (1976).

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characteristics of the offense a significant determinant of bail forfeiture, similarly observes a significant effect of the size of bond on bail risk.<sup>5</sup>

The evidence suggests that bail jumping depends upon the choice behavior of the defendant and the optimal bail-setting (or pretrial-release) procedure of the court. The latter problem has been investigated in depth by Landes. The principal motivation of this paper, however, is to investigate the choice behavior of the bail jumper and to heuristically describe how bail-setting procedures affect the choice to appear for trial. The model sketched in this paper assumes that defendants jump bail when the expected utility of appearing for trial is less than the expected utility of jumping bail. Increasing bail bond, reducing court delay, and releasing defendants on personal bond all could possibly reduce bail jumping. The econometric results confirm that bail jumping is negatively related to release on recognizance and bail bond. But, controlling for plea bargaining, court delay exhibits a minor inverse relationship to bail jumping.

## II. EVIDENCE ON THE DETERMINANTS OF FAILURE TO APPEAR IN COURT

From a sample of Legal Aid Society defendants in New York City, Landes finds that the main determinants of a defendant's bond are the severity of the charge—measured by the unweighted average of the maximum and minimum sentence for the given offense according to the New York penal code—prior felonies, and parole or probation status.<sup>6</sup> The main determinants of bail jumping are the presence of an outstanding detainer, resisting arrest on the current charge, and the amount of bond. That higher bond has a deterrent effect on the propensity of defendants to jump bail is seen by Landes as support for using the bail system to assure appearance at trial.

In their research on the bail system in Charlotte, North Carolina, Clarke *et al.* do not examine the effect of the size of the bond on the probability of appearing at trial.<sup>7</sup> However, they find a significant positive effect of court-disposition time and criminal history on the risk of nonappearance. Furthermore, those released on their own recognizance (ROR) had significantly lower probabilities of jumping bail than those released on bond. Demographic variables, such as race, sex, age, and variables reflecting the effect of the nature of the offense were found to be insignificantly related to bail risk. The authors investigate both the failure to appear in court and rearrest as measures of bail risk. Their results should

<sup>5</sup> William M. Landes, *Legality and Reality: Some Evidence of Criminal Procedure*, 3 J. Legal Stud. 287 (1974).

<sup>6</sup> *Id.*

be viewed cautiously, however, because the analysis used contingency tables in which all intervening variables were not controlled. For example, the lower bail risk discovered for RORs could result from the release practices of judges who set high bail when defendants are deemed less likely to appear for trial.

Clarke *et al.* are aware that the time from arrest to trial, while a determinant of bail risk, is nonetheless unobserved for defendants who jump bail. Time from arrest to disposition clearly is a biased measure of pretrial delay for bail jumpers.<sup>8</sup> Clarke *et al.* cleverly developed survival curves for classes of offenders based on the method of release and criminal history. By measuring the fraction of defendants in a given cohort who can be expected to avoid rearrest or to fail to appear in court for any elapsed period of time, these survival curves serve as the basis for deriving the time from arrest to disposition.

Landes ignores court delay and Clarke *et al.* ignore money bail in their models of failure to appear in court. In what follows both of these variables are incorporated in a model of failure to appear for trial.

### III. OPTIMAL BAIL JUMPING

Consider the problem of the released defendant whose indirect utility of income in any period is given by  $U(Y_t)$ . If the defendant appears as scheduled for trial, he may be acquitted with probability  $\alpha$ , or convicted and sentenced to prison for  $S$  years with probability  $(1 - \alpha)\sigma$  or fined an amount  $F$  with probability  $(1 - \alpha)(1 - \sigma)$ .<sup>9</sup>

At the moment he is released, the defendant's lifetime expected utility, appropriately discounted, can be written as

$$\begin{aligned} \phi_1 = & \alpha \int_0^T e^{-\rho t} U(Y_t) dt + (1 - \alpha) \sigma \left[ \left( \int_0^{t_1} e^{-\rho t} U(Y_t) dt \right) \right. \\ & \left. + \int_{t_1}^s e^{-\rho t} U(Y_t - sY_t) dt + \int_s^T e^{-\rho t} U(Y_t) dt \right] \\ & + (1 - \alpha)(1 - \sigma) \int_0^T e^{-\rho t} U(Y_t - F) dt. \end{aligned} \quad (1)$$

The first expression is the expected present discounted value of utility if acquitted. Added to that (in brackets) is the expected present discounted value of utility if convicted and sentenced to prison. The final term in the

<sup>7</sup> Clarke *et al.*, *supra* note 4.

<sup>8</sup> This is true because "disposition" in the present instance refers to the act of jumping bail.

<sup>9</sup> Of course, he may be given probation or a suspended sentence. Without loss of generality, these cases will correspond respectively to setting  $F$  and  $S$  to zero.

summation is the expected present discounted value of utility if convicted and fined.

It could be argued that income while incarcerated (denoted by  $Y_t - sY_t$  in the second integral within the brackets) really should be zero. On the other hand, income forgone while in prison is offset by the value of prison room and board. Moreover, one might consider postrelease income to be a declining function of prison sentence in order to account for possible discrimination against ex-offenders. To greatly simplify the expression for the expected utility of appearing for trial, let us assume that the monetary equivalent of punishment can be expressed by  $F$  alone, thereby justifying setting  $\sigma = 0$ .

If the defendant fails to appear at the appointed date, he might not be detected. Of course many defendants forget the appearance date, or are already incarcerated for other offenses, or are mentally or physically incapacitated on the date of the trial. Let us assume that failure to appear is a decision to indefinitely avoid prosecution and let us call this decision bail jumping.<sup>10</sup>

Again, the bail jumper possibly may not be reapprehended, the probability of which is  $\beta$ . If caught, however, the probability of which is  $(1 - \beta)$ , the defendant may be acquitted with probability  $\gamma$ . On the other hand, he may be convicted (or fined) with probability  $(1 - \gamma)$ , in which case the monetary equivalent of punishment,  $F$ , is for expository purposes identical to that for the nonbail jumper. In either case, the defendant who is caught must pay an amount  $B$ , which is forfeited bond.<sup>11</sup>

The defendant's expected utility from jumping bail can be written as

$$\begin{aligned} \phi_2 = & \beta \int_0^T e^{-\rho t} U(Y_t) dt + (1 - \beta) [\gamma \int_0^T e^{-\rho t} U(Y_t - B) dt \\ & + (1 - \gamma) \int_0^T e^{-\rho t} U(Y_t - F - B) dt]. \end{aligned} \quad (2)$$

The defendant will appear for trial only if  $\phi_1 - \phi_2 \geq 0$ . So defendants jump bail because the expected lifetime discounted utility of jumping bail exceeds that of appearing for trial.

<sup>10</sup> For want of superior terminology, and to be consistent with the assumptions of Landes, bail jumpers will include those who are released on personal bond but who fail to appear for trial. In a manner of speaking, then, release on recognizance is "zero bond."

<sup>11</sup> This is just another way of stating that if an amount of the bond is deposited with the court upon pretrial release, failure to appear implies this amount is not returned. It could be argued, however, that in such a case even if the bail jumper is not caught, the amount should be deducted from his income. This difficulty does not arise when the bond is posted by securing the aid of a bail bondsman. For equivalent monetary payments by defendants, those posting cash fractions of the bond have lower expected utility from jumping bail.

Suppose that bail were set at the amount of the fine that would be imposed if the defendant were found guilty. Then

$$\begin{aligned} \phi_1 - \phi_2 &> 0 \rightarrow \\ (\alpha - \beta) \int e^{-\rho t} U(Y_t) dt &+ [(1 - \alpha) - (1 - \beta)\gamma] \int e^{-\rho t} U(Y_t - F) dt \\ &- (1 - \beta)(1 - \gamma) \int e^{-\rho t} U(Y_t - 2F) dt > 0. \end{aligned} \quad (3)$$

If the probability of being convicted when one appears for trial exceeds the probability of being reapprehended following a bail jump, then for sufficiently small probabilities of conviction after jumping bail it will almost always pay to jump bail.

Raising bail unambiguously reduces the expected utility from jumping bail. If initially  $\phi_1 = \phi_2$ , an increase in the amount of bond will result in the optimal decision to appear for trial.

Release on personal recognizance, however, could have two effects. Ignoring the selection behavior of courts in determining bond, bail jumping will tend to be higher for ROR because it is like a zero bond. However, if courts choose ROR defendants who happen to have high  $\alpha$ 's and  $\gamma$ 's or low  $\beta$ 's, then ROR defendants will tend to be less likely to jump bail.

Suppose that court delay lowers conviction probabilities or the expected monetary equivalent of punishment, perhaps because of the increased likelihood of plea bargaining. Then the expected utility of bail jumping will tend to rise. But so too does the expected utility of appearing for trial. Hence, court delay has an indeterminate effect on the choice to jump bail.

#### IV. SPECIFICATION AND ESTIMATION

Let  $b$  be equal to 1 if an individual jumps bail and 0 if he does not. Let  $Z$  be a vector of characteristics of the defendant, the offense, and the court process. Included in the vector are the amount of bond, pretrial delay, type of release, and the expected monetary equivalent of punishment. The expected utility,  $\phi$ , depends on  $Z$  but is not observed without error. Assume, then, that expected utility of appearing for trial can be defined as

$$EU_1 = \phi_1(Z) + \epsilon_1 \quad (4)$$

and for not appearing as

$$EU_2 = \phi_2(Z) + \epsilon_2, \quad (5)$$

where  $(\epsilon_1, \epsilon_2)$  are identically and independently distributed random variables independent of  $Z$ . It is well known that the probability

$$P(b = 1 | Z) = P(EU_1 - EU_2 \leq 0 | Z) \quad (6)$$

has a logistic of distribution if the joint distribution of  $\epsilon_2 - \epsilon_1$  is logistic.<sup>12</sup> Assuming that  $\phi_2 - \phi_1$  is linear in  $Z$ , we obtain the familiar logit function:

$$P(b) = \frac{1}{1 + e^{-\beta Z}} \quad (7)$$

The coefficients  $\hat{\beta}$  are estimated for a subset of the Vera Institute of Justice's probability sample of 1888 felony arrests traced through disposition.

#### A. *The Data*

The data set from which the subsample for this study is drawn consists of a sample of felony arrests made in four New York boroughs in 1971—Manhattan, Brooklyn, Queens, and the Bronx.<sup>13</sup> The possible dispositions in each case include conviction, acquittal, dismissal, pending, abatement, and bail jumping. Out of the original sample, 6 percent jumped bail.

For the purposes of this study, a sample of nonjuvenile and nonfamily court defendants was drawn. The sample, which is referred to as the "adult court sample," is predominately young, black, and male. The average age is twenty-six, although one-half of the sample is under twenty-three years old, with the most frequent age being twenty-one. Twenty-six percent are white, 52 percent are black, and most of the remaining 22 percent have Spanish surnames. And, as in most samples of felony arrests, almost 90 percent are male.

Drawn equally from the four boroughs, the sample exhibits some striking differences in previous arrests and offense charges. While 44 percent had no previous felony arrests, for 32 percent the arrest charge represents the second arrest. For another 16 percent this is the third arrest. Eight percent have previously been arrested three or more times. The most frequent charges are for grand larceny and robbery, accounting for 15.1 and 13.8 percent of all charges. In fact, crimes for profit—robbery, burglary, grand larceny, possession of stolen property, gambling, and forgery—represent more than 55 percent of all charges. Another 20 percent came from drug possession and drug sale charges. Hence, it could be argued, that the arrests were for largely economically motivated crimes.

<sup>12</sup> See, e.g., Daniel S. McFadden, *Conditional Logit Analyses of Qualitative Choice Behavior*, in *Frontiers in Econometrics* 105 (Paul Zarembka ed. 1974).

<sup>13</sup> Vera Institute of Justice, *Court Disposition Study* 1972.

In the majority of cases, 57.8 percent, bail was set. About 35 percent of the defendants were released on their own recognizance. Another 6.7 percent had their cases disposed of at arraignment. However, only 63 percent were actually released. The others, who could not post bail, remained in jail to join the less than 1 percent for whom New York law required no bail be set.

There was a heavy use of legal aid. While 21 percent retained private counsel, 57 percent used legal aid. And the outcomes were no less divergent. Half of the sample pleaded guilty either to the arrest charge or to a lesser crime. Only five people were convicted by a judge. Another nine were convicted by jury. A remaining two were convicted, but with mixed verdicts.

### B. Court Delay

In almost every instance, the date of disposition for bail jumpers (or those who failed to appear for trial) was missing. Hence it is not possible to determine the length of time between the defendant's original arrest and the trial. Since pretrial delay is believed to be an important correlate of the decision not to appear for trial, an approximation method is needed for deriving court-delay measures for bail jumpers.

A log-linear model of court delay was estimated for those valid observations in the subpopulation of releases. The antilog of the dependent variable is "court delay" defined as the difference in days between initial arrest and disposition. For those cases disposed of at arraignment on the same day of arrest, the value .50 was substituted for zero. The results are displayed in equation (8).

$$\begin{aligned}
 \ln(\text{court delay}) &= 4.269 - .042 \text{ age} \\
 &\quad (9.104) \quad (-1.450) \\
 &+ .000 (\text{age})^2 - .044 \text{ black} \\
 &\quad (.955) \quad (-.416) \\
 &+ .673 \text{ released} + .121 \text{ previous arrests and convictions} \\
 &\quad (6.001) \quad (1.188) \\
 &+ .593 \text{ Queens} + .768 \text{ Brooklyn} \\
 &\quad (4.639) \quad (5.772) \\
 &- .230 \text{ burglary} - .377 \text{ possession of stolen property} \\
 &(-1.473) \quad (-1.497) \\
 &- .328 \text{ legal aid} + .702 \text{ rape, homicide, or assault} \\
 &(-2.914) \quad (1.993) \\
 R^2 &= .085 \quad F = 10.69 \quad \text{D.F.} = 1264. \quad (8) \\
 &(\text{t-statistics in parentheses})
 \end{aligned}$$

The regression explains only a fraction of the variation in court delay. However, a number of variables have statistically significant effects on court delay.<sup>14</sup> Those who are released from jail have significantly longer court delays. Similarly, those arraigned in Queens and Brooklyn have longer than average delays. Defendants using legal-aid lawyers face shorter delays while those accused of rape, homicide, or assault wait longer periods between arrest and disposition.

Equation (8) can be used to predict court delay for all cases in the sample. While the actual mean for court delay is 55.7 days, the predicted mean is 68.3 days. Hence, the regression predictions tend to overestimate the arrest-to-disposition duration. The limitation this places on the following analysis is considered later.

### C. *Probabilities of Guilty Verdicts*

In theory, the decision to jump bail depends upon the expected losses from appearing at trial. It is extremely difficult to quantify the *ex ante* losses that offenders face when found guilty. One procedure is to use the actual penalties paid by similar offenders who either have completed their sentence or have paid their fines. As is well known, though, changes in the judicial system or paroling policies can dramatically alter the expected punishment of current offenders *vis-à-vis* the actual punishment of former offenders who may have been convicted ten or fifteen years before.

If the *ex ante* loss is not inversely related to the probability of experiencing the loss, it can be shown that expected losses are unambiguously a positive function of the probability of loss.<sup>15</sup> So in most empirical applications only the probability of a loss is needed to capture the salient features of the theoretical model.

A proxy for the probability of loss is the probability of being found guilty. In our sample over 50 percent of the defendants plead guilty, often to a lesser crime and presumably as a result of negotiation with the prosecution. Fewer than 1 percent of those released from jail were convicted by a judge or jury.

<sup>14</sup> Based on a two-tailed test with a 10 percent critical level.

<sup>15</sup> Ignoring the discount factor, the expected loss,  $E(L)$ , if one appears for trial in this case is:

$$E(L) = (1 - \alpha) F(1 - \alpha)$$

and

$$\frac{d E(L)}{d (1 - \alpha)} = (1 - \alpha)F' + F$$

which is positive if  $F' > 0$ .

In Table 1 estimates of the probabilities of the types of guilty verdicts are presented. The probability of pleading guilty is found to depend, among other factors, on sex, criminal history, and arrest offense. Males are ten percentage points more likely to plead guilty than females. Each additional previous arrest increases the probability of pleading guilty by three percentage points. Those arrested for possession of stolen property and rape have lower than average probabilities of pleading guilty, while those arrested for burglary, drug sale, and forgery are more likely to plead guilty. Being released from jail markedly reduces guilty pleas. There is a 12.5 difference in probabilities of a guilty plea between jail releases and nonreleases.

Unlike the guilty-plea equations, for conviction probabilities we reject the hypothesis that the explanatory variables would predict the dependent variable (convictions) better than the average value of the sample. The low chi-squared value is not unexpected in light of the few convictions in the sample.

Although it should be argued that the decision to plead guilty and the process of conviction depend on very different factors, those probabilities are combined in Table 1 to create their complement—not being convicted or not pleading guilty. The coefficients appropriately have the opposite signs of those found significant in the guilty-plea and conviction estimations.

The purpose of estimating the probabilities of guilty verdicts was to provide proxies for the expected loss measures for the theory and to obtain predicted values for the bail jumpers. However, for this to be a valid procedure, one must assume that the process generating probabilities of guilty for those who appear for trial is also operative for those who jump bail. We adopt this assumption below.

#### *D. Bail Jumping*

In Table 2 the results of estimates of equation (7) are presented. First a sample of “at risk” persons was drawn, which included those who either were released on personal bond (ROR) or who were released by posting money bond (through a bail bondsman, in cash or by another method).

In column 1 the results do not take account of differing guilt probabilities. Addicts were found to be more likely to jump bail. Males are five percentage points less likely to jump bail than females. An extra \$1,000 bond reduces bail jumping by five percentage points, yet that same reduction would occur if bail were posted by cash rather than by bail bondsman. Those who are ROR are less likely to jump bail. Being ROR reduces the bail-jumping probability by five points. While grand larceny and drug-sale offenders are more likely to jump bail, those who experi-

TABLE 1  
 MAXIMUM LIKELIHOOD ESTIMATES OF COEFFICIENTS IN LOGISTIC EQUATIONS FOR PROBABILITIES OF GUILTY VERDICTS

Independent Variables	Plead Guilty <sup>a</sup>		Found Guilty (convicted <sup>b</sup> )		Not Guilty <sup>c</sup>	
	$\hat{\beta}_i$	$\partial\hat{p}/\partial x_i^a$	$\hat{\beta}_i$	$\partial\hat{p}/\partial x_i^b$	$\hat{\beta}_i$	$\partial\hat{p}/\partial x_i^c$
Constant	-.243 (.886)	—	-4.061 (-4.231)	—	-.029 (.099)	—
Male	.430 (2.237)	.107	-.135 (-.235)	—	-.262 (-1.361)	—
Age at arrest	.006 (.901)	—	—	—	-.006 (-.894)	—
Black	—	—	-.709 (-1.266)	—	.098 (.873)	—
Arrested in Brooklyn	-.444 (-3.435)	-.110	-.670 (-.876)	—	.289 (2.211)	.070
Previous arrests	.123 (3.149)	.031	—	—	-.073 (-2.009)	-.018
Age x previous arrests	-.003 (-2.691)	-.001	—	—	.001 (1.525)	—
Prior probability of conviction	-.085 (-.447)	—	.128 (.136)	—	-.129 (-.657)	—
No criminal record	—	—	.299 (.520)	—	—	—
Released from jail	-.502 (-4.224)	-.125	.139 (.215)	—	.500 (3.922)	.121
Posted bail with bond	—	—	1.126 (1.866)	.019	-.478 (-3.629)	-.116
Retained counsel	.356 (2.614)	.089	.787 (1.370)	—	-.240 (-1.715)	-.058

Arrest Offense						
Possession of stolen property	-.876 (-3.098)	-.218	—	—	.158 ( 2.743)	.183
Burglary	.532 ( 3.028)	.132	—	—	-.582 (-3.188)	.141
Drug sale	.772 ( 3.295)	.192	—	—	-.781 (-3.160)	.189
Forgery	.571 ( 2.647)	.142	—	—	-.738 (-3.282)	.179
Rape	-2.101 (-2.640)	-.522	—	—	2.166 ( 2.728)	.524
Drug possession	-.026 (-1.529)	—	—	—	.284 ( 1.686)	.069
$\chi^2$	116.036		9.018		131.860	
Number of observations	1456		675		1456	
Predicted probability, $\hat{p}$	.537	—	.017	—	.411	—
Mean of dependent variable, $\bar{p}$	.536	—	.021	—	.424	—

SOURCE: Vera Institute of Justice, Court Disposition Study 1972. Sample restricted to adult court cases.

NOTE: *t*-statistics are in parentheses.

<sup>a</sup>Dependent variable is equal to 1 if plea of guilty to charge or other charge; 0 otherwise. Sample excludes the following types of disposition: diversion, abatement, death, bail jump, incapacitation (mental), case on sentence pending.

<sup>b</sup>Dependent variable is equal to 1 if convicted by judge or jury; 0 otherwise. Sample excludes dispositions listed in (a) and pleas of guilty.

<sup>c</sup>Dependent variable is equal to 0 if convicted or plea of guilty; 1 otherwise. Sample excludes disposition listed in (a).

<sup>d</sup>Derivatives are computed only for variables with coefficients significant at 10 percent level (two-tailed test) and evaluated at the means of the independent variable.

TABLE 2  
MAXIMUM LIKELIHOOD ESTIMATES OF COEFFICIENTS IN LOGISTIC EQUATIONS FOR BAIL-JUMPING PROBABILITIES<sup>a</sup>

Independent Variables	(1)		(2)		(3)		(4)		(5)		(6)	
	$\hat{\beta}_i$	$\partial\hat{p}/\partial x_i$	$\hat{\beta}_i$	$\partial\hat{p}/\partial x_i$	$\hat{\beta}_i$	$\partial\hat{p}/\partial x_i$	$\hat{\beta}_i$	$\partial\hat{p}/\partial x_i$	$\hat{\beta}_i$	$\partial\hat{p}/\partial x_i$	$\hat{\beta}_i$	$\partial\hat{p}/\partial x_i$
Constant	-.261 (-.455)	—	.390 (.416)	—	-.648 (-.565)	—	1.812 (1.488)	—	.373 (.394)	—	1.539 (1.224)	—
Addict	1.467 (1.667)	.07	1.426 (1.615)	—	1.418 (1.601)	—	1.441 (1.607)	—	1.332 (1.516)	—	1.381 (1.549)	—
Sex, male	-.931 (-2.868)	-.05	-.937 (-2.910)	-.05	-.741 (-2.136)	-.04	-.636 (-1.765)	-.03	-.969 (-2.954)	-.05	-.707 (-1.899)	-.03
Race, white	-.374 (-1.163)	—	-.274 (-.800)	—	-.169 (-.480)	—	-.181 (-.530)	—	-.092 (-.254)	—	-.091 (-.250)	—
Amount of bail	-.001 (-2.420)	-.05 <sup>b</sup>	-.001 (-2.489)	-.05 <sup>b</sup>	-.001 (-2.083)	-.04 <sup>b</sup>	-.001 (-2.379)	-.05 <sup>b</sup>	-.001 (-1.775)	-.04 <sup>b</sup>	-.001 (-1.863)	-.04 <sup>b</sup>
Posted cash bail	-.907 (-1.647)	-.05	-.900 (-1.637)	-.04	-.870 (-1.608)	—	-.870 (-1.583)	—	-.867 (-1.611)	—	-.855 (-1.572)	—
Released on own recognizance	-1.265 (-3.174)	-.05	-1.245 (-3.102)	-.06	-1.186 (-2.991)	-.06	-1.213 (-3.017)	-.06	-1.187 (-3.093)	-.06	-1.180 (-3.012)	-.06
Court delay <sup>d</sup>	-.006 (-1.565)	—	-.007 (-1.628)	-.03 <sup>c</sup>	-.008 (-1.892)	-.04 <sup>c</sup>	-.009 (-2.028)	-.04 <sup>c</sup>	-.007 (-1.651)	-.04 <sup>c</sup>	-.008 (-1.956)	-.04 <sup>c</sup>
Arrest offense: grand larceny	.674 (2.061)	.03	.704 (2.141)	.03	.707 (2.133)	.03	.715 (2.160)	.03	.691 (2.100)	.03	.702 (2.136)	.03
Drug sale	.779 (1.991)	.04	.775 (1.961)	.04	1.170 (2.482)	.04	1.241 (2.627)	.06	.779 (1.966)	.04	1.159 (2.409)	.06
Predicted release probability <sup>e</sup>	—	—	.983 (.861)	—	-1.410 (-1.168)	—	-1.484 (-1.242)	—	-.715 (-.615)	—	-1.215 (-.983)	—
Predicted not guilty probability <sup>e</sup>	—	—	—	—	2.226 (1.617)	—	—	—	—	—	—	—
Predicted plead guilty probability <sup>e</sup>	—	—	—	—	—	—	-2.717 (-1.930)	-.13	—	—	-2.234 (-1.468)	—
Predicted probability of conviction <sup>e</sup>	—	—	—	—	—	—	—	—	-14.202 (-1.407)	—	-8.725 (-.835)	—
$\chi^2$	32.124		35.862		38.508		39.512		38.136		40.264	
$\hat{p}$	.0526		.0522		.0527		.0511		.0535		.0522	

SOURCE: Vera Institute of Justice, Court Disposition Study, 1972. Sample restricted to adult court cases for whom bail was set and who were released on bail, and to adult court cases released on recognizance.

NOTE: *t*-statistics are in parentheses.

<sup>a</sup>Derivatives computed only for variables with coefficients significant at 10 percent (two-tailed test) and evaluated at the means of the independent variables.

<sup>b</sup>Derivative expressed with respect to thousands of dollars.

<sup>c</sup>Derivative expressed with respect to hundreds of days.

<sup>d</sup>See text for estimated coefficients used to compute this variable.

<sup>e</sup>Computed from estimated coefficients obtained in Table 1.

ence longer court delay have insignificantly lower bail-jumping probabilities. These results, however, could be sensitive to our choice of sample.

Obviously we wish to restrict our sample to those who were released from jail. But could restricting ourselves to this sample yield biased estimates because of the inherent selectivity in the process of release from prison? A clear majority of the defendants who were not released were ones for whom bail was set but who were unable to post it. But the bails for those not released tended to be set much higher than those who were released. Any effect of amount of bond on bail jumping may be distorted by this imbalance.

To correct for this selectivity bias, we first estimate the probability of release from jail, given that bail was set. A predicted value is then assigned to each individual in the at-risk sample.<sup>16</sup>

Equation (9) predicts release-from-jail probabilities:

$$\begin{aligned}
 \ln(\text{released})/(1-\text{released}) &= .882 \\
 &\quad (6.780) \\
 + .602 \text{ no criminal record} &+ .391 \text{ forgery} \\
 &\quad (4.963) \quad (1.712) \\
 + 18.352 \text{ assault} &+ 2.070 \text{ gambling} \\
 &\quad (.008) \quad (2.801) \\
 + -.923 \text{ robbery} &- .431 \text{ nonwhite} &- .791 \text{ burglary} \\
 &\quad (-6.024) \quad (-3.722) \quad (-5.041) \\
 - 1.592 \text{ homicide} &- .126 \text{ drug sale} \\
 &\quad (-3.539) \quad (-6.987) \\
 \chi^2 &= 153.46 \\
 \text{actual mean (adult sample)} &= .630 \quad (N = 1612) \\
 \text{predicted mean (bail sample)} &= .666 \quad (N = 972) \\
 (t\text{-statistics in parentheses}). & \quad (9)
 \end{aligned}$$

<sup>16</sup> This procedure for correcting for a selectivity bias is a variant of that proposed by James S. Heckman, *Sample Selection Bias as a Specification Error*, 47 *Econometrica* 153 (1979). Heckman cautions that techniques such as these may lead to inefficient coefficient estimates when a selectivity bias is found to exist. Lung-Fei Lee, G. S. Maddala, & R. P. Trost, *Asymptotic Covariance Matrices of Two-Stage Probit and Two-Stage Tobit Methods for Simultaneous Equations with Selectivity*, 48 *Econometrica* 491 (1980), demonstrate, however, that while the inefficiency arising from heteroscedasticity is evident in probit models, it does not pose serious problems for tobit models. Peter Schmidt & Robert P. Strauss, *Estimation of Models with Jointly Dependent Qualitative Variables: A Simultaneous Logit Approach*, 43 *Econometrica* 745 (1975), explore a two-step logit model such as ours, although they do not explicitly investigate the properties of a sample selection model

Those with no criminal record and who are charged with less serious crimes are more likely to be released. However, controlling for the type of crime and previous record, nonwhites are less likely to be released. Controlling for previous criminal record, if whites and nonwhites received identical bail for identical crimes, the lower release probability for blacks could be attributable to their lower financial resources or perhaps to discrimination by bail bondsmen. There may be racial differentials in the actual setting of bail, but exploration of this phenomenon is beyond the scope of this discussion.

The high chi-square value suggests that the model explains well the process of who gets released. Although in the sample of releases—the at-risk group for jumping bail—the ex post probability of being released is one, equation (8) predicts that the average release probability is .67. This means that only two-thirds of the people who actually get released would have been released if decisions were made only on the basis of race, type of offense, previous criminal record, and jurisdiction. This fraction is just a few points higher than the average release frequency in the entire adult sample. Qualitative assessment of this conclusion is reserved for a final section.

Column 2 of Table 2 presents the bail-jumping results, controlling for selection bias. The results are essentially unchanged, except for the improved explanatory power of court delay. Longer court delay is found to *reduce* bail jumping. But this finding should be interpreted cautiously. An increase of 100 days—almost twice the average court delay—will bring about a reduction in average bail jumping of only three percentage points. This is approximately what would have been found without controlling for selection bias if less stringent statistical significance levels had been chosen. Moreover, the differential in bail jumping that could be accounted for by release alone—having controlled for differences in amount of bail and court delay—is negligible. The coefficient for the predicted release-

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as does Heckman. But our model correctly should be considered a recursive model and not a simultaneous equation model. One must be released from jail in order to be able to jump bail. Hence what we have there is the Maddala and Lee recursive logit model, G. S. Maddala & Lung-Fei Lee, *Recursive Models with Qualitative Endogenous Variables*, 14 *Annals of Econ. & Soc. Measurement* 525 (1976), which recently has been questioned by Donald Elliott, *Recursive Systems Containing Qualitative Endogenous Variables Representing Nonstochastically Dependent Events*, 48 *Econometrica* 761 (1980). However, our estimates are immune from Elliott's criticism that it is logically impossible to obtain estimates in certain recursive logit models. The impossible case occurs when it is never possible for one to jump bail if one were not released from jail. Yet, it is logically possible not to have been originally released from jail and then to jump bail. These are the people who after their convictions are awaiting sentencing or who were released subsequent to their initial inability to raise bail. Thus one can conclude that the two-stage logit estimates provided in the text are at least unbiased and at most efficient.

from-jail probability is insignificantly different from zero at even the most liberal statistical levels. So it can be concluded that selection bias does not dramatically alter the qualitative results.

In columns 3 through 6 we take account of expected losses by including our various measures of probabilities of guilty verdicts. All of the other qualitative results remain essentially the same. Males have lower probabilities of jumping bail, each extra \$1,000 of bail reduces bail jumping by four to five percentage points from the average bail-jumping probability. As we found before, those accused for grand larceny and sale of drugs are more likely to jump bail. While court delay still has a negative coefficient, the magnitude of the effect is small.

In theory one would expect that increasing guilty-verdict probabilities should, by way of increasing expected losses, increase bail jumping. We include the predicted probability of not being guilty in the estimates displayed in column 3. Included in column 4 is the probability of pleading guilty; in column 5, the predicted probability of conviction. Both the probability of pleading guilty and the probability of conviction are inserted in the estimation displayed in column 6. In every case the results contradict the theoretical expectation: the probability of being guilty reduces the likelihood of jumping bail.

There is a plausible explanation for this counterintuitive result. Few defendants are actually convicted of a crime. Most plead guilty. This action, not explicitly modeled here, can be regarded as a rational choice, just as jumping bail is regarded as a rational choice. The decision not to jump bail may well be made in conjunction with the calculation to appear at one's hearing, to plead guilty, to hope for a reduced punishment, and perhaps to avoid trial altogether.

Indeed, the only guilty variable found significant is the guilty-plea variable when it enters the equation alone. This is a telling sign that conviction probabilities and guilty pleas are correlated. But because there is so little variation of convictions in the sample, little can be learned by including it in the equation.

So, taking into account selection bias, guilty pleas, personal and offense characteristics, and court delay, we still find that increased bond reduces failure to appear for trial. Moreover, ROR, or personal bond, appears to be an effective means for assuring appearance at trial once other factors and type of crime have been accounted for.

#### IV. SUMMARY AND CONCLUSION

Previous writers have argued that reducing court delay and increasing bond should reduce bail-forfeiture rates. But these two factors had not previously been incorporated in a single model. We constructed a simple

model of rational bail jumping and discovered that, although increasing bail bond does indeed reduce optimal bail jumping, court delay has ambiguous effects.

Our empirical test confirms that, controlling for a host of related factors, increasing bail bond reduces bail jumping but that court delay has a negligible effect on bail jumping. Our findings further support the view that reform measures such as use of personal bond dramatically reduce the failure to appear for trial. These findings prevail even as we adjust for the inherent selectivity effect due to the use of personal bond.

But other questions remain unanswered. To attempt to control for selection bias, we estimated an equation for the probability of release from prison. Predicting that probability for the sample of defendants who in fact were released reveals that some defendants would not have been released if such factors as type of crime or criminal history alone were used to determine who gets released. Do financial factors, like amount of bail, ability to raise that amount, or current income and resources, play a role in bridging this gap? Would we expect similarly that many defendants not released from jail would have been released if factors such as criminal history and type of crime alone were used to determine release from jail? Concomitantly, is there something unfair about the bail-setting practice that leaves some people, who are unable to raise their bond, in jail without their freedom?

Although we do not address all of these questions in this paper, the empirical results suggest the probable effects of bail reforms that reduce disparities and inequities. If we had found that predicted release from jail significantly reduces bail jumping, reforms that increase alternatives to pretrial incarceration may possibly result in more bail jumping. Yet, we find that predicted release from jail has no significant effect on failure to appear for trial. A cautious conclusion then is that the often-expressed fears that further experimentations or reform of the bail system will result in rampant crime and uncontrollable levels of bail forfeiture are unfounded.