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Deterring Rearrests for Drinking and Driving

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Abstract

This study assesses why some individuals are re-arrested for driving while intoxicated (DWI). Using longitudinal data from North Carolina containing information on arrests and arrest outcomes, we test hypotheses that individuals prosecuted and convicted of DWI are less likely to be re-arrested for DWI. We allow for possible endogeneity of prosecution and conviction outcomes by using instrumental variables for the prosecutor's prosecution rate and the judge's conviction rate. With a three-year follow-up, the probability of DWI re-arrest was reduced by 6.6 percent if the person was prosecuted for DWI and, for those prosecuted, by 24.5 percent if convicted on this charge. Prosecution and conviction for DWI deters re-arrest for DWI.

Keywords

drunk driving; recidivism; criminal sanctions; deterrence

JEL Classification

K1; K14; K40; K42

1. Introduction

Considerable negative externalities arise from driving while intoxicated (DWI). While there has been a decline in alcohol related fatalities, DWI remains a significant cause of motor vehicle injury (Wallace 2011). In 2007, 1.4 million people were arrested for DWI, and 32 percent of all fatal motor vehicle crashes were alcohol related (National Highway Traffic Safety Administration 2011; Wallace 2011). An estimated one third of DWI offenders are

recidivists, having been convicted for DWI in the past (National Highway Traffic Safety Administration 2005).

The public policies enacted to address the problem of DWI represent a mix of strategies. At their core, these include the threat of criminal sanctions using a combination of license revocation, incarceration, probation, and fines. Another set of public policies aims to improve roadway safety by increasing the minimum drinking age, the price of alcohol and the price of other addictive substances through a combination of excise taxes, requiring licensure of sellers, and enhancement of law enforcement to reduce frequency of illegal sales (Carpenter and Dobkin 2009; Cook and Durrance 2012; Dee and Evans 2003; Jackson and Owens 2011; Kenkel 2005; Ruhm 1996). These approaches vary in detail among states.

Repeat offenders have been the focus of policy interventions for good reason. Recidivists have higher rates of alcohol abuse and dependence than do persons in the general population (Lapham, Stout, and Skipper 2011). Many individuals reoffend after arrest for DWI; estimates are as high as 20–50 percent (Fell 1995). There is also empirical evidence that individuals with prior arrests are more likely to be involved in subsequent drunk driving events (Ahlin et al. 2011; Hilton, Harris, and Rice 2007; Kingsnorth 2006; Woodall et al. 2004).

This study uses criminal court data from North Carolina to assess determinants of the probability of DWI re-arrest. We evaluate the effects of being prosecuted for and being convicted on a DWI charge on the probability of re-arrest for DWI. We find that prosecuting and convicting persons arrested for DWI reduces the probability that they will be re-arrested for DWI in the following three years.

2. Background

ROLE OF SUBJECTIVE BELIEFS

Imposition of penalties may deter crime and arrest through several channels. One channel is by affecting an individual's subjective probability of a sanction conditional on committing a crime. The effect of prior beliefs about the negative consequences of committing a crime on the decision to engage in criminal activity is often referred to as general deterrence. The effect of being arrested, convicted, and penalized for a crime on the decision to engage in criminal activity in the future is referred to as specific deterrence. Personal experiences with the law lead to modifications in prior beliefs. In particular, adverse personal experiences with an arrest, including prosecution, conviction, and penalties imposed following a conviction may increase the subjective probability of adverse consequences of engaging in illegal behavior and thereby deter future criminal acts.

Empirical studies of criminal behavior have rarely employed direct measures of subjective probabilities of experiencing adverse consequences conditional on being arrested. An exception is Lochner (2007), who used direct retrospective measures of the subjective probability of arrest from the National Longitudinal Survey of Youth 1997 (NLSY97). He found that the subjective probability of arrest was lower for youth who engaged in criminal activity. Yet subjective probabilities were only weakly related to county measures of arrest-

per-crime rates. Hjalmarsson (2009) studied whether or not youths' perceptions of the probability of jail when youths reach the age of majority (when the person is tried as an adult rather than as a juvenile) tracks the objective change in this probability. Like Lochner, she used data from NLSY97. While she found that the subjective probability of being incarcerated increased upon reaching the age of majority, the increase in the subjective probability was much lower than the corresponding actual increase. Moreover, self-reported criminal behavior did not decline discontinuously at the age of majority. Having measures of subjective probabilities is an advantage of both the Lochner and Hjalmarsson studies. However, a disadvantage is that criminal behavior is self-reported in the NLSY97. Our study uses administrative data, which have advantages of avoiding potential underreporting of criminal behavior in surveys and in recording the exact dates of arrests. Although we infer that deterrent effects operate through changes in subjective probabilities, we have no direct measures of these probabilities.

DETERRENCE VERSUS INCAPACITATION

Observing that individuals who bear adverse consequences of committing a criminal act are less likely to be re-arrested does not necessarily provide empirical support for specific deterrence. Such findings may reflect incapacitation rather than deterrence. In principle, incapacitation following a conviction for DWI can reflect a combination of driver's license revocation, a requirement that the person use an ignition interlock device to prevent the vehicle from starting when the driver has alcohol on his or her breath, monitoring drinking and driving behavior (as part of probation), or imprisonment. North Carolina mandates that a person's driver's license be revoked for a minimum of one year following a DWI conviction.⁵ However, incapacitation due to license revocation is unlikely as many repeat offenders continue to drive with a revoked license (Cavaola, Strohmets, and Abreo 2007; Taxman and Piquero 1998). While studies have shown the effectiveness of ignition interlock in preventing re-offense (Beck et al. 1999) and in reducing fatalities (Elder et al. 2011), the effect is limited to active installation in a vehicle. Based on North Carolina's statute, we expect the incapacitation effect of an interlock device to be less than a year for most persons convicted of DWI in North Carolina, in part because ignition interlock is only mandatory in DWI convictions with a blood alcohol content (BAC) of 0.15 or greater. Judging from the applicable statutes, very few persons convicted of a DWI would have been incapacitated for a year due to incarceration. The schedule for imprisonment length in North Carolina varies from a 30-day minimum (less for DWI offenses of lower severity) to a two-year maximum (for the most severe DWI offenses). In practice, maximum sentences are much lower than this and the judge can suspend incarceration terms. Incarceration lengths may be longer if the person is convicted on other charges at the same time as a DWI charge. During the first year following an arrest for DWI, any reduction in the probability of re-arrest for DWI most likely reflects a mix of specific deterrence and incapacitation. As the follow-up period is lengthened, the role of incapacitation decreases. By three years, the effect of incapacitation is likely to be minimal unless the individual is arrested on a charge other than for DWI.

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⁵N.C. Gen. Stat. §§ 20.17, 20.19.

PREVIOUS RESEARCH OF EFFECTS ON CRIMINAL SANCTIONS ON DETERRENCE OF DWI

Two recent studies have used a regression discontinuity (RD) design to measure deterrent effects of laws on the probability of re-arrest for DWI. Hansen (2015) used data on half a million DWI traffic stops from the state of Washington from 1995 to 2011. The RD estimates were based on BACs around 0.08, the minimum threshold required for a DWI conviction. Persons arrested on a charge of DWI close to but with BACs slightly below 0.08 would have escaped penalties while those arrested on this charge with a BAC at 0.08 or slightly above would have been subject to penalties. He found that the latter group of persons had a reduction in the probability of re-arrest by up to two percentage points. Persons arrested with BACs over 0.15, the minimum threshold for an “aggravated” DWI in Washington, which carried higher penalties, were even less likely to be re-arrested for DWI during follow-up. Although he had no direct measure of subjective beliefs about the consequences of DWI, Hansen interpreted his results as empirical evidence for reliance on past information when deciding whether to drink and drive.

De Figueiredo (2011) used micro-data on DWI arrests from two jurisdictions in Arkansas with an RD methodology to determine whether sentencing enhancements—a two-month increase in license suspension at a BAC of 0.15 or over—reduced the probability of re-arrest for DWI relative to a BAC slightly below 0.15. He found that the sentence enhancement had no effect on recidivism. His sample (N=15,973) was much smaller than ours.⁶

Several non-economic studies have studied deterrent effects of traditional penalties on DWI recidivism. Wagenaar et al. (1995) performed a meta-analysis of drinking and driving control efforts including mandatory jail sentences, community service, license suspension, and fines. Although the findings were uniformly consistent with deterrence, the authors cautioned that the studies were often, if not typically, weak methodologically in that they lacked a control group and did not report standard errors.

Other studies have focused on determinants of recidivism, especially characteristics of re-offenders. In a comparison of 48 one-time DWI offenders with 29 repeat offenders, Cavaiola, Strohmetz, and Abreo (2007) reported that repeat offenders were more likely to have had a revoked driving license before the initial DWI offense, to have been cited for reckless/careless driving, and to have at least one accident after the initial DWI offense. In a study with a much larger sample, Taxman and Piquero (1998) found similar results. Ahlin et al. (2011) concluded that drivers with a prior DWI were at relatively high risk of incurring a repeat offense irrespective of how they were sanctioned for their first-time offenses. Constant et al. (2010) reported that a crackdown on drinking and driving in France failed to deter DWI, but the study was not specific on what the “crackdown” entailed or to what extent it reflected higher probability of arrest, higher prosecution and conviction rates, and/or higher penalties conditional on a conviction.

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⁶If his sample had been as large as ours, his results may have shown deterrent effects statistically significant at conventional levels.

CONTRIBUTION OF OUR STUDY

Our study improves on past research in several respects. First, in contrast to several previous studies, we account for possible endogeneity of legal outcomes of a DWI arrest. Parties involved in the process of adjudicating a DWI arrest are likely to have information on the offender and the circumstances involving the offense that researchers cannot observe. To deal with endogeneity of case outcomes, we use an instrumental variables (IV) strategy based on individual prosecutors' and judges' decisions in cases involving a DWI arrest. Our sample represents 2,851 prosecutors and 648 judges who heard cases over a span of 15 years. An IV strategy is an alternative to an RD design, which was employed in two previous studies of DWI deterrence. Second, previous studies of deterrence have focused on arrest rates as a deterrent. Other legal consequences, such as prosecution, conviction, and penalties conditional on conviction are equally plausible deterrents, especially for persons with a prior arrest history. Our study analyzes effects of prosecution and conviction on the probability of re-arrest for DWI. Third, while most studies have been based on small samples, often from a single geographic area smaller than a state, our sample consists of about 359,834 DWI arrests in a state that had a population of almost 10 million in 2014.

3. Empirical Strategy for Evaluating Deterrent Effects of Prosecution and Conviction

The focus of our study is on deterrent effects of being prosecuted and convicted following an arrest for DWI. The major econometric problem in estimating deterrent effects with micro data is that the prosecutorial and judicial outcome of the arrest may be correlated with unobserved personal characteristics such as the propensity to commit crimes in the future. To the extent this is so, we may observe that individuals who have adverse experiences with criminal law enforcement are more, not less likely, to engage in repeat offenses. To deal with this issue, we specify a two-equation model. The second-stage equation is for the probability of re-arrest for a DWI. First-stage equations are alternatively (1) for the probability that the arrest resulted in a prosecution for DWI and (2) for the probability of conviction given that the arrest was prosecuted.

The second-stage equation is

$$r = \theta_0 + \theta_1 q_j + \theta_2 X + \varepsilon, \quad (1)$$

where r is the probability of a re-arrest during the follow-up period, q_j is the subjective probability of being prosecuted ($j=1$) or convicted ($j=2$), and X represents individual characteristics of the arrested person and the case. All sample persons are arrested for an initial DWI offense, and arrests during follow-up are DWI re-arrests.

The subjective belief about incurring a penalty for DWI is a function, $q_j = f(s_j)$, of whether or not the person arrested for DWI was prosecuted-- $s_1 = 1$ if prosecuted; $=0$ if not or convicted-- $s_2 = 1$ if convicted; $=0$, if not.

The first-stage equation is

$$s_j = \phi_0 + \phi_1 IV + \phi_2 X + v_j. \quad (2)$$

An instrumental variable (IV) is included in (2) but excluded from (1).

4. Methods

DATA

North Carolina's Administrative Office of the Courts (AOC) maintains a database called the Automated Criminal Infractions System (ACIS), which contains information on criminal arrests and case disposition at the level of individual criminal charges. ACIS includes extensive information on each criminal charge, such as the date of the charge and its North Carolina General Statute Code and offense description. The data used in our study span 1998 through 2012 and cover all arrests involving a charge of DWI that are tried in courts of general jurisdiction and arrests on concurrent charges made on the same day as the DWI arrest.

These data have several advantages. First, they allow analysis at the level of the individual offender as opposed to an aggregate at the county or state level (as in many previous studies of criminal behavior).⁷ Although the data do not contain a unique identifier for arrestees, they do contain personal identifying information that we use to generate unique identifiers with reasonable accuracy. To create a person-specific identifier, we use information on the arrestee's first and last names, birth date, and gender. Second, ACIS data provide a substantial amount of information on the arrest disposition process, including type of legal representation the defendant had, method of disposition of the charge (including the verdict), and penalties imposed.

We do not analyze the probability of being arrested given that the person drove while intoxicated since we lack data on individuals' driving behavior. The data begin at the time of the arrest. The observational unit in all of our analyses is the index arrest. We define an index arrest as the *first* arrest for DWI made during January 1, 2001 through December 31, 2009. Data from 1998–2000 are used exclusively to record information from a look-back period. Data from 2010–2012 are used exclusively to provide a minimum of a three-year follow-up period.

To account for the severity of the index DWI arrest and explain the resolution of the case, we include covariates for other non-DWI arrests made on the same date as the index arrest categorized as: felony; misdemeanor; traffic-related; or infraction. These other arrests are linked to the index arrest data using our arrestee identifier and arrest date. We exclude persons under age 21 at the index arrest date because laws pertaining to DWI committed by minors differ from those for adults.

⁷See, e.g., Durlauf and Nagin (2011) for a literature review.

From 2001 through 2009, there were 625,972 arrests for DWI in North Carolina. Arrests are dropped if there is insufficient information in ACIS to create an identifier, the arrestee was under age 21 on the index arrest date, there is missing information on the disposition of the arrest (prosecution/conviction), there is missing data on other key variables, or if the DWI arrest is not the first arrest (i.e., an index arrest) of the individual during 2001–2009. Our analysis sample consists of 359,834 index arrests. Our analysis of probability of being convicted conditional on being prosecuted is based on a sample of 253,469.

EMPIRICAL SPECIFICATION

OVERVIEW—We conduct two separate analyses: (1) effects of being prosecuted for the index DWI arrest on the probability of being re-arrested for DWI; and (2) effects of being convicted for DWI, limited to persons whose index DWI arrest was prosecuted.

DEPENDENT VARIABLE—The dependent variable is the probability of re-arrest for DWI during follow-up. We allow the follow-up period to vary from a minimum of one year to a maximum of seven years after the date of the index arrest.

EXPLANATORY VARIABLES—Explanatory variables fall into the following categories: subjective beliefs; felony index arrest; DWI convictions in the look-back period prior to the index arrest; arrests on non-DWI-related charges on the same day as the index DWI arrest (concurrent charges); demographic characteristics of the arrestee; and characteristics of the case--type of legal representation employed by the defendant pursuant to the index arrest.

Subjective beliefs reflect prosecution and conviction outcomes of the index arrest. We include a covariate for whether the charge for the index arrest was a felony (=1) or a misdemeanor (=0). We include an explanatory variable for the number of DWI convictions in the three years prior to the index DWI arrest. We include binary variables for the presence of concurrent arrests on charges other than DWI.⁸ The binary variables are for (1) felony, (2) misdemeanor, and (3) traffic offenses. Infractions and no concurrent charges are the omitted reference group.

For type of legal representation, ACIS reports the type of defense attorney: court appointed; public defender; privately retained; and waived (defendant represents self). We define binary variables for each category with privately retained attorney as the omitted reference group.⁹

INSTRUMENTAL VARIABLES—To deal with endogeneity, we use instrumental variables.¹⁰ Underlying our IVs is the assumption that at the margin, the threshold of evidence on defendant guilt leading to a specific penalty is likely to vary among prosecutors or judges although the statute specifies a blood alcohol content level that constitutes DWI.¹¹

⁸An infraction (e.g., expired tags, no vehicle inspection) is a noncriminal violation of law not punishable by imprisonment.

⁹In North Carolina, defendants eligible for a publically subsidized attorney do not have a choice of attorney. Private attorneys may exert greater effort in representing the defendant's interests. Hence, we expect that clients of private attorneys are less likely to incur penalties than others.

¹⁰See the Appendix for results of Durbin-Hausman-Wu tests.

¹¹Other indicators of driving while intoxicated are more subjective, although there may be argument about the accuracy of equipment used in testing. The other indicators include signs of excess drinking implied by the vehicle operator's driving patterns prior to being stopped, open containers in the vehicle, and drivers' responses to officers' queries.

This introduces variation in the probability that an individual arrest at a fixed level of evidence of guilt will yield specific arrest outcomes. Our approach has been used in previous studies (see e.g., Abrams, Bertrand, and Mullainathan 2012; Abrams and Yoon 2007; Chang et al. 2008; Doyle 2007, 2008; Green and Winik 2010).

Our IVs are designed to reflect the relative stringency of prosecutors and judges. Although prosecutorial districts have policies regarding prosecution of specific offenses, in the end, the decision of whether or not to prosecute a given arrest for DWI is the prosecutor's decision. Similarly, within a certain range of strength of evidence on liability, judges decide on conviction differently. When a person decides whether to become intoxicated, drive under the influence, or seek another mode of transportation, s/he has no idea who the specific prosecutor or judge will be.¹²

It is likely that DWI cases are randomly assigned to individual prosecutors and judges. Case assignment is not done at the individual defendant level; rather, crimes may be assigned to prosecutors based on the type of crime, e.g., felony or misdemeanor. Furthermore, the volume of cases for a prosecutor is high; so the additional cost of implementing a system to triage DWI cases based on detailed examinations of individual offenses would be substantial. Case assignment to judges is likely to be random for similar reasons. When a case is assigned to a judge, the prosecutor is responsible for introducing details of a defendant's prior record into evidence during trial and sentencing. While knowledge of the charge is available prior to judicial assignment (e.g., DWI first offense, DWI second offense), which gives some indication as to a defendant's prior record, assignment to an individual judge is likely to be random as cases are scheduled according to available dates on a court docket. The vast majority of DWI cases are heard by judges with a small minority receiving trial by jury.

ACIS includes information on both the prosecuting attorney and the defense attorney for the case. To obtain information for the IV for index arrests, we use prosecutor names, initials and judicial district from this file. Names of individual prosecutors may be spelled in different ways. Unique prosecutor identifiers are constructed by matching names with small differences in alphabetic characters and small spelling distances within the same judicial district. In some cases, the full name of the attorney is absent, but initials are present in the data. If there is only one attorney listed in a county with those initials, we match on initials.

We compute the mean fraction of DWI arrests leading to prosecution by prosecutor using data from up to 15 years. We require that each prosecutor-specific mean value be based on a minimum of eight arrests per prosecutor. The 2,851 prosecutors in our sample processed a mean of 125 arrests for DWI.

ACIS data also include the initials of each judge assigned to a particular case, which we use to construct an IV measuring the share of prosecuted cases heard by each judge that result in a conviction. There are 648 judges in our sample. Our approach is similar to that for prosecutors. On average, there are 788 prosecuted cases per judge

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¹²In North Carolina, the vast majority of DWI cases are heard in district courts. There are 44 prosecutorial districts and judicial districts in the state. Thus, for any arrest, there are several prosecutors and judges who could be involved in the case.

ESTIMATION

We use two-stage least squares (TSLS) where the first-stage outcome is whether the arrest was prosecuted and, alternatively, whether the arrest was convicted conditional on prosecution. The second-stage dependent variable is a binary variable for whether the person was rearrested for DWI during follow-up. A Durbin-Hausman-Wu test rejects the null hypothesis that the binary variables for whether the arrestee was prosecuted or convicted are exogenous (Appendix). We estimate separate two-equation models for each of the follow-up lengths.

As an alternative to TSLS, we conduct survival analysis (Appendix). Standard software packages for survival analysis do not allow for endogenous covariates. We adopt an approach which allows for inclusion of IVs within the framework of the Cox proportional hazard model (MacKenzie et al. 2014). Although this approach is limited by the theoretical requirement that the effect of unobservables should be centered and additive on the scale of the hazard ratio, it has been shown to be robust and less biased than the standard Cox model (when unobservable confounders exist) even when this assumption is violated (MacKenzie et al. 2014).

5. Results

DESCRIPTIVE STATISTICS

Of persons arrested for DWI, 80.9 percent were prosecuted, and among those prosecuted, 91.5 percent were convicted (Table 1). Thus, the probability of conviction conditional on arrest was 0.740.

Among persons with index arrests during 2001–2009, the mean probability of being re-arrested for DWI within three years of the index arrest was 0.166. Among those with index arrests leading to prosecution, the mean probability of re-arrest for DWI within the same time period was 0.163. For those whose index arrest was not prosecuted, the probability of re-arrest during a three-year follow-up was higher, 0.176, than for those who were prosecuted ($p < 0.001$). Likewise, the re-arrest rate was higher for persons who were prosecuted but not convicted, 0.169, than for those who were convicted.

About four percent of persons with DWI index arrests had prior convictions for DWI during the three years prior to the index arrest. The mean probability of prior convictions was about the same for persons arrested but not prosecuted as for those who were prosecuted and between those convicted of DWI and those not convicted, conditional on having been prosecuted for DWI. The modal arrestee was aged 25–34, white, and male. The most frequent concurrent charge was for a traffic offense in addition to the DWI.

Compared to the demographic composition of North Carolina's population, females and persons over age 55 were substantially underrepresented among persons with index DWI arrests. Blacks were proportionally represented (blacks in North Carolina in 2006: 21.7%) and Hispanics were considerably overrepresented (Hispanics in state in 2006: 6.7%).¹³

¹³Data on race/ethnicity come from the *U.S. Statistical Abstract 2008*, Table 18, p. 23 (Census Bureau 2008).

However, Hispanics were less likely to be prosecuted than were whites following arrest for DWI ($p < 0.01$).

FIRST-STAGE RESULTS

The dependent variables in the first stage are alternatively whether the index DWI arrest was prosecuted and if so, whether the prosecution resulted in a conviction (Table 2). Even with the other covariates included, the instrumental variables are positively related to the prosecutor's prosecution and the judge's conviction rates. The t -values of 31.0 and 61.7 respectively indicate that these are strong IVs—the large values reflecting the large sample sizes in part. The partial correlations with the dependent variable are 0.30 for the prosecution analysis and 0.24 for the conviction analysis. Arrestees with concurrent non-DWI charges were less likely to be prosecuted on the DWI charge, the omitted reference group being infraction-no concurrent charge. The probability of being prosecuted rose monotonically with arrestee age until age 64. By contrast, conditional on being prosecuted, conviction rates fell with age. Hispanics, who had much higher DWI arrest rates than other race/ethnic groups, were less likely to be prosecuted, but given prosecution, faced higher probabilities of being convicted on a DWI charge.

SECOND-STAGE RESULTS

Persons who are prosecuted following the index DWI arrest were less likely to be re-arrested for DWI during the next three years (Table 3). The probability of re-arrest was reduced from 0.011 if the person was prosecuted, and by an additional 0.04 if the person was convicted following prosecution. In percentage terms, the 0.011 reduction amounts to a 6.6 percent reduction in the probability of re-arrest relative to the observational mean. The 0.04 reduction translates into a 24.5 percent reduction in re-arrest for DWI among arrestees who were prosecuted.

With follow-up periods of lengths varying from one to seven years (Table 4), using TSLS, being prosecuted for the index arrest reduces the probability of re-arrest for DWI by 0.017, 0.016, and 0.011 with one-, two-, and three-year follow-up periods, respectively. Results with longer follow-up periods are no longer statistically significant at conventional levels, and for follow-up periods of five years and more, the coefficient switches from negative to positive.

In the conviction analysis, being convicted conditional on being prosecuted for the index arrest reduces the probability of re-arrest during the follow-up by 0.027 for one year, 0.038 for two years, and 0.040 with a three-year follow-up (the result also reported in Table 3). However, for longer follow-up periods, the coefficient on being convicted loses statistical significance and switches sign with a follow-up period of five years or longer.

With OLS, all coefficients on the binary for being prosecuted are negative and statistically significant at better than the 0.01 level except for the six- and seven-year follow-up periods. Even when significance is lost, the effect remains negative. The implied marginal effects are smaller in absolute value than their TSLS counterparts with one- and two-year follow-up periods, and the same with three-year follow-up periods and, in contrast to the TSLS results, uniformly negative for longer follow-up periods than this.

However, the deterrent effect becomes very small as the follow-up period lengthens. For example, with a six-year follow-up period, the coefficient on being prosecuted implies a 0.003 reduction in the probability of being re-arrested for DWI in six years. By that year, a quarter of persons with index arrests were re-arrested for DWI. The implied percentage reduction in the re-arrest probability is 1.7 percent.

For convictions, except for the one-year follow-up period, the coefficients are negative and statistically significant at conventional levels; the OLS results imply that convicting DWI arrestees is an effective deterrent of re-arrest for DWI. The OLS coefficients for the two- and three-year follow-up are substantially smaller than their TSLS counterparts. The difference is that with follow-up periods of three years or more, the OLS coefficients remain negative although smaller in absolute value than the coefficients for the shorter follow-up periods.¹⁴

6. Robustness Checks

RANDOMNESS OF CASE ASSIGNMENT

Our instruments are only valid to the extent that assignment of arrestees to prosecutors and judges is random and not based on the severity of the offense or the complexity of the case. Institutionally, randomness seems likely. DWI arrests are numerous, and there exist biochemical tests on which to gauge guilt. Given the large number, triaging DWI cases among prosecutors and judges would be quite burdensome. The latter factor reduces the comparative advantage of prosecutors and judges specializing in this case type. To determine whether case assignment is truly random, we determine whether prosecutors and judges differ in the propensity of the arrestees they handle to be re-arrested for DWI.

We estimate an equation for which the dependent variable is a binary for DWI re-arrest within the first three years following the index DWI arrest, separately with samples of DWI arrests and for prosecuted DWI arrests. The explanatory variables are covariates in X , but without the IV (see eq. 1). Using the parameter estimates from these regressions and the values of X for each prosecutor's and judge's DWI arrests, we compute mean predicted probabilities of re-arrest for arrestees associated with each prosecutor and judge in our sample.

Next, we rank-order prosecutors and judges from the lowest to the highest mean prosecution and conviction rates and divide the resulting lists into quartiles. Prosecutors in the lowest quartile of prosecution rates (Q1, Table 5, Panel A) had a mean prosecution rate of 0.47. By contrast, the mean rates for Q2–Q4 were 0.73, 0.82, and 0.93, respectively. Differences between the mean probability of prosecution for Q1 prosecutors and those for prosecutors in the other quartiles are statistically significant at better than the 0.01 level. By contrast, there is very little variation in mean predicted probabilities of re-arrest by quartile; all means are either 0.17 or 0.18. Thus, the reason that Q1 prosecutors have much lower prosecution rates is not because they have caseloads of arrestees who are much less likely to be re-arrested, at

¹⁴With longer-follow-up periods, we find more evidence for a deterrent effect with OLS than with TSLS, even though for prosecution these implied deterrent effects from OLS are small. The large deterrent effect with a three-year follow-up from being convicted is from TSLS. The implied effect with the same follow-up period from OLS is substantially smaller.

least based on observables, such as whether the charge is a felony versus a misdemeanor, concurrent charges, history of DWI convictions, and type of legal representation.

For judges, the differences in mean conviction probabilities by quartile is much lower than for prosecutors, although differences between the mean conviction probability for Q1 judges and judges in other quartiles are statistically significant at better than the 0.01 level (Panel B). We expect there to be less extreme differences in conviction rates because DWI cases have relatively well-defined evidentiary standards and often hinge on biochemical evidence such as BAC tests – so when these standards are met, conviction is highly probable. Q1 judges are outliers, but not to the same extent as Q1 prosecutors. As with prosecutors, there are no meaningful differences by conviction rate quartile in mean predicted probabilities of re-arrest for DWI.

IS THE PROBABILITY OF CONVICTION RELATED TO PENALTIES ON CONVICTION?

Although we find a deterrent effect of prosecution and conviction, the results for conviction in particular may reflect the effect of penalty severity rather than conviction per se. This concern is especially valid if a judges' penalty severity is systematically related to his or her propensity to convict. For DWI, the probability of receiving some amount of jail or prison time conditional on conviction is nearly 1.0.

The probability of a jail or prison sentence being imposed upon conviction is 0.98 for judges in Q1 and 0.97 for judges in the other quartiles. Conditional on some incarceration, the mean durations of minimum sentences are 212, 190, 198, and 227 days for judges in Q1 through Q4, respectively. The most lenient judges on duration of minimum sentences are the judges in conviction rate quartiles Q2 and Q3. The difference in mean incarceration length between the least stringent and the most stringent quartiles is only 15 days. That extending incarceration length from roughly seven months for Q1 judges to 7.5 months for Q4 judges would materially affect the statewide probability of re-arrest for DWI seems doubtful. Furthermore, these incarceration lengths reflect the sentences assigned by judges at verdict, not time actually served.

In North Carolina, as in most other states, persons convicted of a misdemeanor or some minor felonies are subject to unsupervised probation. At sentencing, a person convicted of DWI typically receives both a jail term (or in rare cases, state prison) and a term of unsupervised probation. Convicted individuals may choose to fulfill their sentence in one of these two ways; if they choose to serve it in jail, they may be given credit for time served prior to conviction. If the person has no criminal conviction within a specific time period following sentencing, s/he will no longer be subject to incarceration on the charge for which s/he was convicted.

More severe criminal offenses or cases with aggravating factors may receive a term of supervised probation instead of unsupervised. Under supervised probation, the individual must report to a probation officer regularly. Convicted individuals face restrictions on travel and must submit to periodic searches. S/he may be required to be in school or employed or looking for a job in order to be eligible for probation (instead of incarceration). There may be other court-ordered requirements such as paying restitution or supervised probation fees,

performing community service, or participating in treatment programs, especially for substance abuse. Violation of these provisions may lead to revocation of probation and subsequent incarceration.

Unsupervised probation is more common for arrests for DWI (Table 5, Panel B), but supervised probation is also common. There is only one statistically significant difference between probation probabilities for the Q2 through Q4 judges and the reference group: the difference in unsupervised probation probabilities between Q3 and Q1. Likewise, the mean duration of unsupervised probation is significantly higher for Q3 than for Q1. We would attach more importance to these differences among quartiles if they were monotonically increasing and more differences were statistically significant.

In sum, some form of probation and incarceration is bundled with conviction for DWI. More lenient judges, measured in terms of the fractions of DWI arrests they decide are guilty, do not tend to more lenient in terms of the incarceration and probation penalties they impose conditional on a finding of guilt.

7. Discussion and Conclusions

Our results show that decisions about whether or not to prosecute and convict DWI cases have important effects on the probability of DWI re-arrest. The differences in prosecution rates among prosecutors of seemingly similar costs are striking. Fewer than one percent of DWI episodes result in an arrest for DWI (Beitel, Sharp, and Glauz 2000). Nevertheless, it is plausible that the reduction in re-arrests for DWI following prosecution or conviction reflects a reduction in DWI episodes.

To demonstrate the importance of increasing prosecution and conviction rates in reducing drinking and driving, we perform the following calculations. Consider the consequences of raising the mean DWI prosecution rate of prosecutors in the lowest quartile (Q1) to the mean prosecution rate of prosecutors in Q2. This change would reduce the three-year DWI re-arrest probability by 0.003. If the prosecution rate of the Q1 were increased to the mean rate of prosecutors in the Q4 group, the decrease would be 0.005. These changes are relative to an observational mean before the changes of 0.18 for Q1 prosecutors. If the mean prosecution rate of Q1–Q3 prosecutors rose to the mean of the Q4 group, the decrease in the three-year DWI re-arrest rate would be much larger, 0.008. A 100 percent prosecution rate is unlikely since some cases lack adequate evidence for prosecution.

If judges in the Q1 category were to increase their DWI conviction rates to the rates of Q2 judges, the DWI re-arrest probability would decrease by 0.004. If the Q1 conviction rate were raised to Q4's, the decrease would be 0.007. If Q1–Q3 judges raised their conviction rates to Q4's, the decrease would be 0.010.

Even higher decreases in DWI re-arrest rates can be anticipated if prosecutors and judges simultaneously increase their rates. The assumption underlying these projections is that additional prosecutions would look similar in terms of underlying guilt to those arrests already prosecuted and the truly weak cases are in the seven percent of cases that prosecutors in the Q4 group did not prosecute. Our calculations reveal that increasing rates

of prosecution and conviction for DWI would reduce re-arrests for DWI and by implication drinking and driving more generally. But this solution is not a panacea, especially considering that the effects diminish after three to four years following the date of DWI arrest. In the very short run, i.e. less than a year, the reduction in the probability of re-arrest for DWI is at least partly due to incapacitation (the inability to drink and drive while under court sanctions such as a revoked driver's license or jail sentence) rather than altered incentives.

Fines and court costs are usually also imposed on persons convicted of DWI. However, while fine and court cost amounts are available in the hard copies of case files available at courthouses, these data are not recorded in ACIS or other machine-readable sources. We do not observe payments by defendants for court-assigned attorneys or public defenders, since these are usually processed as part of court costs.

Our estimates of the deterrent effects are lower than those reported for arrests by Hansen (2015). However, Hansen's follow-up period is shorter than ours, and he bases empirical analysis exclusively on results of BAC tests. By contrast, our analysis includes index arrests for which BAC information is not available. Conviction is more difficult without a BAC, but a substantial number of cases for which BAC test results are unavailable are still processed in the court system.

Having a large administrative database with linkable arrests and information on arrest outcomes and being able to compute prosecution rates for individual prosecutors and conviction rates and incarceration and probation penalties for individual judges over a 15-year time period are major strengths of our study. However, information on some specific policies is unavailable from the data in electronic form, e.g., referrals to substance abuse treatment, requirements that emission interlock devices be installed in the convicted person's motor vehicles. In an ideal world, we would know about the person's drinking and driving behaviors prior to and after arrest/conviction.

Extensions of this research might examine the impacts of specific penalties and penalty mixes on recidivism as well as on the probabilities of other decisions, such as those affecting employment and voluntary treatment seeking. To fully realize the potential of administrative data on criminal arrests, it will be useful to link the data with other administrative databases such as on employment (e.g., Social Security data), marital status, and data on restraining orders and on child maltreatment.

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Appendix 1

RESULTS OF DURBIN-HAUSMAN-WU TESTS

The conceptual case for endogeneity is strong, especially since there is much information about the arrestee potentially observed by the parties, e.g., defendant's employment record, marital status, skill of the attorney, not observed by the researcher that is likely to be systematically related to case outcomes. We perform a Durbin-Hausman-Wu test separately for each of the follow-up periods from one to seven years. The results do not include the covariate for the residual from the first stage because it is so highly correlated with the binary variable for being prosecuted, and alternatively, for being convicted. Thus, we rank order the residuals from most negative to most positive and divide the residuals into quartiles, with the most negative residual being the first quartile. The second through fourth quartiles are then included as covariates in regressions with a binary variable for DWI re-arrest as the dependent variable. With this specification, the coefficients on the binary variable for being prosecuted, and alternatively, convicted, are uniformly negative and

statistically significant. The coefficients on the binary variables for second, third, and fourth quartiles of residuals are always positive and statistically significant. With this specification, the null hypothesis of exogeneity of the binary variables for prosecution and conviction is rejected. These results add further support for the use of an IV strategy to measure the deterrent effects of prosecution and conviction.

SURVIVAL ANALYSIS OF TIME TO DWI RE-ARREST

As an alternative to the two-stage least squares (TSLS) and ordinary least squares approach used in the text, we estimate Cox proportional hazard models with various alternative maximum follow-up periods (after which the data are right-censored), assuming first that being prosecuted and convicted are endogenous—the hazard model counterpart to TSLS, and second that being prosecuted and convicted is exogenous—the hazard model counterpart to OLS. The equation specifications are the same as for eq. (2) in the text. Only results for being prosecuted and being convicted are shown in Table A1.

As for the TSLS results in Table 4, the hazard ratios show reductions in the probability of re-arrest with follow-up periods up to four years (the four-year follow-up result not statistically significant at conventional levels). For longer follow-up periods, the hazard ratios exceed 1.0, implying that being prosecuted or convicted increases the probability of DWI re-arrest—a finding that is similar to the TSLS results in the text. When we assume that being prosecuted or convicted is exogenous, we obtain the same pattern from the Cox proportional hazard model that we obtain from OLS applied to the second-stage equation in the text except the effect of being convicted does not diminish as the follow-up period is increased in length. Yet conviction rates for DWI are high. Most of the variation in the deterrent comes from differences in the propensity to prosecute. Thus, the conclusion that the deterrent effect decreases over time remains in tact.

Table A1

Survival Analysis with Varying Follow-up Periods

Panel A: Effect of Being Prosecuted on DWI Re-Arrest				
Duration of Follow-Up Period (years)	Prosecuted			
	Endogeneous		Exogeneous	
	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio
1	−0.199 ** (0.045)	0.820 **	−0.108 ** (0.014)	0.897 **
2	−0.139 ** (0.037)	0.870 **	−0.092 ** (0.011)	0.912 **
3	−0.085 * (0.033)	0.919 *	−0.076 ** (0.010)	0.927 **
4	−0.059 (0.032)	0.942	−0.054 ** (0.010)	0.948 **
5	0.000 (0.033)	1.000	−0.038 ** (0.010)	0.963 **
6	0.012 (0.033)	1.012	−0.022 * (0.010)	0.978 *
7	0.039 (0.035)	1.039	−0.013 (0.010)	0.987

Panel B: Effect of Being Convicted on DWI Re-Arrest				
Duration of Follow-Up Period (years)	Convicted			
	Endogeneous		Exogeneous	
	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio
1	-0.304 ** (0.099)	0.738 **	0.054 * (0.026)	1.056 *
2	-0.291 ** (0.079)	0.748 **	-0.059 ** (0.020)	0.943 **
3	-0.253 ** (0.071)	0.777 **	-0.079 ** (0.018)	0.924 **
4	-0.077 (0.074)	0.926	-0.077 ** (0.017)	0.926 **
5	0.019 (0.076)	1.019	-0.066 ** (0.017)	0.936 **
6	0.121 (0.079)	1.128	-0.066 ** (0.017)	0.936 **
7	0.134 (0.080)	1.144	-0.055 ** (0.017)	0.946 **

Standard error in parentheses.

*
p<0.05,

**
p<0.01

In the prosecution analysis, index DWI arrest prosecuted is the variable for which coefficients and hazard ratios are reported. In the conviction analysis, this is index DWI arrest convicted.

Table 1

Descriptive Statistics

	Prosecution Analysis			Conviction Analysis		
	Arrested, Not Prosecuted	Prosecuted	t-value	Prosecuted, Not Convicted	Convicted	t-value
Any DWI re-arrest (3 years)	0.176 (0.381)	0.163 (0.370)	8.37**	0.169 (0.374)	0.161 (0.368)	2.84**
DA prosecution rate	0.650 (0.187)	0.757 (0.112)	-194.48**	--	--	--
Judge conviction rate	--	--	--	0.860 (0.104)	0.920 (0.062)	-128.31**
Index DWI Arrest						
Prosecuted	--	1.000 (0.000)	--	1.000 (0.000)	1.000 (0.000)	
Convicted	--	0.919 (0.273)	--	--	1.000 (0.000)	
Felony	0.001 (0.025)	0.002 (0.039)	-5.94**	0.000 (0.010)	0.001 (0.031)	-4.12**
Criminal History						
Prior DWI Conviction	0.042 (0.201)	0.041 (0.198)	1.30	0.038 (0.191)	0.040 (0.197)	-1.77
Concurrent Charges						
Felony	0.002 (0.046)	0.002 (0.042)	2.19*	0.001 (0.025)	0.001 (0.035)	-2.26*
Misdemeanor	0.040 (0.196)	0.039 (0.194)	1.03	0.024 (0.154)	0.040 (0.196)	-11.58**
Traffic	0.285 (0.451)	0.199 (0.400)	49.19**	0.140 (0.347)	0.204 (0.403)	-22.39**
Infraction	0.101 (0.302)	0.102 (0.302)	-0.29	0.122 (0.327)	0.101 (0.302)	9.36**
Defense Attorney						
Court-appointed	0.137 (0.344)	0.131 (0.337)	4.14**	0.078 (0.268)	0.130 (0.337)	-22.09**
Public defender	0.086 (0.280)	0.076 (0.265)	8.53**	0.045 (0.207)	0.077 (0.267)	-17.53**
Attorney waived	0.210 (0.407)	0.189 (0.392)	12.50**	0.110 (0.312)	0.194 (0.395)	-30.37**
Private attorney	0.567 (0.495)	0.604 (0.489)	-17.59**	0.768 (0.422)	0.599 (0.490)	48.95**
Demographic Attributes						
Female	0.186 (0.389)	0.192 (0.394)	-4.09**	0.217 (0.412)	0.190 (0.392)	9.56**
Age						
21 – 24	0.233 (0.423)	0.220 (0.414)	7.73**	0.215 (0.411)	0.221 (0.415)	-1.86
25 – 34	0.347 (0.476)	0.330 (0.470)	8.54**	0.306 (0.461)	0.331 (0.471)	-7.45**

	Prosecution Analysis				Conviction Analysis			
	Arrested, Not Prosecuted	Prosecuted	t-value		Prosecuted, Not Convicted	Convicted	t-value	
35 – 44	0.240 (0.427)	0.247 (0.432)	-4.15**		0.251 (0.434)	0.247 (0.431)	1.19	
45 – 54	0.130 (0.336)	0.144 (0.352)	-9.74**		0.154 (0.361)	0.143 (0.350)	4.47**	
55 – 64	0.039 (0.193)	0.047 (0.211)	-8.75**		0.058 (0.234)	0.046 (0.210)	8.01**	
65 and over	0.011 (0.106)	0.012 (0.110)	-2.13*		0.016 (0.124)	0.012 (0.110)	4.43**	
Race/Ethnicity								
White	0.533 (0.499)	0.607 (0.488)	-35.51**		0.690 (0.462)	0.602 (0.490)	25.56**	
Black	0.225 (0.418)	0.213 (0.409)	7.16**		0.202 (0.402)	0.212 (0.408)	-3.19**	
Hispanic	0.215 (0.411)	0.155 (0.362)	37.84**		0.068 (0.252)	0.162 (0.369)	-36.79**	
Other	0.025 (0.156)	0.023 (0.150)	3.01**		0.038 (0.191)	0.023 (0.149)	14.01**	
N	68,877	290,957			21,542	231,927	-	

Means with the standard deviation in parentheses.

* p<0.05,

** p<0.01

The sum of the number of observations in the sample with judge IV (columns 3 and 4) is not equal to the number of all persons prosecuted in the prosecution analysis (column 2). This is because observations with a missing judge identifier are included in column 2 but excluded from the conviction analysis sample.

Table 2**Determinants of Prosecution and Conviction: First Stage**

	<u>Index DWI Arrest Prosecuted</u>	<u>Index DWI Arrest Convicted</u>
	<u>(1)</u>	<u>(2)</u>
DA prosecution rate	0.867 ** (0.028)	--
Judge conviction rate	--	0.987 ** (0.016)
Index DWI felony	0.103 ** (0.016)	0.061 ** (0.011)
Criminal History		
Prior DWI Conviction	0.013 ** (0.004)	-0.005 (0.003)
Concurrent Charges		
Felony	-0.020 (0.020)	0.015 (0.014)
Misdemeanor	-0.014 ** (0.005)	0.018 ** (0.003)
Traffic	-0.050 ** (0.006)	0.024 ** (0.002)
Defense Attorney		
Court-appointed	-0.005 (0.004)	0.031 ** (0.002)
Public defender	-0.004 (0.007)	0.045 ** (0.004)
Attorney waived	0.002 (0.011)	0.035 ** (0.003)
Demographic Attributes		
Female	-0.015 ** (0.002)	-0.003 (0.002)
Age		
25 – 34	0.007 ** (0.002)	-0.003 (0.002)
35 – 44	0.013 ** (0.002)	-0.006 ** (0.002)
45 – 54	0.015 ** (0.003)	-0.007 ** (0.002)
55 – 64	0.022 ** (0.003)	-0.014 ** (0.003)
65 and over	0.006 (0.006)	-0.014 * (0.006)
Race/Ethnicity		
Black	-0.001 (0.003)	0.016 ** (0.002)
Hispanic	-0.031 ** (0.005)	0.047 ** (0.002)
Other	-0.016 * (0.007)	0.004 (0.008)
Constant	0.181 ** (0.024)	-0.013 (0.015)
Observations	359,834	253,469
R-squared	0.100	0.073

Robust standard errors in parentheses.

*
p<0.05,

**
p<0.01

In the prosecution analysis, the partial r between the DA's prosecution rate and the dependent variable is 0.30. In the conviction analysis, the partial r is 0.24.

Table 3

Determinants of DWI Re-Arrest: Second Stage

	DWI Re-Arrest Within 3 Years	
	Prosecution Analysis	Conviction Analysis
	(1)	(2)
Index DWI prosecuted	-0.011 * (0.005)	--
Index DWI convicted	--	-0.040 ** (0.011)
Index DWI felony	0.006 (0.017)	0.002 (0.024)
Criminal History		
Prior DWI Conviction	0.076 ** (0.003)	0.061 ** (0.004)
Concurrent Charges		
Felony	-0.046 ** (0.014)	-0.028 (0.022)
Misdemeanor	0.029 ** (0.003)	0.028 ** (0.004)
Traffic	0.035 ** (0.002)	0.044 ** (0.002)
Defense Attorney		
Court-appointed	0.033 ** (0.002)	0.038 ** (0.002)
Public defender	0.015 ** (0.002)	0.027 ** (0.003)
Attorney waived	-0.008 ** (0.002)	-0.004 (0.002)
Demographic Attributes		
Female	-0.044 ** (0.002)	-0.040 ** (0.002)
Age		
25 – 34	-0.017 ** (0.002)	-0.017 ** (0.002)
35 – 44	-0.011 ** (0.002)	-0.011 ** (0.002)
45 – 54	-0.036 ** (0.002)	-0.036 ** (0.003)
55 – 64	-0.064 ** (0.003)	-0.066 ** (0.004)
65 and over	-0.090 ** (0.006)	-0.084 ** (0.007)
Race/Ethnicity		
Black	0.011 ** (0.002)	0.013 ** (0.002)
Hispanic	-0.041 ** (0.002)	-0.027 ** (0.002)
Other	-0.009 * (0.004)	-0.010 * (0.005)
Observations	359,834	253,469
R-squared	0.011	0.010

Standard errors in parentheses.

*
p<0.05,**
p<0.01

Table 4

Determinants of DWI Re-Arrest: Varying Follow-up Periods

Panel A: Effect of Being Prosecuted on DWI Re-Arrest				
Duration of Follow-up Period (years)	N	Re-arrest Rate	Prosecuted	
			Endogenous	Exogenous
1	359,834	0.087	-0.017 ** (0.004)	-0.009 ** (0.001)
2	359,834	0.132	-0.016 ** (0.005)	-0.011 ** (0.001)
3	359,834	0.166	-0.011 * (0.005)	-0.011 ** (0.002)
4	323,740	0.197	-0.007 (0.006)	-0.008 ** (0.002)
5	289,986	0.223	0.005 (0.006)	-0.006 ** (0.002)
6	256,424	0.245	0.008 (0.007)	-0.003 (0.002)
7	221,289	0.265	0.015 (0.008)	-0.000 (0.002)

Panel B: Effect of Being Convicted on DWI Re-Arrest				
Duration of Follow-up Period (years)	N	Re-arrest Rate	Convicted	
			Endogenous	Exogenous
1	253,469	0.083	-0.027 ** (0.008)	0.004 (0.002)
2	253,469	0.128	-0.038 ** (0.010)	-0.008 ** (0.002)
3	253,469	0.162	-0.040 ** (0.011)	-0.013 ** (0.003)
4	228,433	0.193	-0.011 (0.012)	-0.015 ** (0.003)
5	203,873	0.220	0.008 (0.013)	-0.014 ** (0.003)
6	179,462	0.243	0.030 * (0.014)	-0.015 ** (0.004)
7	154,496	0.264	0.036 * (0.015)	-0.013 ** (0.004)

Standard errors in parentheses.

*
p<0.05,**
p<0.01

Table 5

Robustness Checks

Panel A: Effect of Being Prosecuted on DWI Re-Arrest				
Variable	Q1	Q2	Q3	Q4
Prosecution Probability	0.47 (0.21)	0.73 ** (0.03)	0.82 ** (0.03)	0.93 ** (0.04)
Mean Predicted Re-arrest Probability	0.18 (0.01)	0.18 (0.01)	0.17 (0.01)	0.17 (0.02)

Panel B: Effect of Being Convicted on DWI Re-Arrest				
Variable	Q1	Q2	Q3	Q4
Conviction Rate	0.81 (0.10)	0.91 ** (0.01)	0.95 ** (0.01)	0.98 ** (0.01)
Mean Predicted Re-arrest Probability	0.17 (0.01)	0.17 (0.01)	0.17 (0.01)	0.18 ** (0.02)
Probability of Incarceration	0.98 (0.03)	0.97 (0.03)	0.97 (0.03)	0.97 (0.04)
Mean Duration of Incarceration	211.99 (130.02)	189.63 (88.61)	198.16 (85.29)	226.75 (120.71)
Supervised Probation Probability	0.34 (0.16)	0.34 (0.15)	0.34 (0.16)	0.37 (0.18)
Mean Duration of Supervised Probation	626.23 (198.38)	629.81 (188.39)	654.24 (203.40)	658.24 (235.54)
Unsupervised Probation Probability	0.45 (0.26)	0.49 (0.23)	0.51 * (0.23)	0.45 (0.26)
Mean Duration of Unsupervised Probation	454.70 (159.25)	471.00 (201.93)	529.58 ** (250.18)	499.85 (250.79)

The number of prosecutors in each quartile is: Q1=738, Q2=688, Q3=713, Q4=712

Q1 and Q2 are of unequal size because several prosecutors in Q1 had the same predicted values.

The number of judges in each quartile is as follows: Q1=163, Q2=161, Q3=162, Q4=162.

Standard error in parentheses.

*
p<0.05,

**
p<0.01

Asterisks indicate a significant difference in means between the given quartile and the lowest quartile (Q1).