FINAL SUMMARY REPORT

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Oregon Criminal Justice Commission

Project Title:
Effect of Pretrial Detention in Oregon

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Acknowledgements

Abstract

Objectives: Criminal defendants can be held in pretrial detention when a judge believes that s/he represents an imminent threat to public safety or poses a serious flight risk. A small but growing body of scholarship, however, suggests that such placements may have a negative influence on sentencing decisions. This study seeks to add to this literature by evaluating the effect of pretrial detention on sentencing outcomes in Oregon.

Methods: Using a sample of 3,390 criminal defendants from nine Oregon counties, this study employs propensity score modeling (PSM) and regression to assess the impact of pretrial detention on two outcomes: sentencing outcome (incarceration versus probation) and the length of sentence imposed. In addition to examining the dichotomous (fully detained versus released pre-trial), this study also explores the effect of time spent in detention on these sentencing outcomes.

Results: After controlling for several factors (e.g., criminal history, charge type and count), our analyses reveal that detained defendants were more than twice as likely to be incarcerated (either prison or jail) as part of their sentence compared to those who were released prior to their disposition. Separating out prison and jail yielded the same results, with detained defendants more than twice as likely to receive a prison sentence and 50% more likely to receive jail. The results also indicate that the longer one spends in pretrial detention the greater the likelihood s/he receives a sentence if incarceration. These findings were consistent across offenders who were rated as low-, medium-, and high-risk to recidivate. We did not find any evidence that the experience of pretrial detention or the length of time served in detention had any significant effect on the length of incarceration or probation sentences imposed.

Conclusions: The results of this study suggest the use of pretrial detention may unnecessarily be increasing the use of incarceration in Oregon. The implications of these findings suggest that counties should explore options to reduce their use of pretrial detention.

Effect of Pretrial Detention in Oregon

Background

Between 1994 and 2013, the Oregon state prison population more than doubled, expanding from 6,936 to 15,517 inmates. Recognizing that this rate of growth was no longer practically or economically sustainable, the Oregon Legislature passed House Bill 3194—also known as the Justice Reinvestment Act—in 2013, as a strategy for spending state resources more cost-effectively when responding to selected nonviolent crimes. The goal of the Justice Reinvestment Initiative (JRI) was to reduce the states use of prison, while also improving public safety, decreasing recidivism, and holding offenders accountable.

The Oregon Criminal Justice Commission (CJC) is a state agency whose mission is to improve the legitimacy, efficiency, and effectiveness of state and local criminal justice systems. As part of the JRI, the CJC has worked with several counties to help develop and implement a wide range of community-based alternatives to prison for offenders convicted of the nonviolent crimes listed in House Bill 3194. During the 2017-2019 biennium grant cycle, several Oregon counties have requested funds from the CJC to reform their pretrial detention processes. Given this interest, the CJC has contracted with the Principal Investigators to examine the effect that pretrial detention has on sentencing outcomes in Oregon. The findings of this evaluation will help the CJC determine if funding select Oregon counties to modify their use of pretrial detention is likely to aid the state in achieving its JRI goals.

Pretrial Detention

Although policies and practices differ by jurisdiction, in general defendants can be placed in pretrial detention if a judge believes that the s/he represents an imminent threat to public safety or poses a serious flight risk. In addition, some offenders may remain in pretrial detention simply because they do not have money to post bail (Gupta, Hansman, & Frenchman, 2016). One of the concerns about the use of pretrial detention is that it may encourage defendants to be more willing to accept pleas that involve incarceration and longer sentences than if they were released and had the opportunity to appear before the court while not in custody (Petersen, 2019). Therefore, the use of pretrial detention not only has potential consequences for the safety of the community, but also for the defendants held in their control.

An investigation on the impact of pretrial detention in Kentucky reported that detained defendants were significantly more likely than those who were released to be sentenced to jail or prison and also to receive longer sentences (Lowenkamp, VanNostrand, & Holsinger, 2013). This report also revealed that low-risk defendants held in pre-trial detention were more adversely affected than moderate- and high-risk defendants, respectively. The negative effects of pretrial detention on sentencing outcomes have also been documented in several other jurisdictions, including New Jersey (Sacks & Ackerman, 2014), Pennsylvania (Gupta et al., 2016), Philadelphia and Miami (Dobbie, Goldin, & Yang, 2018), New York (Leslie & Pope, 2017), Texas (Heaton, Mayson, & Stevenson, 2017), and in the federal court system (Oleson, Lowenkamp, Cadigan, VanNostrand, & Wooldredge, 2014; Oleson, Lowenkamp, Wooldredge, VanNostrand, & Cadigan, 2017).

These prior evaluations have attempted to control for the influence of demographic, offense, and criminal history information through the use of multivariate regression analyses. These quasi-experiments, however, cannot rule out the possibility that systematic, unobserved differences between the detained and released defendants may have had an influence on the outcomes. In addition, prior scholarship has largely operationalized pretrial detention as being held in custody during the entire pretrial period. It is possible, however, that serving any length of time in pretrial detention may have an adverse effect on sentencing decisions. These outcome evaluations have also focused on the impact of pretrial detention on judicial decisions to incarcerate and the length of time sentenced to jail or prison. It remains unknown, therefore, what the impact of pretrial detention may have on other sentencing decisions, such as the length of probation sentences imposed. Given these considerations, there is a need for more empirical research on the impacts of pretrial detention, especially for methodologically rigorous studies using other types of statistical analyses to account for group differences that take place in other jurisdictions (Bechtel, Holsinger, Lowenkamp, & Warren, 2016).

Current Study

In the current study, we evaluate the influence of pretrial detention on the sentencing outcomes of more than 3,000 convicted criminal defendants in nine Oregon counties. More specifically, we analyze jail, corrections, and court records to address the following research questions:

1. *Is being fully detained before the case disposition associated with…*
   a. *a higher probability of receiving an incarceration sentence?*
   b. *a longer sentence of incarceration or probation?*
   c. *a difference in the probability or duration of sentences across defendant risk levels?*

2. *Are longer stays in pretrial detention ("detention dosage") associated with …*
   a. *a higher probability of receiving an incarceration sentence?*
   b. *a longer sentence of incarceration or probation?*
   c. *a difference in the probability or duration of sentences across defendant risk levels?*

Methodology

The ideal approach for assessing the impact of pretrial detention on sentencing outcomes would be to conduct a randomized controlled trial (RCT) in which defendants were randomly assigned to either be detained in jail or released into the community prior to their sentencing date. This approach, however, is clearly not a realistic possibility given the ethical and legal issues it would raise. Therefore, in order to address our research questions, we employ a quasi-experimental design with the use of propensity score modeling (PSM) to isolate the effects of pretrial detention. Prior scholarship suggests that PSM is an effective strategy for simulating the results of RCT experiments, especially when analysts are able to reduce the post-match selection bias to within an acceptable standard (e.g., less than 20% average bias, see Campbell & Labrecque, 2018). As such, the use of PSM in the current study provides the best-known approach for identifying an unbiased estimate of the effect of pretrial detention on sentencing outcomes.

Sample

The data used in this study was provided to us by the Oregon CJC. The sampling frame included all criminal defendants convicted of a felony offense between 2016 and 2017 in nine of Oregon's counties, including Clackamas, Clatsop, Columbia, Coos, Deschutes, Klamath, Lincoln, Multnomah, and Yamhill. The initial database was comprised of 3,428 individuals, however, we had to remove 38 cases due to missing information (< 1% of total sample). Our final sample contained 3,390 unique criminal defendants. Generally speaking, the individuals in our sample were most likely to be white men in their mid-30s represented by a public attorney and convicted of a property crime. While the sample characteristics are described in Table 1, characteristics of each of the nine counties are provided in the Appendix.

Measures

Sentencing outcomes. There are three outcomes of interest in this study, including type of sentence, length of incarceration sentence (measured in months), and length of probation sentence (also measured in months). Sentence type was initially listed by the CJC as five different options: (1) probation, (2) jail on a new sentence, (3) jail due to a supervision violation, (4) prison on a new sentence, and (5) prison due to a supervision violation. Unfortunately, the jail sentences and sanctions made up too small a proportion of the total sample (6.5% [or 120 cases] of those released, and 7.3% [or 114 cases] of those fully detained) to be used as a separate outcome in this investigation. Violation sanctions to either jail or prison also made up too small a proportion of the sample to analyze separately as well. Subsequently, jail and prison sentences and sanctions were collapsed into a dichotomous measure (1 = *incarceration*, 0 = *probation*).

Measures capturing the final sentence length are often reported in direct months sentenced. However, using this does not account for time served in pretrial detention. The measures used in this study account for time served by subtracting this amount from the final sentence imposed. Thus, the measures included here are the remaining months to be served by the convicted.

Pretrial detention. This study operationalizes pretrial detention in two ways. The first measure captures whether defendants are detained or released. However, such a measure focusing on zero versus any days would be flawed considering very few felony cases are released in the same day that they are booked. Therefore, the dichotomous measure used here accounts for if the individual was held in detention through the disposition of his/her case, "fully detained", or if the person was released at all before the disposition (1 = *detained through case disposition*, 0 = *released prior to case disposition*). To account for how much detention someone experiences while awaiting his/her disposition, "detention dosage", the second measure captures the length of time (in days) spent in pretrial detention.

Control variables. We account for a number of theoretically relevant constructs as controls to help isolate the effects of pretrial detention. These factors were selected based on their availability and relevance to judges' and prosecutors' decision-making process for determining which defendants to detain (or release) prior to trial. Case-relevant information used to model the decision to detain includes the number of charges against the defendant prior to disposition, number of prior community supervision violations and revocations (i.e., via probation or post-prison supervision),

number of prior institutional commitments (i.e., jail and prison), number of prior convictions (i.e., person, property, and drug offenses), number of prior arrests in the past five years (i.e., person and property offenses), and most serious charge type (dummy variables for driving [e.g., driving under the influence], drug [e.g., manufacturing, possessing, trafficking], person [e.g. assault], property [e.g., arson, theft, burglary], and other crime types), court summons record (1 = *has prior failure to appear conviction*, 0 = *no prior failure to appear conviction*), probation history (1 = *has prior supervision violatio*n, 0 = *no prior supervision violation*), probation status (1 = *was on probation at the time of the current offense*, 0 = *was not on probation at time of current offense*).

The defendant's risk to reoffend or risk level was also accounted for by identifying low-, medium- and high-risk defendants according to their score on the Oregon Public Safety Checklist (PSC). Each risk level was dichotomized (e.g., 1 = *low-risk*, 0 = *any other level*), to decipher the effects of pretrial detention in relation to validated risk categorizing of offenders. Lastly, we also accounted for additional factors that might play a role in influencing discretion to detain, such as defendant age (at time of disposition, measured in years), gender (1 = *male*, 0 = *female*), race (1 = *white*, 0 = *other*), age at first arrest (measured in years), attorney type (1 = *public*, 0 = *private*), mental health status (1 = *has a record of mental illness*, 0 = *no record of mental illness*), and plea type (1 = *not guilty or Alford*, 0 = *guilty*). The county of instant offense (dummy variables for Clackamas, Clatsop, Columbia, Coos, Deschutes, Klamath, Lincoln, Multnomah, and Yamhill counties) were also used in the modeling process to account for the possibility that perspectives and use of pretrial detention may vary by county.

Analyses

In order to answer the research questions, we aimed to model the decision to fully detain someone pretrial, as well as any other factors that might influence the sentencing decision. Figure 1 provides a diagram of how our analytical approach achieves this strategy. The approach to modeling the decision to detain employs two PSM techniques to address its research questions.[1] These include 1-1 (read one-to-one) greedy matching with a caliper and marginal means weighting through stratification (MMW-S). (Both are described in more detail below). We then assess pre- and post-group balance using four indicators: (1) the percentage of covariates with statistically significant differences (i.e., $p \leq .05$),[2] (2) the mean standardized percent bias,[3] (3) the percentage of covariates with more than 20% bias,[4] and (4) the receiver operating characteristic - area under the curve statistic (AUC) as a sensitivity check to gauge how well the propensity score predicted placement of pretrial detention.[5] The closer the PSM techniques get to the ideal benchmarks of balance (i.e.,

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[1] We refer the interested reader to Guo and Fraser (2014) for more detailed information about PSM.

[2] According to Shadish, Cook, and Campbell (2001), equivalent comparison groups should possess fewer than 5% of measures with statistically significant differences.
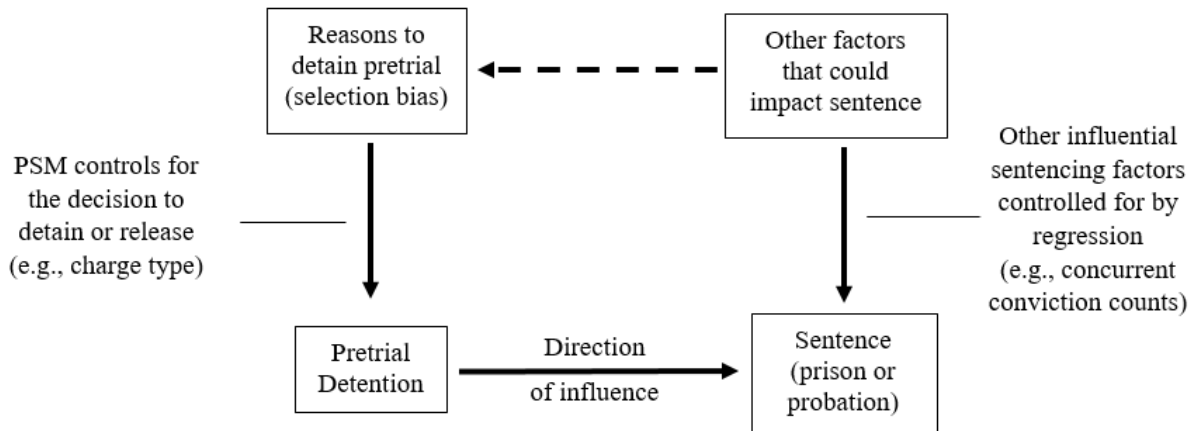
[3] The standardized percent bias statistic represents the degree to which the treatment and control groups differ on a particular construct. We used Austin's (2011) two formulas for continuous and dichotomous variables to estimate the standardized percent bias for each of the 44 measures in our study. We then computed the average percent bias for the pre- and post-match groups, where larger values indicate more bias than smaller values.

[4] According to Rosenbaum and Rubin (1985), a balanced treatment and control group should not differ on the standardized percent bias of any covariate by more than 20%.

[5] Possible AUC values range from 0 to 1, with a .5 indicating that the propensity score performed no better than chance in identifying which cases were in the treatment and control groups and a 1 indicating that the propensity score was able to perfectly predict which cases were in the treatment and control groups. The closer an AUC value is to .5, the more it can be said that the two groups are balanced (see Austin, 2008).

fewer statistically significant differences, lower standardized percent bias, no standardized percent bias over 20%, AUC ≈ .500), the more we consider it successful at generating equivalent groups which is key for determining causal relationships. After matching, we compare the sentencing outcomes of the fully detained and the released groups and conduct multivariate regression (both logistic and ordinary least squares) to isolate the effects of pretrial detention while accounting for any remaining imbalanced covariates. Additionally, the regression analyses will account for the effects of pretrial detention as they relate to PSC risk level using interaction effects.

Figure 1. Diagram of analytical plan and use of PSM

One-to-one match. In order to address the first research question, we conducted a 1-1 greedy match with a caliper. Essentially, 1-1 matching begins with a statistical summary (i.e., propensity score) of the attributes that make people in the treatment condition unique when compared to those in the control group. In the current study, the propensity score summarizes a defendant's likelihood of being detained in custody until the disposition of his or her case. The use of PSM in the current context allows us to identify a "statistical twin" for the detained offenders in our sample (i.e., defendants who share similar propensity scores, but whom were released rather than detained prior to sentencing). We set the threshold for how close propensity scores need to be with one another in order to be considered a match (i.e., the caliper) using the best practices established in the literature.[6] The greedy matching technique identifies and selects the closest pair of statistical twins within the caliper (one from each of the detained and released groups), removes the pair from the pool of possible matches and places it into a separate dataset. This process is continued until there are no more pairs left in the pool. Greedy matching has been shown to be a reliable and valid approach to simulating the effects of RCT experiments (see Campbell & Labrecque, 2018). Table 1 provides a summary of the pre- and post-match descriptive statistics of the detained and released samples.

As shown in Table 1, the 1-1 greedy match was able to substantially reduce the level of bias from a pre-match average standardized percent bias (%Bias) of 14.7% to a post-match mean bias of 4.6%. The post-match percent bias falls well within the acceptable standards for determining a

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[6] According to Rosenbaum and Rubin (1985), the caliper should be set by multiplying the standard deviation of the propensity score by .25.

successful match (i.e., less than 20% [preferred] and 10% [ideal]).[7] Each of the findings and balance between the detained and released groups were checked with other methods (boosted regression, optimal pairwise matching, and coarsened exact matching). The findings from each remained the same as what is reported here. Because the balance was best in the PSM 1-1 approach (i.e., PSM was most successful at reducing the bias in the data), we use and report models associated with that approach.

When examining Table 1 and the results section, readers should keep in mind two important points. First, the race statistics provided in Table 1 are shown as they were examined in the more robust models. The measure of *race_white* was created to capture the proportion of White defendants compared to all other races. This is common practice in criminological studies to control for race in this way, especially when White defendants make up the overwhelming majority of cases, such as over 70% as is the case here.

That being said, each race category was also examined separately. The largest post-match proportion of other race/ethnicities included Black (12.9% of those released, and 11.6% of those fully detained), followed by Hispanic, non-white (8.3% of those released and 7.5% of those fully detained), then Native American (2.6% of those released and 2.3% of those fully detained), and lastly Asian (2.0% of those released and 2.5% of those fully detained). There was no difference in the effect or use of pretrial detention or subsequent sentence type on the basis of race/ethnicity.

Second, from here on, it is important to note we report the results with just the post-match sample (i.e., the right side of Table 1), unless otherwise stated. For interested readers, we report key differences between the matched and unmatched groups on the outcomes in Footnote 10.

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[7] One measure increased in the bias from pre- to post-match – the proportion of defendants from Multnomah County. After removing the cases from the fully detained group that did not have a match, the remaining matched cases increased in proportion by 6.8%. Although this increase was statistically significant, the bias was not enough to be of concern. As a precaution, we included the Multnomah County measure as a control in the post-match regression.

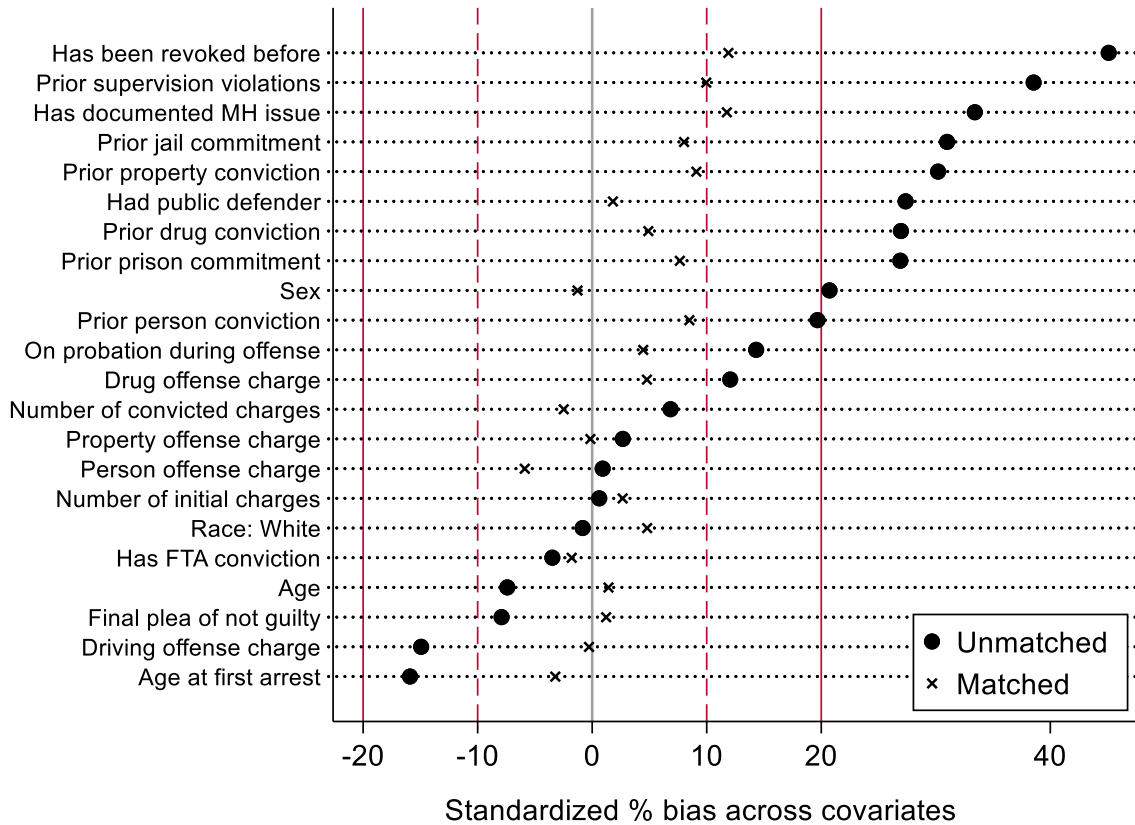**Table 1. Pre- and post-match sample descriptive statistics**

	Pre-Match			Post-match		
Model Balance Summary						
Percent significant differences		59.6			25.0	
Mean standardized percent bias		14.7			4.6	
Percent with bias over 20		31.9			0.0	
Area under the curve (AUC)		.723			.557	
Measures (47 total compared)	**% Detained**	**% Released**	**%Bias**	**% Detained**	**% Released**	**%Bias**
Demographics Sample size	*1,544*	*1,846*		*1,273*	*1,273*	
Male	***80.0	71.1	20.7	78.5	79.0	1.3
White	76.0	76.3	0.8	76.1	74.1	4.7
Average age at disposition (SD)	*35.1 (10.4)	35.9 (11.2)	6.0	35.2 (10.5)	35.0 (10.9)	1.2
Average age at first arrest (SD)	***23.8 (8.2)	25.1 (9.0)	12.1	24.2 (8.4)	24.2 (8.4)	0.9
County						
Clackamas	***19.0	7.1	36.0	**13.6	10.2	10.5
Clatsop	**2.4	4.2	10.3	2.8	3.5	3.6
Columbia	3.2	2.2	6.3	3.7	2.5	6.8
Coos	1.2	1.4	2.1	1.2	1.4	2.0
Deschutes	***14.6	18.9	11.5	16.0	15.2	2.2
Klamath	***5.1	12.2	25.8	5.9	6.1	0.7
Lincoln	5.2	4.7	2.4	5.7	5.0	3.1
Multnomah	44.3	44.3	0.1	**45.8	51.1	10.7
Yamhill	5.0	4.9	0.2	5.3	5.0	1.4
Most serious charge type						
Driving	***6.4	10.6	14.9	7.3	7.4	0.3
Drug	***21.8	17.1	12.1	21.4	19.5	4.7
Person	3.7	3.5	0.9	3.7	4.8	5.5
Property	65.7	64.5	2.7	64.8	64.9	0.2
Number of charges						
5 to 6	13.2	12.4	2.2	13.1	13.0	0.2
7 or more	14.5	13.8	2.0	15.2	13.4	4.9
Average prior outcomes (SD)						
Prior supervision violations	***0.6 (0.8)	0.4 (0.7)	30.6	*0.6 (0.8)	0.5 (0.7)	7.9
Prior jail commitments	***0.5 (0.8)	0.3 (0.6)	24.4	*0.4 (0.7)	0.4 (0.7)	6.3
Prior prison commitments	***0.5 (0.8)	0.3 (0.6)	21.3	0.5 (0.7)	0.4 (0.7)	6.1
Prior person convictions	***0.4 (0.7)	0.3 (0.6)	15.6	*0.4 (0.7)	0.3 (0.6)	6.6
Prior property convictions	***0.8 (1.1)	0.5 (1.0)	24.0	*0.7 (1.1)	0.6 (1.1)	7.2
Prior drug convictions	***0.8 (1.1)	0.5 (1.0)	21.5	0.7 (1.1)	0.7 (1.1)	3.9
Person crime arrests in past 5 years	***0.8 (0.8)	0.7 (0.8)	13.9	0.8 (0.8)	0.7 (0.8)	3.7
Property arrests in past 5 years	***1.5 (1.3)	1.3 (1.3)	11.5	1.5 (1.3)	1.4 (1.3)	3.4
PSC risk level						
Low	***58.7	40.7	36.6	49.1	45.3	7.7
Medium	23.6	26.0	5.6	27.5	26.9	1.4
High	***17.7	33.3	36.3	*23.4	27.9	10.3
Represented by public attorney	***96.1	88.9	27.4	95.4	95.0	2.2
Possesses some mental health issue	***20.3	8.7	33.3	**16.1	12.0	11.8
Final plea not guilty or Alford	*3.2	4.7	7.9	3.2	3.0	1.3
Possesses an FTA conviction	7.0	7.9	3.5	7.1	7.5	1.8
Status information						
Has had a supervision revocation	***49.7	28.3	45.1	**43.8	38.2	11.5
On probation during current offense	***10.8	6.8	14.3	9.7	8.5	4.4

Note: SD = standard deviation. Measures for "other" and reference categories are not reported in this table for the sake of space, but they are included in the analysis.
*** $p \le .001$. ** $p \le .01$. * $p \le .05$.

Figure 2 further depicts the degree of bias reduction achieved from pre- to post-match separated by construct. The figure highlights how much bias was removed with PSM in those measures that possessed a bias beyond the 20% and 10% thresholds prior to the match. Moreover, PSM reduced the proportion of measures that possessed over 20% bias from 14.7% prior to the match, to zero after the match.

Figure 2. Bias reduction achieved through the propensity score matching

Standardized % bias across covariates

The match was also able to reduce the number of measures that were significantly different between the detained and released groups ($p \leq .05$) from 59.6% pre-match to 25% post-match. Although the post-match estimate is higher than would be expected in an RCT experiment (i.e., 5% statistically significant), the remaining differences are controlled for in later regressions (this process is explained in more detail below). Finally, the reduction in AUC values from .723 to .557 (pre- to post-match) indicates the propensity score following PSM could no longer identify the difference between the fully detained and released groups. This suggests that before the match the propensity score was able to predict group placement with a relatively high degree of accuracy, however, following the match, the score performed only slightly better than chance at differentiating between the detained and released defendants.

Marginal means weighting through stratification (MMW-S). The second type of PSM we employ here is MMW-S. Essentially, weighting approaches allow analysts to estimate the impact that the dosage (or intensity) of an ordinal variable has on a particular outcome of interest (see Hong, 2010). The MMW-S approach has been used in other areas of criminal justice research,

such as in assessing the impact of prison length on post-release recidivism (see e.g., Loughran, Wilson, Nagin, & Piquero, 2015). MMW-S has also been shown to be an effective approach for simulating the effects of RCT experiments (see Campbell & Labrecque, 2018). In this sense, the propensity score is then used to weight people who were held for different durations so that the characteristics examined (e.g., age, sex, race, criminal history) are similar within each grouping of offenders.

In the current study, the propensity score summarizes a defendant's likelihood of being detained in custody for a specific duration of time before sentencing. Because the number of days spent in pretrial detention had a heavy skew (i.e., 52.7% of cases were detained for 30 days or less, with large clusters at five and ten days), we categorized the "dosage" of time spent in detention into 11 ordered groups. The cut-points for the categories were constructed to maintain similar counts of defendants within each grouping. Table 2 describes the category duration ranges, the number of defendants falling into each group, and their respective propensity score distributions. The table demonstrates how applying the weight is able to substantially reduce the significant differences (from 52.4% of the measures to 19% after applying the weights), and the ability of the propensity score to identify the different dosage groups – thus, noting few to no differences when the weight is applied.

Table 2. Pre- and post-weight sample size and propensity score distribution

Days in detention	Pre-Weight			Post-Weight		
	N (3,390)	Mean propensity score	Standard deviation	N (3,202)	Mean propensity score	Standard deviation
Zero days	262	.062	.015	251	.058	.016
1-5	743	.066	.012	714	.059	.016
6-10	191	.062	.016	177	.058	.016
11-15	185	.062	.014	174	.059	.015
16-30	146	.063	.015	138	.058	.017
31-40	139	.059	.015	137	.058	.016
41-50	153	.060	.017	149	.058	.017
51-60	235	.057	.016	229	.058	.016
61-90	434	.053	.018	412	.058	.017
91-120	310	.050	.019	287	.057	.017
Over 120 days	592	.043	.019	534	.058	.017
F-statistic		85.99			.26	
p-value for *F*		<.001			.99	
% of covariates significant		52.4%			19%	
AUC		.707			.509	

Post-match comparisons. Following the application of the two PSM techniques, we conducted a series of chi-square and independent sample *t*-test analyses of the differences in the outcomes between the detained and released groups in the matched samples. The initial comparisons following the 1-1 match provide the unbiased baseline effects of pretrial detention on the likelihood of receiving incarceration and a longer sentence. These comparisons were followed by multivariate regressions which allow us to control for other factors, such as those measures that

remain unbalanced after the PSM techniques (i.e., remained statistically significant [$p \leq .05$]). A binary logistic and ordinary least squares regression analyses for the outcomes of receiving an incarceration sentence and determining sentence length were employed, respectively, to further isolate the average effects of pretrial detention.

Results

Research Focus #1: Impact of being fully detained on sentencing outcomes

Probability of incarceration. Table 3 shows sentencing outcomes after the match. These represent the *unbiased baseline* effects of detaining someone through their case disposition. Before additional controls were included, the fully detained defendants have a significantly greater likelihood of receiving an incarceration sentence. More specifically, about half (50.1%) of the defendants who were detained through their disposition received an incarceration sentence compared to only 32.9% of those released prior to their disposition (a 17% difference).

This relationship was consistent even when breaking apart the incarceration sentence, as those who were fully detained were significantly more likely to receive a prison sentence (versus probation) and a jail sentence (versus probation). In the entire post-match sample, 11.2% (187 cases) received jail time as their sentence, and 36.9% (870 cases) received prison.[8] Among those fully detained, 13.3% received a jail sentence, compared to 9.5% those who were released at some point ($p=.017$). Similarly, though to a larger degree, 46% of those fully detained received a prison sentence whereas only 27.8% of those released were sentenced to prison. That being said, there was no difference between those fully detained and those released on the length of their prison and jail sentences, separately.

Table 3 also shows that defendants were significantly more likely to receive an incarceration sentence across all three risk categories. The low-risk defendants who were detained were 15% more likely to receive an incarceration sentence than the released defendants. The difference for the medium-risk defendants was 19% and among the high-risk defendants was 12%.

Although our use of PSM was able to reduce the selection bias between the detained and released groups, there were some factors that remained significantly different post-match. This means that while we controlled for many of the factors that might influence the decision to detain, there is still the possibility other factors might help explain incarceration sentences more than just the decision to detain (refer to Figure 1). Following research standards, we have subsequently included variables still greater than or equal to 10% bias[9] (along with the number of concurrent convictions, see Figure 1) in the post-match regression models to further control for any confounding effect they may have on sentencing (Dehejia & Wahba, 2002). Even when controlling for these remaining factors, the impact of detention on sentencing outcomes persisted. Ultimately, *holding*

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[8] The reader should note that in examining the likelihood of receiving prison or jail versus probation, separately, the percentages reported exclude the third group not being compared. For instance, comparing prison versus probation excludes the cases that received jail. Thus, the percentages for this comparison are out of 2,359 (1,176 fully detained, and 1,183 released). For the jail versus probation comparison, the percentages are out of 1,676 cases (732 fully detained, and 944 released).

[9] These measures include supervision revocation history, risk level, possessing documented mental health issue, and being supervised in either Clackamas or Multnomah county.

all else constant in the most conservative models, defendants who are fully detained through their dispositions are 2.1 times more likely to receive an incarceration sentence than those who were released (odds ratio = 2.09, $p < .001$). This likelihood increases to 2.4 times more likely than those released (OR=1.46, $p<.001$) when only examining prison versus probation, and decreases to 45.6% more likely than those released (OR=1.46, $p=.022$) to receive a jail sentence versus probation, holding all else constant.

Figure 3 summarizes the effects of being fully detained, broken down by risk level. The figure depicts the likelihood of defendants within each risk level to receive an incarceration sentence while holding the remaining measures (see footnote 7) at their means. In other words, an average person of a given risk category possesses a significantly higher likelihood of receiving an incarceration sentence if that person is fully detained prior to their disposition.

For instance, given two otherwise average people of low-risk to reoffend, the person who is fully detained has a 21% higher likelihood to receive incarceration than the person who is released. Similarly, pretrial detention increases the likelihood to receive incarceration by 24% among medium-risk defendants and by 23% for those of high-risk.
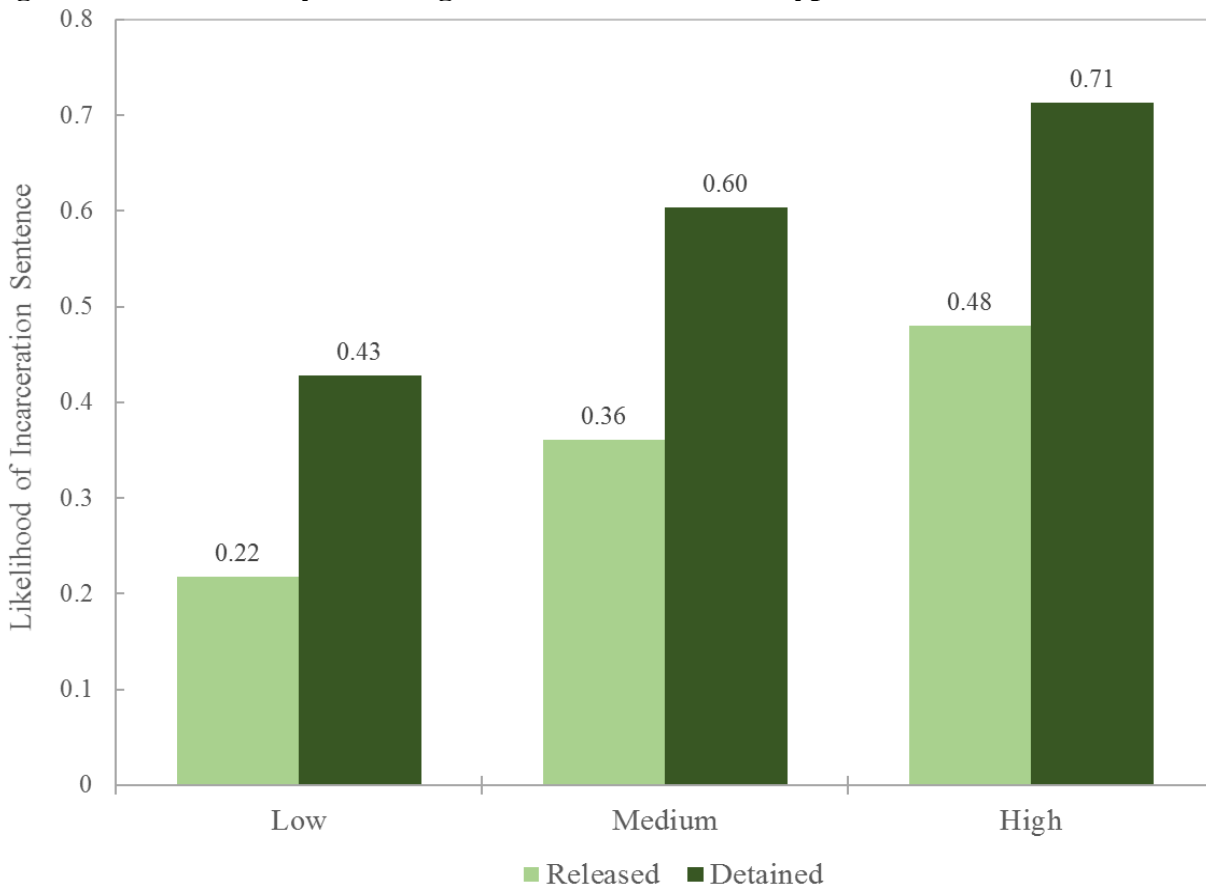
Table 3. Baseline effect of outcome measures post-match, by risk level

	Fully Detained	**Released**
Post-match sample size	*1,273*	*1,273*
Sentence received		
Received *incarceration* sentence	***50.1 %	32.9 %
Average length of *incarceration* sentence (SD) [a]	18.4 (17.3)	17.1 (17.1)
Received *jail* sentence (vs. probation) [b]	**13.3 %	9.5 %
Average length of *jail* sentence (SD)	2.8 (3.5)	2.4 (2.7)
Received *prison* sentence (vs. probation)	***46.0 %	27.8 %
Average length of *prison* sentence (SD)	21.2 (17.3)	21.2 (17.2)
Received *probation* sentence	***49.9 %	67.1 %
Average length of *probation* sentence (SD)	25.5 (12.8)	24.8 (13.7)
Sentence by risk level		
Low-risk sentenced to incarceration	***34.2 %	19.0 %
Average length of incarceration sentence (SD)	17.4 (17.3)	14.9 (13.7)
Average length of probation sentence (SD)	26.0 (14.2)	26.6 (12.7)
Medium-risk sentenced to incarceration	***54.4 %	34.9 %
Average length of incarceration sentence (SD)	19.9 (20.8)	16.5 (15.1)
Average length of probation sentence (SD)	23.5 (12.2)	25.1 (12.4)
High-risk sentenced to incarceration	***71.8 %	59.7 %
Average length of incarceration sentence (SD)	18.1 (14.1)	19.1 (20.0)
Average length of probation sentence (SD)	22.6 (13.4)	21.8 (13.5)

Note: SD = Standard deviation. *p < .05, ** *p* < .01, *** *p* < .001
[a] Length of sentence measured in months.
[b] The sample size is different for the prison and jail versus probation as the two groups are broken out – 187 people received a jail sentence, 870 received a prison sentence, and 1,489 received a probation sentence.

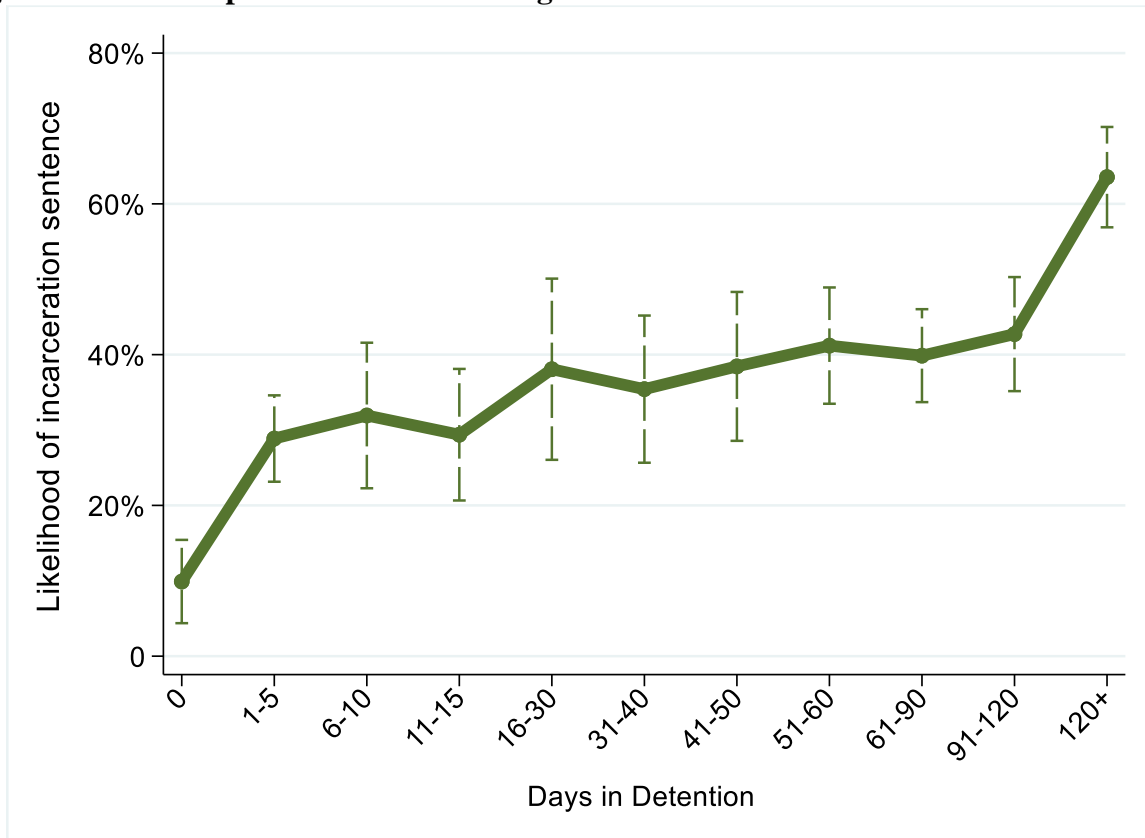**Figure 3. Effects of fully detaining defendants on sentence type**

Likelihood of longer sentences. Table 3 also provides incarceration and probation sentence length by pretrial status of released or detained. In terms of sentence length, there were no statistical differences found between those released or fully detained in the total sample, and in any of the breakdowns. On the surface, it appears that being held in detention until one's disposition does not have much of an effect on the length of the sentence handed down. On average people who were released before the close-out of their case were given incarceration sentences of about 21 months, which was statistically similar to that of detained defendants' 23.9 months. A similar effect is seen in the month difference in the average sentence of probationers – 30.5 months for those released and 31.5 months for those fully detained. The lack of a relationship remains when controlling for multiple other factors in a linear regression.

Research Focus #2: Influence of time spent in detention on sentencing outcomes

Probability of incarceration. Using the weighted, dosage groupings from the MMW-S shown in Table 2, we examined the likelihood of an incarceration sentence in relation to the time spent in pretrial detention. Figures 4 and 5 show the effects of pretrial detention dosage overall and by risk level, respectively. Overall, Figure 4 indicates that as defendants spend more time in pretrial detention, their likelihood of receiving an incarceration sentence incrementally increases. This equates to an average of 0.2% increase in the likelihood of incarceration for every day the individual stays in detention. The most significant differences are seen for those who are released
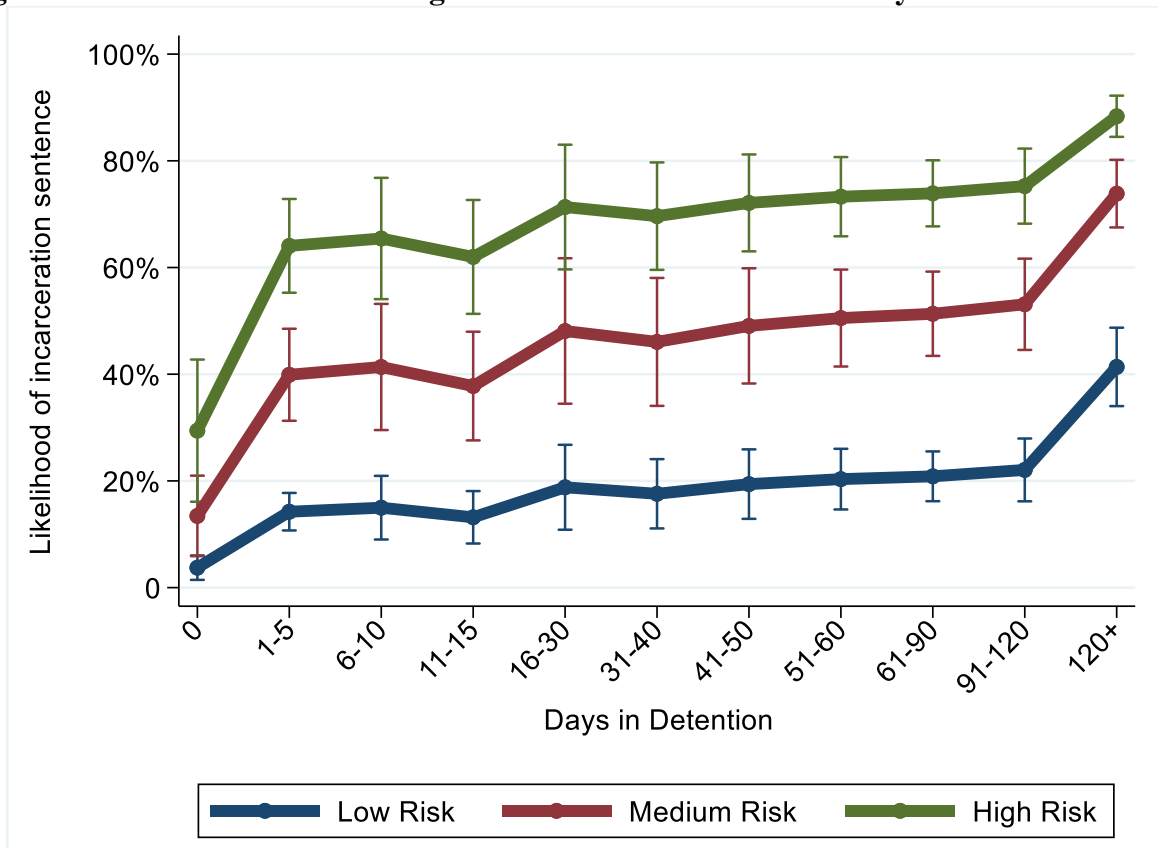
on the same day they are arrested (9% likely on average), and those who are detained for more than 120 days (64% likely on average).

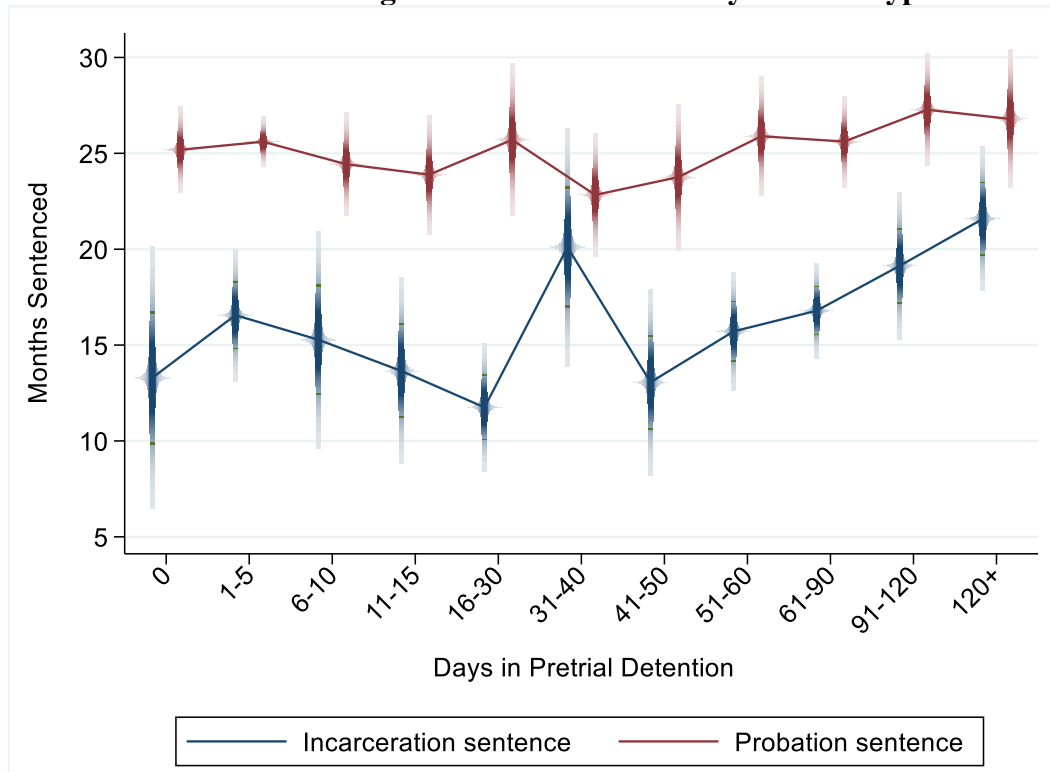**Figure 4. Effects of pretrial detention dosage on likelihood of incarceration**

We found similar results when breaking the detention dosage down across defendant risk levels (see Figure 5). As one would expect when considering the importance of criminal history on sentencing, a defendant's likelihood of an incarceration sentence corresponds with his/her risk level. For instance, those with the highest risk possessed the highest likelihood to receive incarceration. In spite of some minute differences in slope, this figure shows that the positive relationship between days detained and likelihood of incarceration remained. Regardless of one's risk level, as the number of days in pretrial detention increased, so too does the likelihood of receiving an incarceration sentence. Perhaps most notable is the sharp rise in likelihood of incarceration from zero to five days for the medium- and high-risk groups. Both groups see at least a 20% increase in the likelihood of incarceration in that range.

Figure 5. Effects of detention dosage on likelihood of incarceration by risk level

Likelihood of longer sentences. Examining the relationship between detention dosage and longer sentences, we again used the weighted dosage categories. Figure 6 depicts the average months sentenced for both probation and incarceration sentences, with elongated confidence intervals, from weighted ordinary least squares regressions. As shown, there is not a notable relationship between time in detention and longer probation sentences. In contrast, some significant relationships were found among the dosage categories within incarceration sentences. While zero to 30 days in detention were found to be not significant, 31-40 days and 91 days or more were found to be significantly increasing the likelihood of incarceration. The same patterns were reflected when breaking out risk levels, with no significant differences between the risk levels.

Figure 6. Effects of detention dosage on months sentenced by sentence type

Discussion

Within the context of JRI, Oregon has made concerted efforts to reduce the frequency and length of offender prison sentences. Given the nationwide concerns that the overuse of pretrial detention may result in more severe sentencing outcomes for criminal defendants, several Oregon counties have expressed a desire to reform their use of pretrial detention. Given this interest, the CJC contracted the Principal Investigators to review the literature on the impacts of pretrial detention and to evaluate the effect that pretrial detention has on sentencing outcomes in nine of Oregon's counties. ***The findings of this evaluation suggest that the CJC should explore options to help counties reduce their use of pretrial detention and continue to prioritize research that may help the state achieve its JRI goals.***

Prior scholarship consistently reports that detained defendants are at a greater likelihood for being incarcerated and receiving a longer custodial sentence than those who are released prior to sentencing (Dobbie et al. 2018; Gupta et al., 2016; Heaton et al., 2017; Leslie & Pope, 2017; Lowenkamp et al., 2013; Oleson et al., 2014; Oleson et al., 2017; Sacks & Ackerman, 2014). The current body of research, however, is unfortunately limited primarily to regression-based analyses (Bechtel et al., 2016). Such approaches overlook the importance of selection bias in the decision-making processes of pretrial detention. That is to say, that judicial and prosecutorial discretion are not being modeled in these methods to isolate the impacts of pretrial detention. To address the methodological shortcomings of this prior literature, we employ PSM coupled with regression to evaluate the impact of pretrial detention on sentencing outcomes. This choice of statistical analysis

is important because research shows that PSM (particularly the two types used here) is an effective strategy for approximating the effects of RCTs (Campbell & Labrecque, 2018). The current study also helps advance knowledge in this area by assessing the impact of pretrial detention *and* the length of time spent in detention on the sentencing outcomes. This is also the first known investigation of the impact of pretrial detention on probation sentence length and to occur in Oregon.

Summary of findings. Overall, the findings of this evaluation suggest that reducing the use of pretrial detention in Oregon may have multiple benefits for the state, including reducing jail and prison admissions, decreasing financial costs of incarcerating inmates, and improving offender and community outcomes. The results of this study suggest that *with all else being equal, defendants detained during their trial period were more than twice as likely to be incarcerated as part of their sentence*, *but were not more likely to receive a longer incarceration or probation sentence than those who were released into the community prior to sentencing*.[10] These effects are most apparent when examined across criminal risk to reoffend. Across all risk levels (low, medium, and high), being fully detained significantly increased the likelihood of being incarcerated. This is particularly important for low-risk defendants. The results from our analysis indicate that *given two otherwise average and equal defendants who are low-risk to reoffend—one fully detained pretrial and one released—the one fully detained is 21% more likely to receive an incarceration sentence*. Similar findings emerged when examining the duration of time spent in pretrial detention, or the "detention dosage". According to our analyses, *all else equal, the longer someone spent in pretrial detention the higher the likelihood s/he was for receiving an incarceration sentence*. This trend is also reflected and amplified across risk levels; however, when held for longer than 91 days, the likelihood of incarceration increases regardless of risk.

While several aspects of pretrial detention predicted the likelihood of receiving an incarceration sentence, it largely did not influence the number of months to which someone was sentenced to either incarceration or probation, even across risk level. The only caveat to this is the time spent in pretrial detention. Our analysis revealed that *those who spent between 31 and 40 days, as well as more than 91 days in pretrial detention had a significantly higher likelihood of receiving longer incarceration sentences*. This spike following the one-month mark may be due in part to courtroom scheduling and procedures. That is, one's trial date may be set a number of weeks following the initial arraignment and preliminary hearings (i.e., the 31 to 40-day mark). It is also probable that prosecutors use jail as leverage to encourage guilty pleas. After spending one month in jail, inmates may be more likely to take whatever sentence they can to be transferred to the prison system, which offers better services and accommodations. It is also possible that inmates who stay in pretrial detention for prolonged durations (i.e., 91 days or more) may be penalized for not going with the prosecutorial flow. These inmates fail to accept the plea offer from the prosecutor and as such the prosecutor may then seek a more severe sentence. Probation sentence length appears to remain stable regardless of pretrial detention. This is likely due to the fact that there is relatively little

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[10] It is important to note that the matching sequence removed 844 (24%) cases (573 released, and 271 fully detained) from the analysis due to not being able to find a match. These cases were examined separately and in comparison to the 2,546 matched cases because there may be something unique about these cases that could change the results. Upon inspection, the unmatched cases presented a higher proportion of those who were fully detained received incarceration sentences (80.4%). Similarly, those who were released were much more likely to receive probation (88.7%). Together, these would exacerbate or inflate the effects of pretrial detention if they remained in the sample used for the analysis.

variation in probation sentences, as most people (approximately 87% of the probation sample) receive a flat 18-, 24-, or 36-month term.

As with any research, the results of this investigation should not be interpreted without considering its limitations. Some measures have inherent limitations due to the way they are collected. For instance, information on failure to appear (FTA) has the potential to sway a judicial decision for full pretrial detention versus release. However, FTA data is not commonly collected across all counties unless it is a formal conviction. Thus, our reliance on FTA convictions is a conservative estimate of the detention decision-making process. That being said, the measures used here were given careful consideration with this in mind. As our measures closely align with those used in prior literature, we are confident that our findings provide an accurate, though conservative, estimate of the effects of pretrial detention.

Implications

Limiting pretrial detention. The general purpose of pretrial detention is to ensure that defendants are present for their court date while also protecting the public from the commission of other crimes as they await trial. While pretrial detention in these nine Oregon counties may be achieving these goals, when considering the findings of this study it appears that its use may also be unnecessarily increasing the use of incarceration. Given the aim of JRI, such increases in the likelihood of incarceration sentencing run counter to the goals of the state. Granted, we are not arguing that relying on pretrial detention and later incarceration is a deliberate decision by judges and prosecutors. There may be a host of reasons for why these findings suggest pretrial detention increases incarceration probabilities, all of which are outside of the scope of this study. For instance, our findings on the relationship between increased length of incarceration sentences with longer stays in pretrial detention seem to align with recent research on plea bargaining. Some scholars have noted how pretrial detention could be used to encourage defendants to accept sentences of incarceration or longer sentences because they desire to leave the jail (Petersen, 2019). Such use would be outside of the general purview of pretrial detention. This remains an area for future research. What can be concluded from our study, however, is that pretrial detention ought to be limited to cases in which it is deemed absolutely necessary. That is, holding defendants for longer than 30 days should follow more of a targeted or selective application so that it does not increase the likelihood of jail and prison sentences and overall use.

Beyond our findings, other studies have noted a host of other problematic outcomes related to pretrial detention. Research has shown that defendants placed in pretrial detention may be at increased risk for losing their employment status, financial situation, residential stability, and other family obligations (Holsinger, 2016), as well as committing post-release recidivism in the community (Kim, Chauhan, Lu, Patten, & Smith, 2018). Studies also suggests that extended stays in pretrial detention at local jails, may have an adverse effect on one's experience when transferred to prison (e.g., increase in rule violations during the early part of one's commitment; Toman, Cochran, & Cochran, 2018). Yet another concern about the use of pretrial detention is that justice officials may base their decisions to detain in part on the extra-legal characteristics of defendants. For example, some highlight that men are more likely to be detained before trial than women, and Black and Hispanic offenders are more likely to be detained before trial than White offenders (Demuth, 2003; Demuth & Steffensmeier, 2004; Pinchevsky & Steiner, 2016; Schlesinger, 2005;

Wooldredge, 2012). While each of these aspects related to pretrial detention require more investigation, especially in Oregon, this was not the focus of our examination, and they remain areas for future academic inquiry.

Pretrial risk assessments. One viable strategy for targeting and minimizing the use of pretrial detention, while also maintaining public safety, is to apply the risk-need-responsivity (RNR) framework to the pre-adjudication process. The RNR model posits that criminal behavior is predictable when valid risk assessments are used (*risk principle*), criminal risk can be modified by altering one's dynamic crime-producing factors, or criminogenic needs (e.g., antisocial personality, antisocial cognitions, antisocial associates; *need principle*), and treatment interventions work best when matched to the individual learning style, motivation, abilities, and strengths of the offender (*responsivity principle*; see Bonta & Andrews, 2017). The use of an actuarial risk assessment instrument during the pre-adjudication process (i.e., pretrial risk assessment) would provide officials with an evidence-based strategy for ensuring that the highest risk defendants are held in pretrial detention, while the lower risk defendants can remain in the community during their trial period where they could continue to work, provide for their families, and prepare for their case (Bechtel, Lowenkamp, & Holsinger, 2011).

There is good reason to anticipate that the use of a pretrial risk assessment would benefit Oregon counties. Research has documented that these risk instruments can predict failure to appear for a court appearance, violations of pretrial conditions, and new criminal behavior (Cadigan & Lowenkamp, 2011; Laura and John Arnold Foundation, 2013; Lowenkamp, Holsinger, & Dierks, 2018; Lowenkamp & Whetzel, 2009; Milgram, Holsinger, Van Nostrand, & Alsdorf, 2015). Furthermore, the information from these assessments can serve additional benefits, including the level of supervision required in the community during pretrial release, what conditions to impose on offenders during their pretrial release supervision, and what programs or interventions to target if convicted to reduce their propensity toward criminal behavior.

Although some scholars warn about the potential for discriminatory biases in the use of pre-adjudication risk instruments for sentencing purposes (Angwin, Larson, Mattu, & Kirchner, 2016), the research on validated pretrial risk instruments have shown support for these tools across gender and race categories (Cohen & Lowenkamp, 2018). Nevertheless, there is an inherent need with any tool used to make justice related decisions to ensure that its administration does not create biases (Chouldechova, 2017). Most importantly, when aiming to develop or implement a pretrial risk assessment to aid in streamlining pretrial detention decisions, it is of critical importance that the assessment have two traits: (1) It is based on measures that are theoretically and practically predictive of the outcome of interest, and (2) that outcome of interest is specifically related to the pretrial process (i.e., failure to appear, pretrial conditional violation, or pretrial re-arrest).

Understanding judicial discretion. Lastly, the findings of our study highlight the need for future research to examine the nuances of the decision to detain someone pretrial. This issue reverberates throughout the literature on pretrial detention/release. Current examinations, including this one, rely heavily on the use of administrative data from various agencies (e.g., the courts and corrections). Such measures were not designed to capture informal decision-making like that related to pretrial detention and plea-bargaining. This shortcoming is illustrated in the potential sensitivity of our findings in the 1-1 match. After completing the initial 1-1 match, we conducted

a sensitivity analysis as laid out in the literature on PSM (see Rosenbaum, 2005). The analysis suggested some measures unaccounted for in our study likely still exist that models the decision to fully detain a defendant slightly better than the measures used here. That said, identifying such measures requires a qualitative study that involves in-depth interviews with judges and prosecutors, followed by further quantitative data collection.

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Appendix. Descriptive characteristics of the nine counties

	Clackamas (N = 424)	Clatsop (N = 115)	Columbia (N = 91)	Coos (N = 44)	Deschutes (N = 576)	Klamath (N = 304)	Lincoln (N =166)	Multnomah (N = 1,504)	Yamhill (N = 168)
Demographics									
Male	77.4 %	75.7 %	71.4 %	79.5 %	72.7 %	70.7 %	67.5 %	77.1 %	76.8 %
White	83.4	93.9	98.9	95.5	86.5	76.8	86.2	64.1	84.8
Black	6.9	0.9	0.0	2.3	2.3	4.2	1.8	21.6	0.0
Hispanic	5.8	3.5	0.0	0.0	7.8	8.2	2.4	8.9	11.7
Other race	3.9	1.7	1.1	2.3	3.4	10.8	9.6	5.4	3.5
Mean age at disposition (SD)	33.7 (10.6)	36.2 (11.5)	36.9 (11.4)	37.2 (9.8)	36.1 (11.3)	36.1 (10.9)	35.2 (11.3)	35.7 (10.6)	35.5 (10.8)
Detained pretrial	69.1 %	32.2 %	54.9 %	40.9 %	39.2 %	25.7 %	48.2 %	45.5 %	45.8 %
Mean days detained (SD)	40.9 (51.1)	45.7 (73.0)	45.2 (45.6)	20.8 (38.0)	33.0 (41.1)	35.2 (46.0)	41.3 (43.2)	60.5 (76.5)	34.1 (36.6)
Most serious charge type									
Driving	13.7 %	7.8 %	13.2 %	4.5 %	13.7 %	5.6 %	12.7 %	5.1 %	11.3 %
Drug	12.7	15.7	11.0	11.4	27.6	18.4	19.9	18.8	20.2
Person	0.0	1.7	2.2	4.5	2.6	3.0	0.6	5.7	3.0
Property	73.6	73.9	68.1	77.3	50.3	70.4	63.3	66.6	60.7
Mean number of charges (SD)	4.0 (3.7)	4.2 (4.2)	4.2 (5.8)	3.1 (2.4)	4.1 (4.2)	3.6 (3.2)	4.0 (4.6)	4.2 (4.4)	4.8 (8.4)
PSC risk level									
Low	35.6 %	50.4 %	59.3 %	45.5 %	49.0 %	58.6 %	58.4 %	52.3 %	51.8 %
Medium	24.5	27.0	20.9	22.7	23.3	22.0	21.7	26.4	22.6
High	39.9	22.6	19.8	31.8	27.6	19.4	19.9	21.3	25.6
Sentencing outcomes									
Incarceration	56.8 %	41.8 %	27.5 %	50.0 %	45.1 %	36.5 %	39.1 %	32.8 %	44.0 %
Prison	45.0	32.2	23.1	47.7	30.7	31.9	28.3	30.1	36.9
Jail	11.8	9.6	4.4	2.3	14.4	4.6	10.8	2.7	7.1
Probation	43.2	58.3	72.5	50.0	54.9	63.5	60.8	67.2	56.0
Mean incarceration sentence (SD)	11.1 (10.7)	8.1 (6.6)	12.0 (8.5)	14.5 (6.7)	8.0 (7.2)	10.7 (7.2)	11.5 (8.3)	13.4 (7.8)	13.3 (7.6)
Mean prison sentence (SD)	23.4 (15.2)	24.2 (15.9)	17.7 (13.7)	29.7 (19.8)	15.2 (10.2)	19.9 (12.2)	27.1 (27.1)	22.6 (20.0)	20.0 (12.1)
Mean jail sentence (SD)	4.1 (8.14)	1.7 (1.2)	2.2 (1.5)	1.0 (—)[a]	2.0 (2.3)	1.9 (2.9)	5.7 (3.1)	2.9 (2.8)	3.8 (1.8)
Mean probation sentence (SD)	15.2 (9.9)	10.8 (6.1)	13.7 (8.0)	15.9 (5.3)	11.8 (6.7)	12.5 (6.4)	13.8 (8.6)	14.7 (7.2)	15.8 (6.5)

Note: [a] Could not calculate SD because N = 1.

[a] Length of sentence measured in months.