'Diversion, a deterrence to delinquency?' The impact of Florida's Juvenile Civil Citation Program on recidivism

Tessie Krishna*

Abstract

Florida's Juvenile Civil Citation Program, implemented in a staggered fashion across counties, allows police officers to choose to divert first-time misdemeanants from coming into contact with the formal juvenile justice system by substituting a Civil Citation (akin to a traffic ticket) for arrest. Upon successful completion of the citation rehabilitation program, the citation is erased without entering the criminal record. I use the implementation of the Civil Citation Program across counties in Florida to explore whether diversion affects juvenile recidivism. Using data collected from the Florida Department of Juvenile Justice and a combination of standard and dynamic difference-in-differences, ordinary least squares, and instrumental variable estimators, I find the Civil Citation Program is associated with a decline (of 15-57% over baseline means) in juvenile recidivism. Among those eligible, the citation-receiving juveniles are 32-38% less likely to recidivate compared to those who were eligible but did not receive the citation.

I. Introduction

Like most other states during the 'Get tough' era of the 1980s and early 1990s, Florida undertook a massive overhaul of its juvenile judicial system. What separates Florida from the other states, however, is the juvenile justice reforms that were passed in the legislation since the late 1990s to re-emphasize rehabilitation rather than punitiveness. One of the most well known and popular among those is Florida's Juvenile Civil Citation Program, which recommends that law enforcement officers issue a Civil Citation to a juvenile committing first-time misdemeanors instead of arresting them.[1] The program rewards successful participants by keeping their criminal record clear. Initially an innovation of Miami-Dade County in 2007, the Juvenile Civil Citation Program was also implemented by twelve other counties between the years 2007 and 2010. The success of the Juvenile Civil Citation Program in these counties in terms of cost effectiveness and public safety levels prompted the Florida Legislature in 2011 to recommend (but not mandate) that other jurisdictions in the state also use Civil Citations or create similar diversion programs (Committee Substitute for House Bill No. 997).

In this paper, I explore whether Florida's Juvenile Civil Citation Program reduced juvenile recidivism. Diversion to this program has several mechanisms that would lower recidivism: appropriate assessments, access to evidence-based services, absence of stigma and discrimination a criminal record might lead to (Freeman 1991; Heller et al. 2015; Shah & Strout 2016). At the same time, a juvenile might view the citation as a mere slap on the wrist and could be lulled into a false sense of immunity from serious punishment (Levitt 1998; Lee & McCrary 2009; Arora 2023).

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[1]Refer Figure A.1 in the Appendix for a citation form example

The staggered adoption of Florida's Juvenile Civil Citation Program provides several challenges for identification. First, each county decides whether and when they would like to adopt the citation program. To address this non-random treatment assignment caused by potential self-selection of counties into the program, I use difference-in-differences as an identification strategy. Second, the treatment effect of the program might vary across both the counties as well as each of the years in the post-treatment period. To address this potential heterogeneity in treatment effects, I use the event study design along with other staggered difference-in-difference estimators such as Callaway & Sant'anna (2021) and Sun & Abraham (2021). Third, not all juveniles eligible for citations received citations. There is a certain amount of discretion exercised by the law enforcement officer when deciding whether to give a juvenile a citation instead of arresting them. To address this issue of selection endogeneity, I use an instrumental variables estimator by instrumenting receiving a citation with the intensity of citation implementation of the county in that quarter.[2] All the estimators are measured at the individual level. I estimate the net effect of the reform on first-time misdemeanants eligible for citation and find that, depending on the comparison group, Florida's Juvenile Civil Citation Program leads to a decrease in recidivism amongst juveniles between 15 and 57%. Among juveniles eligible for citation, the recidivism rates of the juveniles who actually received the citation are on average 32-38% lower compared to those who were eligible but did not receive the citation.

Deterrence is a popular choice theory that states that even the threat of punishment prevents people from offending. In the Civil Citation Program, there is a change in the levels of deterrence. Although the juvenile may view a higher probability of getting a citation over being arrested as a reduction in deterrence, once diverted, they would

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[2]Discussed in more detail in the methodology and results sections

view the program requirement for them to remain crime-free for a year as an increase in deterrence. The net change in their deterrence levels is unclear. Incapacitation is another criminology theory that suggests that reductions in crime levels also come from the literal incapability of offending by people who are incapacitated either due to being incarcerated or otherwise occupied. By virtue of not being detained or committed to residential facilities, the program may lead to a reduction in the incapacitation effect. However, the requirement of community service hours and attendance to intervention-based services leads to an increase in the incapacitation effect. The net change in incapacitation levels in this case is still unclear. My paper studies the net effect of these changes on recidivism rates. The results of the current literature on the effects of incapacitation and deterrence are quite mixed (Mocan & Rees 1999; Jacob & Lefgren 2003; Imai, Katayama & Krishna 2006; Bayer, Hjalmarsson & Pozen 2009; Lee & McCrary 2009; Aizer & Doyle 2013; Heller et al. 2015; Eren & Mocan 2017). This implies that the efficacy of incapacitation and deterrence effects may depend on the circumstances in which they are used. To the best of my knowledge, there is no paper that provides a quantitative report on the causal impact of the Civil Citation Program on juvenile recidivism.

This paper contributes to the growing literature on the impact of justice reforms in the economics of crime; specifically, it attempts to answer whether diverting first-time offenders from the juvenile justice system and addressing their needs affects future recidivism rates of those juveniles. Kuch (2016) provides a comprehensive analysis of the variation in the implementation of Civil Citation as a form of diversion between counties in Florida. Most closely related to my work is a paper by Nadel et al. (2019) that also studies the same policy and investigates the effect of the citation program

on recidivism rates using logistic regressions and finds that juveniles receiving citations were 54% less likely to reoffend than those arrested. What separates my contribution from Nadel et al. (2019) is the multiple methodologies used in this paper to address the potential selection bias (who receives citations vs. who does not), potential heterogeneous treatment effects, complications arising from staggered implementation spanning more than a decade (Miami-Dade County as early as 2007, Calhoun as late as 2019 and Bradford has not taken it up until now/2023) when examining the effect of the reform on recidivism. I employ a variety of difference-in-differences estimators with multiple comparison groups as well as instrumental variables estimators, all including fixed county and year effects, to address the selection issues discussed above.

Mears et al. (2016) talk about the potential benefits and costs associated with diversion programs in general, using the Civil Citation Program as a case study. They argue that, while the intention of a diversion program may be good, whether it overall ends up benefitting or harming the juveniles depends on its implementation. I find that my results also echo Mears et al. (2016), where the highest reductions in recidivism rates are also in counties with the highest citation implementation rates as well. [3]

The structure of the rest of the paper is as follows. Section II provides background on the Civil Citation Program, and Section III lays out the empirical strategies employed to obtain the results. Section IV describes the data used along with summary statistics on demographics and recidivism, and Section V contains the results. Section VI concludes

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[3]To address the heterogeneity in implementation, as well as selection bias among juveniles who received citation and those who did not, I use the leave-out means of intensity of citation implementation ($\frac{total\ number\ of\ citations - 1}{total\ number\ of\ eligible\ juveniles\ - 1} \times 100$) per quarter per county as an instrumental variable for receiving a citation. Refer to Figure A.2 for the quarterly citation implementation rates by county

the paper with a discussion of the limitations of the current paper and scope for future research.

II. Florida's Juvenile Civil Citation Program Details

In 2007, Miami-Dade County implemented the Civil Citation Program, and a few other counties followed suit. The Civil Citation Program recommended that law enforcement officers issue a citation instead of arresting a juvenile for first-time misdemeanor offenses. This innovation thus introduced a new enforcement option and made it the default for a subset of offenders. In 2011, the state passed a legislative bill that recommended, not mandated, the use of Civil Citations statewide.[4]

Civil Citations are an option available for first-time misdemeanants. Any juvenile without a history of arrest whose offense/s is/are misdemeanors only is eligible to receive a Civil Citation, instead of being formally processed or arrested.[5] The citation itself can be offered by the law enforcement officer directly upon contact with the juvenile or during the intake process at a Juvenile Assessment Center or a similar processing office. All counties along with Miami-Dade County that implemented Civil Citations prior to 2011 included an arrest record that would be expunged on the successful completion of the program. After 2011, there is no arrest record created upon the issue of a citation. After successful completion of the program, the citation is cleared and this history is kept separately with the Florida Department of Juvenile Justice (FDJJ) to ensure that no outsiders can have access to this information.[6] This also removes any chances of

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[4]In 2015, the government passed legislation again that recommended expansion in the use of Civil Citations up to a count of 3. I do not study the effect of this expansion in this paper.

[5]Counties have the discretion to exclude eligibility for certain offenses

[6]Law enforcement officers can access citation history under certain circumstances.

discrimination against a juvenile's employment or housing application on the basis of their citation history (Shah & Strout 2016).

Once a juvenile receives a citation, it generally involves a couple of services and/or sanctions. Parents/guardians of juveniles also have to acknowledge and accept the citation and its requirements since the juvenile is still a minor.[7] While the citation details and its specific requirements may vary from offense to offense, juvenile to juvenile, and county to county, overarchingly, there are four types of requirements for successful completion to discharge of citation - community service, intervention services based on the juvenile's needs (mental health services, substance abuse treatments, etc.), other services/sanctions (such as restitution or written apology to the victim) and no subsequent arrests within one year of the date of citation referral. Only if the juvenile has completed all the requirements of the Civil Citation Program does the juvenile's record get expunged. As soon as any of the terms of the citation are violated, the charges against the juvenile will be reopened to be formally processed.

There are two ways in which the Civil Citation Program would constitute a diversion. First, for a juvenile to even receive a citation, they must admit guilt for the offense. If not, they cannot receive a citation and will be formally processed instead, which puts the juvenile in contact with the juvenile justice system during the adjudication process. By admitting guilt, they now do not come into contact with any justice system at all and instead only have to go to the community-based provider to which they have been referred in their citation. Second, by expunging the criminal history upon successful completion of the citation, this program provides juveniles with an opportunity to begin anew, and

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[7]Fewer than 3% of parents/guardians decline the citation

if they commit another offense, they will not be subject to more severe punishments because they are viewed as repeat offenders (Kuch, 2016).

III. Empirical strategy

I employ multiple strategies to measure the effect of the Civil Citation Program on juvenile recidivism across counties in the state of Florida. Difference-in-differences (both standard and staggered), ordinary least squares, and instrumental variables are some of the estimators employed in this paper. I also explore different types of effects of the program. For starters, not every juvenile eligible for citation was given a citation. So when analyzing the effect of the reform, I consider all the citation-eligible juveniles, not just the juveniles that received the citation, i.e., I examine the intent-to-treat (ITT) effect of the reform. Once I have the ITT effect of the program, I explore whether there is an impact of receiving a citation among citation eligible juveniles, that is, the average treatment effect on the treated (ATET/ATT). The following is a detailed explanation of each of the methodologies used to estimate the ITT as well as ATT effects of the Civil Citation Program on recidivism. Recidivism is defined as any subsequent contact with the justice system within Florida within two years of initial referral/contact. It is more typical to define recidivism over shorter spans, such as six months or one year. However, since the juvenile receiving the citation must remain crime-free for a year, I am measuring recidivism within two years of the initial contact to differentiate the effect of the reform from the deterrence caused by the program's requirement.

III.1 *Measuring the intent to treat effect*

Table 1: Treatment & Comparison groups (Intent-to-treat effect

Treatment Groups (Citation eligible juveniles)	Comparison Groups	
	Citation ineligible first-time offenders	Citation eligible juveniles
Miami-Dade (2004-2011)	Miami-Dade (2004-2011)	Untreated Counties (2004-2011)
Treated Counties (Years since treatment $\epsilon\{-3,3\}$)	Treated Counties (Years since treatment $\epsilon\{-3,3\}$)	Untreated Counties (2004-2013)

I utilize several comparison groups to measure the ITT effect of the program as shown in Table 1. First, I estimate the effect of the program on first-time misdemeanants eligible for citations in Miami-Dade County compared to first-time offenders ineligible for citations in Miami-Dade County.[8] Next, I compare juveniles eligible for citations in Miami-Dade County with juveniles eligible for citations from untreated counties.[9] Miami-Dade County was not the only county to implement the Civil Citation Program. Eleven other counties also implemented the program by the year 2009. I consider these 12 counties to be the treated counties for my analysis going forward.[10] I then repeat the above analysis (for Miami-Dade County) with the counties that implemented the citation program by 2009 as the treatment group.[11] It is important to note here that all treated counties implemented the program at different times.

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[8]The first-time ineligible offenders would be those committing felonies or misdemeanors that were deemed an exception for the program eligibility such as sexual offenses, firearms related offenses, etc.

[9]For my analysis, I consider the 19 counties that did not implement Civil Citation Program until 2013 as the untreated counties

[10]This is to ensure that the 4-year follow up period is not overlapping with the untreated counties starting treatment

[11]First, I compare the first-time misdemeanants eligible for citations of the treated counties with citation-ineligible first-time offenders of the treated counties. Then, I compare the juveniles eligible for citation from treated counties with the juveniles who would have been eligible for citation but are from untreated counties

For all of these comparisons, I initially employ an event study design to estimate the year-wise effect, the equation for which is given below:

$$Y_{i,g,t} = \alpha + \Sigma_{k=T_0}^{-2} \delta_k \times treat_{g,k} + \Sigma_{k=0}^{T_1} \delta_k \times treat_{g,k} + \theta X_{i,g,t} + \lambda_t + \phi_c + \epsilon_{i,g,t} \qquad (1)$$

where, $Y_{i,g,t}$ is the recidivism rate of individual i from county g in the year t,[12] $treat_{g,k}$ is a dummy variable, that turns 1 when the number of periods to treatment for the observation is the same as k when compared to the county's first treated period, otherwise stays 0 and is also 0 for all never-treated counties, T_0 is the lowest lead and T_1 is the highest lag to consider surrounding the treatment period. $X_{i,g,t}$ are controls which include age, sex, race, ethnicity, and crime type, λ_t and ϕ_c are year and county fixed effects.

I also use a standard difference-in-differences estimator accounting for county and year fixed effects to estimate the average intent-to-treat effect of the Civil Citation policy in Miami-Dade County, as well as the treated counties group.[13] The estimating equation is as follows:

$$Y_{i,t} = \alpha + \beta Treat_i + \gamma Post_t + \delta(Treat_i \times Post_t) + \theta X_{i,t} + \lambda_t + \phi_c + \epsilon_{i,t} \qquad (2)$$

where, $Y_{i,t}$ is the recidivism rate of a juvenile i in the year t,[14] $X_{i,t}$ are controls which include age, sex, race, ethnicity, and crime type, $Treat_i$ is an indicator variable for the

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[12]Recidivism here is defined as any subsequent contact with the justice system within two years of initial referral date

[13]It is an intent-to-treat effect because even after the policy has been implemented, not every juvenile eligible for citation ends up receiving it. Later, I leverage an instrumental variables estimator to estimate the impact on juveniles who actually receive the citation

[14]Recidivism here is defined as any subsequent contact with the justice system within two years of initial referral date

juveniles eligible for the program, $Post_t$ is the indicator variable for (upto four years) period after Civil Citation Program implementation, δ is our coefficient of interest, λ_t & ϕ_c are year and county fixed effects.[15]

For all regressions that compare estimates across counties, standard errors have been wild-cluster bootstrapped at the county level. For the regression that examines the intent-to-treat effect within Miami-Dade County, standard errors are robust. As additional robustness checks, I also use the staggered difference-in-differences estimators using Callaway & Sant'anna (2021) and Sun & Abraham (2021)'s methodologies. Another advantage of these estimators is that they allow me to include all counties treated by 2018 in my treatment group.

III.2 *Measuring the average treatment effect on treated*

Table 2: Treatment & Comparison groups (Average treatment effect on treated)

Treatment Groups (Citation eligible juveniles who received citation)	Comparison Groups (Citation eligible juveniles who did not receive citation)
Miami-Dade (2007-2011)	Miami-Dade (2007-2011)
Treated Counties (Years since treatment $\epsilon\{0,3\}$)	Treated Counties (Years since treatment $\epsilon\{0,3\}$)

Because the Civil Citation policy is a recommendation and not a mandate, the decision to arrest a juvenile or issue a citation is dependent on the law enforcement officers' discretion. Not all juveniles eligible for citations end up receiving them. I also measure the impact of receiving a citation among citation eligible juveniles, that is, the average treatment effect on treated. I do this analysis for Miami-Dade County separately, and for all treated counties together (including Miami-Dade County) as shown in Table 2.

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[15]No county fixed effects are used when measuring the ITT effect within Miami-Dade County.

First, I estimate the quarter-wise effect of receiving a citation on recidivism using year- and county-fixed effects (if applicable) in a linear regression. I also use ordinary least squares estimator accounting for year and county fixed effects for an average effect with the below equation:

$$Y_{i,t} = \alpha + \delta Citation_{i,t} + \theta X_{i,t} + \lambda_t + \phi_c + \epsilon_{i,t} \tag{3}$$

where, $Y_{i,t}$ is the recidivism rate of a juvenile i in a year t,[16] $X_{i,t}$ are controls which include age, sex, race, ethnicity, and crime type, λ_t and ϕ_c are year and county fixed effects, and $Citation_{i,t}$ is an indicator variable that turns 1 if the juvenile received a citation.

Since there is discretion involved in the decision by the law enforcement officer of who receives a citation and who does not, instead of using a citation indicator variable directly that might lead to potential bias in the regression, I instrument for receiving a citation with the program implementation intensity in that county in that quarter using the following measurement method:

$$Y_{i,c,q} = \frac{n(Citation\ receiving\ juveniles_{c,q}) - 1}{n(Citation\ eligible\ juveniles_{c,q}) - 1} \times 100 \tag{4}$$

where $Y_{i,c,q}$ is the citation implementation rate being measured for a juvenile i from county c who got arrested/issued a citation in the quarter q since the county implemented the program. $n(Citation\ receiving\ juveniles_{c,q})$ is the number of juveniles receiving the citation in county c in quarter q. $n(Citation\ eligible\ juveniles_{c,q})$ is the number of

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[16]Recidivism here is defined as any subsequent contact with the justice system within two years of initial referral date

juveniles eligible for citation in county c in quarter q. It is important to note here that these are leave-out means, i.e., the average citation implementation intensity of all other citation eligible juveniles in that county in that quarter not counting the said juvenile in question, that are used in the regression below.

I believe citation intensity is a good instrument to use for receiving a citation for the following reasons. If a county has not implemented the citation program, both the number of citations received and the intensity of citation implementation of that county in that quarter would be 0. If a county has implemented the citation program, then the higher the citation intensity of a county, the higher the chances of receiving a citation. From a law enforcement officer's point of view, the more other officers around him are issuing citations, the higher the chances of him issuing a citation as well. From a juvenile's point of view, since the outcome variable being measured is their recidivism rate, I do not have to worry about the citation intensity of the quarter the juvenile was arrested/issued a citation in affecting their decision to recidivate later in time (within two years) since only first-time offenses are eligible for receiving a citation.

Using implementation intensity as an instrumental variable for receiving a citation, I use the two-stage least squares estimator to estimate the impact of actually receiving a citation on recidivism, addressing selection bias in the process, if any. The first stage results of the IV estimator (also shown along with the regression results later on to address the relevance of the instrument) use the following equation:

$$1^{st} stage : Citation_{i,t} = \alpha + \beta \ Citation \ intensity_{c,q} + \theta X_{i,t} + \lambda_t + \phi_c + \epsilon_{i,t} \qquad (5)$$

where, $Citation_{i,t}$ is an indicator variable that turns 1 if the juvenile i received a citation in a year t, $Citation\ intensity_{c,q}$ is the percentage of citation eligible juveniles that ended up receiving a citation in county c in the quarter q when the juvenile i was formally processed or given a citation, $X_{i,t}$ are controls which include age, sex, race, ethnicity, and crime type, and λ_t and ϕ_c are year and county fixed effects.

IV. Data

I use data collected and shared by the Florida Department of Juvenile Justice (FDJJ). I use the Civil Citations Dataset provided by FDJJ that contains detailed information about juveniles who received citations as well as about juveniles who were eligible to receive citations but did not. I merge this data with the main arrest data set, which contains offense-level data from all juveniles ever arrested. Records contain demographic details such as sex, race, ethnicity, age, county, etc. as well as charges data such as offense, category, offense date, disposition, etc. For this paper, I define recidivism as any subsequent contact with the justice system within two years of initial referral. Although it is more common to define recidivism for shorter periods of time, such as six months or one year, since the juvenile receiving citation is required to remain crime-free for a year, I measure recidivism within two years of initial contact to separate the effect of the reform from the effect of deterrence caused by the program requirement.

For my analysis, I use data from 2000 to 2018 and include juveniles only in the age range of 10-16 years. I choose 2018 as the end of the time frame to ensure that no Covid-effects are accidentally conflated with the effect of the Civil Citation Program. I also chose to end the age range at 16 to accurately measure recidivism over two years.[17]

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[17]A 17 year old who recidivates a year later as an adult would not be present in the juvenile records

There are a total of 1,665,386 records of juvenile arrests belonging to this sample, of which 604,824 are first time offenders. Of the 604,824 first-time offenders, 382,184 were eligible for citations. It is important to note here that I created a variable to measure the eligibility of an arrest based on the offenses. This implies that, while the program was only implemented after 2007, I can track the citation eligible cases for the entire range of data set. After the implementation of the Civil Citation Program in the treated counties, of the 35,345 (9,176 for Miami-Dade County) first-time offenders who were eligible for citations in the first four years, about 13,274 (7,100 for Miami-Dade County) received the citations.[18]

Table 3: Summary statistics - Miami-Dade county and comparison groups

	Citation eligible: Miami		Citation ineligible: Miami		Citation eligible: UC	
	mean	sd	mean	sd	mean	sd
Age	14.60	(1.32)	14.51	(1.38)	14.32	(1.52)
Female	0.35	(0.48)	0.22	(0.41)	0.42	(0.49)
Black	0.53	(0.50)	0.51	(0.50)	0.34	(0.47)
Hispanic	0.43	(0.49)	0.45	(0.50)	0.14	(0.35)
Recidivism	0.35	(0.48)	0.52	(0.50)	0.36	(0.48)
Observations	14120		11921		28776	

Source: FDJJ Data. Dataset:2004-2011. UC stands for untreated counties. Counties that were not treated by 2012 are considered untreated here. Citation-Eligible juveniles are first-time misdemeanants eligible for a citation. Citation ineligible juveniles are first-time offenders who committed felony offenses or misdemeanors exempted from the list of eligible offenses for citation. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact.

Table 3 provides the demographic and recidivism statistics of citation eligible juveniles from Miami-Dade County with its comparison groups, citation ineligible first-time offenders in Miami-Dade County and citation eligible juveniles in untreated counties.[19]

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[18]Treated counties are counties that implemented the citation program by 2009.

[19]Citation ineligible juveniles are first-time offenders who committed felony offenses or misdemeanors that were exempted from the list of eligible offenses for Civil Citation. Untreated counties are counties that did not implement the citation program until 2013.

Although the average age seems consistent between all groups, women are lower in proportion among first-time offenders ineligible for citations in Miami. Black and Hispanic juveniles are lower in proportion among citation eligible juveniles in untreated counties, reflecting the difference in demographic statistics of untreated counties compared to Miami-Dade County. While the recidivism rates of citation eligible juveniles from both Miami-Dade County and the untreated counties seem similar, the recidivism rates of citation ineligible first time offenders of Miami-Dade County are much higher.

Table 4: Summary Statistics - Treated counties and comparison groups

	Citation eligible: TC		Citation ineligible: TC		Citation eligible: UC	
	mean	sd	mean	sd	mean	sd
Age	14.42	(1.45)	14.37	(1.49)	14.34	(1.52)
Female	0.42	(0.49)	0.23	(0.42)	0.41	(0.49)
Black	0.43	(0.50)	0.47	(0.50)	0.34	(0.47)
Hispanic	0.20	(0.40)	0.21	(0.41)	0.14	(0.35)
Recidivism	0.33	(0.47)	0.52	(0.50)	0.35	(0.48)
Observations	82143		50760		37280	

Source: FDJJ Data. Dataset:2004-2013. TC & UC stand for treated and untreated counties respectively. Counties that were treated by 2012 are considered treated & counties that were not treated by 2012 are considered untreated here. Citation-Eligible juveniles are first-time misdemeanants eligible for a citation. Citation ineligible juveniles are first-time offenders who committed felony offenses or misdemeanors exempted from the list of eligible offenses for citation. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact.

Table 4 compares the citation eligible juveniles of treated counties with the citation ineligible first-time offenders in treated counties and citation eligible juveniles in untreated counties. Again, the average age appears to be consistent across all groups, and females are lower in proportion among citation ineligible first-time offenders in treated counties. Black and Hispanic juveniles are lower in proportion among citation eligible juveniles in untreated counties, although by a much smaller margin compared to before.

The recidivism rates follow the same trend as before, where they are similar for citation eligible juveniles among both treated and untreated counties, but the rates are much higher for citation ineligible first time offenders in the treated counties.

Table 5: Summary Statistics - Citations received Vs eligible

| | Within | | Miami | | Within | | Treated counties | |
| | Citation received | | Citation not received | | Citation received | | Citation not received | |
	mean	sd	mean	sd	mean	sd	mean	sd
Age	14.67	(1.27)	14.52	(1.36)	14.41	(1.43)	14.42	(1.46)
Female	0.36	(0.48)	0.35	(0.48)	0.40	(0.49)	0.42	(0.49)
Black	0.52	(0.50)	0.53	(0.50)	0.46	(0.50)	0.42	(0.49)
Hispanic	0.44	(0.50)	0.42	(0.49)	0.31	(0.46)	0.16	(0.37)
Recidivism	0.23	(0.42)	0.46	(0.50)	0.25	(0.43)	0.36	(0.48)
Observations	6827		7293		20673		61470	

Source: FDJJ Data. Dataset:2004-2010 for Miami & 2004-2013 for Treated counties. Counties that were treated by 2012 are considered treated here. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact.

Table 5 compares the juveniles receiving citations in our treatment groups with the citation eligible juveniles who did not receive the citation in the respective treatment groups. All other factors seem consistent across groups, except the recidivism rates which are lower for the juveniles receiving citation compared to juveniles who were eligible but did not receive a citation irrespective of whether we are considering just Miami-Dade County or treated counties as a group. Across both Miami-Dade County and treated counties, the average recidivism rates of juveniles receiving citations are 11 to 23 percentage points lower compared to juveniles eligible for citations that do not receive them.

V. Results

V.1 *Intent to treat effect of Civil Citation Program*

V.1.A *Within Miami*

Figure 1. Recidivism rates of first-time offenders within Miami-Dade County
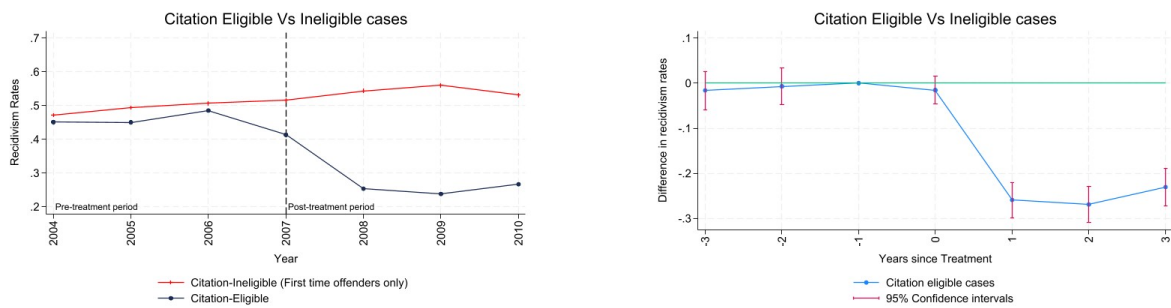
(a) Recidivism rates - Time trends   **(b)** Recidivism rates - Event study

Source: FDJJ data. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. Citation eligible juveniles are first-time misdemeanants of offenses eligible for citations. Citation ineligible juveniles are first-time offenders who committed felony offenses or misdemeanors that were exempted from the list of eligible offenses for Civil Citation. (a) shows the unconditional recidivism rate averages whereas (b) depicts the average recidivism rates conditional on covariates.

Miami-Dade County was the first county to implement the Juvenile Civil Citation Program in 2007. According to the program, all first-time misdemeanants are eligible for a citation.[20] The first thing I examine is whether there are differences in the recidivism rates of these first-time citation-eligible juveniles compared to first-time citation-ineligible offenders in Miami-Dade County before and after the implementation of the program.[21] Figure 1a shows the time trends of recidivism rates of eligible juveniles for citations compared to other first-time offenders. The three years preceding the implementation of

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[20]Miami-Dade County made offenses such as firearms/weapons related, sex related and gang related ineligible for citations. This has been taken into account when creating the list of eligible cases.

[21]These would be both first-time felony offenders as well as first-time misdemeanants that were ineligible for citations

the program show parallel trends between citation-eligible juveniles and other first-time offenders before a steep decline in the recidivism rates of citation-eligible juveniles in 2007, a trend that continues until 2011 and then evens out.

Figure 1b shows the event study, the numerical results of which are presented in Column 1 of Table 6. The effect of the Civil Citation Program is statistically insignificant in the year of implementation, but shows an annual average of 25.28 percentage points (51.57%) decline in the recidivism rates of juveniles eligible for citation compared to first-time offenders not eligible for citation.[22] I also utilize a standard difference-in-differences estimator using a single post-period coefficient to estimate the average effect of the reform on citation eligible juveniles compared to other first-time offenders. Column 2 of Table 6 shows that there is no statistically significant difference between both recidivism rates before program implementation of eligible juveniles for citations compared to other first-time offenders, as well as recidivism rates of first-time offenders ineligible for citation before and after program implementation. In the four years following the implementation of the program, the recidivism rates of juveniles eligible for citations decreased by 21.49 percentage points (43.84%) compared to other first-time offenders within Miami-Dade County.

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[22]More than half of the citation eligible juveniles did not receive citations in Miami-Dade County in 2007. On average, every year thereafter, 80- 90% of the citation eligible juveniles received a citation.

Table 6: Recidivism rates in Miami

	Within Miami		Miami Vs Untreated	
	(Citation Eligible Vs Ineligible)		(Citation Eligible only)	
	(1)	(2)	(3)	(4)
	Event study estimates	2x2	Event study estimates	2x2
Years since treatment=-3	-0.0160		-0.0220*	
	(0.02)		(0.01)	
Years since treatment=-2	-0.0069		-0.0103	
	(0.02)		(0.01)	
Years since treatment=0	-0.0152		-0.0931***	
	(0.02)		(0.02)	
Years since treatment=1	-0.2590***		-0.2354***	
	(0.02)		(0.02)	
Years since treatment=2	-0.2691***		-0.2235***	
	(0.02)		(0.02)	
Years since treatment=3	-0.2303***		-0.1748***	
	(0.02)		(0.03)	
Treat		0.0015		0.0933***
		(0.01)		(0.01)
Post		0.0490		0.0336
		(0.03)		(0.32)
Treat X Post		-0.2149***		-0.2041
		(0.01)		(0.33)
Controls	Yes	Yes	Yes	Yes
Observations	27032	27032	46143	46143
Control mean	0.4902	0.4902	0.3575	0.3575

Recidivism rates are defined as the proportion of juveniles who came in subsequent contact with the justice system within two years of initial contact. Year to treatment=0 represents the year 2007. Post is an indicator variable that turns 1 for the four years period following program implementation and 0 prior to implementation. (p-value < 0.05 - * , < 0.01 - ** , < 0.001 - ***). For columns (1) & (2): Treat is an indicator variable that turns 1 when the first-time offenders are eligible for a citation and 0 for firt-time offenders who committed felony offenses or misdemeanors exempted from the list of eligible offenses for citation. Control means are the average recidivism rates of citation-ineligible first-time offenders in Miami from 2004 to 2006. Robust standard errors provided in parentheses. For columns (3) & (4): Treat is an indicator variable that turns 1 when the juveniles eligible for a citation are from Miami-Dade county and 0 if from untreated counties (Counties that did not implement the program until 2013). Control means are the average recidivism rates of citation-eligible juveniles of untreated counties from 2004 to 2006. Wild cluster bootstrapped standard errors provided in parentheses.

V.1.B *Miami-Dade County Vs Untreated counties*

Figure 2. Recidivism rates of citation eligible juveniles in Miami-Dade County Vs. counties untreated until 2013
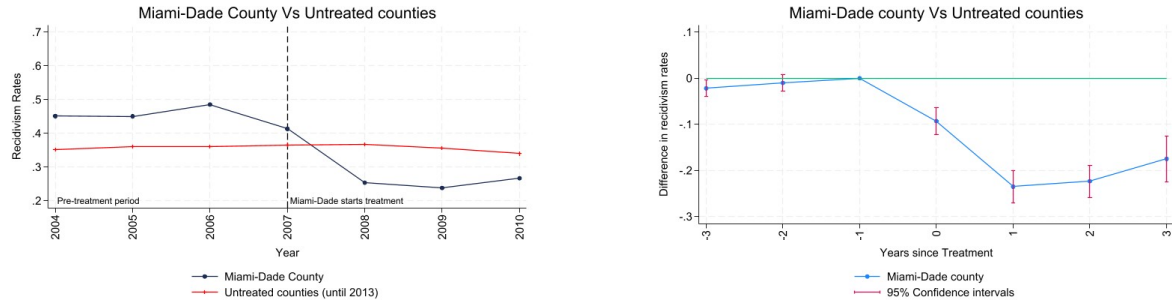
(a) Recidivism rates - Time trends   **(b)** Recidivism rates - Event study

Source: FDJJ data. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. Citation eligible juveniles are first-time misdemeanants of offenses eligible for citations. All counties that did not implement the Civil Citation Program until 2013 are counted as untreated counties here. (a) shows the unconditional recidivism rate averages whereas (b) depicts the average recidivism rates conditional on cavariates.

Now, I compare the recidivism rates of citation eligible juveniles of Miami-Dade County with those of other counties that did not implement the Civil Citation Program until 2013 and are therefore considered untreated counties. In Figure 2a, we can see that the recidivism rates of citation eligible juveniles from Miami-Dade County were, on average, higher than those of untreated counties, but run parallel until 2006. After that, the recidivism rates of citation eligible juveniles from Miami-Dade County fall below the average recidivism rates of the untreated counties and again stabilize over time.

Figure 2b shows the event study, the numerical results of which are presented in Column 3 of Table 6. The effect of the Civil Citation Program shows an annual average of 18.17 percentage points (50.82%) decline in the recidivism rates of juveniles eligible for citation from treated counties compared to the recidivism rates of juveniles

eligible for citation who are from untreated counties. Running a standard difference-in-differences estimator using a single post-period coefficient to estimate the average effect of the reform on citation eligible juveniles from Miami-Dade County compared to their counterparts in untreated counties gives us the results presented in Column 4 of Table 6. It shows that there is no statistically significant difference between the recidivism rates of juveniles eligible for citations in untreated counties before and after the implementation of the Civil Citation Program in Miami-Dade County. However, the recidivism rates of juveniles eligible for citation in Miami-Dade County, on average, are 9.33 percentage points (26.1%) higher than those of untreated counties. In the four years after the implementation of the program, the recidivism rates of juveniles eligible for citations decreased by 20.41 percentage points (57.1%) compared to juveniles eligible for citations from untreated counties, although this estimate is not statistically significant.

V.1.C *Within Treated counties*

Figure 3. Recidivism rates of first-time offenders within Treated counties
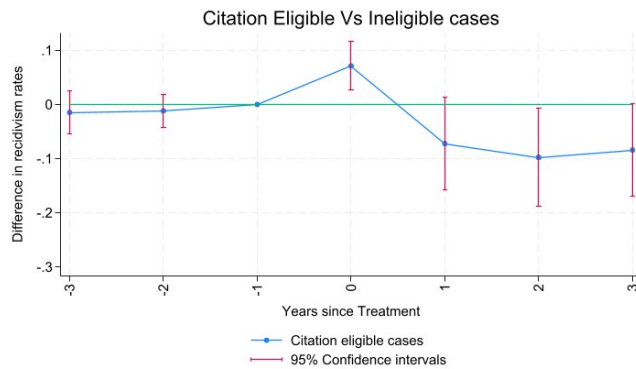
Source: FDJJ data. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. Citation eligible juveniles are first-time misdemeanants of offenses eligible for citations. Citation ineligible juveniles are first-time offenders who committed felony offenses or misdemeanors that were exempted from the list of eligible offenses for Civil Citation. Baseline means are the average recividism rates of citation ineligible juveniles.

While Miami-Dade County was the first to implement the citation program, another eleven counties also implemented the citation program by the year 2009. To examine whether the effect of the Civil Citation Program we found earlier among citation eligible juveniles in Miami-Dade County is limited to just Miami-Dade County, due to its inherent characteristics and individual policies, or if it reflects across all treated counties in a similar fashion, I now explore the effect of the reform within treated counties.

Table 7: Recidivism rates in Treated counties

|	Within Treated counties (Citation Eligible Vs Ineligible)		Treated Vs Untreated (Citation Eligible only)	
	(1)	(2)	(3)	(4)
	Event study estimates	2x2	Event study estimates	2x2
Years since treatment=-3	-0.0148		-0.0119	
	(0.02)		(0.01)	
Years since treatment=-2	-0.0117		-0.0062	
	(0.02)		(0.01)	
Years since treatment=0	0.0713**		-0.0322	
	(0.02)		(0.02)	
Years since treatment=1	-0.0723		-0.0662	
	(0.04)		(0.04)	
Years since treatment=2	-0.0977		-0.0773*	
	(0.05)		(0.04)	
Years since treatment=3	-0.0842		-0.0601	
	(0.04)		(0.04)	
Treat		-0.0915**		0.0342
		(0.02)		(0.02)
Post		0.0423*		0.0774***
		(0.02)		(0.02)
Treat X Post		-0.0763*		-0.1264***
		(0.03)		(0.03)
Controls	Yes	Yes	Yes	Yes
Observations	111915	111915	98435	98435
Control mean	0.5141	0.5141	0.3575	0.3575

Recidivism rates are defined as the proportion of juveniles who came in subsequent contact with the justice system within two years of initial contact. Year to treatment=0 represents the year in which each county implemented the program. Post is an indicator variable that turns 1 for the four-year period following program implementation and 0 prior to implementation. Wild cluster bootstrapped standard errors provided in parentheses. (p-value < 0.05 - * , < 0.01 - ** , < 0.001 - ***). For columns (1) & (2): Treat is an indicator variable that turns 1 when the first-time offenders are eligible for a citation and 0 for first-time offenders who committed felony offenses or misdemeanors exempted from the list of eligible offenses for citation. Control means are the average recidivism rates of citation-ineligible first-time offenders in treated counties from 2004 to 2006. For columns (3) & (4): Treat is an indicator variable that turns 1 when the juveniles eligible for a citation are from the treated counties and 0 if from untreated counties (Counties that did not implement the program until 2013). Control means are the average recidivism rates of citation-eligible juveniles of untreated counties from 2004 to 2006.

Figure 3 depicts the event study showing the difference in recidivism rates of citation eligible juveniles and citation ineligible first-time juvenile offenders within the treated counties. There is a spike in the recidivism rates of citation-eligible juveniles compared to citation-ineligible first-time juvenile offenders in the year of treatment. There is also a distinct decrease in the recidivism rates of citation eligible juveniles in the years following after treatment. The numerical results of the event study are presented in Column 1 of Table 7. I also use a dynamic difference-in-differences estimator using a single post-period coefficient to measure the average effect of the reform on citation eligible juveniles as compared to other first-time offenders within the treated counties. Column 2 of Table 7 suggests that in the four years following the implementation of the program, the recidivism rates of juveniles eligible for citations decreased by 7.63 percentage points (14.84%) compared to other first-time offenders within treated counties.

V.1.D *Treated counties Vs Untreated counties*

Now that we have seen the effect of Civil Citation Program within treated counties, next, I compare the recidivism rates of citation eligible juveniles between treated and untreated counties. All counties that did not implement the program until 2013 are treated as the comparison group, I do not consider any of the counties that implemented the program between 2010 and 2012 to avoid any conflation.[23] Figure 4 is an event study showing the recidivism rates of citation eligible juveniles in treated counties compared to the mean recidivism rates of citation eligible juveniles between 2004-2013 in untreated counties. The recidivism rates are almost identical in the pre-treatment period, but go down in the post-treatment period for treated counties compared to the untreated counties.

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[23]This is to ensure we get at least four years worth of data in the post-implementation period

Figure 4. Event study of treatment effect on recidivism rates of citation eligible juveniles
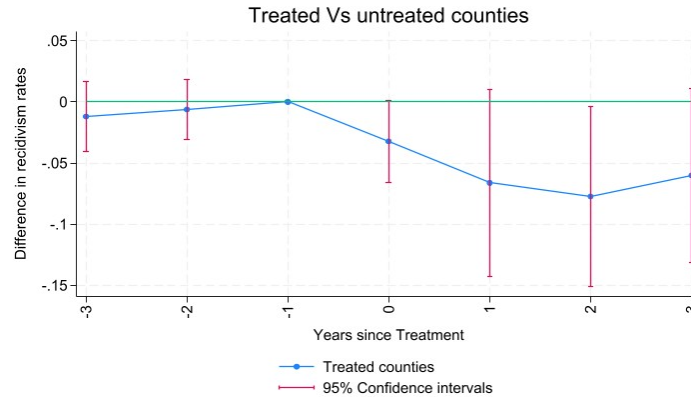
Source: FDJJ data. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. Citation eligible juveniles are first-time misdemeanants of offenses eligible for citations. All counties that implemented the Civil Citation Program by 2009 are considered treated counties. All counties that did not implement the Civil Citation Program until 2013 are counted as untreated counties here. Baseline means are the average recidivism rates of citation eligible juveniles from untreated counties.

Column 3 of Table 7 represents the numerical results of the above event study. It shows that in the years prior to treatment there were no statistically significant differences in the recidivism rates of juveniles eligible for citation between treated and untreated counties. Column 4 of Table 7 provides the average intent-to-treat (ITT) effect of the reform in treated counties using a dynamic difference-in-differences estimator. The recidivism rates of juveniles eligible for citations decreased by 12.64 percentage points (35.36%) in treated counties after the implementation of the program.

One of the limitations of the above analysis is that it assumes that the effect of the Civil Citation Program is homogeneous across counties and years. To relax this assumption and to allow for heterogeneous treatment effects, I utilize the dynamic difference-in-differences estimators by Callaway & Sant'anna (2021) as well as Sun & Abraham (2021). Another advantage of using these estimators is that I can now use all the coun-

Figure 5. Average intent-to-treat effect on recidivism rates of counties treated by 2012
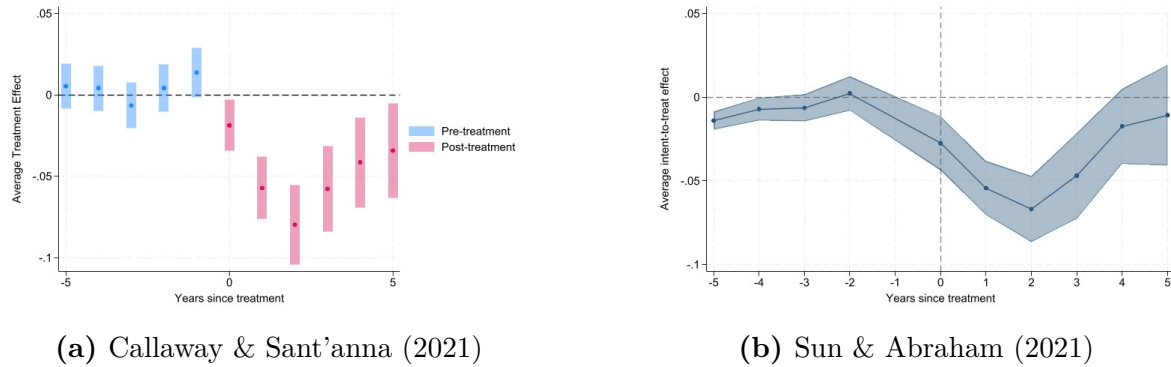
(a) Callaway & Sant'anna (2021)   **(b)** Sun & Abraham (2021)

Source: FDJJ data. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. All counties that implemented the Civil Citation Program by 2012 are considered treated counties. All counties that did not implement the Civil Citation Program until 2013 are counted as untreated counties here. Callaway & Santanna use the year in which counties implemented the program for cohort classification, i.e., all counties that implemented the program in a given year would belong to a single group. Sun & Abraham allows to choose the program implementation date that lets me define each county as a singular group.

ties that received treatment by 2012 as my treatment group.[24] These estimators enable me to estimate the average intent to treat effects of the Civil Citation Program on the recidivism rates of counties treated until 2012. Figure 5a is a visual representation of the results provided in Column (1) of Table 8 suggesting that the average intent-to-treat effect of the program among counties treated by 2012 is a decline in recidivism rates by 4.82 percentage points (13.5%). As an additional robustness check, I also utilize the event study design by Sun & Abraham (2021) that allows me to estimate the heterogeneous treatment effects shown in Figure 5b and find the results consistent across both estimators.

The last thing I do while measuring intent-to-treat (ITT) effect of the Civil Citation

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[24]Since the State legislation was passed in 2011, this allows me to measure the effect of the reform among the early adopters (counties that implemented in the first two years after legislation) along with the trendsetters (counties that implemented before legislation) and examine whether the effects persist.

Program before moving on to measuring the average treatment effect on treated (ATET), is running dynamic difference-in-differences regressions on the entire dataset, i.e., using data from 2000 to 2018, and considering all counties that got treated by 2018 as the treated group and all counties that did not get treated by 2018 as the control group.

**Table 8:** Staggered DiD - Treated Vs Untreated counties

	(1) Never-treated (Until 2012)	(2) Not-yet-treated (Until 2012)	(3) Never-treated (Until 2018)	(4) Not-yet-treated (Until 2018)
ITT	-0.0459***	-0.0470***	-0.0479	-0.0203
	(0.01)	(0.01)	(0.03)	(0.01)
Yearly Average	-0.0494***	-0.0499***	-0.0622	-0.0262*
	(0.01)	(0.01)	(0.03)	(0.01)
Group Average	-0.0344***	-0.0370***	-0.0314	-0.0134
	(0.01)	(0.01)	(0.03)	(0.01)
Post-period Average	-0.0482***	-0.0491***	-0.0482	-0.0269***
	(0.01)	(0.01)	(0.03)	(0.01)
Observations	301,335	301,335	378,539	381,755
Control mean	0.3575	0.3575	0.3812	0.3812

Recidivism rates are defined as the proportion of juveniles who came in subsequent contact with the justice system within two years of initial contact. Column (1) provides the average intent-to-treat effect of the program using counties not treated until 2013 as control group. Column (2) provides the average intent-to-treat effect of the program using counties not 'yet' treated until 2013 as control group. Column (3) provides the average intent-to-treat effect of the program using counties not treated until 2018 as control group. Column (4) provides the average intent-to-treat effect of the program using counties not 'yet' treated until 2018 as control group. ITT provides the average intent-to-treat effect of the program. Yearly Average provides the average year-wise intent-to-treat effect of the program of all the counties that have implemented the program. Group Average provides the average group-wise intent-to-treat effect of the program where each group is a cohort of counties implementing the program in a given year. Post-period Average provides the average intent-to-treat effect of the program in the period post program implementation across all counties. Control means are the average recidivism rates of citation-eligible juveniles of untreated counties from 2004 to 2006. Standard errors provided in parentheses. (p-value < 0.05 - * , < 0.01 - ** , < 0.001 - ***)

Figure 6a shows the average intent-to-treat effect of the Civil Citation Program in all counties that implemented the program by 2018 in the years following its implementation. The numerical results are displayed in Column (3) of Table 8, are consistent with

the estimates of Sun & Abraham (2021) as shown in Figure 6b and suggest a similar reduction of 4.82 percentage points in the recidivism rates of citation eligible juveniles in treated counties although this number is not statistically significant. Since the number of counties that did not implement the Civil Citation Program until 2018 is very low, I also employ the Callaway & Sant'anna estimators using the counties 'not yet' treated as the comparison group. Using the not-yet treated counties as the comparison group, I find the Civil Citation Program is associated with a decline of 4.91 and 2.69 percentage points for counties treated by 2012 and counties treated by 2018 respectively.

Figure 6. Average intent-to-treat effect on recidivism rates of counties treated by 2018
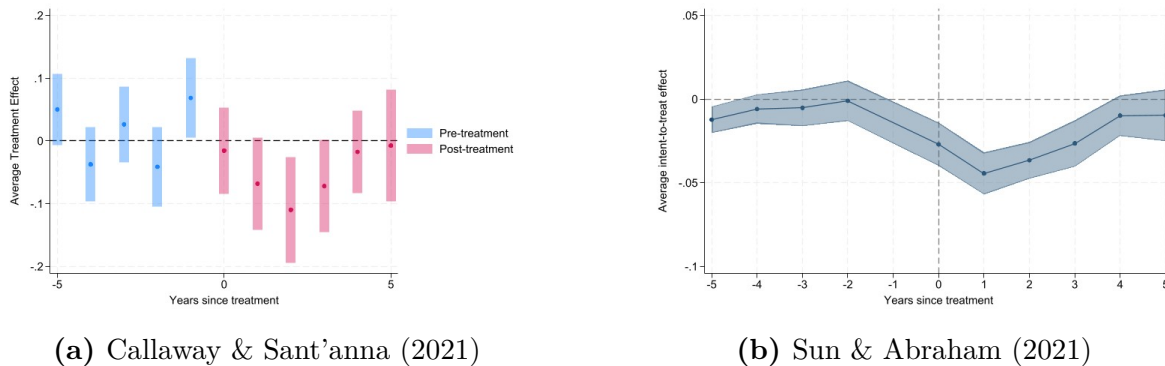
(a) Callaway & Sant'anna (2021)   **(b)** Sun & Abraham (2021)

Source: FDJJ data. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. All counties that implemented the Civil Citation Program by 2018 are considered treated counties. All counties that did not implement the Civil Citation Program until 2019 are counted as untreated counties here.Callaway & Santanna use the year in which counties implemented the program for cohort classification, i.e., all counties that implemented the program in a given year would belong to a single group. Sun & Abraham allows to choose the program implementation date that lets me define each county as a single group.

The Civil Citation Program is associated with a decline of 44-57% in the recidivism rates of citation eligible juveniles of Miami-Dade County depending on whether they are being compared against citation-ineligible first-time offenders in Miami-Dade County or the citation eligible juveniles from untreated counties. The program is also associated with a decline of 15-35% in the recidivism rates of citation eligible juveniles of treated

counties when compared against citation-ineligible first-time offenders in treated counties or the citation eligible juveniles from untreated counties. Additionally, even when the treated counties group is expanded to include counties that got treated by 2012 and 2018, there is a decline of about 4.91 & 2.69 percentage points respectively in the recidivism rates of citation-eligible juveniles in treated counties after program implementation.

Whether examining Miami-Dade County individually or the treated counties as a group, whether using standard difference-in-differences estimator or dynamic difference-in-differences estimator, the average intent-to-treat effect of the Civil Citation Program is a decline in recidivism rates and it seems to be consistent, although of smaller magnitude among treated counties compared to just Miami-Dade County. Along with measuring the average treatment effect on the treated, I also explore why this magnitude might be smaller for treated counties as a whole compared to just Miami-Dade County in the following subsection.

V.2 *Average treatment effect on the treated of Civil Citation Program*

Not all juveniles eligible for citations end up receiving citations due to discretion in the use of citation program available to law enforcement officers. While it is clear that citation eligible juveniles in treated counties show a decline in recidivism rates compared to their respective comparison groups, it is not necessarily true that this is directly due to reform. There could be other factors that reduce the rates of recidivism of these juveniles. So to examine what is driving this reduction in recidivism rates, as well as to see if there are any marked differences between the juveniles that receive the citation compared to those who do not, I explore whether the average recidivism rates of citation eligible juveniles

differ based on whether they received a citation or not. I do this for both, Miami-Dade County separately and for the treated counties group including Miami-Dade County.

V.2.A *Miami*

Figure 7. Recidivism rates of citation eligible cases within Miami-Dade County
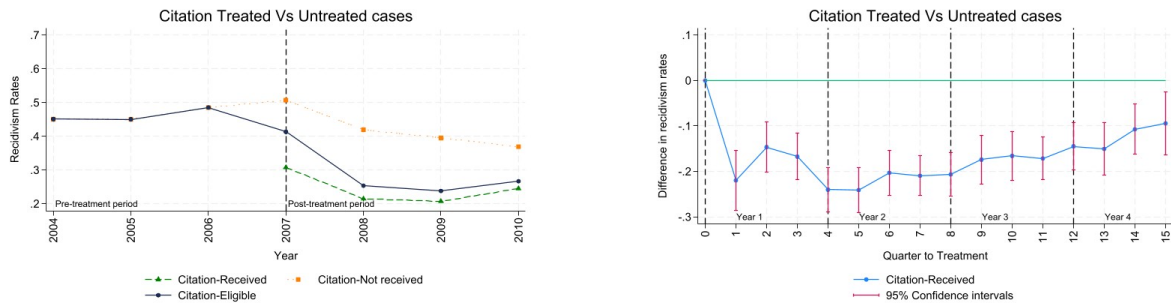
(a) Recidivism rates - Time trends   **(b)** Recidivism rates - Event study

Source: FDJJ data. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. Citation eligible juveniles are first-time misdemeanants of offenses eligible for citations. (a) shows the unconditional recidivism rate averages whereas (b) depicts the average recidivism rates conditional on covariates.

Figure 7a shows the recidivism rates of juveniles eligible for citations based on whether they received a citation or not. The recidivism rates of citation eligible juveniles lie right in between citation-receiving juveniles and non-citation-receiving juveniles for the year 2007 due to less than half of the eligible juveniles actually receiving citations. However, after 2007, the recidivism rates of juveniles eligible for citations track very closely the recidivism rates of juveniles receiving citations, implying that most juveniles eligible for citations were receiving citations in Miami-Dade County.[25]

Another important thing to note here is the large gap between the recidivism rates of juveniles who received citations relative to juveniles who did not. Figure 7b displays the

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[25]About 80% of eligible juveniles have received citations in Miami-Dade County between 2007-2018

quarter-wise effect of having received a citation in the four years (16 quarters) after the implementation of the Civil Citation Program, the numerical form of which is presented in Column (1) of Table 9, where juveniles who receive citations are on average approximately 14.39 percentage points (31.05%) less likely to recidivate compared to juveniles who did not receive citation despite being eligible for it. This is slightly lower than the ordinary least squares regression results accounting for year-fixed effects presented in Column 2 of Table 9, which show a decline of 18.07 percentage points (39%).

Since the law enforcement officer who makes the call about whether or not the juvenile receives a citation uses a certain amount of discretion,[26] this might potentially lead to selection bias that affects my estimates. To address this concern, I use quarterly program implementation intensity or citation intensity (Percentage of citation eligible juveniles who received citation calculated as leave-out means) per county as an instrument for whether an eligible juvenile ends up receiving a citation or not, and explore how that affects the recidivism rates. Citation intensity is a good instrument to use according to me for receiving a citation for the following reasons. If a county has not adopted the citation program, the number of citations they have received and the intensity of their implementation of the program in that quarter will both be 0. If a county has adopted the citation system, then the greater the citation rate in that county, the more likely it is that a juvenile will receive a citation. From the perspective of a law enforcement officer, the higher the number of other officers issuing citations, the more likely it is that he will issue one, too. From the perspective of a juvenile, the recidivism rate is the result being measured, so there is no need to be concerned that the citation intensity of the quarter in which the juvenile was arrested or given a citation would influence their decision to

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[26]based on observables that are not available to us in the data set

Table 9: Recidivism rates in Miami: Citation received Vs Not received

|	(1) Event study estimates	(2) OLS	(3) IV	(4) IV ($1^{st}stage$)
Quarters since treatment=1	-0.2197***			
	(0.03)			
Quarters since treatment=2	-0.1466***			
	(0.03)			
Quarters since treatment=3	-0.1673***			
	(0.03)			
Quarters since treatment=4	-0.2402***			
	(0.02)			
Quarters since treatment=5	-0.2409***			
	(0.03)			
Quarters since treatment=6	-0.2030***			
	(0.03)			
Quarters since treatment=7	-0.2095***			
	(0.02)			
Quarters since treatment=8	-0.2066***			
	(0.02)			
Quarters since treatment=9	-0.1741***			
	(0.03)			
Quarters since treatment=10	-0.1659***			
	(0.03)			
Quarters since treatment=11	-0.1714***			
	(0.02)			
Quarters since treatment=12	-0.1446***			
	(0.03)			
Quarters since treatment=13	-0.1504***			
	(0.03)			
Quarters since treatment=14	-0.1073***			
	(0.03)			
Quarters since treatment=15	-0.0942**			
	(0.04)			
Citation		-0.1807***	-0.1499*	
		(0.01)	(0.06)	
Citation intensity				0.0094***
				(0.00)
Controls	Yes	Yes	Yes	Yes
Observations	9176	9176	9176	9176
F				357.3
Control mean	0.4633	0.4633	0.4633	

Outcome variable for Column (1), Column (2) and Column (3) is recidivism. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. Outcome variable for Column (4) is receiving a citation. F statistic of first-stage results of 2SLS is provided. Control means are the average recidivism rates of citation eligible juveniles who did not receive citations in treated counties from 2004 to 2006. Robust standard errors provided in parentheses. (p-value < 0.05 - * , < 0.01 - ** , < 0.001 - ***)

reoffend within two years, since only initial offenses are eligible for a citation.

The instrumental variables estimator results are displayed in Column 3 of Table 9, which shows that receiving a citation reduces the likelihood of recidivating by 14.99 percentage points (32.35%). Column 4 of Table 9 provides the first-stage results of the two-stage least squares that I estimate and shows that for each percentage point increase in the intensity of the citation, the likelihood of receiving the citation increases by 0.94 percentage points. Therefore, the Civil Citation Program in Miami-Dade County reduced the average recidivism rates of first-time misdemeanants (ones eligible for citation only) by about 44% compared to other first-time offenders, most of which appear to be driven by juveniles receiving citations who are on average 32% less likely to recidivate compared to juveniles who did not receive citation despite being eligible.

V.2.B *Treated counties*

Figure 8. Recidivism rates of citation received cases
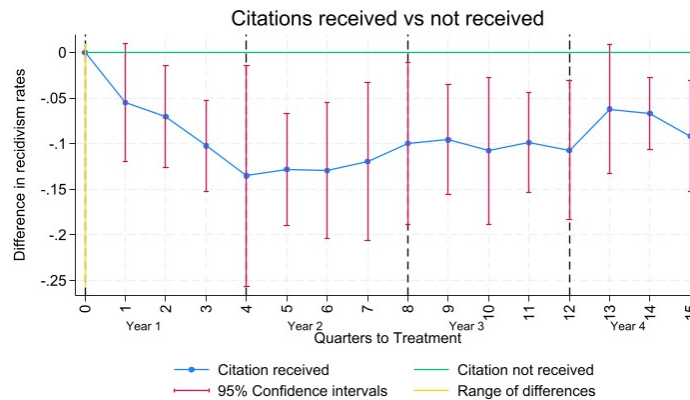
Source: FDJJ data. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. Citation eligible juveniles are first-time misdemeanants of offenses eligible for citations. Baseline means are the recividism rates of citation eligible juveniles who did not receive citations.

Finally, I estimate the average treatment on treated effect within the treated counties. Figure 8 depicts that the recidivism rates of juveniles who received citation are on average about 9.99 percentage points (26.5%) lower compared to those who did not receive citation despite being eligible, in the four years after implementation of the Civil Citation Program in treated counties.[27] Column 2 of Table 10 confirms this impact of receiving citation among citation-eligible juveniles, reducing recidivism rates by 10.87 percentage points (28.84%).

Similarly to before, to address the potential selection bias that might arise out of the law enforcement officer's discretion, I instrument for receiving a citation with the program's implementation intensity (Percentage of citation eligible juveniles who received the citation calculated as leave-out means) measured on a quarterly basis for each county. Then, I estimate the two-stage least-squares regression with county and year-fixed effects. Column 3 of Table 10 shows that on average receiving a citation is associated with a decrease in recidivism rates of 14.5 percentage points (38.47%). Column 4 of Table 10 shows the first-stage IV results where increasing the intensity of implementation by 1 percentage point is associated with an increase in the probability that the citation is given by 1.02 percentage points. Therefore, the Civil Citation Program in treated counties reduced the average recidivism rates of first-time misdemeanants (ones eligible for citation only) by approximately 35% compared to untreated counties, most of which appear to be driven by juveniles receiving citations who are on average 38% less likely to recidivate compared to juveniles who did not receive a citation despite being eligible.

Although the average treatment on the treated effect of the reform seems similar

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[27]Refer Column (1) of Table 10 for numerical results

Table 10: Recidivism rates on receiving citation in treated counties

	(1) Event study estimates	(2) OLS	(3) IV	(4) IV ($1^{st} stage$)
Quarters since treatment=1	-0.0927*			
	(0.04)			
Quarters since treatment=2	-0.0711**			
	(0.02)			
Quarters since treatment=3	-0.1108***			
	(0.02)			
Quarters since treatment=4	-0.1363*			
	(0.05)			
Quarters since treatment=5	-0.1655***			
	(0.03)			
Quarters since treatment=6	-0.1309**			
	(0.03)			
Quarters since treatment=7	-0.1296**			
	(0.04)			
Quarters since treatment=8	-0.1222*			
	(0.04)			
Quarters since treatment=9	-0.1012*			
	(0.03)			
Quarters since treatment=10	-0.1038**			
	(0.03)			
Quarters since treatment=11	-0.1021*			
	(0.04)			
Quarters since treatment=12	-0.1008**			
	(0.03)			
Quarters since treatment=13	-0.0827			
	(0.04)			
Quarters since treatment=14	-0.0836***			
	(0.02)			
Quarters since treatment=15	-0.0649*			
	(0.03)			
Citation		-0.1087**	-0.1450***	
		(0.03)	(0.04)	
Citation intensity				0.0102***
				(0.00)
Controls	Yes	Yes	Yes	Yes
Observations	35345	35345	35345	35345
F				2670.64
Control_mean	0.3769	0.3769	0.3769	

Outcome variable for Column (1), Column (2) and Column (3) is recidivism. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. Outcome variable for Column (4) is receiving a citation. F statistic of first-stage results of 2SLS is provided. Control means are the average recidivism rates of citation eligible juveniles who did not receive citations in treated counties from 2004 to 2006. Clustered standard errors provided in parentheses. (p-value < 0.05 - * , < 0.01 - ** , < 0.001 - ***)

for both Miami-Dade County and the treated counties as a group, the intent-to-treat effect of the Civil Citation Program on recidivism rates of juveniles eligible for citation from Miami-Dade County is markedly higher (more decline in recidivism) as compared to treated counties. A clear distinction between the two is the implementation rates of the citations. Although the average implementation rate for citations is about 78% for Miami-Dade County, it is less than 38% for all the treated counties combined (including Miami-Dade County). It is clear that while the program itself has a definitive impact on the recidivism rates of juveniles being treated, the size of the impact is determined by the intensity of citation implementation.

VI. Conclusion

This paper studies the Juvenile Civil Citation Program implemented in a staggered fashion in the state of Florida across counties over the years (from 2007 to 2018). The program recommends law enforcement officers issue a Civil Citation to a first-time misdemeanant instead of arresting them. Civil Citation includes referring these juveniles to appropriate evaluations, community service, various evidence-based services, and/or sanctions. The idea is to both eliminate contact with the juvenile justice system as well as address the needs of the juveniles instead of merely punishing them. All first-time misdemeanants are eligible for a citation.[28] On successful completion of the program, the juveniles' citation/arrest history is erased and there are no criminal records under their name.

It is not clear from previous theories based on empirical studies of other diversion

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[28]Jurisdictions have the discretion to decide if certain misdemeanors such as firearms related offenses, sexual offenses are not allowed under citation eligible offenses.

programs what the net effect of the Civil Citation Program on recidivism would be. While a juvenile may view a higher probability of getting a citation over being arrested as a reduction in deterrence, they would also view the program requirement for them to remain crime-free for a year as an increase in the deterrence effect. By virtue of not being detained or committed to residential facilities, the program does lead to a reduction in the incapacitation effect. However, the requirement of community service hours and attendance to intervention-based services leads to an increase in the incapacitation effect. Although there is a change in both deterrence and incapacitation levels, their net change is not definitively clear.

Using a combination of standard and dynamic difference-in-differences estimators, I find that the Civil Citation Program is associated with a 15-57% decline in the recidivism rates of citation-eligible juveniles in counties that were treated. Using a combination of ordinary least squares and instrumental variables estimators, I find that juveniles receiving a citation are on average 32-38% less likely to recidivate compared to juveniles who were eligible but did not receive a citation. The intent-to-treat effect of the reform is much higher with the 44% reduction in recidivism rates for Miami-Dade County compared to the 15% reduction in recidivism rates for the treated counties group (all counties that implemented the reform by 2009 including Miami-Dade County). This seems to be primarily driven by the intensity of citation implementation, which on average is 78% for Miami-Dade County but only 38% for all treated counties combined. It is important to note here that all credit for the reduction in recidivism rates cannot be attributed to the singular concept of avoiding contact with the justice system. It also goes to the citation system overall that addresses the juveniles' particular problem, requires them to

stay crime-free for a year, and teaches them accountability.

A 2007-2008 report from Miami-Dade County's Office of Strategic Business Management on the cost of the Juvenile Services Department revealed that the average expenditure per juvenile in the Civil Citation Program in Miami was $1,351. This amount is $468 less than the average cost per youth who have been placed in other diversion programs post arrest and $2,210 less than those who have been arrested and placed in detention. In Miami-Dade County alone, this would indicate savings of $4.47 million in the first four years of implementation assuming that each juvenile eligible for citation was diverted post-arrest and no one was placed under detention. Assuming that the average savings per youth who received citations in the rest of the counties treated by 2018 is similar to those in Miami, this would indicate savings of $37.36 billion between the years 2007 and 2018. Not only is Civil Citation reducing reoffending behaviors among juveniles treated by the program, it is also cost-efficient for the government. It is important to take these results with a pinch, as the report is quite dated and the savings have been estimated based on fixed costs per capita, which do not necessarily reduce with reduction in juveniles.

Although the Civil Citation Program undoubtedly reduces recidivism rates across all counties, a few things to further explore the story behind would be the spike in recidivism rates of citation eligible juveniles in treated counties compared to citation ineligible first-time offenders in the year of treatment, the change in ATET effect when using instrumental variables estimator,[29] and the evidence for net widening, if any. One

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[29]The ATET effect decreased for Miami-Dade County but increased for the treated counties when compared to their respective OLS estimates.

of the main limitations of this paper is that since I use encoded data provided by FDJJ, if a juvenile from Florida is committing a crime out of state, I would not be able to account for this. While I only use juveniles up to the age of 16 in my analysis to get an accurate measure of two-year recidivism, if most juveniles who are receiving the citations are older than 16 years old, then not being able to measure their recidivism would mean my results are either an overestimation or an underestimation depending on the behavioral pattern of juveniles (and if they are aging out of the juvenile system by the time they are recidivating, I would not be able to link the adult criminal records with their juvenile history as these are encoded values). My next step in furthering this research would be to find a way to link juvenile data with adult criminal records so that I can repeat the analysis done in this paper to check whether the treatment effect holds when there are no age barriers to the data set. Ideally, I would also like to link this dataset with state administrative data to measure the long-term effects of the reform on outcomes such as graduation, college enrollment, and labor market entry.

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VII. Appendix

Figure A.1. Citation form for Miami-Dade County

Miami-Dade County Juvenile Services Department

Juvenile Civil Citation Form
F.S. 985.12

275 N.W. 2nd Street Miami FL, 33128

Juvenile's Name:				PD Case #	
DOB:	Race:	Sex:	SSN or Student ID:		
S/M/T: Y / N	HT:	WT:	Hair:		Eyes:
Home Address:					
City:	State:	Zip:	Phone #'s:		
Incident Location:			Date:	Time:	am/pm
1st Offense:		2nd Offense:			
School:				Grade:	
Parent/Guardian:		Cell#		Work#	

Narrative: See Arrest Affidavit Enclosed

You must call the Juvenile Services Department during business hours, Monday through Friday, 9:00 A.M- 5:00 P.M., to schedule an appointment at the location listed below within 5 to 7 business days. Failure to schedule an appointment will result in criminal charges being filed and your child will have an arrest record.

Juvenile Services Department
275 N.W. 2nd Street
Miami, Florida 33128
Phone #: (305) 755-6282 / 6283
**   (305) 755-6239**
Fax #:   (305) 755-6301

I further understand that under Florida Rules of Juvenile Procedures, I have a right to have my case brought to trial within ninety (90) days from the date of arrest. In order to be considered for participation in a Civil Citation Initiative, I do hereby freely and voluntarily waive my right to a speedy trial, pursuant to the Florida Rules of Juvenile Procedure, Juvenile Constitution and the United States Constitution. Additionally, I understand that if I am accepted into Civil Citation Initiative and I violate any of the rules of the Citation, my case will be forwarded to the appropriate court for prosecution.

Solely for the purpose of the Civil Citation Program (CCP), I admit to the offense(s) cited and waive my right to appear in court. I agree to have my case handled by the Miami-Dade County Juvenile Services Department Civil Citation Program. I understand that there may be sanctions assigned by the Civil Citation Program and/or partner agencies as authorized. **Additionally, I understand that I will be arrested and prosecuted for the offense(s) listed above if:**

- **The victim objects to my participation in this program**
- **I fail to report to the Civil Citation Program assigned**
- **I am arrested for any other crime prior to completion of the Civil Citation Program**
- **I do not live, or continue to live in the State of Florida**
- **I fail to comply with the terms and conditions of the Civil Citation Contract**

_____   _____   _____
JUVENILE'S SIGNATURE   DATE   OFFICER/TRANSPORTER'S SIGNATURE

_____   _____   _____
OFFICER/TRANSPORTER'S NAME (Print)   AGENCY NAME   COURT I.D #/LOC.CODE

Was Parent/Guardian Contacted? Y / N
1st Attempt Date _____ Time_____
2nd Attempt Date _____ Time_____   _____
                                                 Parent or Responsible Adult's Signature

(Right Thumb Print)

Distribution: White-Youth/Parent/Guardian • Yellow-JSD/Referral Reduction Coordinator

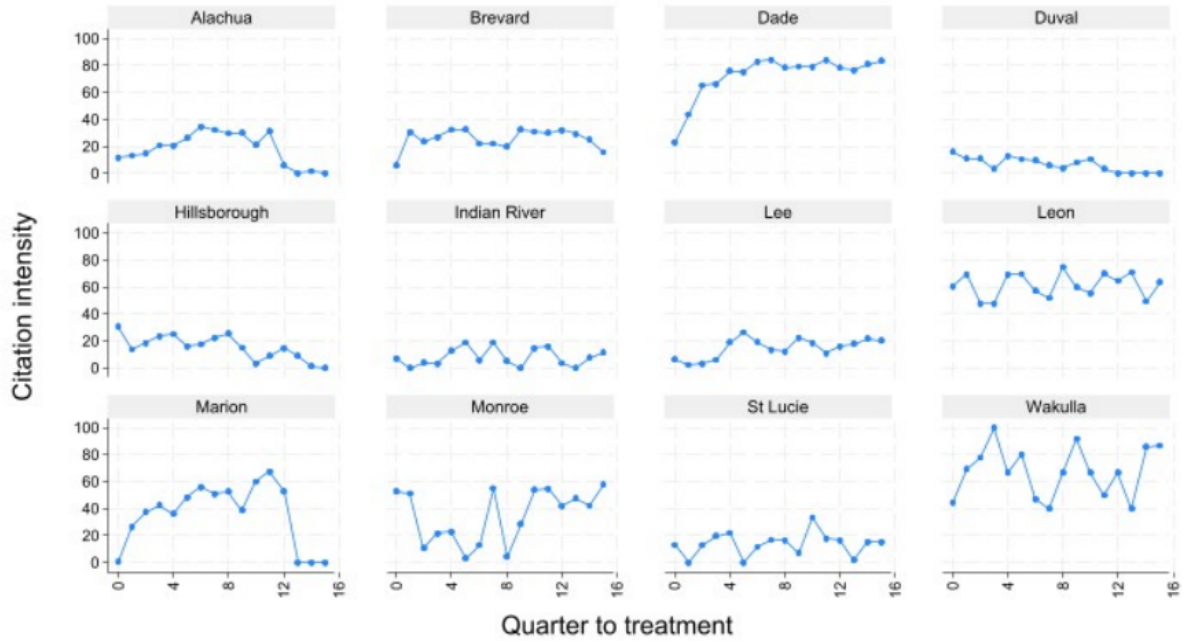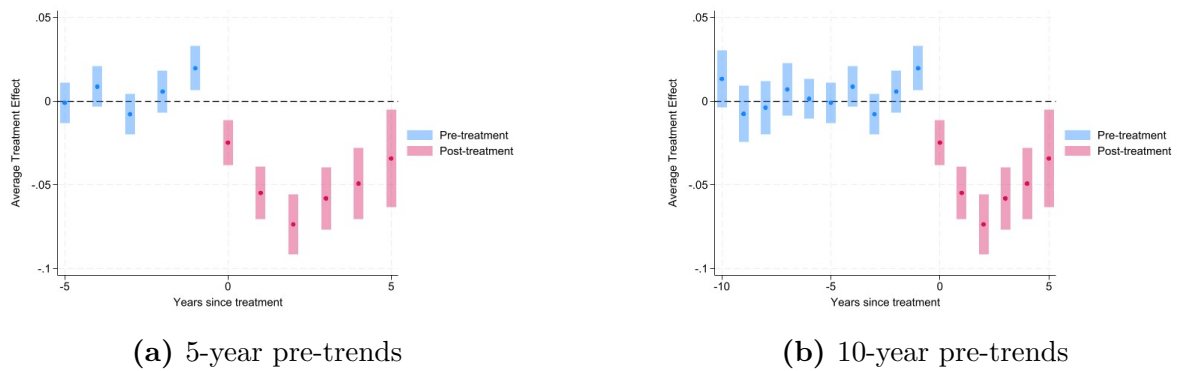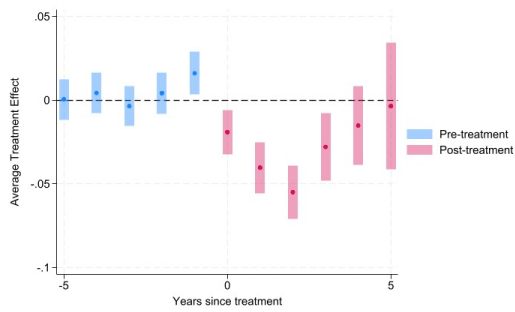**Figure A.2.** Citation Implementation percentages by county

Figure A.3. Callaway & Sant'anna (2021) using counties not yet treated as control group (Dataset: 2000 to 2012)

(a) 5-year pre-trends
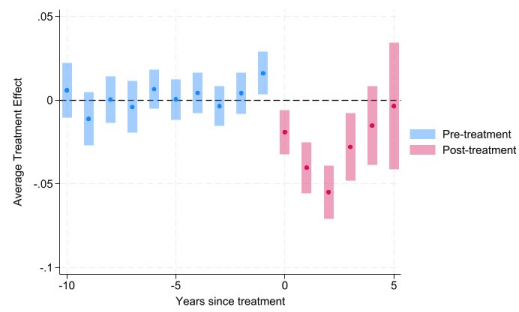

(b) 10-year pre-trends

Source: FDJJ data. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. All counties that implemented Civil Citation Program by 2018 are considered treated counties. All counties that did not implement Civil Citation Program until 2019 are counted as untreated counties here whose average recidivism rates are considered as baseline means.

Figure A.4. Callaway & Sant'anna (2021) using counties not yet treated as control group (Dataset: 2000 to 2018)

(a) 5-year pre-trends

(b) 10-year pre-trends

Source: FDJJ data. Recidivism is defined as any subsequent contact with the justice system within two years of initial contact. All counties that implemented Civil Citation Program by 2018 are considered treated counties. All counties that did not implement Civil Citation Program until 2019 are counted as untreated counties here whose average recidivism rates are considered as baseline means.