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Mitigation of drug sentencing and its effect on crime

Evidence from Supreme Court rulings

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Bachelor Thesis in Economics

Department of Economics

Autumn 2017

Abstract

We estimate the effect of several Supreme Court rulings during 2011 and 2012 that reduced the punishment for serious drug crime. We evaluate whether a decrease in punishment for serious drug crime had an impact on the aggregate crime rates and clear-up rates for seven other crime types. Those are the following; **Assault, robbery/theft, theft of car, theft out of car, burglary, minor- and production drug offences**. Our findings suggest that crime rates decreased for all property crime types and increased for drug crime following the Supreme Court rulings. In addition we find evidence that the clear-up rate increased for property crime offences while no significant change can be observed for drug crime. Regarding assault crime- and clear-up rates our findings are mixed.

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1.Introduction

Drug policy is heavily debated in most countries of the world with various policy approaches ranging from legalization to heavy regulation with long time prison sentences, or even death penalty¹. In some countries like Portugal and the Netherlands the possession and use of drugs is either decriminalized or only yield mild punishment such as a fine. Whereas in countries like the US and Sweden a large part of the prison population, 46,3- and 26 percent respectively is made up of drug offenders, (Federal Bureau of Prisons 2017, Kriminalvården, 2016). Both the mild and the harsh policy approach have been criticized either for dealing with drug abuse too lightly, allowing citizens to damage their health or because of the vast cost that follows with large amounts of incarceration along with the cost for police hours and criminal justice system, (Glaeser & Shleifer, 2001, Becker et al, 2006). Learning more about criminal behaviour is beneficial for society since the cost for it is very high, an estimated \$179 billion in government expenditure annually in the USA (McCollister, 2010). The cost of crime is paid for collectively by mutual tax means in order to maintain a working court system and law enforcement.

Our objective with this thesis is to evaluate what effect a sharp decrease in punishment for serious drug crime (§1 narkotikastrafflagen) had on crime rates as well as clear-up rates. We look at **serious drug crime** and the following seven crime types: **assault, car theft, theft out of car, robbery, burglary, minor- and production drug crime**. The data on drug crime when reported from the Swedish crime statistics bureau, Bottsförebygganderådet (BRÅ), is categorized as own consumption-, dealing- and production offences. This categorization differs from the court definition that instead categorize offences as “minor”, “normal” and “serious”. The majority of minor drug crimes consist of possession for own consumption offences while the majority of serious drug crimes are dealing offences. Most people getting convicted for serious drug crime have dealt narcotics, whereas far from every dealer getting caught gets a “serious” conviction. So forth the majority of serious drug crime convictions constitutes of dealing offences, (BRÅ). Production offences are mostly considered serious by the court but are however rare why we choose not to give them too much attention in this thesis.

Assault is defined as assaults without deadly outcome. Robbery is defined as the aggregate of robbery and thefts, hence all kinds of robberies both against a person such as pickpocketing for example or property, such as store hold-ups.

¹ Several countries mainly in Asia and the Middle East execute death penalty for drug trafficking. (The Economist, 2015)

The sharp decrease in punishment came from a verdict from the Supreme Court in June 2011 (NJA 2011 s. 357). This verdict became a new praxis and was followed by thirteen similar verdicts in 2012 (Maukku, 2012). In accordance with earlier findings in the literature on the subject and the rational model of crime, both discussed in extent below, our hypothesis is that when the punishment for drug crime is decreased the offence rate increases while property crime rates decrease. Regarding the effect on the number of cleared offences what to hypothesis is unclear. If the aggregate crime rate decrease then the clear-up rate could increase since there are fewer crimes for the police to investigate. If however there is need for a reallocation of police resources due to the increased workload following the Supreme Court ruling then it is instead possible that the clear-up rate decreases.

The plausible relationship between drug use and criminality has been widely examined during a relatively long period of time and in numerous different countries. Pacula and Kilmer (2003) declare that numerous reports from Europe, USA and Australia all show consistent results that drugs in general and marijuana in particular is more a rule than an exception when arrestees are tested. The causality, however, that drug use causes crime is still very much under debate. Miron and Swiebel (1995) make the convincing argument that it is the fact that drug use is prohibited that drives the relationship between drug use and criminality. Because the lack of a legal or juridical alternatives in a prohibited market there are increased incentives to use violence to resolve disputes. Competing parties, such as “rival gangs”, lack incentives to include law enforcement in their affairs why they instead turn to violence. This might increase violent offences in society. Furthermore, Miron and Swiebel argue that the existence of cartels, increased accidental drug overdoses and increased property crime levels are all effects of the prohibition itself and would disappear with a ‘free market’ for drugs. As it did when the alcohol prohibition ended in the USA in 1933 (Miron & Swiebel, 1995). Almost two decades later, following numerous policies and decriminalization acts, natural experiments appeared that made it possible to statistically evaluate what effect decriminalization drug policies had on crime rates. Discussed in more detail in the following chapter, these natural experiments found evidence of decreasing crime rates for property crime following the decriminalization of illicit drugs.

In Sweden drugs are still illegal although there have been interesting changes in the severity of punishment for various drug crime. Our contribution to this debate is to evaluate whether a decrease in punishment for serious drug crime has an effect on crime rates for property and

violent crimes. To our knowledge there exists no previous research on this specific topic in Sweden. Our research plausibly provides suggestions into what real changes different laws and policies may generate. Our research approach is collecting monthly data on offence rates from the Swedish statistical crime bureau, BRÅ, for eight different crime types in all 21 of the Swedish counties. After collecting this data we constructed a panel data set from January 1995 until December 2014. Using fixed effects and controlling for county specific demographics we estimate the effect of the Supreme Court rulings by measuring the offence rates before and after the first verdict in June 2011. In addition we construct a similar panel data set with yearly regional observations for clear-up rates as measured by total number of solved crimes divided by total reported crimes for each of the eight crime types. Once again we deploy fixed effects and county specific demographics to evaluate if the Supreme Court ruling and the changes in crime rates had an effect on police effectiveness. The ruling could alternatively result in law enforcement resources reallocation towards difference crime types.

Finally, using a standard difference-in-differences research design, we evaluate whether the Supreme Court rulings had an effect on serious drug crime offences relative to minor drug offences. We have chosen to specify serious drug crime as dealing offences and minor drug crime as possession for own consumption. By doing so the two crime types get highly correlated since drug trade consist of a dealing and a buying part. The Supreme Court rulings only lowered the sentencing length for serious drug crime while the punishment for minor drug crime remained constant. Furthermore the two crime types have similar pre-treatment trends why the difference-in-difference research design is appropriate.

We find that total crime rates decreased by between 28 and 46 percent following the Supreme Court rulings relative to before the verdicts. The largest decrease regards property offences and it is this decrease that drives the total crime rates down. Regarding drug crime we find that both minor and serious drug offences increase after the Supreme Court ruling. With regard to clear-up rates we find increasing levels for property crime clear-ups, which is a natural effect from lower crime rates. Since police resources are fixed in the short run and there are fewer reported crimes to investigate an increase in clear-up rates should arguably be interpreted as a decreased workload for the law enforcement officers rather than an increase in effectiveness. Lastly we find that serious drug offences increase following the Supreme Court rulings relative to minor drug offences. This effects is expected since the Supreme Court ruling only regarded serious drug crime.

The thesis is organized as follows. Section 2a consists of a literature review where we present earlier research and findings on the subject. In section 2b background to the Supreme Court rulings and history of the drug politics in Sweden are presented. In section 3 economic theory and hypotheses are presented where focus lies on the Becker model of crime. Section 4 presents the data and methodology that we have used along with our regressions. Section 5 consists of analysis and results. Finally section 6 summarizes with a discussion and conclusion.

2. Literature review & Institutional Background

2a. Literature review

Much of the previous research on the subject of illicit drugs and its role in crime and society has been made in other fields than economics. Researchers active in fields such as law, medicine, criminology and sociology would be interested in the legal, medical and criminal effects of illicit drugs. The research used in this thesis however, have an economic approach. The Becker model of crime is fundamental in the studies of the economics of crime and broadly used by researchers.

The general findings on the subject of illicit drugs and crime is that in the case of a decriminalization or legalization policy, crime rates for non-drug crime often decreases or experiences no real change at all. Gavrilova, Kamada and Zoutman (2014) found that violent crime rates decreased following the introduction of medical marijuana laws in the US states that border Mexico. Huber, Newman and LaFave (2015) find evidence that legalizing policies tend to decrease crime rates whereas decriminalization policies tend to have no effect or an increasing effect on crime rates. Discussed in more detail below are three studies that have been of special interest for us while working with this thesis.

Benson et al. (1992) studied whether property crime is caused by drug use or that it is drug enforcement policy itself that drives property crime. By using data on arrests the authors proxy police resource allocation in order to investigate if there exist a correlation between the number of drug arrests and the amount of property crime. At the same time as the number of drug arrests and thereby police resources allocated towards drug crime increased there was also an increase in property crimes. If more resources are devoted to drug crimes this would mean that the risk of getting caught increases hence the number of crimes should decrease. So forth

property crime should decrease as well if the same criminals were committing these crimes. Instead the authors found that they increased as well. These results indicate that when more resources are being allocated to fighting drugs there are less police resources investigating property crimes. This then leads to a smaller risk of getting caught for property crime and it becomes more attractive.

The authors employed a structural model that takes the size of the drug market into account when investigating the supply of property crime and the demand for police resources. By using data from several Florida counties in their model Benson et al. are able to conclude three things regarding property crime and drug enforcement policies. Drug enforcement policies do appear to cause property crime, the population of drug offenders is not equal to the population of property crime offenders. For about 15-25% of the drug using population drug use may cause property crime (Benson et al 1992). From these findings the authors argue that the correlation between drug use and property crime does not imply causation. The fact that most property criminals use drugs does not prove that most drug users commit property crime and it is possible that the correlation between drug use and crime might disappear with legalization of illicit drugs (Benson et al 1992).

Further research on crime and illicit drugs have been made by Jerome Adda, Brendon McConell and Imran Rasul (2014) who studied a policing experiment in London during 2001. During a period of 18 months the possession of cannabis was no longer a punishable offence in one London borough, Lambeth. After the experiment the possession of cannabis was once again a punishable offence. This temporary policy change had various effects on non-drug and drug crime rates in the borough of Lambeth which Adda et al (2014) evaluate in their study. The authors performed a differences- in-difference research design and found that six months after the policy was taken into effect crime rates started decreasing for several non-drug crimes. The authors were able to pin down the reason for the effect to a shift in law enforcement resources from drug crime to property crime. The policing experiment from Lambeth indicates that when drug crime is deprioritized and thereby freeing up police resources to focus on other, non-drug crime, then crime rates for these crimes will decrease.

Braakman and Jones (2004) study the effect of lowered expected punishment for cannabis possession following a declassification act in the UK. The authors use individual panel data to evaluate the effect of the policy change on both drug use and crime. Braakman and Jones (2004)

find no evidence that decreased expected punishment should increase drug use, crime or other risky behavior.

With these studies in mind and following the reasoning of the Becker rational model of crime our aim is to investigate if decreasing crime rates following an expected punishment reduction is observable in Sweden. Our contribution to the debate is to evaluate whether there is an effect on crime rates for non-drug crime due to a policy change towards a decrease in punishment for drug crime.

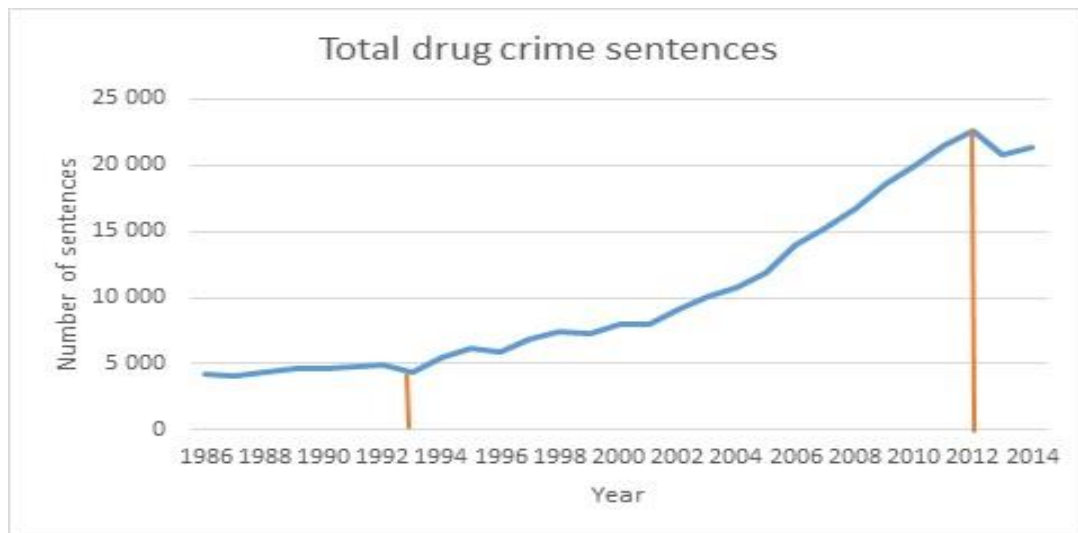
2b. Background

Since the 1960's drug abuse has been considered a social problem in Sweden and in 1968 the current drug law was legislated. The law regulates possession, dealing, production and own consumption (BRÅ 2012). There was a crucial change in the current drug law in 1988 when the use itself got criminalized. Shortly after, 1993, a new law was enacted² which included prison for a maximum of six months as imposed penalty for the crime of possession of narcotics for own consumption. Figure 1 provides an overview to the total drug crime development in Sweden between the years 1986 to 2014.

Ever since 1986 drug crime have had a constant positive time trend in Sweden. During recent years the police have put in higher efforts to conquer the “own possession” drug crimes. Some of the increase in reported offences can be explained by this change in police routines. Since it is mostly the police who report drug offences it is natural that more efforts made by them leads to an increase in the statistics of minor drug offences. The number of drug convictions as a share of total convictions increased between 2000 and 2012 from 7 to 20 percent (BRÅ 2013).

² (prop. 1992/ 93:142 s. 18 f.)

Figure 1



Note: Figure shows total drug crime sentences in Sweden from 1986 until 2014. The vertical line in 1993 indicates the year of the new law, which increased punishment for minor drug crime. The vertical line in 2012 indicates the time for the new praxis, which lowered punishment severity for serious drug crime.

In Sweden the police powers depend on how severe punishments are associated with the crime. Thus the increase in punishment also lead to increased police powers (BRÅ, 2000). The main purpose of the increase in the severity of punishment for own consumption drug crime was to give the police powers to disrupt juvenile drug habits at an early stage. Furthermore, the law change made it possible to offer treatment for drug addiction to the offender (BRÅ 2012). However, following the law amendment in 1993, drug use arose with 40% during the five following years relative to the five years prior to 1993 (BRÅ 2012). With an increase in police powers the number of drug-tests taken where there was suspicion of illegal drug use, doubled in the same five following years. 90 percent of the drug tests executed by the police were positive. An increasing part of the arrests consists of minor drug crime, such as possession for own consumption (BRÅ 2000).

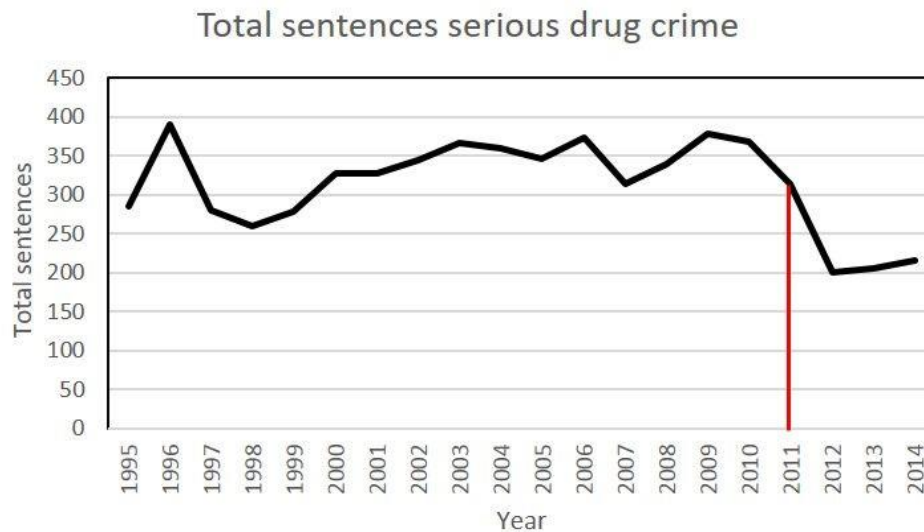
During the 90's and until 2011 the law enforcement officers had high demands from bosses to catch a certain amount of offenders. In other words the police could in practice just pick up a known previous offender who they knew would test positive and thereby increase their statistics. This is why this sort of behaviour within the police department have earned the name "pinnjakt" meaning that law enforcement officers arrest and book known drug addicts in order to fulfill their quota and appear as an efficient department. This phenomenon seems to have re-appeared since the police reform in 2015 (SvD, 2017). In 2002 one third of the sentenced drug offenders was 30 years or older and had priorly been sentenced three or more times for any

crime. This indicates that law enforcement officers focused their arrests on known drug abusers in order to increase arrest rates rather than deterring total drug abuse (BRÅ 2000).

In June 2011 the Supreme Court effectively lowered the sentence length of a serious drug crime³. This has later been described as a revolutionary event in the history of drug crime in Sweden (Maukku, 2012). The new praxis prompted thirteen similar rulings from the Supreme Court during 2012, which led to a new standard in serious drug crime verdicts. Before the 2011 ruling, the focus of the assessment of the crime was put on the amount of narcotics that had been handled and not much attention was given to the circumstances surrounding the crime. Following the ruling, the Supreme Court established that circumstances should have greater importance in deciding whether a drug crime were to yield a “serious” verdict or not (Maukku, 2012). Circumstances include, if the business was profitable, well organized or whether it aimed its sales towards youths. After the praxis 2011-2012 these kinds of circumstances are given more attention. In practice the same amount of drugs that would be considered a serious drug crime, yielding a long prison sentence before the praxis 2011-2012 could after the praxis be diminished to drug crime of the normal degree with shortening of the prison sentence to half of the prior length. The praxis change resulted in fewer sentences for drug crime of the serious degree as seen in figure 2.

³ (NJA 2011 s. 357).

Figure 2.



Note: The figure shows number of serious drug sentences between 1995 and 2014. The vertical line indicates the starting point of the praxis.

The Supreme Court argued that the new praxis was more in line with the original purpose of the legislation as intended by the legislator, thus meaning that the law itself was not the problem but the courts practice of it.

After the Supreme Court rulings serious drug crime received a higher evidential burden. Law enforcement officers now had to provide not only a certain amount of narcotics but also proof of sales, to what customer sales had aimed and potential economic gain the perpetrator benefited. This led to an increase in police hours in order to investigate serious drug crime following the 2011/2012 praxis (BRÅ, 2013). To get a perspective from within the police force on how the policy change affected their working routines, we conducted interviews with law enforcement officers in Stockholm, Skåne and Västra Götaland⁴. Officers from all three regions share the same view, that the new policy made it harder to convict drug crime offenders, since more police hours were required in order to have enough evidence for the court to convict. To achieve a verdict of the same extent as before, the documentation of the suspects criminal business would after the verdict have had to be more extensive. The focus of the police work also changed. Before the target was to catch as many drug users as possible, but with more restrictions and the need of higher suspicions the police had to spend more hours in order to

⁴ Information from telephone interviews with officer Per Karlsson, Polisen Stockholm, officer Ola Hornmark, Polisen Syd and polisen Väst.

have enough evidence for the prosecutor to classify the crime as a drug offence of the serious degree. The police claimed that this thorough work would more often lead to an arrest of a criminal gang through for example, wire-tapping, and that this possibly could lead to more people being arrested in the same swop instead of just the dealers on the street.

3. Economic theory & Hypotheses

The Becker model of crime argues that there is an optimal level of police enforcement, and this level depends on the cost of catching and convicting offenders. (Becker, 1968)

The model argues that every individual has a personal utility function and a linear payoff to punishment function. If the person's utility for engaging in criminal activity exceeds the utility for making a living with legal earnings the model states that the person will indeed commit criminal acts. Hence the model assumes rational individuals that make a choice between criminal and legal activity based on the expected utility of both. This choice is made under uncertainty since the probability of being caught when committing a crime is of course uncertain.

3.1 Mathematical characteristics - Becker Rational model of crime

According to the Becker model of crime the expected utility (EU) from crime is:

$$EU = (1 - p) \cdot U(W_c) - p \cdot U(S)$$

Abbreviations used in the equations are the following. W_c is the monetary gain from committing an offence. S is the sanction for being caught and p is the probability of being caught. If legal wages are W , then an individual will commit a crime if the utility of legal earnings is smaller than the utility of criminal activity. Shown mathematically below.

$$(1 - p) \cdot U(W_c) - p > U(W)$$

These equations imply that **(1) Crime needs to pay more than working.**

As p rises the gap ($WC - W$) also increase because there is a higher chance of being caught. The model also reveals how crime participation depends on individual characteristics for example earnings W , education E , age and gender as well as characteristics of the criminal justice system like police or sentence length (Machin, 2017). **(2) Utility is individual.**

Meaning, for the same risk of getting caught, the utility of crime might be worth the cost of getting caught for one individual, but not for another. Whether crime pays off becomes a calculation of the person's willingness to take risk. Risk however is the risk to get caught, which normally should increase with more police resources. It could also decrease with other types of cautions say, good lawyers, (Becker, 1968).

Getting arrested for committing a crime is not certain, only a risk. The reporting rate on drug crime depends mostly on how much drugs are around and on the police's priorities and efforts (BRÅ 2000). This is reasonable because with drug crime no one except for the police have an incentive to report the crime. Both buying and selling drugs is illegal in Sweden so neither buyer nor seller has an incentive to report. So forth the probability of getting caught affects criminals' incentives, their cost, of committing crime. Benson et al (1992) argue that this is why drug dealing and other criminal activity can be very common and visible in some city parts but not in others. Criminal activity is not visible in some areas because the risk of getting caught, either from law enforcement officers or seen by witnesses, is higher than the gain. There is a lot of evidence supporting the negative relationship between the probability of arrest and the level of crime, all other things equal (Benson et al 1992). This would be in line with Beckers argument of people making a cost- benefit calculation before committing crime.

3.2 Hypotheses section

Following the reasoning of the Becker rational model of crime and earlier findings from research on the subject we hypothesize that following the Supreme Court rulings, offence rates for drug crime of the serious degree should increase. The Supreme Court rulings in 2011-2012 decreased punishment for serious drug crime. When the expected punishment for a crime is decreased there is an increased incentive for individuals at the margin to commit that crime, why it is plausible that drug offences of the serious degree increases following the Supreme Court ruling.

After interviews with officers from the police departments of region Stockholm, Syd and Väst and from reports from BRÅ we have learnt that more police working hours have to be put into investigating each drug crime after the Supreme Court ruling. The increased time spent on each drug crime could either be seen in our results as a decreased clear-up rate for drug offences of the serious degree or, if resources are reallocated within the police as decreased clear-up rates for non-drug crime. However, if the decreased punishment for drug crime has a similar

decreasing effect on aggregate crime rates as it had in the UK (Adda et al 2004) and the US (Gavrilova et al 2014) then it is instead possible that clear-up rates increase for non-drug crime in Sweden as well. If reported crime decreases and solved crime is constant then the clear-up ratio will increase even though the same amount of crimes are solved.

4. Data & Methodology

4.1 Data

Data has been collected from the Swedish statistical crime bureau, *Brottsförebygganderådet*, database. Monthly data on crime rates for all eight crime types from the year 1995 until 2014 from all 21 Swedish counties. Statistics on crime rates were collected for property crime including; burglary, robbery, car theft and theft out of car and statistics of reported drug offences, sorted as minor, serious and production offences. Minor drug offences are made up of possession and own consumption offences. Serious drug crime is dealing offences. BRÅ reports drug crime in their statistics as possession-, dealing- and production offences without specifying whether the offences are dealt with in court as a serious or minor drug crime. Because of this we have chosen to use the variables “serious” as proxy for dealing offences and “production” as a proxy for production offences. Most of the offences that are treated as serious in court are dealing offences and hence reported as “serious” from BRÅ.

All the data was summed on a excel sheet categorized by time, year , month, region and crime type. The dependent variable in our first equation (1) is *Crime rate*, which would be impossible to measure since not all crime is reported. Instead we proxy for the actual crime rate, using the reported number of crime in each county for each crime type during a certain time period. It is important to acknowledge here that the reported crime rate varies for different crime types and is in extent a good measure regarding some crime types and a lesser good measure regarding other. The reported amount of property crime is to be considered a good proxy since an individual in Sweden is required to present a police report in order to collect insurance. This is why it can be assumed that most property crime is reported. For assault on the other hand, while not being prioritized in this thesis, the reported crime rate is a crude measure of the actual crime rate. Since we have decided to use aggregate data on non-fatal outcome assault the estimated number of unknown cases is expected to be large. BRÅ concludes that the actual amount of assault is approximately four times the reported amount (BRÅ 2006). Drug offences are as

stated above the number of reported offences by the police why the actual crime rate is plausibly larger.

4.2 Empirical Strategy

In order to evaluate the effect on crime rates of the 2011-2012 Supreme Court rulings we use both a before-and-after and a difference-in-differences research design.

4.2.1 Criminal behaviour

To evaluate whether there is a causal impact of the 2011-2012 Supreme Court ruling on property- and violent crime rates we estimate the following panel data specification.

$$\ln(C)_{cmy} = \beta_0 + \beta_1 SCR_{cmy} + \beta_2 X_{cmy} + \alpha_c + \alpha_y + \alpha_m + \varepsilon_{cmy} \quad (1)$$

Where $\ln(C)_{cmy}$ is the total number of reported offences of a given crime type in a specific county during a specific month and year. SCR_{cmy} is a dummy taking the value of 1 after the first Supreme Court ruling 2011 that initiated the decreasing sentencing length for drug crime. This ruling was then followed by several similar verdicts. Thus, β_1 measures the effect on crime rates that the Supreme Court ruling and its aftermath had. X_{cmy} contain the following controls; rate of male unemployment and county demographics. This controls for amount of population that is male and aged 15-24, 25-34, 35-44 and 45-54. α_c represent county fixed effects that control for persistent differences across countries. α_y is year fixed effects that control for national time trends that are equal across counties and α_m denotes monthly fixed effects that control for the seasonality of crime. We include fixed effects in our estimation in order to control for the unobserved heterogeneity in our model. Since the expected severity of punishment for serious drug crime decreases we would expect drug offences of the serious degree to increase. In other words we expect $\beta_1 > 0$.

4.2.2 Effective allocation of police resources?

We evaluate equation (2) in order to investigate if the Supreme Court ruling in 2011 and the following rulings in 2012 had an effect on the allocation of police resources between various crimes. From interviews with high ranking police officers in Stockholm, Göteborg and Malmö⁵

⁵ Information from telephone interviews with officer Per Karlsson, Polisen Stockholm, officer Ola Hornmark, Polisen Syd and polisen Väst.

we have learnt that following the Supreme Court verdicts the police were required to spend more investigating and working hours per drug crime.

$$\ln(\text{Clear} - \text{up})_{cy} = \beta_0 + \beta_1 \text{SCR}_{cy} + \beta_2 X_{cy} + \alpha_c + \alpha_y + \varepsilon_{cy} \quad (2)$$

Clear up is total amount of cleared crimes of a given crime type divided by total amount of reported crime in a specific county during a certain year. \square_{cy} is once again a dummy taking the value of one after the first Supreme Court ruling in 2011 and zero otherwise. We apply the same controls as in equation (1) and use the same fixed effects as earlier. The data on clear-up rates when reported from BRÅ is on yearly level why equation (2) is subject to far less observations than equation (1) and is thereby lacking monthly fixed effects. If we find that crime rates decreases following the 2011-2012 Supreme Court rulings, we would expect the clear up rates to increase. If there are fewer crimes to investigate, the police would be able to spend more time and resources on each crime, and hence we expect clear-up rates to increase. If crime rates would increase following the ruling, plausibly clear-up rates would decrease due to an increased workload.

4.2.3 Effect of Supreme Court ruling on serious and minor drug offences

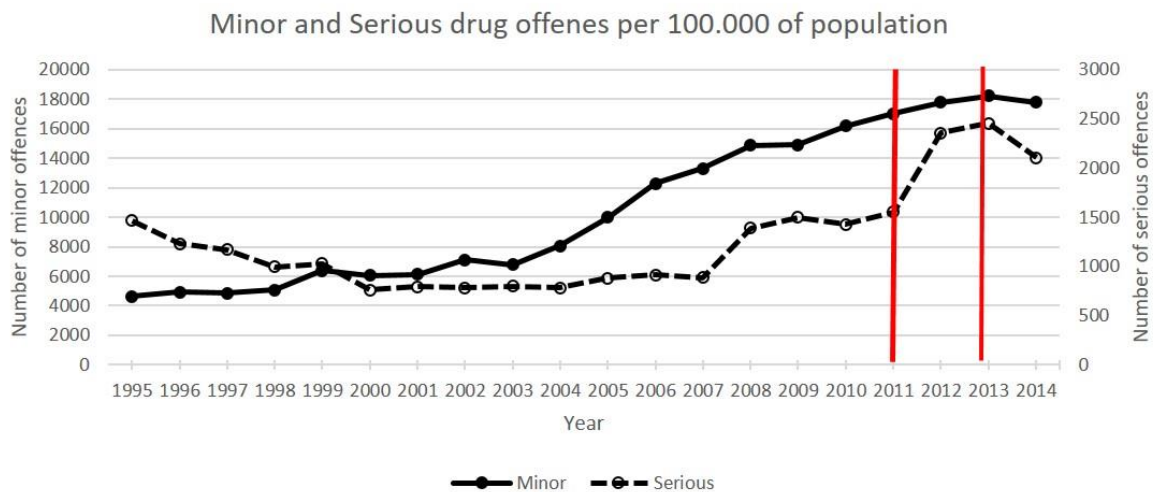
Lastly we estimate the impact of the 2011-2012 Supreme Court rulings on serious drug offences relative to minor drug offences. The two offences are correlated since the majority of the minor offences are possession for own consumption and the majority of the serious drug crimes are dealing offences. Naturally these two offences are dependent on each other and one of them would not exist without the other. In figure 4 we show the trends for both offences and the red lines indicates the period of the 2011-2012 Supreme Court rulings that lowered the expected punishment for serious offences. In other words serious drug offences are treated while the expected punishment for minor drug offences is unchanged, making this offence our control offence. When we limit the sample size to run from 2000 until 2014 it is further possible to argue that the two crime types have similar pre-treatment trends, as seen in figure 4. We split up the effect of the Supreme Court rulings since it seems, from observing figure 4, that serious offences increased in a more rapid pace directly after the first verdict. The increase then flats out during 2012. The separation is done in order to observe the effect of the praxis change on serious drug crime directly after the first verdict and after the following verdicts in 2012.

Presented below is the panel data specification for minor and serious drug offences estimated using a standard difference-in-difference research design.

$$\ln(C)_{cmy} = \beta_0 + \beta_1 post1 + \beta_2 post2 + \beta_3 treatment + \beta_4(post1 * treatment) + \beta_5(post2 * treatment) + \beta_6 X_{cmy} + \alpha_c + \alpha_y + \alpha_m + \varepsilon_{cmy} \quad (3)$$

$(C)_{cmy}$ is the reported crime rate for serious drug offences. $post1$ is a dummy variable taking the value of one after the first verdict in June 2011 until the last of December 2011. $post2$ is a dummy variable taking the value of one after the first of January 2012 until the last of December 2014. $treatment$ is a dummy variable taking the value of one if the crime is a drug crime of the serious degree. $post1 * treatment$ and $post2 * treatment$ are interaction variables of the different dummy variables and the treatment. β_4 and β_5 are so forth the coefficients of interest that estimate the differential change in serious drug offences relative to minor drug offences after the policy change. We use the same controls and fixed effects in all three equations.

Figure 4.



Note: Graph shows number of serious and minor offences from year 1995 until 2014. Number of serious offences are being shown at the right hand vertical axis and minor at the left hand vertical axis. The red lines indicate the period of the Supreme Court rulings, with the first one in June 2011 and thirteen more until December 2012. Both crimes show similar trends from around year 2000 but moves in different direction after the Supreme Court rulings

Controls that are added to our equation are demographics of the male population and male unemployment. We add controls in order to eliminate part of the omitted variable bias. It is

reasonable to only add the male population since men stand for the vast majority of the crimes examined. Men stand for 93 percent of the car thefts, 92 percent of the burglaries, 64 percent of “other theft”, 87 percent of assault offences and 85 percent of the narcotics offences (BRÅ 2007). Controls are expected to be both correlated to the dependent variable and the independent variable.

Male demographics is controlled for to make sure an observed change in crime rate, not only comes from a larger male population, which naturally would drive up the crime rate but from changes because of the policy change.

As further robustness checks we limit the sample size to run between both 2000 until 2014 and 2005 until 2014 in order to make our results robust to potential trends early in the sample period that would otherwise drive the effect of the Supreme Court ruling in a plausibly unwanted and untrue direction.

We have chosen to include equation (3) because of the threats of internal validity of the before-and-after design. Because our sample period is relatively long, even after limiting it, we can't be sure that other circumstance except the Supreme Court ruling affects our estimates. Since both minor and serious drug crime show similar pre-treatment trends before the praxis, we use the difference-in-difference design (DiD) to only bring out the change in criminal behavior that is causal to the Supreme Court praxis. In other words the effect that we can observe with the DiD is arguably a cause of the Supreme Court praxis change in 2011-2012.

5. Results

Table 1.

Table 1: The effect of the 2011 Supreme Court ruling on offence rates for non-drug crime
Dependent variable: Log (recorded offences of a given crime type, per 100 000 of total pop.)

Crime type:	(1) Total	(2) Assault	(3) Theft out of car	(4) Robbery/ Theft	(5) Car theft	(6) Burglary
Baseline	-0.282*** (0.0238)	0.209*** (0.0103)	-0.843*** (0.0168)	-0.311*** (0.0100)	-1.015*** (0.0204)	-0.427*** (0.0117)
Observations	37,282	5,016	5,016	5,016	5,015	5,016
Fixed Effects	-0.351*** (0.0608)	0.420*** (0.0146)	-0.978*** (0.0235)	-0.390*** (0.0114)	-1.289*** (0.0301)	-0.623*** (0.0197)
Observations	37,282	5,016	5,016	5,016	5,015	5,016
FE & Controls	-0.365*** (0.0618)	0.439*** (0.0146)	-0.960*** (0.0237)	-0.389*** (0.0114)	-1.231*** (0.0301)	-0.621*** (0.0198)
Observations	37,282	5,016	5,016	5,016	5,015	5,016
FE & C 2000	-0.454*** (0.0796)	0.332*** (0.0179)	-1.333*** (0.0301)	-0.492*** (0.0143)	-1.337*** (0.0375)	-0.699*** (0.0255)
Observations	28,139	3,756	3,756	3,756	3,755	3,756
FE & C 2005	-0.469*** (0.0752)	0.0849*** (0.0160)	-1.203*** (0.0289)	-0.393*** (0.0137)	-1.053*** (0.0356)	-0.552*** (0.0234)
Observations	19,147	2,520	2,520	2,520	2,519	2,520

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Sample period runs from January 1995 until December 2014. Total shows the effect of the Supreme Court ruling on the dependent variable; log of the number of total offences for all crime types per 100.000 of the total population. The Supreme Court Ruling (SCR) is a dummy variable equal to one from June 2011, after the first verdict, until December 2014, end of sample, and zero otherwise. The following columns, representing different crime types, show the dependent variable; log of total number of offences for each specific crime type per 100.000 of the total population. County, year and month fixed effects are included in all estimations except the baseline. We use socio-demographic controls. These are the share of the adult population that is male and aged 15-24, 25-34, 35-44 and 45-54, and the male unemployment rate. In the last two rows "Fixed effects & Controls 2000" and "FE & C 2005" we test if our results are robust to limiting the sample period to January 2000 until December 2014 and January 2005 until December 2014 respectively.

In the first column the effect on total crime rates are shown. At the baseline, row 1, a decrease by 28.2 percent is observed after the first Supreme Court ruling in June 2011. The baseline results however is likely to be subject to large omitted variable bias and when we include time, county and month fixed effects to the equation, row 2, the magnitude of the effect increase to -35.1 percent. The fixed effects control for differences across counties over time, national time trends and the seasonality of crime respectively and thereby amount for a part of the earlier omitted variable bias. Our results suggests that after the policy change there is at least a 35.1 percent decrease in total reported crime rate relative to before the Supreme Court ruling. Our

results are robust to additionally controlling for socio-demographic properties of the counties. When applying a full set of controls to the equation and limiting the sample period to run between 2005 until 2014 the estimated effect of the Supreme Court ruling increases to -46.9 percent and this measure is arguably the most accurate of the above since limiting the sample size cancels out potential earlier trends that plausibly drive the effect of the Supreme Court ruling. However, for all crime types the effect on our estimates from limiting the sample size is relatively small, showing that our results are robust.

All property crime types, column 3-6, show significant negative effects of the Supreme Court ruling on offence rates. This indicates that property offences in total have been decreasing since 2011 and are driving the total crime rates down. The largest decrease in crime rates are shown for crimes against motor vehicles. Both theft out of car and car theft show large significant and negative effects on crime rates after the 2011 Supreme Court ruling. However, the effect is not for certain a result of the decreased punishment regarding drug crime. It is possibly partially a result of technical improvements. The security and alarm systems on modern vehicles have rapidly increased since the 1990's making car theft a more advanced crime than earlier. This could be one reason to why crime rates regarding car theft and theft out of car decreased after the praxis. There are multiple possible reasons for why property crime rates are decreasing after the 2011 Supreme Court ruling that have no relation to the verdict itself. Reasons ranging from anti-theft campaigns to police reprioritizing could very well be alternative explanations.

Assault offences increased after the policy change with between 20.9 and 43.9 percent. It is possibly correlated with the increase in drug offences (See table 2). Because of the fact that drugs are illegal there are no court system to use when help is needed to solve disputes. Instead violence is often used between individuals or cartels (Miron and Swiebel 1995). It is plausible that more drugs around might increase and encourage this kind of violence. The increase in assault offence is plausibly an effect of drugs nature to affect people's mind and consequence thinking (National Institute on Drug Abuse). Our findings suggest that if drug use increases there is a possible correlation to an increase in assault rates.

When the sample size is limited to run between 2005 until 2014 the coefficient on assault crime rates drops sharply and the effect of the Supreme Court ruling is close to zero. However, reported assault offences have increased during our sample period but in a more rapid pace during the latter part of our sample period. It is likely that this increase is what causes our

volatile assault results. Between 2005 and 2007 there was a spike in the number of assaults, mostly in public places, which was likely due to large number of youths and a positive economic cycle, which lead to more people engaging in nightlife and public entertainment activities (Granath 2012). Since the coefficient on assault is close to zero when we limit the sample size it is difficult to draw any conclusions. Just as with our results on property crime we can't be sure that the change in assault crime rates are actually correlated to the 2011 Supreme Court ruling. There are many other possible explanations for the increasing offence rates.

Table 2.

Table 2: The effect of the 2011 Supreme Court ruling on offence rates for drug crime
Dependent variable: Log (recorded offences of a given crime type, per 100 000 of total pop.)

Crime type:	(1) Serious	(2) Minor	(3) Production
Baseline	0.631*** (0.0337)	0.864*** (0.0245)	0.585*** (0.0331)
Observations	4,750	5,016	2,437
Fixed Effects	0.755*** (0.0738)	1.509*** (0.0398)	0.988*** (0.0857)
Observations	4,750	5,016	2,437
FE & Controls	0.782*** (0.0749)	1.534*** (0.0402)	0.806*** (0.0853)
Observations	4,750	5,016	2,437
FE & C 2000	1.178*** (0.0928)	1.294*** (0.0434)	0.424*** (0.0949)
Observations	3,590	3,756	2,014
FE & C 2005	0.983*** (0.0890)	0.872*** (0.0377)	0.414*** (0.0885)
Observations	2,433	2,520	1,595

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Sample period runs from January 1995 until December 2014. Total shows the effect of the Supreme Court ruling on the dependent variable; log of the number of total offences for all crime types per 100.000 of the total population. The Supreme Court Ruling (SCR) is a dummy variable equal to one from June 2011, after the first verdict, until December 2014, end of sample, and zero otherwise. The following columns, representing different crime types, show the dependent variable; log of total number of offences for each specific crime type per 100.000 of the total population. County, year and month fixed effects are included in all estimations except the baseline. We use socio-demographic controls. These are the share of the adult population that is male and aged 15-24, 25-34, 35-44 and 45-54, and the male unemployment rate. In the last two rows "Fixed effects & Controls 2000" and "FE & C 2005" we test if our results are robust to limiting the sample period to January 2000 until December 2014 and January 2005 until December 2014 respectively.

Regarding drug offences, as seen in table 2, all of the variables serious, production and minor show significant positive effects after the Supreme Court ruling. Regarding serious and production offences this is not surprising since the policy effectively lowered the expected punishment for these crime types. According to the Becker rational model of crime an expected effect of decreased punishment is increased crime rates for that specific crime. The magnitude of the coefficients vary when the sample period is shortened and full controls are added but never change sign and are statistically significant at the one percent level. Minor drug offences show a positive effect after the 2011 Supreme Court verdict. This effect is reasonable since serious, or dealing offences, stands for the supply, which are reliant on demand, which would be possession or minor offences. Another indication of this is that the increase in minor offences is of the same magnitude as the increase in serious offences. Our findings suggest a positive correlation between minor and serious drug offences, which is of course not surprising.

Table 3.**Table 3: The effect of the 2011 Supreme Court ruling on clear up rates for non-drug crime** Dependent variable: Log (clear-up rate of a given crime type, per 100 000 of total

Crime type:	(1) Total	(2) Assault	(3) Theft out of car	(4) Robbery/ Theft	(5) Car theft	(6) Burglary
Baseline	0.192*** (0.0532)	-0.000370 (0.0188)	0.367*** (0.0569)	0.240*** (0.0305)	0.288*** (0.0507)	0.432*** (0.0501)
Observations	2,663	336	336	336	336	336
Fixed Effects	0.294** (0.118)	-0.0631* (0.0329)	0.623*** (0.0925)	0.233*** (0.0364)	0.396*** (0.0587)	0.519*** (0.0708)
Observations	2,663	336	336	336	336	336
FE & Controls	0.260** (0.132)	-0.126*** (0.0358)	0.588*** (0.103)	0.195*** (0.0403)	0.278*** (0.0635)	0.468*** (0.0760)
Observations	2,663	336	336	336	336	336
FE & C 2000	0.273* (0.160)	-0.0716* (0.0390)	0.731*** (0.126)	0.360*** (0.0503)	0.312*** (0.0769)	0.761*** (0.0920)
Observations	2,331	294	294	294	294	294
FE & C 2005	0.286** (0.131)	0.0503 (0.0311)	0.735*** (0.104)	0.242*** (0.0421)	0.373*** (0.0625)	0.642*** (0.0747)
Observations	1,509	189	189	189	189	189

pop.)

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Sample period runs from January 1998 until December 2013. Total shows the effect of the Supreme Court ruling on the dependent variable; log of the clear-up rate for all crime types per 100.000 of the total population. The Supreme Court Ruling (SCR) is a dummy variable equal to one from June 2011, after the first verdict, until December 2014, end of sample, and zero otherwise. The following columns, representing different crime types, show the dependent variable; log of clear-up rate for each specific crime type per 100.000 of the total population. County and year fixed effects are included in all estimations except the baseline. We use socio-demographic controls. These are the share of the adult population that is male and aged 15-24, 25-34, 35-44 and 45-54, and the male unemployment rate. In the last two rows "Fixed effects & Controls 2000" and "FE & C 2005" we test if our results are robust to limiting the sample period to January 2000 until December 2014 and January 2005 until December 2014 respectively.

Following the first Supreme Court ruling in 2011 the clear up rate increased by between 19.2% and 28.6% for crimes in total. The effect of the Supreme Court ruling on clear up rates is positive for all crime types except for assault where the results are mixed. Since the police authority claim not to have done any organizational changes it is plausible that the reason for the increase in clear up rates for all examined crimes, except assault is simply fewer reported crimes. If the police have the same resources as before but there is a decrease in number of crimes, this means that more resources can be put to each crime, which also should increase the clear up rate. The Clear-up rate for assault offences are small, change signs and are in some cases insignificant making it hard for us to draw any conclusions. We believe the "FE &

Controls 2005” row in the table are the most relevant since that specification include both fixed effects and controls. Those values are significant and arguably yield the most correct results.

Table 4.

Table 4: The effect of the 2011 Supreme Court ruling on clear-up rates for drug crime
Dependent variable: Log (clear-up rate of a given crime type, per 100 000 of total pop.)

Crime type:	(1) Serious	(2) Minor	(3) Production
Baseline	0.0120 (0.0601)	0.0278 (0.0181)	0.0771 (0.0725)
Observations	336	336	311
Fixed Effects	0.117 (0.128)	-0.0167 (0.0346)	0.415** (0.165)
Observations	336	336	311
FE & Controls	0.152 (0.143)	-0.0200 (0.0389)	0.364* (0.188)
Observations	336	336	311
FE & C 2000	0.314* (0.182)	0.0667 (0.0433)	-0.352 (0.219)
Observations	294	294	273
FE & C 2005	0.0733 (0.171)	0.00455 (0.0379)	0.0720 (0.191)
Observations	189	189	186

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Sample period runs from January 1998 until December 2013. Total shows the effect of the Supreme Court ruling on the dependent variable, log of the clear-up rate for all crime types per 100.000 of the total population. The Supreme Court Ruling (SCR) is a dummy variable equal to one from June 2011, after the first verdict, until December 2014, end of sample, and zero otherwise. The following columns, representing different crime types, show the dependent variable; log of clear-up rate for each specific crime type per 100.000 of the total population. County and year fixed effects are included in all estimations except the baseline. We use socio-demographic controls. These are the share of the adult population that is male and aged 15-24, 25-34, 35-44 and 45-54, and the male unemployment rate. In the last two rows “Fixed effects & Controls 2000” and “FE & C 2005” we test if our results are robust to limiting the sample period to January 2000 until December 2014 and January 2005 until December 2014 respectively.

There is no significant change in clear-up rates for most of the drug crimes except for some that are marked in the table. Without significant values it is difficult to interpret the effect of the Supreme Court ruling on clear-up rates for drug offences. The offence rate for drug crime, table 2, showed large, positive and significant results that indicate large increase in crime after the 2011 praxis change. Since the reported crime rate for drug crime is from the police via arrest records most of the drug crime that is reported is also solved (BRÅ 2005). This might be a possible reason for our insignificant results regarding clear-up rates. If most reported drug crime still is solved by the police then neither a decrease nor increase in clear-up rates after the 2011 verdict should be visible.

Table 5.

Table 5 shows the results from estimating equation (3). In post1 the policy dummy is equal to one after the first Supreme Court ruling in June 2011 and in post2 the policy dummy is equal to one from the beginning of 2012. Column 1 is the baseline results where we include no controls. In column 2, 3 and 4 however, we include the same controls and fixed effects as earlier. In column 3 we limit the sample size to run between 2000 and 2014 and in column 4 between 2005 and 2014, as we have done the earlier specifications.

Table 5: The effect of the 2011 Supreme Court ruling on serious drug crime relative to minor
 Dependent variable: Log (recorded offences of a given crime type, per 100 000 of total pop.)

	(1) Baseline	(2) Fixed effects	(4) Bandwith 2000	(6) Bandwith 2005
Post1	0.499*** (0.0439)	0.413*** (0.0432)	0.182*** (0.0410)	0.0313 (0.0404)
Post2	0.841*** (0.0179)	0.754*** (0.0201)	0.381*** (0.0232)	0.155*** (0.0252)
Treatment	-2.418*** (0.0196)	-2.424*** (0.0186)	-2.716*** (0.0207)	-2.924*** (0.0282)
Post1*Treatment	0.144** (0.0660)	0.0773 (0.0634)	0.176*** (0.0613)	0.259*** (0.0628)
Post2*Treatment	-0.145*** (0.0416)	-0.139*** (0.0415)	0.153*** (0.0424)	0.361*** (0.0463)
Observations	9,766	9,766	6.862	4.465

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Sample period runs from January 1995 until December 2014. All observations are at the county-year-month level. Post1 is a dummy variable taking the value 1 after the first Supreme Court ruling in June 2011 until December 31 the same year. Post2 is a dummy variable taking the value of 1 from January 1 2012 until December 31 2014. Treatment is a dummy variable taking the value of 1 if the crime type is serious drug crime. Post1*Treatment and Post2*treatment are interaction variables. County, month and year fixed effects are included in all estimations except the baseline. We use socio-demographic controls. These are the share of the adult population that is male and aged 15-24, 25-34, 35-44 and 45-54, and the male unemployment rate. In the last two columns "Bandwith 2000" and "Bandwith 2005" we test if our results are robust to limiting the sample period to January 2000 until December 2014 and January 2005 until December 2014 respectively.

In the first row the results shows the effect of the first Supreme Court ruling in June 2011 on drug offences of the serious degree. These results are in line with the earlier results from table 1. The results indicate that drug offences of the serious degree increased after the policy. In the fourth row the results from the difference-in-difference using serious drug crime as treated after

the first Supreme Court verdict in June 2011 are presented. At baseline level there is a positive effect of 14.4 percent on drug offences of serious degree relative to drug offences of minor degree. When we include fixed effects and controls to our estimation the results become insignificant. However, when limiting the sample size to run from 2000 and 2005 until 2014 respectively the effect is instead once again significant and positive indicating that offences of the serious degree increased with between 17.6 and 25.9 percent relative to minor offences after the Supreme Court ruling. We believe these results, column 3 and 4, to be the best prediction since the DiD research design assumes similar pre-treatment trends and this is true for our two crimes after the year 2000.

In row 5 when the policy dummy takes the value of one after the first Supreme Court ruling in 2012 the positive effect increases with between 15.3 and 36.1 as relative to minor offences depending on the sample size. This is in line with what we can read of graph 3. It seems that after the Supreme Court ruling drug offences of the serious degree increased more rapidly than minor offences. Only after 2013 it would seem that the police caught up with the intensified criminal behaviour and the number of offences decreased. From this it is plausible to believe that criminal individuals react faster to a change in expected punishment than the police are able to reorganize their operational method.

6. Conclusion

When looking at the effect of the Supreme Court rulings that decreased punishment for serious drug crime, in 2011-2012, the Becker model would predict crime rates to increase. This is because the cost, eg. the risk of getting caught, for committing a crime decreases and so forth the benefit of committing crime increases. This would mainly affect people at the margin to commit more serious drug crime.

Our findings are in line with what the Becker model predicts. We found that serious drug crime increased as an effect of the new praxis with between 75 and 98%.

So what about property crime? Our results suggest a decrease in actual crime rates and an increase in clear up rates, after the policy change. There seems to be some sort of positive correlation between property crime and a decrease in punishment for serious narcotics. This is also what earlier research on the subject has found. However, it is hard to conclude whether the increase in clear up rates was an effect of police reallocation towards investigating more

property crime, or if the clear up rate increased because of fewer property crimes to investigate. In the short run police resources are assumed to be fixed and we confirm from sources from the police departments that there has been no reallocation of labor within the police department.

For assault it is hard to draw any conclusions since the number for the reported rates became diminishingly small when limiting the sample size, including the controls and fixed effects. Regarding the clear up rates for assault the results were not significant or robust.

7. Discussion

Our results point towards that a decrease in punishment would lead to an increase in that specific crime. Whether the same applies the other way around, hence that an increase in punishment would decrease crime rates is nothing we can conclude. However the Becker model would predict such a scenario (Becker 1968).

Since the praxis change came into place because of ill interpretation of the original law, and not because of a sudden change in drug criminality, we do not believe our results to be subject to simultaneity.

Regarding the exogeneity assumption we believe it to exist variables other than male demographics and male unemployment rate hidden in the error term. Earlier research from other countries than Sweden has estimated the size of the drug market, which we would have appreciated to control for. This however, we believe to be beyond the scope of our bachelor thesis why we haven't included it. Estimating the size of an illegal market is difficult because of no official data and actors in the market have low incentives to share their sales statistics. Because of this we do not believe that we fulfill the exogeneity assumption in our before-and-after estimation. Which is why we also estimate the difference-in-difference model that don't make as strong assumptions.

After the new praxis from the Supreme Court we can expect fewer serious drug crime convictions. This is because the Court requires the prosecutors to present more details of the circumstances surrounding the case in order to convict a suspect for drug crime of the serious degree. Sources from the police department confirm that they need to allocate more police hours and reconnaissance in order to provide enough evidence to the prosecutor for a serious

conviction. However, this thorough work is also expected to pay off as they can arrest gangs and not just single criminals that are often simply part of a large chain.

For property crime, we can't conclude that the decrease in property crime is an effect of the decrease in punishment for serious drug crime. If we would have evidence of the police shifting resources towards investigating more property crime, that would be a plausible reason to why clear up rates increase for all property crimes examined. As Adda et al (2014) found in their research it is plausible that a decrease in punishment for drug crime will make other crime rates decrease. That would be an effect of police having fixed resources and when they don't have to spend time investigating one crime, they can instead shift resources and efforts towards solving another crime. Adda et al (2014) argued that the increase in clear up rates was an effect of police being able to solve more property crimes since they don't have to be occupied clearing up drug crimes. This implies that the police can shift their resources from drug crime investigation to property crime investigation. In Sweden we have found no evidence of such a resource shift since narcotics-police in Sweden work only with narcotics and the same applies for the property crime investigators.

There seems to be some effect that increased the number of assaults after the mitigation of punishment for serious drug crime. However this increase is very small in comparison to how much the other crimes decrease. It is questionable if there is an effect on assault at all, but if so, that effect seems to be a diminishingly small positive effect. Why assault would increase after the praxis change can have several other reasons than the policy change regarding drug crime itself. For further research we believe that it would be interesting to include shootings as a violent crime since it might be correlated to drug crime to a higher extent than assault offences.

During our work with this thesis there have been multiple shootings across Sweden (SVT, 2017) and those might be correlated to illegal drug markets. We think it would be a good idea for further research on this subject to investigate this correlation.

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