ABORTION AND CRIME: DONOHUE AND LEVITT REVISITED

by

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Abstract

I test whether Donohue and Levitt's (2001) theory that the 1973 legalization of abortion and associated increase in abortion rates caused crime to decline still holds true for the period 1998-2014. Crime rates have continued to fall since 1997 but abortion rates have fallen since the 1980s. I find that abortion rates are still negatively influencing crime rates. The cumulative effect of abortion grew as more age cohorts of arrestees were born after abortion's legalization and were thus affected by abortion. When I restrict the sample to only include arrestees under age 25 in an effort to remove the mechanical increase in the effective abortion rate caused by the passage of time, I find that abortion is not negatively influencing two of the three crimes I examine. Thus, falling abortion rates are decreasing the effect of abortion on crime.

Section 1: Introduction

My research is motivated by the paper "The Impact of Legalized Abortion on Crime" by Donohue and Levitt (Donohue and Levitt 2001). In this paper, the authors found that the federal legalization of abortion in 1973 by the Supreme Court (Roe) caused the fall in crime rates that began in the early 1990s. Their logic was that the increased access to abortion caused by its legalization would allow more women to abort pregnancies and thus prevent unwanted births. Donohue and Levitt (henceforth DL) argued that women would have fewer unwanted children because of Roe vs. Wade, and that unwanted children are more likely to grow up to be high-probability offenders. They thought this because young, poor, and single women are more likely to get an abortion than other women (Levine et al 1996) and these women are more likely to have children who will grow up to be criminal offenders (Comanor and Phillips 1999, Antecol and Bedard 2007). Abortion allowed women to either never become mothers or wait until they felt able to provide for a child. Additionally, the size of a birth cohort would decrease because of abortion which would mean fewer criminals even if the percentage of offenders within an age cohort remained the same. DL regressed crime on abortion rates and a collection of controls and found that states with higher abortion rates saw larger declines in property crime, violent crime, and murder than states with lower abortion rates. They conclude that the legalization of abortion caused as much as 50% of the drop in crime seen in the 1990s.

DL argued that abortion rates would continue to explain crime rates as far as 20 years into the future. They estimated that the effect seen in 1997 would double in two decades. Crime rates have continued to decline for property crime, violent crime, and murder since 1997. In my research I test this prediction by re-estimating their model with recent data. DL's analysis covers

the period 1985-1997, mine covers 1985-2014. I hypothesized that abortion rates would not explain falling crime rates for the extended period because while crime rates have decreased over 1985-2014, abortion rates have been declining since the 1980s. DL theorize that there is a negative relationship between abortion and crime, so if abortion rates were falling crime should have been rising. This negative relationship is not seen between current abortion and crime rates. These rates can be seen in Figures 1-4.

To test this hypothesis, I first replicate DL's work by re-estimating their model for 1985-1997. I use the same data sources as they do, however I have to predict some of my abortion data and all the data has been retrospectively revised. My replication successfully reproduces their basic results, although they are not exactly the same. The differences stem from the differences between our data.

Then I expand DL's model to examine data from 1985-2014 using an interaction term regression that estimates the effect of each variable for 1985-1997 as well as any additional effect for 1998-2014. My results show that abortion rates are still negatively influencing crime for the 1998-2014 period. The coefficients for property and violent crime are negative, large in magnitude, and significant. For murder, I find a flipped positive relationship between abortion and crime. The negative effects I find are likely because DL's model uses an effective abortion rate, a calculated rate that creates a cumulative measure of abortion. The effective abortion rate is a weighted average abortion rate across all age cohorts of arrestees that is calculated using a summation. Thus, even though abortion rates have been declining since the 1980s, the cumulative effect is still strong because more arrestees in 2014 were born post-Roe than in 1997. The decreasing abortion rate and increasing effective abortion rates can be seen in Figures 4 and 5. Overall, my research shows that the federal legalization of abortion in 1973 is still negatively

affecting property and violent crime 41 years later. While abortion rates have fallen, the cumulative effect has grown.

In an effort to isolate the effect of falling abortion rates, I redo my analysis for a restricted sample only including arrestees under age 25. By restricting my sample, I remove the effect of the presence of additional age cohorts from my effective abortion rate. For this specification, I find that the effect of abortion for 1998-2014 is reduced again. For property crime my estimate is not significantly different from 0, and for violent crime and murder my estimate is positive. Together, these results suggest that while the cumulative effect of abortion is large, the effect is driven by the increased number of persons born after the legalization of abortion and that falling abortion rates are beginning to decrease the overall effect.

I also suggest two paths for future research: studying the effects of anti-abortion regulation and the rise in contraception use on crime. Anti-abortion regulation makes it harder for women seeking abortions to undergo the procedure and contraception is another way to avert unwanted births. These are avenues for future research because most anti-abortion laws were passed in the late 1990s and 2000s, meaning their effect on crime will not be seen for 15-20 years. The available data on contraception use is extremely poor for the 1970s, 80s, and 90s but is of high quality after 2006. So, the relationship between crime and contraception use could be studied when sufficient high quality data is available.

My paper is structured as follows. Section 2 is a Literature Review that describes the existing literature surrounding DL's paper and theory. Section 3 describes my data sources and summary statistics. Section 4 describes my methodology and results for each model and specification. Section 5 suggests further research and Section 6 contains my conclusion. Tables, figures and citations are at the end.

Section 2: Literature Review

DL's paper has drawn copious amounts of attention and criticism. Outside of academia, the theory is mentioned in Levitt's book Freakonomics (Levitt and Dubner 2005) and the Netflix show Orange is the New Black (Mother's Day). It has also garnered attention from anti- and pro-abortion groups for its positive seeming outcome of abortion. The economic critiques it has received have been numerous as well. Lott and Whitley (2001) argued that the theory utilized an inaccurate abortion rate that did not take into account abortions performed before Roe vs. Wade. Levitt responded to this critique himself on his website (Levitt 2005), saying that if their 2001's paper analysis is rerun with Lott's preferred measure of abortion their results still hold. Ted Joyce (Joyce 2004) repeated DL's analysis but focused on the years 1985-1990 rather than 1985-1997, focusing on the coming of age of the cohorts born immediately before and after Roe. He found that DL's result disappeared under this specification. Donohue and Levitt responded to this critique and pointed out that Joyce focused his analysis on the peak of the crack epidemic and that he did not adequately control for the spike in crime, particularly homicide, that the epidemic caused (Donohue and Levitt 2003). When DL expanded Joyce's analysis to contain the age cohorts entire lives, their result reappeared.

One of the most significant critiques DL faced was from Foote and Goetz (Foote and Goetz 2008). Foote and Goetz identified a coding error in DL's original paper. They realized that DL had failed to include their controls for variations in arrests on the state-year level in their regressions which compare crime rates between age cohorts within states. After rerunning the regression with the corrected variables and with a different measure of arrests, Foote and Goetz found that DL's result disappeared. DL (Donohue and Levitt 2008) conceded the coding error,

and reaffirmed their result by using a more in depth measure of abortion. The regressions that contained this error are not the ones I am replicating.

DL's study has been replicated in other contexts. Kahane et al examine the effect of the legalization of abortion on crime rates in England and compare the rates to Wales where abortion remained illegal (Kahane et al 2008). They at first found the same negative association the DL found in the U.S., however the result disappeared under robustness checks and overall they found no effect of abortion on crime. Pop-Eleches, on the other hand, found evidence from Romania that supports DL's results (Pop-Eleches 2006). He showed that the illegalization of abortion, after it had been legal, caused children born after the change to have worse educational and labor achievements. Most relevantly, he found suggestive evidence that children born after the ban had increased criminal behavior later in life. Sen also reinforced DL's results with evidence from Canada (Sen 2007). He focused on the effect of the legalization of abortion on teenage birth rates as the children of teenagers are the most likely to grow up to be criminals. He found that the legalization caused a drop in teenage fertility and that this decrease in fertility caused more than 25% of the drop in violent crime that was seen in the 1990s.

The literature on crime is undecided as to what else may have caused the fall in crime from the 1990s on. Levitt himself published a reflection on the causes of crime in 2004 (Levitt 2004). He dismisses the strong 1990s economy, changing demographics, gun control laws, improved policing, and the increased use of the death penalty as possible explanations for the fall in crime. He then attributes the decline to increases in the number of police officers, the growing prison population, the end of the crack epidemic, and of course the legalization of abortion. At the end of the review, Levitt cautiously suggests that in the future crime rates will continue to fall because of abortion rates and rising incarceration rates.

A report from NYU Law School that is part literature review and part empirical analysis disagrees with Levitt's 2004 theories (Roeder et al). They found that mass incarceration did not contribute to falling crime rates, as states that reduced their imprisoned population also saw decreases in crime. They also found that new policing strategies did help reduce crime, particularly the statistics based program CompStat. The researchers claimed some of the factors that are included in DL's paper, such as beer consumption and income levels, helped reduce crime. Additionally, they contributed a new theory, that the increasing age of the American population has caused falling crime rates, however DL would respond to that by pointing to their 2001 paper's final regressions in which they show that the effect they find is focused on 18-22 year olds.

Section 3: Data

Sources

My data comes from several different sources. The number of abortions occurring in every state and year from 1973-2014 comes from the Guttmacher Institute and the Center for Disease Control and Prevention. DL only cite the Guttmacher Institute as their abortion data source, however Guttmacher is missing several years of data, as is the CDC. To address this issue, I predict the missing years of Guttmacher data with a quadratic regression of the CDC data for which the missing years are available. The R-squared value for this regression is 0.9738. Eleven years of abortion data (1990, 1993, 1994, 1997, 1998, 2001, 2002, 2003, 2006, 2009, 2012) are predicted this way, 6 of those years are after 2000 making them less relevant to my

effective abortion rate calculation as children born in those years have yet to enter their high crime years in 2014. For 1983, 1986, and 1989 there is neither Guttmacher data nor CDC data. For these three I predict their values by averaging the previous and subsequent years. To get the number of abortions per live birth I divide each state-year observation by the number of live births that took place in that state-year, data from the National Vital Statistics Reports.

Crime data comes from the FBI's Uniform Crime Reports, the same source as DL. The UCR reports the crime rates as the number of reported offenses per 100,000 population. The data are then converted to the natural log of the per capita rate for analysis. Arrest by age data comes from the UCR's 1997 Crime in the United States Report. My data on state populations is from the FBI's Police Employee Data set. The state-level average crime rates per 1000 residents are shown in Figures 1, 2, and 3.

DL use a variety of control variables: correctional population per capita, police officers per capita, the unemployment rate, per capita income, the poverty rate, the presence of shall-issue conceal carry laws, average welfare payment per family recipient, and beer consumption per capita. I include all of these except for per capita beer consumption and I only include average welfare payment per family for the 1985-1997 regressions. DL get their beer consumption data from the Beer Institute, however their data is no longer publicly available. Additionally, while average welfare payment per family is available for 1958-1994 and 1996 from the US Statistical Abstract, it is not available for 1995 or 1997-1999. This is possibly reflective of the switch from Aid to Families with Dependent Children to Temporary Assistance for Needy Families that took place in 1997. The welfare generosity data is lagged 15 years so the missing years affect my data for the latter part of my period. Thus, I do not include average welfare payment per family in my regressions post 1997 because it restricts my regression to

1973-2009 and 2011. Additionally, the poverty rates for 1973-1976 are unavailable, however as I focus on persons born after 1972 in years in which they are old enough to commit crimes these years are unimportant to my analysis.

The other gap in my control data is for per capita income in 1974. To address this issue I average per capita income at the state year level for 1973 and 1975. I adjust these incomes to 2014 dollars. Police officers and correctional population per capita come from the FBI's Police Employee Data Set and the Bureau of Justice Statistics respectively and are lagged by one year. The data on enactment of shall-issue conceal carry laws mainly come from Grossman and Lee's 2008 paper (Grossman 2008) and Lott and Mustard's 1997 paper (Lott and Mustard 1997) on conceal carry laws. I supplement this with information from Giffords Law Center and state legal codes. Unemployment data comes from the Bureau of Labor Statistics and the US Statistical Abstract, poverty rate and per capita income data come from the Census Bureau. I adjust my welfare and income data to 2014 dollars.

Effective Abortion Rate

DL calculate an effective abortion rate to use in their analysis. This rate is a "weighted average legalized abortion rate across all cohorts of arrestees" (DL 2001). It is calculated with the following formula for each year (t), crime (c), and state (s):

$$Effective\_Abortion_{cst} = \sum_a Abortion_{s,t-a}(Arrests_{ca}/Arrests_c)$$

$Abortion_{s,t-a}$ is the number of abortions per live birth that took place in state *s* in year *t* at the year of birth of the cohort of people of age *a* in year *t*. $Arrests_{ca}$ is the number of arrests of people for crime *c* of age *a* and $Arrests_c$ is the total number of arrests for crime *c*. Arrest by age data covers ages 10-65 and the abortion rate for years prior to 1973 is 0.

For example, the effective abortion rate for property crime in Wisconsin in 1983 equals the percent of property crime arrests of 10 year olds multiplied by the Wisconsin abortion rate in 1973. Only 10 year olds are included in the 1983 rate because my arrest by age data begins with 10 year olds. 1983 is the first year that arrest by age data and lagged abortion data coexist. For property crime in Wisconsin in 1993 it would be the percent of property crime arrests of 20 year olds times the 1973 abortion rate, plus the percent of 19 year old property arrests times the 1974 abortion rate, and so on till the percent of 10 year old arrests times the 1983 abortion rate. This calculation creates a measure of the abortion rate that affected arrestees in a state-year. The effective abortion rate is used in all the analyses and its coefficient represents the effect of abortion on crime for that state-year-crime. Simply using the abortion rate of year *t* when explaining the crime rate of year *t* would be analyzing the effect of the absence of infants on crime in what would have been the year of their birth. So, I calculate effective abortion rates that capture the effect of all previous abortions on a specific crime in year *t*, thus creating the rate that is actually relevant to crime in year *t*. The state-level average abortion rates for each state over time are displayed in Figure 5 which is discussed later.

I also calculate the effective abortion rate exclusively for arrestees under the age of 25. To do this I restrict my arrest by age data to only include persons ages 10-24. DL's original analysis only included persons under the age of 25 in their effective abortion rate because the oldest persons born when abortion was legal by the end of their sample were 24. My extended analysis includes persons ages 25-41 as well as those below age 25 because the oldest persons at the end of my sample who were born when abortion was legal are 41 years old. When looking at the formula, it is clear that this time effect would increase the effective abortion rate as more cohorts would be added to the summation. By restricting the effective abortion rate to those

under 25, I try to force my effective abortion rate to reflect the abortion rate that I hypothesized would affect the effect of abortion. Figure 6 displays this rate and is discussed later. This sample is referred to as the restricted sample while the sample with data on all the arrestees is referred to as the unrestricted sample.

DL compute the effective abortion rate for each state-year using the same weighting of arrests which is calculated from 1985 national data (see DL footnote 26). 1985 arrest by age data is not available so I use 1997 arrest by age data. The data on arrests by age is separated into bins. For some ages, there is data for that specific age, however, for other age groups there is only data on how many arrests there were for the group. To account for this I divide the total number of arrests by the number of ages within the group and assign the same number of arrests to each age within the group. Arrest by age data begins at age 10 and ends at age 65, which is sufficient for my analysis as the oldest persons who had legal abortions occurring in the year of their birth in 2014 are younger than age 65.

The calculated effective abortion rate is then multiplied by 1000 to get the effective abortion rate per 1000 live births. For the regression analysis, this rate is divided by 100 so that the coefficients reflect the effect of a 100 unit change in the effective abortion rate. The state-level average abortion rate per 1000 live births is displayed in Figure 4. The unrestricted state-level average effective abortion rates for property crime, violent crime, and murder are shown in Figure 5 and Figure 6 shows the average effective abortion rates for the sample restricted to persons under the age of 25. These figures show that the abortion rate has been declining since the 1980s, the unrestricted effective abortion rate rose from 1983-2014 but begins to plateau towards the end of the period, and the effective abortion rate for under 25s rose through the 1990s and has been declining since the early 2000s.

Summary Statistics

I compute basic summary statistics for my data. DL do their regression for the years 1985-1997 so I compare the 1985-1997 statistics that I get with those that DL publish to compare the data for my replication period. I also compute the statistics for 1998-2014 and find the changes that took place between the two periods.

My summary statistics in Table 1 show the summary statistics that DL published and the summary statistics that I have for the same period. Although my statistics are not exactly the same as DL, they are very similar. For example, our averages for property crime per 1000 residents differ by 2.5, for violent crime by 1.31, and for murder by .0122. My average rate for each crime is below DL's. For the effective abortion rate per 1000 live births, my estimates for property and violent crime are below DL's, with a difference for property crime of 21.1 and violent crime of 11.49. My average effective abortion rate for murder is 16.75 above DL's. The largest difference between our data exists in the average police officers per 1000 residents. My average is 4.69 while DL's is 2.85. However, my median value for the police per 1000 residents is 1.85 which is closer to DL's average.

Some of the differences between our data are likely attributable to retrospective revising of the data from the various sources. The differences between our effective abortion rates could also come from three other sources. Firstly, DL incorporate abortion data from 1970-1972 for Alaska, California, Hawaii, New York, and Washington as they legalized abortion before Roe vs. Wade. I do not have this data. Secondly, I predicted portions of my abortion rate data as the Guttmacher Institute data that DL use was not available to me for all of 1985-1997. DL do not

discuss predicting any of their abortion data. Thirdly, DL use arrests by age for 1985 in their effective abortion calculations while I use 1997 because 1985 data is not available.

Table 2 shows my summary statistics for 1985-1997 and 1998-2014. There are large changes in conditions between the two periods. The abortion rate per 1000 live births decreased significantly between the two periods, by 28.50%. However, the effective abortion rates for each crime increased greatly, the increases range from 130.71% to 287.60%. This is because more of the arrest cohorts were born after the legalization of abortion in the second period than in the first. Arrestees up to age 41 are contributing to the effective rate in the second period while only arrestees up to age 24 were contributing in the first period. Thus, even though abortion rates have declined, the cumulative effective abortion rates are large.

I also report mean state-year values for my effective abortion rate restricted to arrestees under age 25. For the 1985-1997 period these values are the same as the unrestricted effective abortion rates reported in the first 3 table rows because only persons under age 25 in 1997 were affected by abortion in the years of their births. For 1998-2014, the effective abortion rate for persons under age 25 is lower than those for all ages. This is because the restricted sample does not contain the effect of abortion on arrestees ages 25-41 that is in the unrestricted sample. The restricted sample means are closer to the 1985-1997 values for effective abortion, with differences ranging from 79.76% to 186.2%.

The crime rates for all three crimes decreased significantly between the two periods. Property crime per 1000 residents decreased by 28.03%, from 45.51 to 32.75. Violent crime per 1000 residents decreased 22.68% from 5.42 to 4.19 and murder per 1000 residents declined by 33.80%, from 0.0778 to 0.0515. These numbers, like all the summary statistics, are the average state-level values for the period.

The control variables increased and decreased, most notably per capita income increased and poverty rate declined substantially. The correctional population per 1000 residents increased between the two periods, however the increase is small in magnitude. Mass incarceration is often brought up in discussions of crime so this small increase is of note. Standard deviations are large across the board as there is great variety among the 50 states and DC and over the 41 years.

Section 4: Regression

Part 1: Replicating Donohue and Levitt's Results

I rerun Donohue and Levitt's regressions for their years of analysis (1985-1997) using the same regression equation they use:

$$\ln(Crime_{cst}) = B_1 Effective\_Abortion_{cst} + B_{2s} State_s + B_{3y} Year_t + XControls_{st} + \varepsilon_{cst}$$

Effective_Abortion is the effective abortion rate for the relevant crime, state, and year, its coefficient is B_1. State is a vector of dummy variables for each state and DC, B_{2s} is the coefficient for each state *s*'s indicator variable. Year is a vector of dummy variables for each year included in the regression, B_{3s} is the coefficient for each year *t*'s dummy variable. Controls is the vector of control variables included in this regression which are: natural log of per capita correctional population lagged one year, natural log of police officers per capita lagged one year, unemployment rate, natural log of per capita income in 2014 dollars, poverty rate, average annual welfare payment per family multiplied by 1000 and lagged 15 years, and a dummy variable for the presence of shall-issue conceal carry laws. X is the vector of corresponding coefficients for each control variable. The interpretation for the effective abortion rate in all of

my regressions is that for a 100 unit increase in the abortion rate per 1000 live births for the specified crime, the per capita crime rate would change by a percent equal to 100 times that rate's coefficient. I assume that ε is mean independent of the observed random variables.

The regression is a weighted least squares fixed effects model with robust standard errors that uses state population as the weights with controls for state and year. I use analytical weights that are inversely proportional to the variance of an observation and I use fixed effects to account for state and year fixed factors. DL correct for serial correlation in their standard errors, however I do not; this does not greatly affect my results.

First, I restrict my data to 1985-1997 to replicate DL's results. I run this regression for each crime and for specifications with and without controls. In the specification without the control variables, the results for which are displayed in Table 3, I estimate effective abortion coefficients of -0.106 for property crime, -0.177 for violent crime, and -0.0911 for murder. The results are not exactly the same as DL's but they are comparable. My property crime coefficient for effective abortion is 0.011 greater than DL's and 0.04 greater for violent crime. For murder my coefficient is below DL's by 0.0169. DL's results for the effective abortion rate do not greatly change between the specifications with and without the controls and neither do mine. My results with controls are in Table 4. For property and violent crime I once again overestimate DL's effective abortion coefficients, for property crime by 0.012 and for violent crime by 0.047. I understate their effective abortion rate coefficient for murder by 0.09. These differences can be interpreted as a difference of at most 9.11% in the estimated effect of the effective abortion rate on crime.

The most significant difference between our analyses are the dissimilarities that exist between our data. These differences are the reason my replication of DL's results is imperfect.

Overall, the difference between my results and DL's is slight enough that my analysis can be considered credible. My successful replication of DL's results means that my data and model are sufficiently similar to DL's to continue this analysis.

Part 2: Extending Analysis to 1998-2014

In this section I extend the included years of the analysis to 1985-2014. To investigate the effect of the various variables specifically in the period after 1997 I add interaction terms for each variable that equal the variable's value for that state-year for the years after 1997 and equal 0 for years before 1998. Post is a variable that equals 0 for the years 1973-1997 and 1 for 1998-2014.

$$\ln(Crime_{cst}) = B_1 Effective\_Abortion_{cst} + B_2(Effective\_Abortion_{cst} * Post) + B_3 State_s + + B_{4s}(State_s * Post) + B_5 Year_t + B_{6s}(Year_t * Post) + B_7 Post + X_1 Controls_{st} + X_2(Controls_{st} * Post) + \varepsilon_{cst}$$

(Effective Abortion * Post) is the interaction term multiplied by the effective abortion rate for each state-year-crime, B_2 is its coefficient. (State * Post) is the interaction term multiplied by the dummy variable for each state, B_{4s} is the coefficient for each state interaction term. (Year * Post) is the interaction term multiplied by the dummy variable for each year for each state-year-crime, B_{6s} is the coefficient for each year interaction term. (Controls * Post) is a vector of the interaction term multiplied by each control variable, X_2 is a vector of coefficients corresponding to each control-interaction term. The control variables in this regression are the same as in the previous without average welfare payment as that data is unavailable for the entire period. All other variables in the regression are the same as what was described for the Part 1 regression. I again assume ε is mean independent of all the observed random variables.

I estimate the regression for each crime including and excluding the control variables and their interaction terms. The interaction terms for the year variables end up being omitted from the regression due to collinearity. The coefficients for the interaction terms represent the additional effect that variable is having on crime in the 1998-2014 period. The non-interaction term variable's coefficient is the effect the variable is having from 1985-1997.

Table 5 contains the results for the specification only including the effective abortion rate and its interaction term, and the state and year fixed effects and their interaction terms as independent variables. These results imply that there is a highly significant negative effect of the effective abortion rate from 1985-1997 and an additional negative effect just from 1998-2014. All the coefficients are significant at the 0.05 level. By adding together the 1985-1997 coefficient and the interaction term coefficient, the total effect of effective abortion from 1998-2014 seems to be greater than that which DL found for 1985-1997. These results suggest that the effective abortion rate is still very much influencing crime rates in the more recent period and that the effect is growing over time.

However, these results change when controls and interaction terms for those controls are included, these results are shown in Table 6. For all three crimes the 1985-1997 effective abortion rate variable remains significant at the 0.05 level. For violent crime the coefficient is -0.180 meaning that a 100 unit increase in the abortion rate per 1000 live births for violent crime would decrease violent crime by over 18%, a large effect. For property crime and murder, the effects are large in magnitude as well, at 10.4% and 9.0% respectively. The interaction terms for property crime and murder are both positive and significant. This implies that for the 1998-2014 period the effect of the effective abortion rate is smaller than it is in the 1985-1997 period. For property crime, the effect for 1998-2014 is reduced roughly by half. Interestingly, for murder the

effect coefficient for the interaction term is so large it reverses the effect in the 1998-2014 period and makes a 100 unit increase in the effective abortion rate per 1000 live births cause an 11.4% increase in murder rates. This result runs counter to DL's hypothesis. For violent crime, the interaction term is negative, as if the effect increased in the 1998-2014 period, however it is insignificant. These results show that the effective abortion rate is still very much influencing crime rates in the 1985-2014 period, but that the effect is lessened in the 1998-2014 period. This may be because of the decrease in abortion rates that began in the 1980s. A later regression in this paper tries to specifically assess the effect of the fall in abortion rates on crime.

I run a simple Wald test to test the null hypothesis that the sum of the interaction and non-interaction terms equal 0 for the effective abortion rate. These results are in Table 9, in the rows labeled Unrestricted Sample. These results show that at a 0.05 significant level, the null hypothesis is rejected for all three crimes. This means that the effect the effects I find for the 1998-2014 period, including the positive relationship between effective abortion and murder, are significantly present.

The other variables in my regression merit discussion. The measures of economic well-being (unemployment, per capita income, poverty rate) are as a group influential variables on crime. My results show that unemployment is positively related to crime in the 1985-2014 period, meaning an increase in unemployment increases crime rates. The interaction term for unemployment is negative, implying that the effect is lessened in the 1998-2014 period. The size of the negative effect is so large that the effect is flipped in the 1998-2014 period so that unemployment and crime are negatively correlated. However the total effect for 1998-2014 is close to 0 for all three crimes. All of these coefficients are statistically significant. My results for the poverty rate are mainly statistically insignificant. For all of 1985-2014, poverty and crime are

negatively correlated except for poverty-property crime which is positive. The negative effects are small in the 1998-2014 period, a 1% increase in the poverty rate implies a 0.7% decrease in per capita violent crime and a 3.67% decrease in murder. For per capita income, I find a positive relationship with crime for 1985-2014, as if an increase in per capita income is increasing crime rates. This counterintuitive effect might reflect the accompanying increase in income inequality that has taken place from 1985-2014, as is shown in Figure 8. Thus, increases in per capita income may be reflective of increases in total income concentrated at the top rather than increases in average well-being. In the 1998-2014 period, the effects of per capita income are largely reduced to 0.

My regression shows that the size of the correctional population is having very different effects in the 1985-1997 period than in the 1998-2014 period. In the 1985-1997 period, an increase in the correctional population is associated with a decrease in crime. Specifically, a 1% increase implies a 0.08-0.17% decrease in crime across the three crimes. All of these effects are significant. In the 1998-2014 period, the effect is flipped so that increases in the correctional population are increasing crime rates, with effects centering on a 1% increase in correctional population causing a 0.1% increase in crime. This result could be reflective of the side effects of the rise in mass incarceration. None of my results of police presence are significant. They are also very small in magnitude across the three crimes and hover around a 0% effect. In a follow up to DL's original paper, Levitt suggested that larger police presences and incarcerated populations would negatively affect crime, however this is not what I have found (Levitt 2004).

Shall-issue conceal carry laws mandate that while a permit is required to carry a concealed weapon in the state that permit must be issued to anyone who meets the designated criteria and that the person does not have to demonstrate good cause to own a gun. All of my

significant coefficients for this variable are positive, implying that the presence of this law increases crime rates. However, shall-issue conceal carry laws are just one of many laws relating to the availability of weapons and their presence does not entirely describe the status of gun control in a state-year. Thus, this result should not be taken as a reliable measure of the effect of looser gun laws on crime.

Part 3: Focusing on Under 25s

The increased effective abortion rate in the 1998-2014 period compared to 1985-1997 is largely reflective of the increase in the number of potential criminal offenders born after 1973. The effective rate is a cumulative measure of abortion, so even with the decline in abortion rates that began in the 1980s, the effective rate increases over time as more cohorts of arrestees are added to the rate. In an effort to separate this more mechanical effect from the effect of the actual abortion rate, I re-run my interaction term regression only using offenders under the age of 25, the oldest offenders included in DL's analysis. To do this I restrict my effective abortion rate to only include arrestees under the age of 25 and use that effective abortion rate in my regression. I use the same arrest by age fractions as in the original calculation. By restricting my analysis to under 25s, I remove the offenders ages 25-41 causing the effective abortion rate to decline after the early 2000s, as is seen in Figure 6. The age 25 is also significant because it is the final year of what DL call a person's high crime years which begin at age 15.

The under 25 state-level average effective abortion rate for 2014 is shown in Table 7 in comparison to the 1985-1997 rate. The 1985-1997 rate is the same as it was in the unrestricted analysis because nobody over 24 was part of the effective abortion rate for 1985-1997. The 2014 rates for the restricted sample are much lower than the 2014 rates for the unrestricted sample.

The restricted effective abortion rate for property crime is 178 units lower than the unrestricted, for violent crime the restricted rate is 149 units lower, and for murder the restricted rate is 117 units lower. The restricted 2014 rates are also below the 1985-1997 rates. This difference is likely caused by the fall in abortion rates that began in the 1980s as the other components of the formula, namely the arrests by age fractions, are the same.

The regression results for the restricted sample's analysis are shown in Table 8 along with the results for the unrestricted sample. The differences between the results are in the interaction terms because the differences in the effective abortion rates are only in 1998-2014 period. For property crime, the restricted sample shows a larger reduction in the effect of the effective abortion rate for 1998-2014 than the unrestricted sample does. The total effect for 1998-2014 is changed to 0.025 for the restricted sample while it remains at -0.0501 for the unrestricted sample. Similarly, for violent crime the effect of the effective abortion rate is changed to a positive effect of 0.08 while for the unrestricted sample it is -0.238. These changes show that when only considering offenders under the age of 25, the effect of the effective abortion rate is greatly decreased. My results are different for murder. For the murder rate, I see a smaller reduction between the first and second periods in the effect of effective abortion in the restricted sample than in the unrestricted sample. The effect is reduced by 0.182 for the restricted sample and 0.204 for the unrestricted sample. This smaller effect is likely because murder arrestees are generally older than arrestees for the other crimes, as can be seen in Figure 7. So, restricting the rate to arrestees under age 25 removes a high proportion of murder arrests from the sample.

These results show that by restricting the sample to only include persons under 25, the negative effect of the effective abortion rate is greatly reduced for property and violent crime.

This is likely reflective of the lower abortion rates that were present in the birth years of those who were under the age of 25 at some point in 1998-2014. Lower abortion rates means a lower effective abortion rate, and its effect is diminished.

I run a simple Wald test to test the null hypothesis that the sum of the interaction and non-interaction terms equal 0. These results are in Table 9, in the rows labeled Unrestricted Sample. These results show that at a 0.05 significant level, the null hypothesis is rejected for violent crime and murder. The hypothesis is accepted for property crime. This suggests that the positive effect for violent crime is significant and the negative effect for murder is significant is well. However, for property crime, the effect is not significantly different than zero. This implies that effective abortion is no longer affecting property crime in 1998-2014.

My results show that the large negative effect of the effective abortion rate that I found for the 1998-2014 period for property and violent crime in my unrestricted sample is entirely driven by the increased number of persons born post-Roe. When I exclude those above the age of 24, thus reducing the sample to the age groups analyzed by DL and removing the effect of persons 25-41, I find that the effective abortion rate for property crime is not significantly different from 0 and for violent crime is significantly positive. Murder continues to have a negative relationship with effective abortion. Thus, the mechanical increase in the effective abortion rate caused by the passage of time is driving my result for the unrestricted 1998-2014 period. Falling abortion rates are decreasing the effect of the effective abortion rate, however the effect can only be seen in a restricted sample.

Part 4: Sensitivity Tests

DL conduct a variety of sensitivity tests which I repeat for my 1985-2014 interaction term regression. Results are shown in Table 10. I use the interaction term regression with all of the controls as my baseline and I only display the effects of the specifications on the effective abortion rate and its interaction term. I investigate the effect of large states with high abortion rates on my results, namely New York, California, and the city of Washington DC. Excluding New York decreased my estimates of the influence of the 1985-1997 effective abortion rate and for its interaction terms for all crimes except violent crime. Removing California causes very small negative changes to my non-interaction variables if any, the interaction terms for violent crime and murder increase, while the property crime interaction term decreases. Excluding DC enlarged the estimated negative effect for all of the non-interaction variables and increased the estimated positive effects of the interaction variables. It should be noted that DC is excluded for much of the controlled interaction term regressions because correctional population data is missing for DC from 2001-2014. Additionally, data from DC is suspect as its abortion rate is wildly inflated. It has the highest rate in the nation with a 1985-2014 average of 1096.37 abortions per 1000 live births. In reality, many women who are residents in the surrounding states get abortions in DC because abortion is less restricted in the city. Thus, observations from DC should be considered only semi-representative of the city population's actual abortion situation. Excluding New York, California, and DC together decreases all of the coefficients for the 1985-1997 period and increases or does not affect the interaction terms.

My other sensitivity tests analyze the effects of not weighting the regression by state population. Doing so brings my estimates closer to 0 and renders all but the non-interaction variable for violent crime insignificant. DL see similar results for this specification. However,

much of the effect of the effective abortion rate and its interaction term is recovered by excluding New York, California, and DC in the unweighted regression. The estimates are still different than that of the baseline regression, but they are much closer than the all-inclusive unweighted regression's estimates are. Overall, these sensitivity tests show the power of state observations with high abortion rates, crime rates, and for New York and California high populations in my results.

Section 5: Further Research

Abortion is legal in the United States, however access to abortion has been heavily restricted in some states. Among existing restrictions, there are laws requiring "informed consent" meaning women seeking an abortion must get information on the abortion process that often has an anti-abortion slant. Other laws require a waiting period of up to 24 hours before a woman can undergo the procedure. Some states require women to receive counseling before getting an abortion while others have Targeted Regulation of Abortion Provider laws which place difficult to meet requirements on abortion clinics. In an effort to exploit these state level differences in abortion access, I constructed a model that adds dummy variables for the presence of any of these laws. The results of this model would show if the presence of a law restricting abortion access is affecting crime rates, hypothetically positively as women would be less able to prevent unwanted births.

However, this model proved to be futile. The vast majority of anti-abortion laws were passed in recent years, specifically after the 1992 Supreme Court case Planned Parenthood of Southeastern Pennsylvania vs. Casey which allowed for more stringent anti-abortion laws (Roe

V. Wade). Thus, most anti-abortion laws appeared in the late 1990s and early 2000s. These dates made them useless for my study as I am interested in the effect of abortion in their birth year on people in their high crime years, meaning that I would need to lag the laws by 15 years and which would remove most of them from my sample. Studying the effect of restricted abortion on crime would be a fascinating avenue for future research once the effects of those laws can be seen, at least 15 years after their passage. I also try restricting my analysis to only consider 2010-2014, however the variable for the presence of an anti-abortion law lagged by 15 years is omitted due to collinearity.

A common explanation for declining abortion rates is the increased use of contraception amongst American women. Contraception, like abortion, is a way of preventing unwanted births. Young, poor, single women using contraception can avert the births of unwanted children who are more likely to grow up to be criminals, just as women who get abortions can. The sale of contraception to unmarried persons was legalized nationally in 1972 with the Supreme Court case Eisenstadt v. Baird and contraception use is thought to have increased since then. Access to contraception has increased in recent years with new laws mandating insurance coverage of some forms of contraception. For an analysis of the effect of contraception on crime in recent years one would need data on contraception use from the 1970s, 1980s, and 1990s so that an effective contraception use rate could be calculated in a similar way that the effective abortion rate is. The best source of data on Americans' usage of contraception is the National Survey of Family Growth conducted by the Center for Disease Control and Prevention which surveys Americans about their families, sexual behaviors, and health (NSFG).

Unfortunately, the survey was only conducted in the years 1973, 1976, 1982, 1988, 1995, and every year since 2006. Also, 1976 data is not accessible. Additionally, the survey data is

only given a geographical marker at the regional level, not the state level. The country is divided into 4 regions: North Central, North East, South and West. Table 11 shows the percent of women reporting that they were sexually active and not using contraception for 1973, 1982, 1988, and 1995 at the region level. The percent of sexually active women not using contraception clearly decreases from 1982-1995. Data from 1973 is available, however its question about contraceptive status is worded in a less inclusive way than the 1982, 1988, or 1995 question is. The 1973 survey does not have sufficient options for women to describe their sexual activities, risk of pregnancy, or sterility, and it assumes that sexually active women are married which alienates the population most likely to have a child likely to grow up to be an offender: single women.

Three years of data is not enough to calculate a credible effective contraception use rate for all of 1985-2014. The statistics that are available show that contraception use was increasing in the 1980s and 1990s, which supports the theory that contraception use was enabling women to avoid unwanted births. The NSFG has been conducted every year since 2006 so an analysis of the effect of contraception use on crime could be done in the future when sufficient data is available. The currently available data encourages such future research.

Section 6: Conclusion

My central question for this research was whether abortion rates are still explaining crime rates. I hypothesized that abortion was no longer strongly negatively influencing crime because abortion rates have been falling since the 1980s while crime rates have been falling as well. The average state level abortion rate per 1000 live births decreased from 335.57 for 1985-1997 to

262.60 for 1998-2014, a decrease of 28.50%. However, the effective abortion rate has increased dramatically between the two periods, increasing for property crime by 130.71%, for violent crime by 254.42%, and for murder by 287.6%. Effective abortion rates increased even while real abortion rates declined because the effective abortion rate is analogous to a cumulative measure of abortion weighted by arrests. Even if fewer abortions were occurring in the later period, more arrestees were born after Roe vs. Wade so their age cohorts were affected by abortion and contributed to the effective abortion rate.

My results for the interaction term regression with controls for 1985-2014 (Table 6) show that the effective abortion rate is influencing crime over the entire period 1985-2014. For the 1985-1997 period, a 100 unit increase in the abortion rate per 1000 live births for the respective crime is associated with a 10.4% decrease in per capita property crime, an 18.0% decrease in per capita violent crime, and a 9.0% decrease in per capita murder. The effect of effective abortion is different for the period 1998-2014 relative to the entire period. For 1998-2014, the effect of the effective abortion rate is greatly reduced for property crime and murder and is increased for violent crime, meaning the estimates for property crime and murder get closer to 0 and for violent crime get farther away in the negative direction. For murder the effect has flipped, so that murder and abortion are positively related. Overall, these results show that the legalization of abortion is still affecting crime rates after 1997, but that the effect has decreased since 1997.

My results for the sample restricted to arrestees under the age of 25 for 1998-2014 further supports this conclusion. This restriction attempts to show the effect of the changes in the abortion rate over time rather than just the effect of more people being affected by abortion. The results show that the negative effect of abortion on crime is erased for property and violent crime. For murder and violent crime abortion and crime become positively related and for

property crime the effect is not significantly different from 0. This decrease of the effect of abortion is possibly because people who were under the age of 25 at some point from 1998-2014 were born in years with lower abortion rates, so the effect of abortion has lessened. I hypothesized that the fall in abortion rates would reduce the effect of abortion on crime for 1998-2014, these results show that this effect is happening but that the cumulative effect is overpowering it for now.

DL make a few predictions about the future of their theory. They say in their paper, "When a steady state is reached roughly twenty years from now, the impact of abortion will be roughly twice as great as the impact felt so far. Our results suggest that all else equal, legalized abortion will account for persistent declines of 1 percent a year in crime over the next two decades" (DL 2001). They interpret their results to mean that because an increase of 100 in the abortion rate per 1000 live births causes about a 10% drop for all three crime, the 1997 effective abortion rates imply that abortion caused a 15-25% reduction in crime in 1997 as opposed to a counterfactual where abortion remained illegal. Following their interpretation, my results imply for the unrestricted sample a 14% reduction in property crime, a 68% reduction in violent crime, and a 33% increase in murder in 2014. For my sample restricted to under 25s, I extrapolate to a 4% increase in property crime, an 11% increase in violent crime, and a 16% increase in murder.

Overall, I find that DL correctly predicted that abortion would still be affecting crime 20 years after their paper. However, I only find a continued negative effect for property and violent crime. Additionally, much of these effects can be attributed to the increase in the number of persons born after Roe in the latter period of analysis. When the people who represent this cumulative effect are removed, my estimates change so that for all three crimes effective abortion is not having a negative effect on crime, likely because of falling abortion rates.

TABLE 1: Summary Statistics, DL vs Analysis

Variable	1985-1997 DL Means	1985-1997 Means
Effective Abortion Rate per 1000 Live Birth, Property Crime	132.26 (116.46)	111.16 (116.95)
Effective Abortion Rate per 1000 Live Births, Violent Crime	77.11 (83.18)	65.62 (79.79)
Effective Abortion Rate per 1000 Live Births, Murder	51.00 (66.57)	67.75 (98.22)
Abortions per 1000 Live Births	Unreported	335.57 (234.76)
Property Crime per 1000 Residents	48.04 (11.46)	45.51 (12.14)
Violent Crime per 1000 Residents	6.73 (2.81)	5.42 (3.63)
Murders per 1000 Residents	0.09 (0.04)	0.0778 (0.09)
Correctional Population per 1000 Residents	2.83 (1.26)	2.79 (2.27)
Police Officers per 1000 Residents	2.85 (0.64)	4.69 (9.75)
Unemployment Rate	6.15 (1.55)	5.89 (1.74)
Per Capita Income, 2014$	34,230 (5,027)	31,782 (5,264)
Poverty Rate	13.80 (3.51)	13.41 (4.20)
Average Welfare Payment per Family, 2014$ (n-15)	10,681 (4,284)	10,329 (4,721)

Numbers given are means with overall standard deviations in parentheses

TABLE 2: Summary Statistics, 1985-1997 vs 1998-2014

Variable	Pd1: 1985-1997	Pd2: 1998-2014	Change	Percent Change
Effective Abortion Rate (per 1000 Live Birth) Property Crime	111.16 (116.95)	256.47 (169.88)	145.30	130.71%
Effective Abortion Rate (per 1000 Live Birth) Violent Crime	65.62 (79.79)	232.57 (159.43)	166.95	254.42%
Effective Abortion Rate (per 1000 Live Birth) Murder	67.75 (98.22)	262.60 (172.23)	194.85	287.60%
Effective Abortion Rate (per 1000 Live Birth) Property Crime Under 25	111.16 (116.95)	199.82 (128.42)	88.66	79.76%
Effective Abortion Rate (per 1000 Live Birth) Violent Crime Under 25	65.62 (79.79)	153.18 (96.85)	87.56	133.43%
Effective Abortion Rate (per 1000 Live Birth) Murder Under 25	67.75 (98.22)	193.91 (122.08)	126.16	186.21%
Abortions per 1000 Live Births	335.57 (234.76)	239.94 (150.29)	-95.63	-28.50%
Property Crime per 1000 Residents	45.51 (12.14)	32.75 (8.84)	-12.76	-28.03%
Violent Crime per 1000 Residents	5.42 (3.63)	4.19 (2.25)	-1.23	-22.68%
Murders per 1000 Residents	0.0778 (0.09)	0.0515 (0.047)	-0.03	-33.80%
Correctional Population per 1000 Residents	2.79 (2.27)	3.95 (1.88)	1.15	41.25%
Police Officers per 1000 Residents	4.69 (9.75)	4.38 (9.84)	-0.31	-6.54%
Unemployment Rate	5.89 (1.74)	5.74 (2.03)	-0.15	-2.60%
Per Capita Income, 2014$	31,782 (5,264)	36463.09 (8412.37)	4680.56	14.73%
Poverty Rate	13.41 (4.20)	12.64 (3.44)	-0.77	-5.74%

Numbers given are means with overall standard deviations in parentheses.

TABLE 3: DL vs. Analysis without Controls Regression Results

	ln(Property Crime per capita)		ln(Violent Crime per capita)		ln(Murder per capita)	
	DL	Analysis	DL	Analysis	DL	Analysis
Effective Abortion Rate	-0.095 (0.018)	-0.106 (0.0135)	-0.137 (0.023)	-0.177 (0.0206)	-0.108 (0.036)	-0.0911 (0.0238)
R-squared	0.938	0.9243	0.990	0.9743	0.914	0.9271

The numbers in the table are the coefficients for each variable in the corresponding regression, standard errors are in parentheses. There are 663 observations.

TABLE 4: DL vs. Analysis with Controls Regression Results

	ln(Property Crime per capita)		ln(Violent Crime per capita)		ln(Murder per capita)	
	DL	Analysis	DL	Analysis	DL	Analysis
Effective Abortion Rate	-0.091 (0.018)	-0.103 (0.014)	-0.129 (0.024)	-0.176 (0.025)	-0.121 (0.047)	-0.090 (0.029)
ln(Correctional Population per capita, t-1)	-0.159 (0.036)	-0.168 (0.039)	-0.027 (0.044)	-0.072 (0.039)	-0.231 (0.080)	-0.140 (0.072)
ln(Police Officers per capita, t-1)	-0.049 (0.045)	-0.002 (0.003)	-0.028 (0.045)	-0.002 (0.004)	-0.300 (0.109)	0.003 (0.007)
Unemployment Rate	1.31 (0.389)	0.027 (0.004)	0.069 (0.505)	0.015 (0.005)	0.968 (0.794)	0.018 (0.009)
ln(per capita Income, 2014$)	0.084 (0.162)	0.835 (0.163)	0.049 (0.213)	0.567 (0.206)	-0.098 (0.465)	0.727 (0.381)
Poverty Rate	-0.001 (0.001)	-0.005 (0.002)	-0.000 (0.002)	-0.002 (0.002)	-0.005 (0.004)	-0.003 (0.005)
Shall-Issue Conceal Carry Law	0.039 (0.011)	0.053 (0.016)	-0.004 (0.012)	0.0006 (0.015)	-0.015 (0.032)	-0.021 (0.037)
Welfare Generosity (t-15) (x1000)	0.002 (0.004)	0.003 (0.002)	0.008 (0.005)	0.004 (0.002)	-0.00 (0.004)	-0.0003 (0.004)
Beer Consumption per capita (gallons)	0.004 (0.003)	----	0.004 (0.003)	---	0.06 (0.008)	----
R-squared	0.990	0.944	0.942	0.9759	0.918	0.9284

The numbers in the table are the coefficients for each variable in the corresponding regression, standard errors are in parentheses. There are 663 observations.

TABLE 5: Interaction Term Regression without Controls

	ln(Property Crime per capita)	ln(Violent Crime per capita)	ln(Murder per capita)
Effective Abortion Rate	-0.0106** (0.0134)	-0.177** (0.0205)	-0.0911** (0.0237
I Term: Effective Abortion Rate	-0.0801** (0.0223)	-0.0357 (0.0334)	-0.0887* (0.0492)
I Term	-0.430** (0.0329)	0.0150** (0.0653)	-0.316* (0.123)
R-Squared	0.9619	0.9678	0.9374

The numbers in the table are the coefficients for each variable in the corresponding regression, standard errors are in parentheses. There are 1530 observations.

TABLE 6: Interaction Term Regression with Controls

	ln(Property Crime per capita)	ln(Violent Crime per capita)	ln(Murder per capita)
Effective Abortion Rate	-0.104** (0.0139)	-0.180** (0.0258)	-0.0900** (0.0296)
I Term: Effective Abortion Rate	0.0539** (0.0291)	-0.0587 (0.0402)	0.204** (0.0580)
ln(Correctional Population per capita, t-1)	-0.172** (0.0381)	-0.0783** (0.0376)	-0.140** (0.0706)
I Term: ln(Correctional Population per capita, t-1)	0.253** (0.0451)	0.203** (0.0510)	0.251** (0.0882)
ln(Police Officers per capita, t-1)	-.00173 (0.00325)	-0.00152 (0.0038)	0.00337 (0.00659)
I Term: ln(Police Officers per capita, t-1)	0.00413 (0.00404)	0.00435 (0.0049)	-0.00377 (0.00798)
Unemployment Rate	0.0271** (0.00450)	0.0149** (0.0053)	0.0177** (0.00886)
I Term: Unemployment Rate	-0.0292** (0.00596)	-0.0220** (0.0067)	-0.0276** (0.0112)
ln(per capita Income, 2014$)	0.792** (0.164)	0.509 (0.216)	0.736** (0.376)
I Term: ln(per capita Income, 2014$)	-0.995** (0.199)	-0.566** (0.255)	-0.589 (0.0424)
Poverty Rate	0.00508** (0.00211)	-0.00192 (0.0025)	-0.00335 (0.00490)
I Term: Poverty Rate	-0.00441 (0.00316)	-0.00515 (0.0038)	-0.0334** (0.0054)
Shall-Issue Conceal Carry Law	0.0548** (0.0155)	0.00215 (0.0153)	-0.0126 (0.0234)
I Term: Shall-Issue Conceal Carry Law	0.0685** (0.0211)	0.0599** (0.0207)	0.00922 (0.0236)
I Term	11.5** (2.06)	7.34** (2.70)	2.59 (1.78)
R-squared	0.9673	0.9703	0.9155

The numbers in the table are the coefficients for each variable in the corresponding regression, standard deviations are in parentheses. ** denotes significance at the 0.05 level and * denotes significance at the 0.1 level. There are 1,495 observations because of missing DC data. Variables whose labels begin with "I Term" are the interaction terms for the subsequently named variable. I do not report the coefficients for the state or year variables and their interaction terms.

TABLE 7: Effective Abortion 1997 vs. 2014, under 25s

Variable	1985-1997	1998-2014	1998-2014 Restricted
Effective Abortion Rate (per 1000 Live Birth) Property Crime	208 (134)	279 (190)	171 (125)
Effective Abortion Rate (per 1000 Live Birth) Violent Crime	148 (104)	284 (192)	135 (101)
Effective Abortion Rate (per 1000 Live Birth) Murder	181 (132)	291 (203)	174 (134)

Numbers given are the mean value for the year, standard deviations in parentheses.

TABLE 8: Interaction Term Regression, Under 25s and Unrestricted

	ln(Property Crime per capita)		ln(Violent Crime per capita)		ln(Murder per capita)	
	Under 25s	Unrestricted	Under 25s	Unrestricted	Under 25s	Unrestricted
Effective Abortion Rate	-0.104** (0.0139)	-0.104** (0.0139)	-0.180** (0.0257)	-0.180** (0.0258)	-0.0900** (0.0296)	-0.0900** (0.0296)
I Term: Effective Abortion Rate	0.129** (0.0273)	0.0539** (0.0291)	0.260** (0.0406)	-0.0587 (0.0402)	0.182** (0.0462)	0.204** (0.0580)
ln(Correctional Population per capita, t-1)	-0.172** (0.0381)	-0.172** (0.0381)	-0.0783** (0.0375)	-0.0783** (0.0376)	-0.140** (0.0706)	-0.140** (0.0706)
I Term: ln(Correctional Population per capita, t-1)	0.227** (0.0455)	0.253** (0.0451)	0.255** (0.0510)	0.203** (0.0510)	0.187** (0.0909)	0.251** (0.0882)
ln(Police Officers per capita, t-1)	-0.00173 (0.00325)	-.00173 (0.00325)	-0.00152 (0.00377)	-0.00152 (0.0038)	0.00337 (0.00659)	0.00337 (0.00659)
I Term: ln(Police Officers per capita, t-1)	0.00393 (0.00408)	0.00413 (0.00404)	0.00183 (0.00518)	0.00435 (0.0049)	-0.00239 (0.008)	-0.00377 (0.00798)
Unemployment Rate	0.0271** (0.00450)	0.0271** (0.00450)	0.0149** (0.00534)	0.0149** (0.0053)	0.0177** (0.00886)	0.0177** (0.00886)
I Term: Unemployment Rate	-0.0282** (0.00596)	-0.0292** (0.00596)	-0.0274** (0.00712)	-0.0220** (0.0067)	-0.0229** (0.0112)	-0.0276** (0.0112)
ln(per capita Income, 2014$)	0.792** (0.0164)	0.792** (0.164)	0.509* (0.215)	0.509 (0.216)	0.736** (0.376)	0.736** (0.376)
I Term: ln(per capita Income, 2014$)	-0.960** (0.200)	-0.995** (0.199)	-0.451* (0.264)	-0.566** (0.255)	-0.617 (0.426)	-0.589 (0.0424)
Poverty Rate	-0.00508** (0.00211)	0.00508** (0.00211)	-0.00192 (0.00249)	-0.00192 (0.0025)	-0.00335 (0.00490)	-0.00335 (0.00490)
I Term: Poverty Rate	0.00456 (0.00310)	-0.00441 (0.00316)	-0.00124 (0.00385)	-0.00515 (0.0038)	-0.00622 (0.00673)	-0.0334** (0.0054)
Shall-Issue Conceal Carry Law	0.0548** (0.0155)	0.0548** (0.0155)	0.00215 (0.0153)	0.00215 (0.0153)	-0.0210 (0.0371)	-0.0126 (0.0234)
I Term: Shall-Issue Conceal Carry Law	-0.0632** (0.0210)	0.0685** (0.0211)	0.0974** (0.0225)	0.0599** (0.0207)	0.0897* (0.0500)	0.00922 (0.0236)
I Term	11.0** (2.07)	11.5** (2.06)	6.11** (2.79)	7.34** (2.70)	7.29* (4.41)	2.59 (1.78)
R-squared	0.9671	0.9673	0.9394	0.9703	0.9394	0.9155

TABLE 9: F-Test of Sum

Test: Interaction Term+ Non-Interaction Term Variable Coefficients =0			
		F Stat	Prob > F
Unrestricted Sample	Property Crime	3.93	0.0478
	Violent Crime	59.94	0.000
	Murder	5.23	0.0224
Restricted Sample	Property Crime	1.03	0.2986
	Violent Crime	6.54	0.0107
	Murder	5.23	0.0224

TABLE 10: Sensitivity Analysis

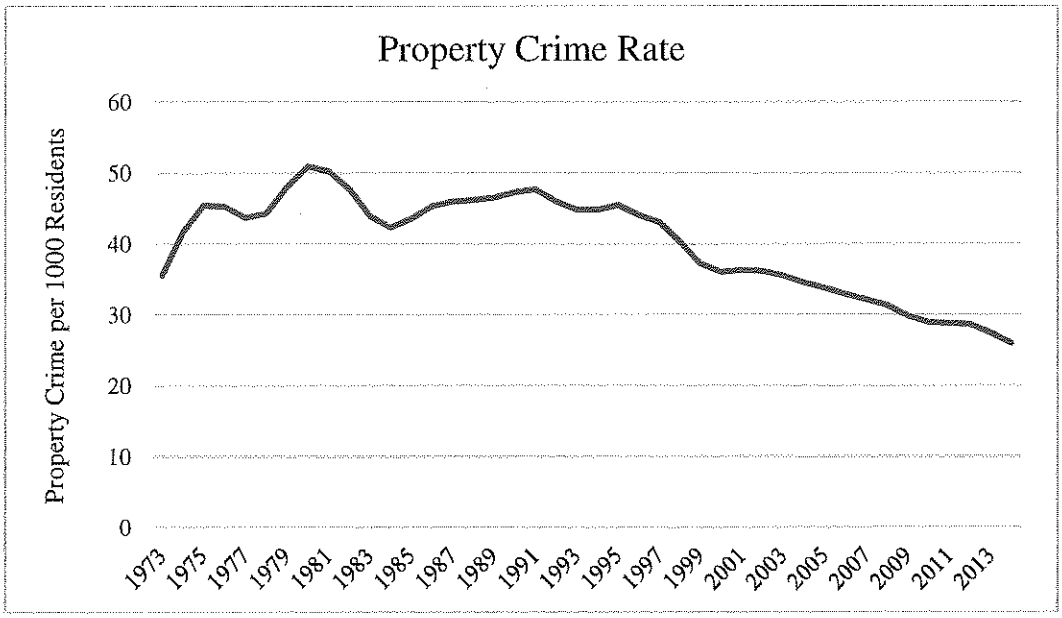
Specification		ln(Property Crime per capita)	ln(Violent Crime per capita)	ln(Murder per capita)
Baseline	Effective Abortion Rate (x100)	-0.104** (0.0139)	-0.180** (0.0258)	-0.0900** (0.0296)
	I Term: Effective Abortion Rate (x100)	0.0539** (0.0291)	-0.0587 (0.0402)	0.204** (0.0580)
Exclude New York	Effective Abortion Rate (x100)	-0.0971** (0.0154)	-0.128** (0.0258)	-0.0585** (0.0279)
	I Term: Effective Abortion Rate (x100)	0.0425 (0.0307)	-0.129** (0.0405)	0.181** (0.0591)
Exclude California	Effective Abortion Rate (x100)	-0.104** (0.0150)	-0.190** (0.0260)	-0.0952** (0.0295)
	I Term: Effective Abortion Rate (x100)	0.0677** (0.0318)	-0.0582 (0.0410)	0.153** (0.0633)
Exclude DC	Effective Abortion Rate (x100)	-0.126** (0.0139)	-0.218** (0.0248)	-0.122** (0.0320)
	I Term: Effective Abortion Rate (x100)	0.0754** (0.0291)	-0.0208 (0.0396)	0.236** (0.0592)
Exclude NY, CA, DC	Effective Abortion Rate (x100)	-0.133** (0.0115)	-0.211** (0.0252)	-0.145** (0.0307)
	I Term: Effective Abortion Rate (x100)	0.0910** (0.0313)	-0.0468 (0.0432)	0.204** (0.0662)
Unweighted	Effective Abortion Rate (x100)	-0.0261 (0.0170)	-0.0288 (0.0237)	0.0325 (0.0280)
	I Term: Effective Abortion Rate (x100)	0.0153 (0.0287)	-0.146** (0.0413)	0.0436 (0.0789)
Unweighted excluding NY, CA, DC	Effective Abortion Rate (x100)	-0.112** (0.0112)	-0.172** (0.0284)	-0.732* (0.0384)
	I Term: Effective Abortion Rate (x100)	0.103** (0.0272)	0.00889 (0.0458)	0.144* (0.0855)

The numbers in the table are the coefficients for each variable in the corresponding regression, standard deviations are in parentheses. ** denotes significance at the 0.05 level and * denotes significance at the 0.1 level. These regressions include the full set of controls

TABLE 11: Contraception Use

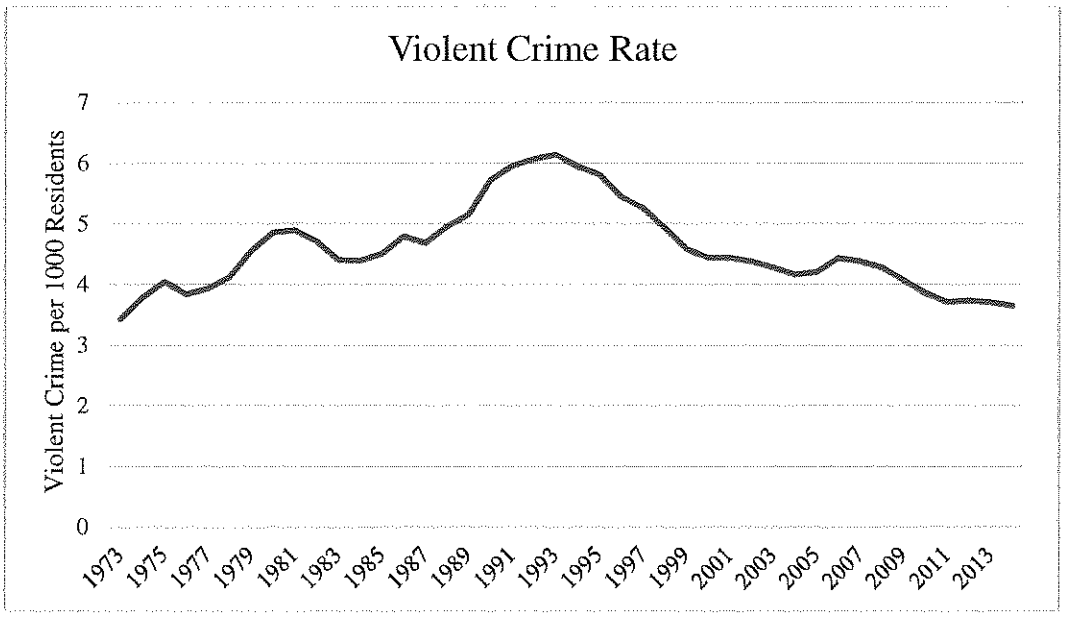
Percent of Sexually Active Women Not Using Contraception				
Region	NC	NE	SO	WE
1973	12.45	14.54	12.55	9.31
1982	12.45	15.05	14.44	13.52
1988	12.2	13.96	12.58	12.86
1995	11.33	12.81	10.1	12.41

FIGURE 1: Property Crime Rate



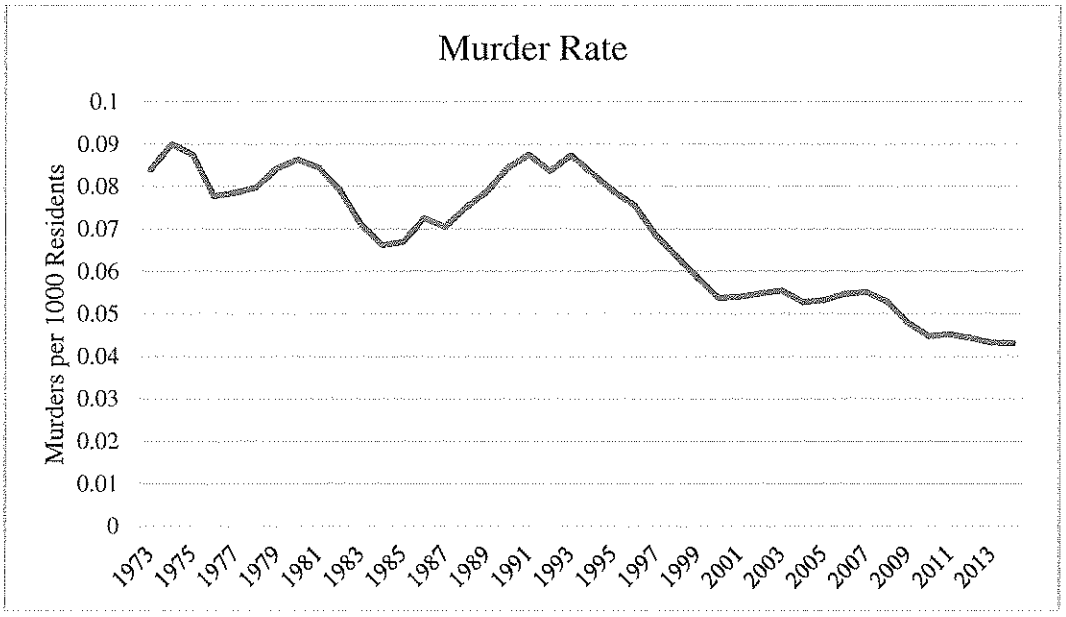
State-level average occurrences of property crime per 1000 residents

FIGURE 2: Violent Crime Rate



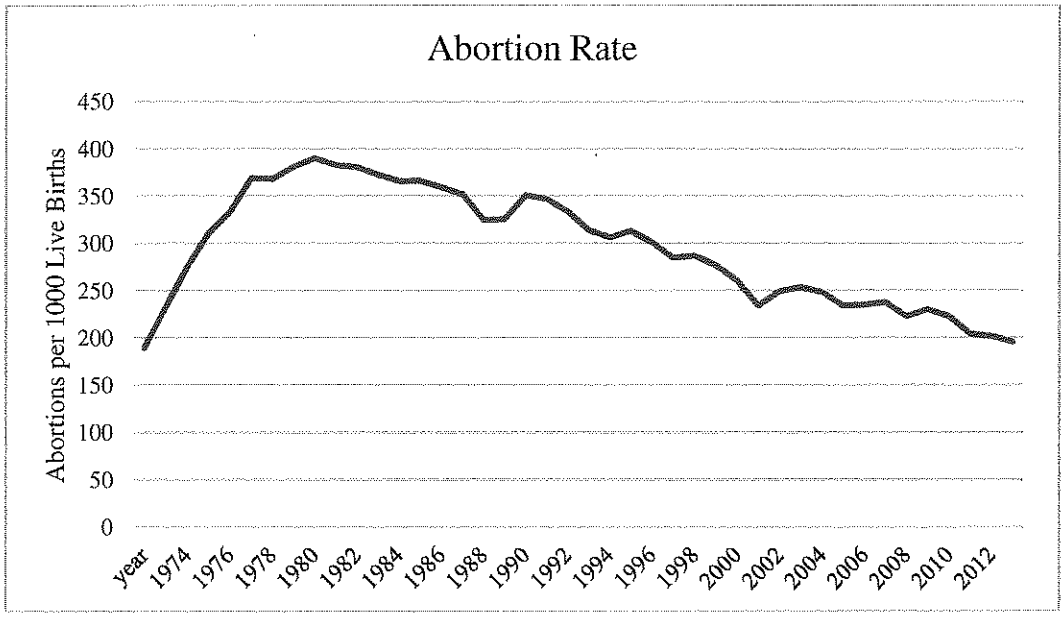
State-level average occurrences of violent crime per 1000 residents

FIGURE 3: Murder Rate



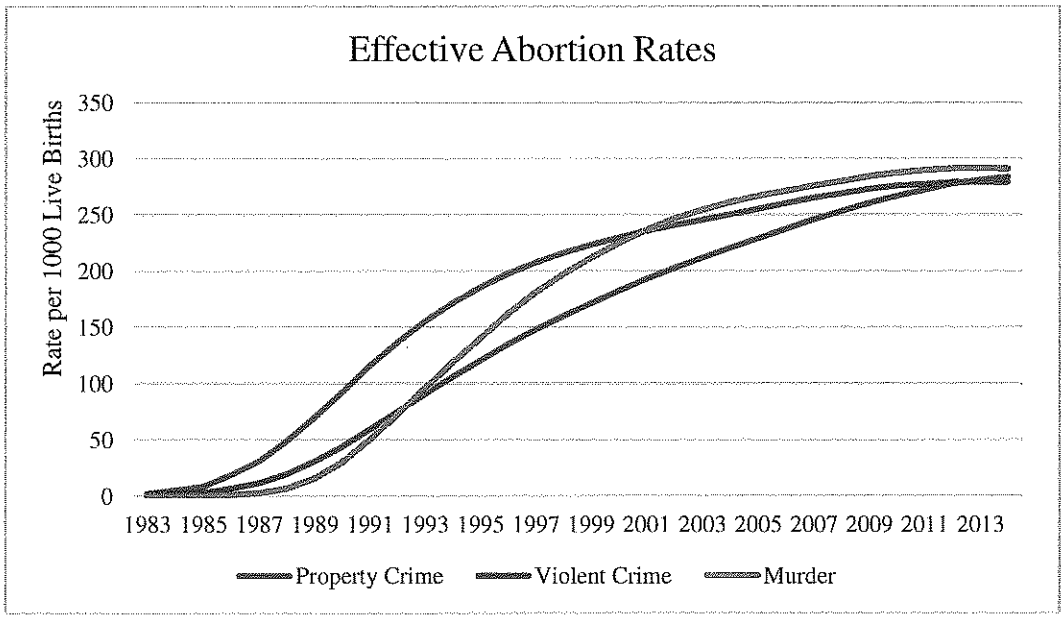
State-level average occurrences of murder per 1000 residents

FIGURE 4: Abortion Rate



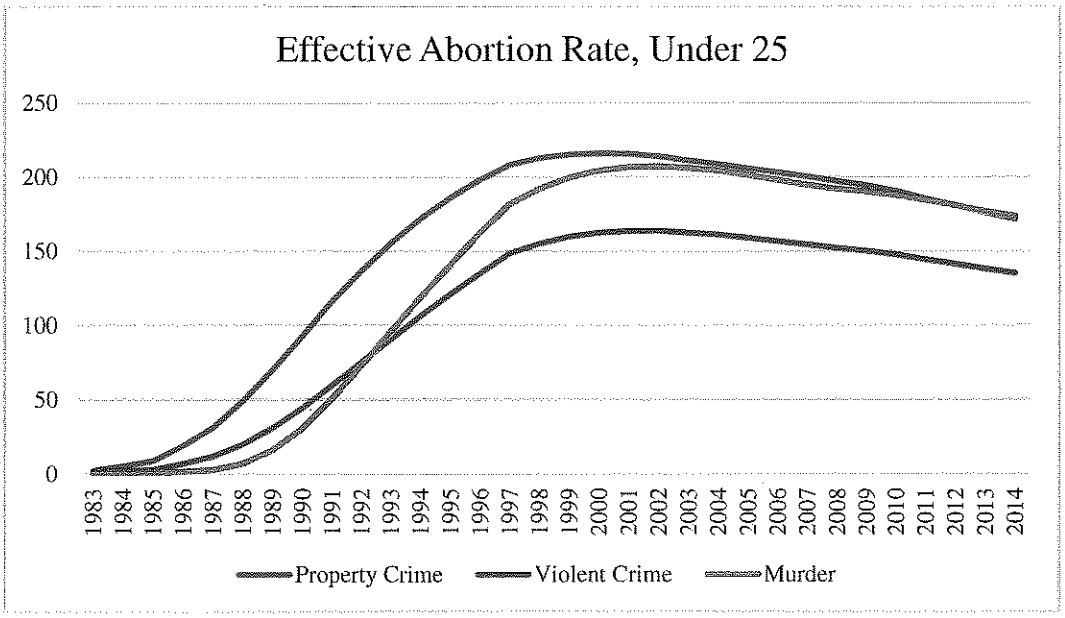
State-level average abortions per 1000 live births

FIGURE 5: Effective Abortion Rate



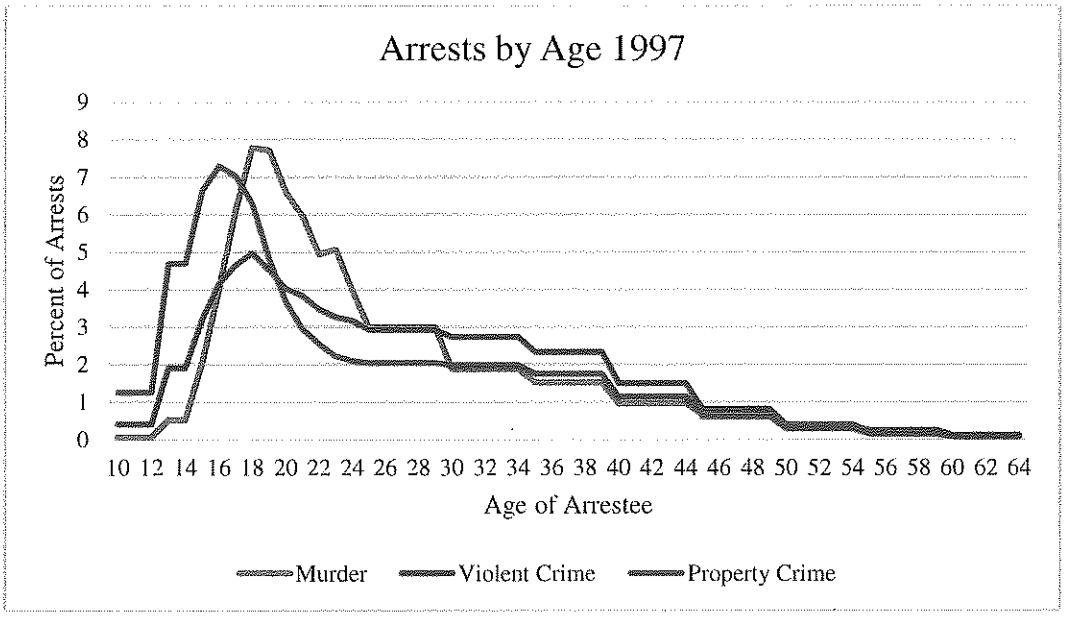
State-level average effective abortion rate per 1000 live births for property crime, violent crime, and murder.

FIGURE 6: Effective Abortion Rates, Under 25



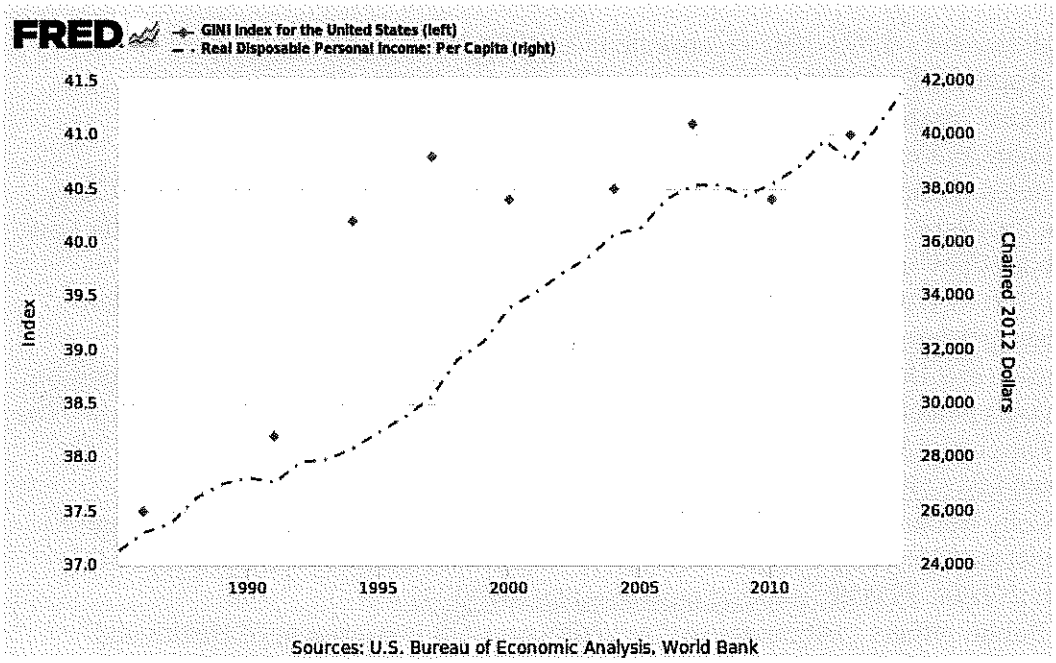
State-level average effective abortion rate per 1000 live births for property crime, violent crime, and murder for arrestees under age 25.

FIGURE 7: Arrests by Age



The figure show the percent of arrestees of each age for murder, violent crime, and property crime in 1997.

FIGURE 8: Inequality and Per Capita Income



The figure shows the United States Gini Index and per capita income 1985-2014.

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