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The impact of Unilateral Divorce Law on murder

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The impact of Unilateral Divorce Law on murder

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Abstract

This paper studies the effect of a law that enables the dissolution of marriage without mutual consent of both spouses on the rates of murder in United States. The analysis exploits the fact that states passed the law at different points in time. The variability across time and space in the implementation of the law offers a potential instrument in order to identify the causal effect of unilateral divorce law on murder rate. After controlling for state and year fixed effects, I find that the states which passed the law experienced an increase of 16 percent in murder rates.

I.   Introduction

This paper studies the impact of unilateral divorce laws on the number of murders. Using data from US states in the 1970s (a period called "the divorce revolution") I find that the implementation of unilateral divorce law increases murder rates in about 16 percent. I perform several false experiments that favour a causal interpretation of the results. Moving from mutual consent to unilateral divorce means that either party can file for the divorce without the consent of their spouse. As summarized in Rasul (2003) moving from unilateral consent to unilateral divorce essentially re-assigns the right to divorce from being held jointly, to being held individually.

Many studies discussed the impact unilateral divorce had on divorce rates. Peters (1986), Friedberg (1998), Gruber (2004) and Wolfers(2006) analyzed short and long term effects of the law and both papers conclude the law increased divorce rates.

The empirical research has also outlined distinctly the existing relation between unilateral divorce law and crime. Stevenson and Wolfers (2006) examine two kinds of offenses: domestic violence and homicide committed by a spouse. For those states that adopted unilateral divorce, they report a decline in the amount of women committing suicide,   a large decline in domestic violence , and a decline in females murdered by their partners.

Although the literature agrees on the idea that unilateral divorce law has been favourable for women and married adults, there is evidence that also has some negative effects on children. Gruber (2004) suggests that those adults who were exposed to the Unilateral Divorce Law as children experience lower family incomes and lower educational achievements, they marry at an earlier age, but they separate more often and have a bigger

propensity to commit adult suicide. Moreover, Cáceres-Delpiano and Giolito (2008) analyze the effect of unilateral divorce on outcomes of children: likeliness of getting divorce, being below the poverty line, of a decrease in their family income, being enrolled in private school and even repeating a school grade. Furthermore, in a following paper they find that unilateral divorce has a positive impact on violent crime rates, with an 8% to 12% average increase for the period 1965-1998, indentifying that the impact concentrates on children from 15 to 24 years old, the most pertinent for this kind of offenses.

Here I exploit the fact that in the 1970s each state decided or not to implement the reform. Moreover, each state decided to set the law at different moments of time. I use this time and space variability in the implementation of the law to identify the causal effect of unilateral divorce law on murders. I show that results are robust to controlling for unemployment and per capital personal income.

The paper is organized as follows: Section II describes the data and Section III presents the specification strategy. Section IV concludes.

II.   Data

The data is a panel of 51 states from United States over the period 1960-2011. These data include information on the dates in which the law was passed and state-level data for unemployment rate, per capita personal income, murder rates and rates corresponding to other types of crime (property, rape, robbery, assault and theft).

The murder rate data was taken from the Uniform State Reports (UCR), published by the Federal Bureau of Investigation, and contains official data on crime in the United States.

Table 1 reports the murder rates per 100,000 habitants. A total of 2,127 observations

are available for estimation and contain an important variation across states and time.

Information as regards the point in time when each state implemented the reform was obtained from the state annotated legal codes. The law is very similar for every state. Out of the fifty one states, forty six had passed the law and there are five states that have never adopted any kind of unilateral divorce (Arkansas, Delaware, Mississippi, New York and Tennessee). The treatment variable is represented by a dummy which indicates if the province has passed the law or not. Table 2 shows the amount of states that implemented the law from 1968 to 2012. The gross of the states passed the law around the first half of the 1970s if they had not done it before 1968. Therefore, as over this period states implemented the reform in different moments, the variation in time and in space is used to identify the causal effect on murders.

The last data set consists of state level information on unemployment rate and per capita personal income. The unemployment rate by state for the period 1976 to 2011 was obtained from the Bureau of Labour Statistics. Per capita personal income is available for the period 1960 to 2011 and was obtained from Bureau of Economic Analysis of the US Department of Commerce.

III.   The Effect of the Unilateral Divorce Law on Murders

A. Empirical Strategy

The object of this paper is to identify the average effect of unilateral divorce on murder rates, comparing murders in the states that passed the law to states that did not pass the law. As no experiment was done, it is not possible to guarantee that the implementation of the law in each state was random. This means, there could be different particular characteristics in some states that may have influenced or not the decision of passing the

law. The fact that several states may be more involved in religious matters could have delayed the passing of the law, or states which have more family violence may have decided to adopt the law earlier. In any of these cases, this would represent a correlation between the unilateral divorce law and certain factors that influence murders resulting in a biased estimator. Fortunately, it can be argued that the variables that might confound the identification are those that change across states but are fixed over time. With the purpose of controlling these time-invariant unobserved variables I use panel data and a estimated difference-in-differences model. The difference in difference model compares the changes in the outcomes of the treated group (states in which the law was passed) before and after the reform to the changes in the outcomes of the control group. The underlying assumption is that the evolution of the control group is a good estimate of what would have happened to the treatment group if there were no treatment (no implementation of the law). Formally,

$$\text{Murders}_{it} = \alpha \text{DivorceLaw}_{it} + \beta X_{it} + \theta_i + \mu_t + \varepsilon_{it} \qquad (1)$$

where Murders_{it} is the log of the murder rate per 100,000 inhabitants in state i for the year t; Divorce Law_{it} is a dummy variable that takes the value of one if the state i has the unilateral divorce law in year t and zero otherwise; X_{it} is a vector that consists of control variables that change over time and space, μ_t represents the time fixed effect equal to all states in period t, and θ_i is a state fixed effect.

The X_{it} vector includes per capita income and unemployment These variables vary over time and stats and are used as proxies for macroeconomic conditions.

The error is a state time-varying error which is generally assumed to be independent across time and space; however, as the analysis uses panel data, the errors could be

correlated across time in the same state. If there were a positive correlation, this would make the model compute the standard errors smaller and the null hypothesis could be over rejected. So, in order to avoid potential biases, standard errors are clustered at state level allowing an arbitrary covariance structure within states over time.[1] It is important to stress that if the state errors are highly correlated, clustering standard errors may reduce the statistical power of the estimation.[2]

The main coefficient of interest is α.. The identification assumption is that the evolution of murder rates in the control group is an unbiased estimator of how the evolution of the murder rates in the treatment group would have been in the absence of the unilateral divorce law. This assumption cannot be tested. However, it is possible to compare the trends of the different groups in the pre-treatment periods using a modified version of equation (1) that contains pre-intervention year dummies.

I find that the null hypothesis that the pre-intervention year dummies are the same for the eventually treated and control states cannot be rejected. It is important to understand that this does not mean that the previous trends are equal; it only means that we do not have sufficient evidence to reject the null hypothesis of equal trends between both groups. I also include a graphical approach see Figure 1)

The approach consists of a graph of the trends and an analysis considering if the pre-treatment trends are similar between groups. The problem is that since the treatment was imposed in different years, and therefore it is difficult to determine the line of "before-after". So, I determine the line in the year where most of the states were treated: 1971 and

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[1] See Bertrand *et al.* (2004)

[2] If there were no effect found, this could be a problem and nothing could be done to avoid it as the number of states cannot be increased (what would solve the power problem by increasing the sample size, including more groups). In this study, each state conforms to a group (so there are 51 groups). Therefore, the sample size cannot be increased because the analysis uses all the states and there are no more groups (states) to add.

1973. I keep only those states that were not treated and compare them with those where the law was passed in the years 1971 and 1973.

There is no significant difference between the murder rate of those states where the law was passed in 1971 or 1973. Therefore, as both results suggest that murder rates in the treated and control states had equal trends in the pre-intervention period, the difference-in-differences approach is valid.

B. Results

Column 1 in table 4 shows the results for a model that includes only the unilateral law dummy, the fixed effect for each province, and the year dummies. States that have passed the unilateral divorce law experience a statistically increase in the murder rate of about 16 percent of the rate.

In column 2 I show that results are robust to controllingo for unemployment rate and per capita income.[3]

Taking everything into account, the results suggest the introduction of a law that allows unilateral divorce generates an increase in murder rates.

C. Falsification Tests

In this section I exploit the timing of the law to construct placebo treatments. This will be useful to give validity to the previous results, discarding the possibility of the results being product of spurious correlation in the data. The method consists of keeping pre-treatment observations and assigning the treatment before it was actually assigned. If the model presented in the previous section is correctly specified, the passing of the law should

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[3] The population is not included as a control variable since all the variables are calculated on a per capita basis.

not affect the murder rates between the years in which it did not exist. We test this for several false treatments: if the treatment was assigned five and six years before it was actually assigned. Clearly, the program did not affect the caseload clearance rates in these years, discarding the possibility of the results being product of spurious correlation in the data, thus giving validity to our previous results.

As reported in in Table 5, the law did not affect the murder rates in these years, discarding the possibility of the results being product of spurious correlation in the data, thus giving validity to our previous results.

D. Impact of Unilateral Divorce law in other crimes

Despite of the robustness of the estimates already calculated, it can still be argued that the impact of the law was in all types of crimes not only in murders. This would suggest that when the Unilateral Divorce Law was passed, other unobserved changes that correlate with crime in general (all types of crime) may have an effect in states where the law was implemented making the crime rate increase. To address this issue I estimate a difference-in-differences model for other types of crime such as crimes on property, robbery, rape, assaults and theft. The results show that there is no statistically significant effect of the law on any other crime.

IV.   Conclusions

This paper studies the impact of unilateral divorce on murder throughout the analysis of state-level US data. Previous research concludes that divorce laws may affect marriage selection and bring some negative effects to individuals who faced the reform as children. Here, the analysis seeks to look at consequences as regards the individuals involved, and it determines that divorce may have a causal effect on the rate of murder. That is, the

emotional disturbance, financial and psychological troubles together with the trauma itself of feeling abandoned by their couple may lead the members affected to commit crime, especially murders.

It can be stated that the relation between murders and the divorce law is causal due to several factors. To begin with, the treatment and the control group showed similar time trends in the period before the intervention occurred, validating the use of difference-in-difference as the identification strategy. The conclusions obtained are robust to the inclusion of variables that may affect divorces and might also impact on murder rates. Finally, it is demonstrated that the reform only affected murder rates and not other types of crime.

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Appendix

Table 1: Summary Statistics, murder rates per 100,000 habitants

State	Mean	Std. Dev.	Min	Max
Alabama	10.577	2.602	5.600	16.000
Alaska	8.824	3.363	3.100	18.500
Arizona	7.604	1.348	5.000	10.500
Arkansas	8.279	1.778	4.600	12.000
California	8.392	3.045	3.700	14.500
Colorado	5.154	1.444	2.600	8.300
Columbia	37.373	19.019	10.600	80.600
Connecticut	3.652	1.291	1.000	6.600
Delaware	5.340	1.725	2.500	10.300
Florida	9.492	3.024	5.000	15.400
Georgia	10.910	3.447	5.600	18.500
Hawaii	3.838	1.887	1.200	8.700
Idaho	3.102	1.146	1.200	5.600
Illinois	8.379	2.082	4.800	11.800
Indiana	5.963	1.496	2.800	8.900
Iowa	1.781	0.427	0.600	2.600
Kansas	4.725	1.320	1.900	6.900
Kentucky	7.012	2.162	3.500	11.100
Louisiana	12.898	3.275	6.400	20.300
Maine	2.079	0.748	0.400	5.300
Maryland	9.240	1.902	4.500	12.700
Massachusetts	3.085	0.806	1.400	4.400
Michigan	8.260	2.548	3.400	13.000
Minnesota	2.315	0.669	0.900	3.900
Mississippi	10.733	2.566	6.600	16.100
Missouri	8.019	1.912	4.400	11.300
Montana	3.398	1.106	1.500	6.000
Nebraska	3.019	0.687	1.500	4.400
Nevada	10.373	3.241	5.200	20.000
New Hampshire	1.921	0.772	0.600	3.600
New Jersey	4.846	1.204	2.500	7.400
New Mexico	8.985	2.170	5.400	13.300
New York	8.530	3.400	4.000	14.500
North Carolina	8.973	2.141	5.000	13.500

North Dakota	1.244	0.610	0.200	3.500
Ohio	.	.	.	.
Oklahoma	6.877	1.646	4.400	12.200
Oregon	3.734	1.284	1.800	6.600
Pennsylvania	5.267	1.169	2.300	6.800
Rhode Island	2.962	1.028	0.800	4.900
South Carolina	10.138	2.764	5.700	16.800
South Dakota	2.115	0.972	0.600	4.600
Tennessee	8.840	1.896	5.600	13.400
Texas	10.173	3.614	4.400	16.900
Utah	2.704	0.787	1.000	4.800
Vermont	2.046	1.015	0.300	5.500
Virginia	7.787	1.985	3.700	12.300
Washington	3.885	1.101	2.100	5.700
West Virginia	4.971	1.242	2.200	7.400
Wisconsin	2.952	0.888	0.900	4.800
Wyoming	4.367	2.140	1.400	10.300
Full Sample	6.738	6.285	0.200	80.600

Note: Each mean was calculated taking into account the whole period (1960 - 2011). There is no available data for Ohio.

Table 2: Number of states that passed the law each year

Year	Amount
pre 1968	10
1969	2
1970	2
1971	7
1972	3
1973	11
1974	3
1975	2
1976	1
1977	2
1978	0
1979	0
1980	1
1981	0
1982	0
1983	0
1984	1
1985	1
Never passed the law	5

Table 3: Test of trends

|	
Inter1960	-1.439
	-1.461
Inter1961	-1.097
	-1.268
Inter1962	0.417
	-1.521
Inter1963	0.258
	-1.519
Inter1964	-0.139
	-1.236
Inter1965	0.608
	-1.288
Inter1966	-0.030
	-1.682
Inter1967	-0.044
	-1.617
Inter1968	0.272
	-1.369
Inter1969	0.712
	-1.399
Inter1970	0.391
	-1.071
Year fixed effect	Yes
State fixed effect	Yes
Observations	743
R-squared	0.868

Note: Standard errors clustered at the state level are in parentheses.

Table 4: Impact of unilateral divorce law on murder rate

VARIABLES	(1)	(2)
Law	0.159***	0.192**
	(0.055)	(0.072)
Income		0.006
		(0.004)
Unemployment		-0.022**
		(0.009)
Observations	2127	1476
R-squared	0.880	0.901

Notes: Standard errors clustered at the state level are in parentheses. All the regressions include year and state fixed effects. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.
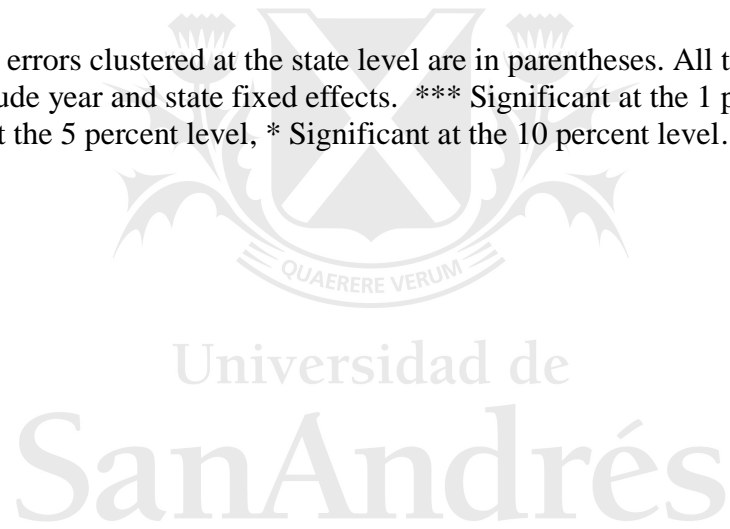
Table 5: Impact of the Divorce Law on murder rates in years in which it was not assigned

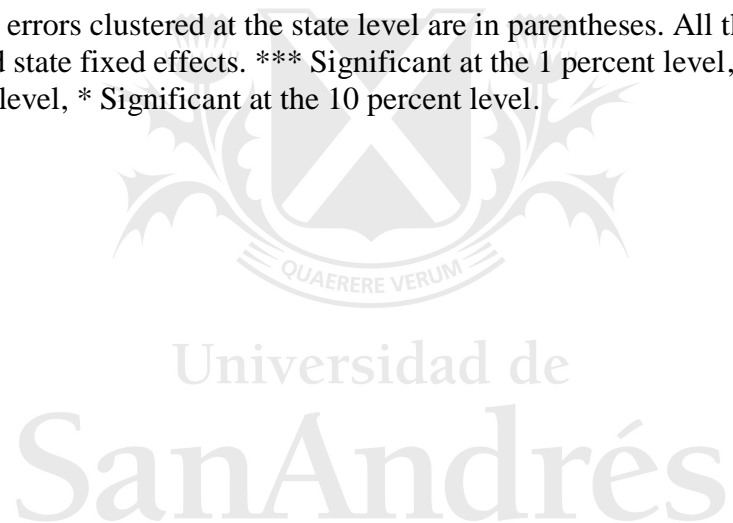|	False Treatment 1	False Treatment 2	False Treatment 3
Divorce Law	1.025	1.112	1.189
	(0.689)	(0.847)	(0.960)
Observations	2,127	2,127	2,127
R-squared	0.775	0.775	0.775

Notes: Each column reports the estimated coefficients of a regression model in which the dependent variable is the murder rate. Standard errors clustered at the state level are in parentheses. All the regressions include year and state fixed effects. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

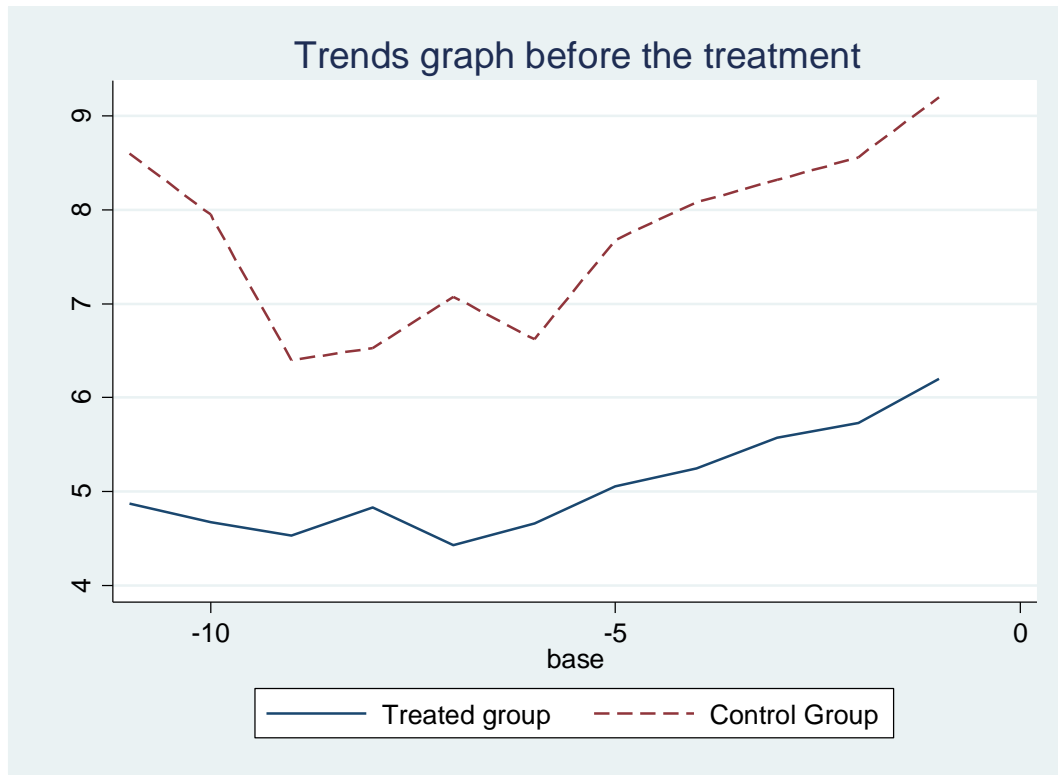**Table 6: Estimated impact of divorce law on crime rates, by type of crime**

VARIABLES	(1) Property	(2) Rape	(3) Robbery	(4) Assault	(5) Theft
Divorce law	-0.112	0.013	-0.146	0.039	-0.125
	(0.089)	(0.105)	(0.104)	(0.081)	(0.083)
Observations	2,179	2,179	2,179	2,179	2,179
R-squared	0.877	0.838	0.922	0.902	0.873

Notes: Standard errors clustered at the state level are in parentheses. All the regressions include year and state fixed effects. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

Figure 1

Trends graph before the treatment