

Causal Inference Replication 3

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4/12/2020

INTRODUCTION

Betsey Stevenson and Justin Wolfers project, “Bargaining in the Shadow of the Law: Divorce Laws and Family Distress”, focuses on the expansion of divorce laws in the U.S. as they relate to changes in domestic abuse. They determine the causal effect of unilateral divorce laws on family violence metrics, particularly domestic violence rates and suicide rates. Stevenson and Wolfers utilize the natural experiment of differentiated timing in the rollout of unilateral divorce laws in U.S. states from the mid-1970’s to the mid-1980’s in order to exploit the following declines in divorce rates. Their data for this project comes from a few sources. Suicide data comes from the National Center for Health Statistics, a census of death certificates with codes for suicide deaths. Domestic violence data is from the Family Violence Surveys taken in 1976 and 1985, with data being collected from household interviews that asked couples how they resolve conflict. Lastly, their homicide data comes from the FBI Uniform Crime Reports (UCR). UCR data is created from a voluntary police reporting system, which collects incident-level data including information on the offender, victim, and their relationship. The authors note that these data sources are not fully reliable for two reasons: They rely on the voluntary participation of agencies, and there are coding breaks stemming from changes in the definition of of the victim-perpetrator relationship.

Stevenson and Wolfers found that unilateral divorce has statistically significant effects for women, while having no evidence of any benefit for men. They estimate that unilateral divorce laws are associated with a 10% decrease on average for the rate of intimate murders against women, 30% decreases in domestic violence for men and women, and 5-10% decreases on average of the suicide rate for women, with larger long-term effects. Figure 2 is Stevenson and Wolfers’ key figure, as it shows the decline in intimate homicides holds under each of the potential definitions (spouse, non-stranger, and family member). I generally find these problems convincing, but there is one potential problem that would be good to look further at. In class, we discussed that estimating δ with differential timing and heterogeneous treatment effects over time produces biased estimates, even possibly changing the sign of the result entirely. While the intuition of the paper and results make logical sense, there is certainly justified concern that the estimates found in Stevenson and Wolfers’ paper are biased.

Background

Unilateral divorce, also known as no fault divorce, is a dissolution of a marriage by only one side of the party that can be carried out for any reason. This contrasts with fault-based divorces, the standard that existed prior. In fault-based divorce proceedings, judges only granted divorces if there were some fault, such as adultery or domestic violence, that could be proved to the court. No fault divorces, as implied by their name, do not have to have any cause established and can be initiated by either party. Prior to unilateral divorce laws, people in bad or violent marriages did not have favorable choices for leaving. Leaving without becoming divorced was possible but would leave partners unable to claim assets from the marriage or even get remarried.

The authors consider the likelihood that more of these violent relationships ended with either suicide or intimate homicide and that unilateral divorce laws, which allow abused spouses to leave the marriage with

a more favorable position, would lower the amount of these relationships that end in negative ways. This contradicts the main predictions of the Coase theorem, in which unilateral divorce laws only transfer the property right or remarriage from the partner who wants to remain married to the one who doesn't, that marriages only end in divorce if the marriage is jointly suboptimal. Under Coase theorem, there are no "inefficient marriages", so changes to divorce laws that allow for unilateral divorce should not affect divorce rates. Thus, Stevenson and Wolfers hypothesis will only be proven correct if the Coase theorem is violated.

Estimation Method

The following equation is the estimation equation that Stevenson and Wolfers utilize

$$Suicide\ rate_{s,t} = \sum_k \beta_k Unilateral_{s,t}^k + \sum_s \eta_s State_s + \sum_t \lambda_t Year_t + Controls_{s,t} + \epsilon_{s,t}$$

Generally, this equation estimates the causal effect of unilateral divorce laws on suicide rates while accounting for state, year, and other controls. To break down this equation, there are three subscripts (k , t , s), three summations, three coefficients, and the error term that should be explained.

- k denotes the number of years since the adoption of unilateral divorce.
- s denotes what state the observation is from.
- t denotes the year an observation is from.
- \sum_k is summation of all numbers of years since a state has passed unilateral divorce laws.
- \sum_s is summation of all states in the model.
- \sum_t is summation of all years in the data set.
- β_k is the effect of a one unit change in the $Unilateral_{s,t}^k$ variable, a binary variable set to 1 is a state adopted unilateral divorce laws k years ago.
- η_s is the fixed effect of $State_s$.
- λ_t is the fixed effect of year = $Year_t$.
- $\epsilon_{s,t}$ is the error term for each $State_s$ and $Year_t$ combination.

The main parameter of interest is β_k , the effect of unilateral divorce laws k years after they were adopted, on suicide rates. At $k = 1$ for example, we estimate β_1 which is the causal effect of unilateral divorce laws on the suicide rate in states which adopted unilateral divorce laws one year before.

Pre-Analysis

In differential timing models, there are generally three timing categories that we can expect to find in the population, which in this case is the U.S. states.

1. Never-Treated: States that never adopted unilateral divorce laws, coded as NRS.
2. Always-Treated: States that adopted unilateral divorce laws before the sample period, coded as PRE.
3. Treated: States that adopted unilateral divorce laws after the sample period or never.

Table 1: Adoption Year of Unilateral Divorce by State

State	Year	State	Year	State	Year	State	Year
Alabama	1971	Arizona	1973	Arkansas	NRS	California	1970
Colorado	1971	Connecticut	1973	Delaware	NRS	District of Columbia	1977
Florida	1971	Georgia	1973	Idaho	1971	Illinois	1984
Indiana	1973	Iowa	1970	Kansas	1969	Kentucky	1972
Louisiana	PRE	Maine	1973	Maryland	PRE	Massachusetts	1975
Michigan	1972	Minnesota	1974	Mississippi	NRS	Missouri	1973
Montana	1975	Nebraska	1972	Nevada	1973	New Hampshire	1971
New Jersey	1971	New Mexico	1973	New York	NRS	North Carolina	PRE
North Dakota	1971	Ohio	1974	Oklahoma	PRE	Oregon	1973
Pennsylvania	1980	Rhode Island	1976	South Carolina	1969	South Dakota	1985
Tennessee	NRS	Texas	1974	Utah	PRE	Vermont	PRE
Virginia	PRE	Washington	1973	West Virginia	PRE	Wisconsin	1977
Wyoming	1977						

Table 2: Difference-in-Difference Estimation

Outcome	Suicide Rate			Homicide Rate		
	1	2	3	1	2	3
<i>Post – Adoption</i>	-3.08** (1.112)	-3.08 (1.112)	-2.75 (1.107, 0.002)	-0.15* (0.089)	-0.15 (0.089)	-0.16 (0.089, 0)
Controls	x	x	x	x	x	x
Clustered SE		x	x		x	x
Trend			x			x

Standard errors in parenthesis. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Additional distinctions can be made depending on the timing of treatment during the sample period, such as creating a distinction between early and late adoption, but this is optional. Table 1 lists all of the states in the sample set along with the year that they adopted unilateral divorce laws.

For this replication, the “Never-Treated” group of states includes Arkansas, Delaware, Mississippi, New York, and Tennessee. We would expect that these states should not experience any significant change of trend in suicide or homicide rates over the time period we are looking at, since they never adopted unilateral divorce laws (at least in sample of time from 1964-1996). The “Always-Treated” group of states includes Louisiana, Maryland, North Carolina, Oklahoma, Utah, Vermont, Virginia, and West Virginia. With these states, we would expect that the suicide and domestic violence trends don’t change during our sample period as well. Every other state is in the “Treatment” group, meaning that those states started the sample period untreated, adopted unilateral divorce laws between 1964 and 1996, and ended the time period as treated. Most of the states in this category adopted unilateral divorce laws in the 1971-1976 year range, with some outliers on either side. If unilateral divorce laws have a significant impact on suicide rates and homicide rates, we would expect that the trend in treatment states should change from the pre-treatment to post-treatment period for each state.

Results

Conclusion