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Financial incentives for kidney donation: A comparative case study using synthetic controls

Fırat Bilgel[a,*], Brian Galle[b]

[a] Faculty of Economics and Administrative Sciences, Okan University, Tuzla Campus, Akfirat 34959, Istanbul, Turkey
[b] Boston College Law School, 885 Centre Street, Newton, MA 02459, United States

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ABSTRACT

Although many commentators called for increased efforts to incentivize organ donations, theorists and some evidence suggest these efforts will be ineffective. Studies examining the impact of tax incentives generally report zero/negative coefficients, but these studies incorrectly define their tax variables and rely on difference-in-differences despite likely failures of the parallel trends assumption. We identify the causal effect of tax legislation to serve as an organ donor on living kidney donation rates in the U.S. states using more precise tax data and allowing for heterogeneous time-variant causal effects. Employing a synthetic control method, we find that the passage of tax incentive legislation increased living unrelated kidney donation rates by 52 percent in New York relative to a comparable synthetic New York in the absence of legislation. It is possible that New York is unique, but our methodology does not allow us to measure accurately effects in other states.

1. Introduction

Can altruism be bought? Prior literature, dating back to Olson (1971), emphasizes the importance of "selective incentives" or private goods in encouraging individual contributions to group goals. On the other hand, Titmuss (1970) famously argued that paying for blood donations would undermine social norms of generosity and reduce giving. Existing evidence is mixed. Some studies, many in the laboratory, suggest that explicit monetary incentives may have minimal or even perverse effects.[1] But a series of results from field experiments document strong positive effects of incentives (Goette and Stutzer, 2008; Lacetera et al., 2014a).

Organ donations are a policy area where these theoretical questions are especially pressing. Earlier qualitative research generally confirms that non-monetary selective incentives, such as the development of emotional and associative bonds between donors and donees, can contribute importantly to expanding the donor base.[2] Perhaps inspired by these efforts, a number of U.S. states have enacted tax incentives for living organ donors.

In four previous studies, however, researchers employing difference-in-differences (DiD) methods did not find any evidence that these incentives affected kidney donations, which comprise the large majority of demand for and supply of donations. Wellington and Sayre (2011) report that state legislation is not associated with overall living donations. Venkataramani et al. (2012) find no statistically significant contemporaneous or lagged effects of tax policy on donation rates, or differential effects by gender, race or donor relationship. They hypothesize that the statistically indistinguishable effects may stem from low cash value of the tax deduction to defray costs faced by donors, lack of public awareness and a depletion of organ donor pools in the pre-legislation period.

Accounting for state fixed-effects and state-specific linear trends, Lacetera et al. (2014b) find significant effects for bone marrow but not other organs. Boulware et al. (2008) find that state legislation and federal policies are not associated with living related or overall donations. They do find a positive effect on living unrelated kidney donations when pooling together all state legislation, but do not separately analyze monetary incentives.

* Corresponding author. Tel.: +90 5323640004
E-mail address: firat.bilgel@okan.edu.tr (F. Bilgel).

[1] Gneezy et al. (2011) offer a review.
[2] See Healy (2010) for a review.

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While all four studies largely reach a consensus, they share a number of methodological and data issues in the identification of causal effects of the law that leave their conclusions open to question. Pooling cross-section and time-series data may cloud any potentially significant effect one might have observed if these effects were analyzed by a state-by-state pure time-series analysis. On the other hand, a pure time-series analysis of the law and kidney donations would be contaminated by structural shocks.

Additionally, compositional differences and non-parallel trends may pose threats to the validity of DiD estimation. That is, the distribution of the law and the covariates that are thought to affect kidney donation rates may not be similar for the pre- and post-legislation periods or the treatment (i.e. states that passed the legislation) and control states (i.e. no legislation) may not have experienced the same trends in the absence of the law conditional on covariates. As Boulware et al. (2008) show graphically, the trend lines for enacting and non-enacting states cross prior to the enactment period (though Boulware et al. (2008) do not note the econometric significance of that fact). Further, there are good reasons to suspect that tax incentives tend to be enacted near the peak of public attention to the organ donation crisis, implying the likelihood of regression to the mean in enacting but not necessarily non-enacting states.

The prior studies also face a set of other identification challenges. Each treats enactment of tax legislation as a binary variable, when in fact the real dollar value of the incentives states offer ranges from a few hundred to ten thousand dollars. In addition to failing to account for this variation, prior papers overlooked two states that enacted credits, not deductions. Next, 70 percent of all U.S. states have passed either a paid leave of absence and/or a tax deduction/credit legislation between the 1990s and 2010. For a state that enacted both forms of legislation, one may not be able to isolate the causal effect of one from the other.

Lastly, the enactment of tax incentive legislation may not be exogenous to kidney donations. In this case, one should resort to an instrumental variable procedure where another variable should be found such that it moves around the covariate of interest (i.e. the law) in a way that can plausibly be viewed as random. We argue that finding such an exogenous source of variation – a plausible instrument for the enactment and value of each state's tax incentive – is very difficult.

We therefore propose another strategy that is robust to the above-mentioned problems provided that its identifying assumptions are met. We employ the synthetic control method (Abadie and Gardeazabal, 2003; Abadie et al., 2010, 2014) where we create a synthetic control group that replicates the pre-legislation living kidney donation rates of the states that enacted a tax incentive legislation by using a convex combination of other states that have not enacted any legislation. For the sake of completeness and for purposes of cross-validation we also perform (1) a DiD approach à la Bertrand et al. (2004) where the tax incentive legislation is captured by a binary variable, and (2) a limited information maximum likelihood (LIML) estimation where the real dollar value of the legislation is measured more accurately and captured through an endogenous treatment.

We find no statistically significant causal effect of tax incentive policies on related or unrelated kidney donation rates via a DiD estimation or an instrumental variable procedure which accounts for the endogenous nature of the law. If anything, we find some weak evidence that enactment of tax incentives diminishes related donations. While in theory this could represent crowding-out of altruistic behavior by money incentives, we cannot rule out the possibility that instead we are observing mean regression.

When we account for this problem through a synthetic control method that allows for unobservable state heterogeneity to vary over time, we find that the passage of tax incentive legislation increased living unrelated kidney donation rates by about 52 percent in New York relative to a comparable synthetic New York in the absence of legislation. We show that this causal effect is robust to the exclusion of any particular state as well as to the use of a very small number of comparison states. It is possible that New York is unique, but our methodology does not allow us to measure accurately effects in other states, so that we can neither rule out nor confirm the efficacy of tax incentives elsewhere, precluding the generalizability of our results.

In short, our advances over prior literature are primarily to refine the methodological approach and the legal accuracy of the data. Our DiD techniques account for several possible aspects of endogeneity not accounted for in earlier papers, and accurately account for large variations in the value of the incentives offered. We also show reasons to believe DiD estimates will tend to produce spurious negative correlations, and when using methods robust to dropping the DiD assumptions find evidence that tax incentive legislation may increase donations.

Section 2 discusses the background on state legislation, Section 3 introduces our empirical strategy where we respectively define tax incentive legislation as a binary treatment, a non-binary endogenous treatment and finally allow for heterogenous causal effects of the law, Section 4 discusses the findings of the analysis with respect to methodological differences and identification strategies and Section 5 concludes.

2. Background and prior literature

2.1. Statutory background

In 1984, the U.S. Congress enacted the National Organ Transplantation Act (NOTA).[3] NOTA established a network of sub-national organ procurement organizations (OPO), each with jurisdiction spanning about one state on average. These OPOs have primary responsibility for soliciting organ donations and matching patients in need with eligible donors.

NOTA also prohibited trade in organs, but at the time of its initial enactment it was unclear whether this prohibition extended to bar reimbursement of donor expenses. During the 1990s, state government interest in encouraging organ donation swelled, but NOTA was seen as a possible obstacle to reform. For example, in 2000 the Kansas Attorney General opined that NOTA prohibited a proposed law allowing tax deductions for expenses associated with organ donation (Calandrillo, 2004). Congress responded in 2000 by amending NOTA to clarify that reimbursements for lost wages, travel, and medical expenses associated with donating would not contravene the Act.

Shortly thereafter, states began enacting moderate financial incentives for donations. Wisconsin was the first, in 2000 granting its own employee donors up to 30 days of paid time off. Thirty other states followed suit, most between 2001 and 2005.

Wisconsin was also the first state to adopt a reimbursement law, enacting a $10,000 tax deduction for NOTA-permitted expenses in 2004. Fourteen states followed, eight of them in 2005, and most similarly providing for a deduction against taxable income to the extent of covered expenses. The laws varied slightly in some details, such as whether undeducted expenses could be carried forward to another tax year; Idaho and Virginia provided for only a maximum $5000 benefit. More significantly, Idaho, Louisiana and Utah allowed for a credit, rather than a deduction, greatly increasing the actual dollar value of the incentive.

[3] See Satel and Hippen (2007) for more details on NOTA.