

# Bloomberg Businessweek

## An Economics Nobel For Saving Lives

By Virginia Postrel - October 16<sup>th</sup>, 2012

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Imagine a parallel universe in which federal law prohibited Americans from paying anyone to care for their children, whether in cash or in some other “valuable consideration,” and where paid child care was similarly repugnant and illegal throughout most of the world.

In this alternate reality, family bonds would simply be deemed too sacred and children too precious to permit the taint of commercial transactions.

Some desperate parents would risk arrest to pay under the table. Parents with a lot of friends and family would help each other out. People with small social networks or loved ones in poor health would be out of luck. A lot of parents would stay home with the kids when they’d prefer to go out, whether to a romantic dinner or a regular job.

The intellectual consequences are equally predictable. Michael Sandel would use child care to demonstrate to his Harvard University classes that there are some things money just shouldn’t buy. The Cato Institute would issue reports showing how the prohibition hurts poor people who would like to be nannies and noting that the law makes an unfair exception for school teachers. Economists would calculate how much higher labor force participation and gross domestic product would be if parents could pay someone else to watch their children. Feminists would debate whether paid child care would liberate women or subject yet another aspect of women’s lives to the brutality of the marketplace. Meanwhile, Alvin E. Roth, who shared this year’s Nobel Prize in Economic Sciences, would be figuring out how to make it as easy as possible for parents to trade off taking care of each other’s children.

### **Real World**

Roth, whose “market design” bridges economics and operations research, is known for developing algorithms to find the best available matches in real-world situations: medical residencies, public schools and -- the analogy to my child-care hypothetical -- kidney transplants from living donors. “He likes to study markets that don’t involve money,” says Michael Rees, a kidney transplant surgeon at the University of Toledo Medical Center in Ohio who has worked with Roth on paired kidney donations.

Some of those markets don’t actually involve exchanges. These include medical residencies, in which both sides care about exactly whom (or what characteristics) they’re matched with. Each side has a ranking of its preferences, and the trick is to get everybody as highly ranked a match as possible. Having an auction wouldn’t solve the

problem, because the highest bidder for a given partner wouldn't necessarily match the partner's preferences.

There's no intrinsic reason, however, that the kidney market couldn't involve money, since a paid donor wouldn't care who exactly got the kidney, as long as the price was right. About 94,000 Americans are on the waiting list for kidneys. Last year, fewer than 17,000 got transplants, about 11,000 of them from deceased donors. If transplant centers offered sufficient compensation, they could enlist enough living donors to eliminate rationing. The reasons they don't are cultural, legal and -- to someone more appalled by needless suffering than by commercial transactions -- infuriating.

Roth, who recently left Harvard for Stanford, isn't trying to change laws or attitudes about the kidney shortage. Those may change in the long term, but his concern is the present. "I would not like to guess whether repeal of the widespread laws against kidney sales is likely to happen more quickly than the advances in xenotransplantation, or artificial kidneys, or other medical breakthroughs that would end the shortage of kidneys," he wrote in a 2007 *Journal of Economic Perspectives* article titled "Repugnance as a Constraint on Markets." His approach is incremental and technical rather than sweeping or political.

### **More Transplants**

Yet unlike the economists, wonks and polemicists who rail against the prohibition of organ sales, Roth can claim credit for actually increasing the number of kidney transplants. "Alvin Roth has been a major contributor to the fastest-growing source of transplantable kidneys in America, and probably in the world, through paired donation," says Rees.

Trades without money are notoriously challenging, since they can only take place in the unlikely case of what economists call a "double coincidence of wants." Without money, if you're a hair dresser with a broken toilet, you have to find a plumber in need of a haircut. But those deals are easy compared to the kidney market, in which most forms of barter are also forbidden. A university can't, for instance, offer tuition waivers to students who donate kidneys to patients in its hospital's transplant program. The only thing you can swap for a kidney is a kidney. In 2007, Congress passed a law explicitly making those swaps legal. It did so because, guided in part by Roth's work, transplant centers were starting to arrange such trades, called "paired exchanges."

Many of the people on the waiting list have someone who'd like to give them a kidney but isn't a compatible donor. Paired donation allows such incompatible pairs to trade. In the simplest case, Alice has type A blood and would like to give a kidney to her husband Ben, who has type B. Meanwhile, Bill is type B and would like to donate to his wife Anne, who is type A. So Alice gives her kidney to Anne, on the condition that Bill gives his to Ben.

The earliest cases of paired donation were such simple two-way swaps -- barter deals with the transplants done in the same hospital at the same time, so nobody could back out. Over time, they've become more complex. In a 2006 article, Roth and his co-authors demonstrated that a chain started by someone who wants to give a kidney but doesn't designate a particular recipient -- a so-called non-directed or "altruistic" donation -- can go on indefinitely. The transplants don't have to be done in the same place or at the same time, because no one is in danger of giving a kidney without having a loved one receive an organ in return.

## **Extended Chains**

The number of transplants done through paired exchanges has also risen dramatically: from 2 in 2000, to 228 in 2008, to 443 in 2012. Extended chains, rather than simple pairs with simultaneous operations, are now the norm. “Whatever other policies might be adopted in the more distant future to benefit patients who need transplants, or to reduce the incidence of kidney disease,” Roth writes, “kidney exchange offers real gains that have proved to be achievable.”

Several national registries, including the National Kidney Registry and Rees’s group, the Alliance for Paired Donation, have enlisted multiple hospitals across the country to create large pools of potential donors. This “thick market” is particularly important in finding kidneys for the subgroup of “sensitized” patients for whom even donors with the matching blood type may trigger antibodies. (Imagine finding another parent to trade babysitting time for a special-needs child whose care requires knowledge most people don’t have. The more parents in the pool, the better your chances.)

In a July working paper for the National Bureau of Economic Research, Roth and his co-authors reported that highly sensitized patients made up more than half those registered with the Alliance for Paired Donation, compared to only about 10 percent of the national waiting list. Now Roth is working to demonstrate how transplant centers could be better off by entering more of their patients in the registries, rather than hoarding the easy-to-match ones while dumping the sensitized patients into the pool. It’s another example of taking one problem at a time -- and of working around the inherent clunkiness and warped incentives of a barter system.

Depending on how you look at it, Roth’s incrementalist approach can be either disquieting or inspiring. Comparing the hundreds of paired-exchange transplants to a waiting list rapidly approaching 100,000 people points to just how crippling the ban on payment is. If the only way to get a babysitter were to take care of that person’s kids yourself, a lot fewer parents would leave the house -- no matter how ingenious the scheme for matching available child-care hours.

But some would find help and that, too, is part of the story. A few hundred extra transplants may not be a revolution. But if you’re one of the people for whom Roth’s algorithms find a donor, it’s a whole new life.