

A Field Study of Donor Behavior in the Iranian Kidney Market

Ali Moghaddasi, Loughborough University

(joint work with **Daniel Sgroi**, University of Warwick)

EEA 2023 Barcelona

August 30

Motivation: kidney transplant, the current picture

- In the USA, according to the National Kidney Foundation there are over 90,421 people on the waiting list for a kidney as of July 2021, the mean waiting time is 3.6 years.
- In 2014, 4,761 patients (13 a day) died waiting for a transplant while another 3,668 became too sick to receive a transplant before they were offered one.

Motivation: kidney transplant, the current picture

- In the USA, according to the National Kidney Foundation there are over 90,421 people on the waiting list for a kidney as of July 2021, the mean waiting time is 3.6 years.
- In 2014, 4,761 patients (13 a day) died waiting for a transplant while another 3,668 became too sick to receive a transplant before they were offered one.
- In the UK the situation is similar with the National Health Service reporting a waiting list of 6,000 people in 2021, and 350 deaths while waiting for a transplant in 2020.

Motivation: kidney transplant, the current picture

- In the USA, according to the National Kidney Foundation there are over 90,421 people on the waiting list for a kidney as of July 2021, the mean waiting time is 3.6 years.
- In 2014, 4,761 patients (13 a day) died waiting for a transplant while another 3,668 became too sick to receive a transplant before they were offered one.
- In the UK the situation is similar with the National Health Service reporting a waiting list of 6,000 people in 2021, and 350 deaths while waiting for a transplant in 2020.

Motivation: Moral Concerns

- In contrast Iran, the world's only country to have a legal and government-regulated kidney market, has almost no waiting list and virtually no deaths.
- There is no doubt that the notion of paying for a kidney raises ethical concerns and compensation would violate “sacred value” of human life and can create revulsion (Elias et al 2019).

Motivation: Moral Concerns

- In contrast Iran, the world's only country to have a legal and government-regulated kidney market, has almost no waiting list and virtually no deaths.
- There is no doubt that the notion of paying for a kidney raises ethical concerns and compensation would violate “sacred value” of human life and can create revulsion (Elias et al 2019).
- Even if participants are willing to take part in a trade, third parties disapprove and wish to prevent it (Alvin Roth 2015).

Motivation: Moral Concerns

- In contrast Iran, the world's only country to have a legal and government-regulated kidney market, has almost no waiting list and virtually no deaths.
- There is no doubt that the notion of paying for a kidney raises ethical concerns and compensation would violate “sacred value” of human life and can create revulsion (Elias et al 2019).
- Even if participants are willing to take part in a trade, third parties disapprove and wish to prevent it (Alvin Roth 2015).
- Moral concerns around payment for kidney include coercion and exploitation of the participants; lack of fairness and equal access; corruption of (public) moral values such as human dignity . . .

Motivation: Moral Concerns

- In contrast Iran, the world's only country to have a legal and government-regulated kidney market, has almost no waiting list and virtually no deaths.
- There is no doubt that the notion of paying for a kidney raises ethical concerns and compensation would violate “sacred value” of human life and can create revulsion (Elias et al 2019).
- Even if participants are willing to take part in a trade, third parties disapprove and wish to prevent it (Alvin Roth 2015).
- Moral concerns around payment for kidney include coercion and exploitation of the participants; lack of fairness and equal access; corruption of (public) moral values such as human dignity ...

Motivation: Market for Kidney?

- Given the apparent success of the Iranian kidney market and the existence of long waiting lists, patient suffering and significant loss of life elsewhere, there has also been something of a re-evaluation of the potential for regulated organ markets in the developed world.
- A recent paper suggesting that 71% of the public would support a shift towards introducing payment for organ donations (Elias et al., 2015).

Motivation: Market for Kidney?

- Given the apparent success of the Iranian kidney market and the existence of long waiting lists, patient suffering and significant loss of life elsewhere, there has also been something of a re-evaluation of the potential for regulated organ markets in the developed world.
- A recent paper suggesting that 71% of the public would support a shift towards introducing payment for organ donations (Elias et al., 2015).
- In the context of the wider debate it seems important to consider the “characteristics” of those likely to come forward as donors if a market is established and to ask what special features they may possess.

Motivation: Market for Kidney?

- Given the apparent success of the Iranian kidney market and the existence of long waiting lists, patient suffering and significant loss of life elsewhere, there has also been something of a re-evaluation of the potential for regulated organ markets in the developed world.
- A recent paper suggesting that 71% of the public would support a shift towards introducing payment for organ donations (Elias et al., 2015).
- In the context of the wider debate it seems important to consider the “characteristics” of those likely to come forward as donors if a market is established and to ask what special features they may possess.

Motivation: Iranian Regulated Kidney Market

- The adoption of a regulated market mechanism for kidney procurement in Iran started in 1988 in the absence of sufficient posthumous donations.
- The mechanism allows living unrelated Iranian individuals to donate kidneys to Iranian patients with end stage renal disease (ESRD) for financial gains.

Motivation: Iranian Regulated Kidney Market

- The adoption of a regulated market mechanism for kidney procurement in Iran started in 1988 in the absence of sufficient posthumous donations.
- The mechanism allows living unrelated Iranian individuals to donate kidneys to Iranian patients with end stage renal disease (ESRD) for financial gains.
- The Association for Supporting Renal Patients, a non-profit organization (NGO), facilitates the market exchange.

Motivation: Iranian Regulated Kidney Market

- The adoption of a regulated market mechanism for kidney procurement in Iran started in 1988 in the absence of sufficient posthumous donations.
- The mechanism allows living unrelated Iranian individuals to donate kidneys to Iranian patients with end stage renal disease (ESRD) for financial gains.
- The Association for Supporting Renal Patients, a non-profit organization (NGO), facilitates the market exchange.
- Both ESRD patients and potential kidney donors are referred and registered with the NGO.

Motivation: Iranian Regulated Kidney Market

- The adoption of a regulated market mechanism for kidney procurement in Iran started in 1988 in the absence of sufficient posthumous donations.
- The mechanism allows living unrelated Iranian individuals to donate kidneys to Iranian patients with end stage renal disease (ESRD) for financial gains.
- The Association for Supporting Renal Patients, a non-profit organization (NGO), facilitates the market exchange.
- Both ESRD patients and potential kidney donors are referred and registered with the NGO.
- A primary medical evaluation is subsequently conducted by the NGO. Upon successful completion of the test, a formal consent is acquired and the potential donor and the recipient are introduced to each other.

Motivation: Iranian Regulated Kidney Market

- The adoption of a regulated market mechanism for kidney procurement in Iran started in 1988 in the absence of sufficient posthumous donations.
- The mechanism allows living unrelated Iranian individuals to donate kidneys to Iranian patients with end stage renal disease (ESRD) for financial gains.
- The Association for Supporting Renal Patients, a non-profit organization (NGO), facilitates the market exchange.
- Both ESRD patients and potential kidney donors are referred and registered with the NGO.
- A primary medical evaluation is subsequently conducted by the NGO. Upon successful completion of the test, a formal consent is acquired and the potential donor and the recipient are introduced to each other.

Experimental Design (1)

- Potential donors were invited to attend a session on a day of their choosing.
- Each of our 215 participants attended an uninterrupted session which took approximately 2 hours. The study started in August 2017 and live sessions continued until May 2019, with further telephone interviews and follow-up sessions continuing until February 2021.

Experimental Design (1)

- Potential donors were invited to attend a session on a day of their choosing.
- Each of our 215 participants attended an uninterrupted session which took approximately 2 hours. The study started in August 2017 and live sessions continued until May 2019, with further telephone interviews and follow-up sessions continuing until February 2021.
- 78 subjects were first interviewed post-donation while the remaining 137 were interviewed pre-donation.

Experimental Design (1)

- Potential donors were invited to attend a session on a day of their choosing.
- Each of our 215 participants attended an uninterrupted session which took approximately 2 hours. The study started in August 2017 and live sessions continued until May 2019, with further telephone interviews and follow-up sessions continuing until February 2021.
- 78 subjects were first interviewed post-donation while the remaining 137 were interviewed pre-donation.

Experimental Design (2)

Following this process we were able to measure behavioural variables such as:

- *risk attitude* (risktaking) and *time preference* (patience) using the staircase tasks developed by Falk et al. 2018

Experimental Design (2)

Following this process we were able to measure behavioural variables such as:

- *risk attitude* (risktaking) and *time preference* (patience) using the staircase tasks developed by Falk et al. 2018
- *cognitive ability* (IQ, using Raven's progressive matrices test)

Experimental Design (2)

Following this process we were able to measure behavioural variables such as:

- *risk attitude* (risktaking) and *time preference* (patience) using the staircase tasks developed by Falk et al. 2018
- *cognitive ability* (IQ, using Raven's progressive matrices test)
- *rationality* (consistency with GARP, the generalized axiom of revealed preference following Choi et al. 2014)

Experimental Design (2)

Following this process we were able to measure behavioural variables such as:

- *risk attitude* (risktaking) and *time preference* (patience) using the staircase tasks developed by Falk et al. 2018
- *cognitive ability* (IQ, using Raven's progressive matrices test)
- *rationality* (consistency with GARP, the generalized axiom of revealed preference following Choi et al. 2014)
- *altruism*, and a wide variety of demographic and socioeconomic data (11 tasks in total).

Experimental Design (2)

Following this process we were able to measure behavioural variables such as:

- *risk attitude* (risktaking) and *time preference* (patience) using the staircase tasks developed by Falk et al. 2018
- *cognitive ability* (IQ, using Raven's progressive matrices test)
- *rationality* (consistency with GARP, the generalized axiom of revealed preference following Choi et al. 2014)
- *altruism*, and a wide variety of demographic and socioeconomic data (11 tasks in total).

Demographic and Socioeconomic Information

	Total	Pre-Donation	Post-Donation
<i>Female (%)</i>	18.6	19.7	16.7
<i>Age (%)</i>			
21-32	54.9	59.1	47.4
32+	45.1	40.9	52.6
<i>Education (%)</i>			
Low	42.4	43	41.3
Medium	43.3	40.7	48
High	14.3	16.30	10.7
<i>Employment (%)</i>			
Employed	49.5	47.5	53.25
<i>Income (Iranian Rials)</i>			
Monthly indi. income	14,356,570	13,798,410	15,333,300
Monthly house. income	15,205,690	15,170,510	15,266,670
<i>Household Composition (%)</i>			
Married	79.1	75.9	85.9
Number of children	2	1.9	2.2
<i>Religious attitudes (%)</i>			
Always practice	29.8	23.4	42.6
Sometimes practice	53.7	59.8	41.2
Never practice	16.6	16.8	16.2
<i>Home ownership (%)</i>			
Owner	5.5	2.9	10.9
Renting	72.5	72.8	71.9
Living with parents	22	24.3	17.2
<i>Car ownership (%)</i>	8.7	3.7	20
<i>Insurance (%)</i>			
Insured	52.9	46.3	65.3
Observations	215	137	78

Findings (1)

- Our results can be summarized as the answers to several important questions.
- The first is whether Iranian kidney donors are irrational?

Findings (1)

- Our results can be summarized as the answers to several important questions.
- The first is whether Iranian kidney donors are irrational?
- Our subjects averaged a CCEI score, which is a widely-accepted measure of rationality within Economics, of 0.85 which translates to a need to reduce the budget line by 15 percent, on average, to eliminate a subject's GARP violations.

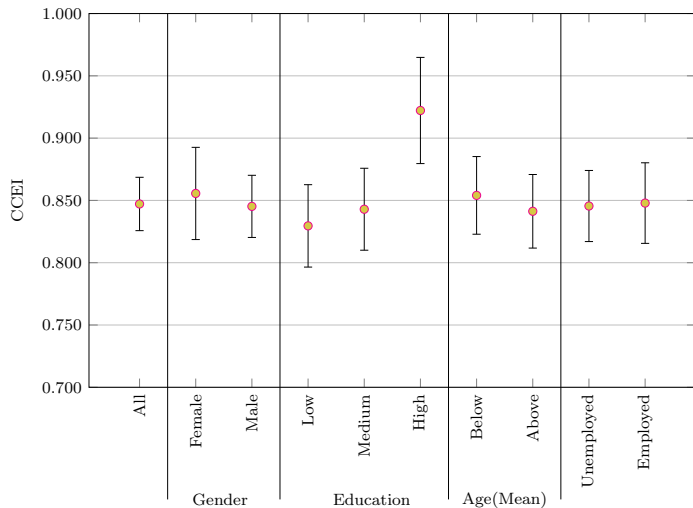
Findings (1)

- Our results can be summarized as the answers to several important questions.
- The first is whether Iranian kidney donors are irrational?
- Our subjects averaged a CCEI score, which is a widely-accepted measure of rationality within Economics, of 0.85 which translates to a need to reduce the budget line by 15 percent, on average, to eliminate a subject's GARP violations.
- This is similar to the average of 0.881 in the paper that introduced this form of measurement Choi et al (2014).

Findings (1)

- Our results can be summarized as the answers to several important questions.
- The first is whether Iranian kidney donors are irrational?
- Our subjects averaged a CCEI score, which is a widely-accepted measure of rationality within Economics, of 0.85 which translates to a need to reduce the budget line by 15 percent, on average, to eliminate a subject's GARP violations.
- This is similar to the average of 0.881 in the paper that introduced this form of measurement Choi et al (2014).

Findings (1): CCEI Scores for Kidney Donors



Findings (2): Summary Statistics

	mean	# Obs.	S.D.	min	max
Organ Market Participants					
Math	1.34	215	1.28	0	4
IQ	3.21	215	2.71	0	13
Risk taking	13.93	210	9.76	1	32
Patience	13.07	205	11.79	1	32
Rationality	0.847	215	0.160	0.22223	0.99994
Iranian Population					
Risk taking	16.12	2463	10.94	1	32
Patience	3.84	2472	6.96	1	32

Note: lower panel observations are from Falk et al. (2018) with values re-weighted in accordance with the sampling weights to achieve representatives.

Findings (2)

- Are Iranian kidney donors unusual in terms of their risk profile?
- In terms of risk we see highly statistically significantly lower levels of risk taking preferences in our sample than in the general Iranian population.

Findings (2)

- Are Iranian kidney donors unusual in terms of their risk profile?
- In terms of risk we see highly statistically significantly lower levels of risk taking preferences in our sample than in the general Iranian population.
- We pick up no treatment effect though suggesting that risk plays a role in entering the market but not through to conclusion.

Findings (2)

- Are Iranian kidney donors unusual in terms of their risk profile?
- In terms of risk we see highly statistically significantly lower levels of risk taking preferences in our sample than in the general Iranian population.
- We pick up no treatment effect though suggesting that risk plays a role in entering the market but not through to conclusion.
- Are donors simply impatient to raise money which is pushing them towards a rash decision? Our findings show that our subjects are highly statistically significantly more patient than general Iranian population.

Findings (2)

- Are Iranian kidney donors unusual in terms of their risk profile?
- In terms of risk we see highly statistically significantly lower levels of risk taking preferences in our sample than in the general Iranian population.
- We pick up no treatment effect though suggesting that risk plays a role in entering the market but not through to conclusion.
- Are donors simply impatient to raise money which is pushing them towards a rash decision? Our findings show that our subjects are highly statistically significantly more patient than general Iranian population.

Findings (2): Participation in the Iranian Organ Market

	(1)	(2)
male	0.691*** (0.083)	0.735*** (0.097)
age	-0.019*** (0.002)	-0.019*** (0.002)
Risk taking		-0.013*** (0.004)
Patience		0.052*** (0.004)
<i>N</i>	2722	2644

Notes: Probit estimates of the participation in the Iranian organ market with standard errors in parentheses. Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Findings (3): Evaluating the Treatment Effects

	Mean	Std. Error	95% Conf. Interval	
Longitudinal Comparison				
Dif. IQ	-0.500	0.552	-1.693	0.693
Dif. Risk taking	2.821	3.204	-4.099	9.742
Dif. Patience	-0.393	1.872	-4.438	3.652
Dif. Rationality	0.043	0.047	-0.059	0.145
Pseudo-longitudinal Comparison				
Dif. IQ	0.123	0.556	-0.979	1.225
Dif. Risk taking	-1.704	2.138	-5.940	2.532
Dif. Patience	-7.263***	2.374	-11.965	-2.560
Dif. Rationality	0.007	0.035	-0.063	0.076

Notes: N=14 in the longitudinal analysis and N=113 in the pseudo-longitudinal analysis. Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Findings (4): Who is more likely to donate in the end?

- A participant who attended the first session but has yet to go through with kidney surgery, changes status to one of the following: either they proceed with transplantation, or they fail the medical test and cannot proceed, or they change their mind and exit the market.
- We compare the first and the last group: our results show that conditional on participating in the market, those who have lower levels of patience are more likely to go ahead with donation.

Findings (4): Who is more likely to donate in the end?

- A participant who attended the first session but has yet to go through with kidney surgery, changes status to one of the following: either they proceed with transplantation, or they fail the medical test and cannot proceed, or they change their mind and exit the market.
- We compare the first and the last group: our results show that conditional on participating in the market, those who have lower levels of patience are more likely to go ahead with donation.
- Recall from the summary statistics that participants in the market start with significantly higher levels of patience than the national average.

Findings (4): Who is more likely to donate in the end?

- A participant who attended the first session but has yet to go through with kidney surgery, changes status to one of the following: either they proceed with transplantation, or they fail the medical test and cannot proceed, or they change their mind and exit the market.
- We compare the first and the last group: our results show that conditional on participating in the market, those who have lower levels of patience are more likely to go ahead with donation.
- Recall from the summary statistics that participants in the market start with significantly higher levels of patience than the national average.

Findings (3): Likelihood to Proceed with Transplantation

	(1)	(2)	(3)
male	0.007 (0.413)	0.061 (0.478)	0.369 (0.501)
age	-0.049 (0.036)	-0.025 (0.044)	-0.037 (0.046)
math		-0.078 (0.187)	-0.073 (0.197)
IQ		-0.006 (0.103)	0.014 (0.105)
Risk taking		-0.008 (0.021)	-0.007 (0.021)
Patience		-0.038** (0.018)	-0.039** (0.018)
Rationality		-0.257 (1.036)	-0.402 (1.075)
Blood donation			-0.136 (0.376)
Organ form			0.873** (0.414)

Notes: N=58. Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Summary and Discussion

- The overall picture is of individuals who are in financial need, often unemployed but with a family to support and where the alternatives are grim.
- These individuals are typically patient and not prone to risk-taking. They are no less rational than the average, but those who end up completing the process may be characterised by more altruism than those who do not.

Summary and Discussion

- The overall picture is of individuals who are in financial need, often unemployed but with a family to support and where the alternatives are grim.
- These individuals are typically patient and not prone to risk-taking. They are no less rational than the average, but those who end up completing the process may be characterised by more altruism than those who do not.
- This presents what may seem to be a counter-intuitive result: we might have worried that participants in this market would be relatively irrational and impatient risk-takers, but at least within the confines of our data and analysis this is not the case.

Summary and Discussion

- The overall picture is of individuals who are in financial need, often unemployed but with a family to support and where the alternatives are grim.
- These individuals are typically patient and not prone to risk-taking. They are no less rational than the average, but those who end up completing the process may be characterised by more altruism than those who do not.
- This presents what may seem to be a counter-intuitive result: we might have worried that participants in this market would be relatively irrational and impatient risk-takers, but at least within the confines of our data and analysis this is not the case.