The Role of Repugnance in the Development of Markets: The Case of the Market for Kidneys for Transplants[1]

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Abstract: Economic efficiency is the criterion that is commonly used in economic analysis to establish an order between different policy alternatives. However, in many situations it would seem that this criterion is not the one that prevails in the decisions of society. This paper presents what some called as the "yuck factor", or disgust factor, and examines how this factor operates as a restriction on certain transactions in the market and what are its consequences. This concept, developed by Al Roth (2007), suggests that some transactions, such as the buy and sale of kidneys for transplantation or of newborn infants, are illegal simply because a sufficient number of people find it repugnant. Using a simple economic analysis, this paper shows that what is repugnant may depend on the circumstances and is closely associated with the social cost imposed by the prohibition or regulation.

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"…ethics is not a branch of statistics; one thing continues to be atrocious even if thousands of people have hailed or executed it".
Jorge Luis Borges, Revista Ficción, 1957

I. Introduction

Economic efficiency is the criterion commonly used in economic analysis to establish an order among policy alternatives. However, in many situations it appears that this criterion is not the one that prevails in the decisions of society. Al Roth (2007), suggests that some transactions and markets, such as the purchase and sale of kidneys for transplantation or the purchase and sale of newborn infants, are illegal simply because a sufficient number of people find it repugnant and the decision is not based in a cost benefit analysis.

In this paper we analyze this repugnance factor, also called the "yuck factor" or disgust factor, and discuss how it operates as a restriction on certain transactions in the market and what are its consequences. Using a simple economic analysis we show that what is repugnant may depend on the circumstances and it is closely associated with the social costs generated by prohibition or regulation.

To develop the analysis, we consider the case of the prohibition to buy and sale human organs for transplantation. Organs for human transplants are extremely valuable assets and the long waiting lists to receive an organ has become one of the most pressing public policy in most countries with major programs of organ transplants. When an economist sees a persistent gap between demand and supply the next step is usually to look for obstacles to equilibrating that market. Such obstacles are obvious in the market for transplants since very few countries allow monetary incentives to acquire organs either from living individuals or from cadavers, even though the social benefits of eliminating the organ shortage are significant.

Using tools of the new economy of mortality and other areas of economic analysis, Becker and Elias (2007) show that the introduction of monetary incentives may increase the

supply of kidneys for transplant sufficiently to eliminate the long queues in the market, by increasing the total cost of transplants to no more than 12%.

This is a prototypical case in which free voluntary, and apparently beneficial, transactions are not allowed by law. In most countries, a market for organs is regarded as repugnant, and such markets are widely illegal. There are many complex ethical and moral issues involved in the financial incentives for living organ providers. The idea of "repugnance" appeals to the presumption that people simply does not like the idea or feel that there is something wrong with having markets for kidneys, even if they work well, increase supply, and keep costs in check; and this represent a substantial and perhaps insuperable obstacle.

In discussing the role of repugnance in the market for kidneys for transplantation, Al Roth said, "the laws against buying or selling kidneys reflect a reasonably widespread repugnance, and this repugnance may make it difficult for arguments that focus only on the gains from trade to make headway in changing these laws." However, in this paper we show that what is repugnant depends on the circumstances and, moreover, it is closely associated with the social economic costs generated by the ban, or regulation, a result consistent with Becker´s seminal paper on pressure groups (see Becker, 1983).

We show that when it is "cheap", in terms of the social cost, repugnancy may arise as a determinant factor. In certain situations there may be a taste factor that makes people repelled by some transaction, like the sale of organs, but that is usually balanced against the benefits from sale.

We begin by discussing some salient features of the market for kidney for transplantation in the United States. The emphasis is on the gap between demand and supply, which is responsible for the growing list of persons in need of transplant surgery. Then, using simple economic analysis, we formalize the idea of a "repugnance" factor that operates as an

obstacle in the market. We analyze how the banning is determined and how the policy may change over time. Finally, we illustrate this idea with some examples in which the social costs affects the policy or regulation.

II. The Ban on the Market for Kidneys for Transplantation

Most people agree that the current organ transplant shortage in most countries is grave. In the United States, since 1991 the difference between the annual number of kidney transplants and the annual number of people who join the waiting list has grown in virtually every year.

For candidates listed for kidney transplantation who do not have a living donor, the statistical likelihood of dying or becoming too sick to transplant while waiting for a kidney transplant has increased significantly over the last two decades. It is evident that the malfunctioning of the current system of kidney procurement has not only continued over time, but has become much worse (see Becker and Elias, 2007, and Cronin and Elias, 2010).

The only feasible way to eliminate the large queues in the market for kidney transplants is by increasing the supply of kidneys. In the U.S., most procurement efforts have been concentrated on increasing the pool of altruistic donors, such as expanding living donor inclusion criteria and organ donor awareness campaigns. Even accounting for modest gains, however, all these efforts have failed to increase significantly the number of organs necessary to alleviate the large and growing shortage of kidneys.

In Becker and Elias (2007), we show that the introduction of monetary incentives could increase the supply of organs sufficiently to eliminate the large queues, without increasing the total cost of kidney transplants by a large percent. Even though the benefits of eliminating the organ shortage are significant, many people have opposed proposals to pay for organs, and it is prohibited under present law in almost every country.

On the economic analysis of the market for kidneys, Paul Bloom, a psychologist at Yale, has said that "the problem is not that economists are unreasonable people, it's that they're evil people. They work in a different moral universe."[2]

Al Roth from Harvard summarizes the opposition against monetary compensation as follows "Legalizing kidney sales faces substantial, perhaps insuperable obstacles. Just as you can't sell yourself into indentured servitude anymore, some transactions are illegal because enough people find them repugnant."[3]

In what follows I use simple economic analysis to get a better understanding on how the repugnant factor operate as a restriction on certain markets, that is why organ selling is not allowed in most countries, and to what extent this real restriction may change over time.

Following Roth, in the analysis we use "repugnant" in its economic sense – in a repugnant transaction the participants are willing to transact, but third parties disapprove and wish to prevent the transaction (rather than in its psychological sense of eliciting disgust among potential participants).

III. A Simple Formalization of Repugnance and its Interaction with the Market

In order to formalize the idea of repugnance as a factor affecting regulations, we start with the simple idea that repugnance of a person towards allowing the sale of kidneys for transplantation depends on a series of factors.

For instance, the degree of repugnance of a person could be a function of the expected price of an organ. If the price is too low people may feel that this is a form of exploitation.

It can also depend on the income level of the potential sellers, if too low people may feel that this is a form of coercion to the poor. Additionally, some doctors may find it repugnant to treat with paid provider instead of altruistic donors.

[2] Cohen, 2008.
[3] Elias and Roth, 2007.

On the other hand, there may be other factors that work the other way around, that negatively affect repugnancy. For example, some people may find repugnant that there are so many people in the waiting list, that some will die while waiting, or that the system may not be working efficiently.

That is, repugnance of a person *i* can be represented by a function

$$Repugnance_i = R_i(Factors) \qquad (1)$$

and it is determined by a series of factors. This relationship may vary across different persons. In what follows, using a simple framework we analyze how repugnance affects a person's decision regarding on whether to allow organ selling or not.

First, let us consider the welfare or wellbeing of individuals under two different regimes. One is a regime in which payments or any other form of financial incentives for kidneys providers are not allowed and the other is a regime in which payments are allowed.

Again, we use a function to represent the individual wellbeing, and for simplicity, we assume that individual welfare is a function of three factors only: Consumption, Health and Repugnance. That is, the individual welfare of an individual *i* in regime *j* is given by

$$Individual\ Welfare_{i,j} = U(C_{i,j},H_{i,j},R_{i,j}) \qquad j = No\ Market, Market \qquad (2)$$

Notice that these three factors are going to vary across persons (*i*) and across regimes (*j*). That is, different individuals will have different level of wellbeing within and across systems.

However, for non-direct participant in the market, consumption and health are going to be approximately the same under the two regimes. For example, this is likely to be the case for individuals who are not in need of a kidney transplant, or for those that do not plan to provide a kidney for transplantation.

According to our representation the individual welfare of an individual *i* under the two different regimes are given by the following expressions

$$Individual\ Welfare_{No\ Market,i} = U(C_{No\ Market,i}, H_{No\ Market,i}, R_{No\ Market,i}) \quad (3)$$

$$Individual\ Welfare_{Market,i} = U(C_{Market,i}, H_{Market,i}, R_{Market,i}) \quad (4)$$

Not having a market for kidneys represents a cost in terms of welfare for some individuals (i.e. individuals for whom $U(C_{No\ Market,i}, H_{No\ Market,i}, R_{No\ Market,i}) < U(C_{Market,i}, H_{Market,i}, R_{Market,i})$) , while for others it represents a benefit (i.e. individuals for whom $U(C_{No\ Market,i}, H_{No\ Market,i}, R_{No\ Market,i}) > U(C_{Market,i}, H_{Market,i}, R_{Market,i})$).

To quantify the like or dislike of the market system allocation we formulate the old question on equalizing differences of Adam Smith: How much consumption, or money, do we have to give to an individual in order for her to be indifferent between the two regimes or systems? Let's call this amount δ. We can calculate δ using the individual welfare function, that is

$$U(C_{No\ Market,i}, H_{No\ Market,i}, R_{No\ Market,i}) = U(C_{Market,i} + \delta, H_{Market,i}, R_{Market,i}) \quad (5)$$

According to equation (5), the value δ may vary across individuals not only because the level of repugnance is different for the individual in the two regimes, but also because their health and consumption could vary across them. As a consequence, there is going to be a distribution of δs in the population. The distribution depends on consumption, health and on the underlying factors that determines repugnance. That is,

$$\delta\ (C_{No\ Market,i}, H_{No\ Market,i}, R_{No\ Market,i}, C_{Market,i}, H_{Market,i}, R_{Market,i}) = \delta_i \quad (6)$$

For example, for a person in need for an organ δ is likely to be negative, not because their repugnance level towards the market is low, but simply because their health status will improve, or is expected to improve under the market system. That is, people's opinion can be inferred as follows

If $\delta_i < 0$ => The person likes the idea of a market for kidneys

If $\delta_i > 0$ => The person does not like the idea of a market for kidneys

If $\delta_i = 0$ => The person is indifferent in the first place

It is worth noticing that for the great majority of the population, their consumption level and health status will be almost independent on whether there is a market for kidneys or not. As a consequence, for this group δ fully reflect the dollar value or implicit price of repugnance.

Now that we have a value assigned for introducing financial compensation in the market according to each individual, we can turn to the question on how the kind of system or regime chosen is determined. We consider two choice criteria in turn: Compensation Principle (i.e. Cost Benefit Analysis) and Majority Vote (i.e. a Referendum).

IV. Market Based System?: Compensation Principle versus Majority Vote

In order to determine whether a market based system is desirable, the first thing an economist is likely to do is to perform a cost benefit analysis. That is, the economist will try to determine the "gains" of implementing or removing a regulation (and see if the winners can compensate the losers).

In our simple framework, we can compute the net gains of removing the ban on organ selling by adding up the deltas of the different individuals across the population. If the sum is negative (remember that negative delta means that individuals are willing to pay to allow for payments) then the "winners" of moving to a market based system can compensate the "losers", and the reverse is true if the sum of deltas is positive. That is, the compensation principle criteria will work as follows

If $\Sigma\delta_i < 0$ => The winners can compensate the losers => Legalize the market.

If $\Sigma\delta_i > 0$ => The winners cannot compensate the losers => Ban the market.

However, in practice this may not be enough to determine the outcome, as noted by Al Roth: "It is illegal to sell horsemeat for human consumption in California, not because a

persuasive case was made that the costs exceed the benefits, but because 4,670,524 people voted to make it illegal in a 1998 referendum." [4]

In our framework, in a referendum a person with negative δ will vote against the ban, while a person with positive δ will vote in favor. We can easily compute the result of the referendum as follows

Let $V_i = 1$ if the person vote against the ban (i.e. $\delta_i < 0$) and $V_i = -1$ if the person vote for the ban (i.e. $\delta_i > 0$). Then

If $\Sigma V_i > 0$ => Legalize the market.

If $\Sigma V_i < 0$ => Ban the market.

As can be seen, with both criteria the outcome depends on the distribution of δ in the population. However, using the first criteria, compensation principle, the intensity (i.e. the magnitude of δ) matters while with the second criteria, majority vote, it only matters whether individuals agree or not with the ban (i.e. whether δ is positive or negative).

Figure 1 shows, as an example, a distribution of deltas in the population. At the right tale of the distribution we have a relatively small group of individuals who are fiercely opposed to the idea of a market for kidneys for transplantation. On the other hand, on the left tail of the distribution we have a small group of people, perhaps in need of an organ or relatives, who are in favor of a market system, and in the middle we have most of the population, that may feel that there is something wrong or repugnant about a market system, but their feelings are not very strong because they do not expect to be involved directly in the market.

In the example of Figure 1, a referendum will lead to a ban on organ selling, while a cost benefit analysis could indicate that there is a social gain of having a market. As a consequence, there is a conflict between efficiency and majority vote.

[4] Elias and Roth, 2007.

V. Shifting Repugnance: Effect of an Increase in the Waiting List

According to the analysis of repugnance as an obstacle to market development, an important attribute of repugnance is its unpredictability. However, in our framework what is repugnant is determined by underlying factors and they may change over time in a predictable way. In particular, the social cost of banning certain transactions at a given moment in time operates as an important implicit factor.

In the particular case of kidneys for transplantation, the potential benefits of a market system may have seemed low compared to the costs of implementing a new system when the legal constraints were implemented, since the shortage was not so severe. Currently the kidney waiting list is over 73,000 persons, and in the last 10 years it has grown at an annual rate of 7%. Additionally, technological progress that has made transplants safer and more effective during the past 15 years has significantly increased the potential benefits.

Based on the projected growth in additions to the waiting list and the relatively fixed supply of organs available for transplantation, a system that depends on altruism will have waiting times for deceased donor kidney transplantation that will soon exceed the life-expectancy of most dialysis patients with end-stage kidney failure.

Both the growth in the waiting list and the improvements in the safety and effectiveness in kidney transplantation are factors that reduce repugnance toward a market system and, at the same time, increase the social costs of the ban.

According to equations 1 and 6, an increase in the waiting list would lead to a shift to the left of the distribution of δs in the population and the vote of some individuals may change. The sign of δ, and as a consequence the vote, is less likely to change for groups with radical positions (i.e. with high δs in absolute value), than for non-direct participant in the market (i.e. those for which δ fully reflect repugnance).

Assuming a distribution like the one displayed in Figure 1, a small change in δs may lead to a change in the result of the referendum. Remember that in the case of a referendum intensity does not matter. The repugnance factor and the existence or not of the market are jointly determined by a third underlying factor, in this case the size of the waiting list.

In practice things work a little different, in most countries there is a political process that determines the final outcome. In our example, we have two groups with radical positions, so they are likely to fight in the political arena. Becker analyzes a similar problem in his seminal paper on the theory of pressure group and one of his main results is that a key determinant of the final outcome in the political process is the social costs of the policy.

VI. What is Repugnant Depends on Circumstances

There are other cases in history in which bans or transactions restrictions were removed because of the large social costs of maintaining them. Someone might say Americans found drinking alcohol repugnant, so there was a prohibition in 1920. 15 years later people changed their mind because the costs of prohibition seemed so high.

Life insurance was once considered repugnant. As late as 1853, a New York Times editorial contended that "He who insures his life or health must be victim of his own folly or other's knavery." Previous to the institution of the life insurance, the widow and their orphans were assisted by their neighbors and relatives as well as by mutual aid groups. In the 19th century, the financial protection of American families became a purchasable commodity. The funeral was another "family and neighborhood" affair that became a business. Now life insurance is considered a form of institutionalized altruism.

Following Al Roth's example on repugnance on California against human consumption of horse meat; if the price of beef and other meats rose a lot, the repugnance toward horse meat would go down, and might even disappear. In fact, during World War II,

due to the low supply and high price of beef, New Jersey legalized its sale, but at war's end, the state again prohibited the sale of horse meat.[5]

The Nobel press release to the award in Medicine in 2010 to the father of in vitro fertilization notes the great opposition Robert G. Edwards faced: "These early studies were promising but the Medical Research Council decided not to fund a continuation of the project. However, a private donation allowed the work to continue. The research also became the topic of a lively ethical debate that was initiated by Edwards himself. Several religious leaders, ethicists, and scientists demanded that the project be stopped, while others gave it their support."

However, what was repugnant for over thirty years, today represents a great benefit to society and is considered by many to be a medical miracle, the Nobel press release continues: " Approximately four million individuals have so far been born following IVF. Many of them are now adult and some have already become parents. A new field of medicine has emerged, with Robert Edwards leading the process all the way from the fundamental discoveries to the current, successful IVF therapy. His contributions represent a milestone in the development of modern medicine."

That is, our analysis shows that repugnance responds to costs. When it is cheap, we observe a lot of it. When it becomes expensive, it disappears. The analysis also indicates that as economists we cannot ignore the importance of this factor because it may have important consequences on the types of markets and transactions that we observe.

VII. Conclusions

The organ transplant problem is grave. People suffer and die while waiting for organ transplants. The present system imposes an intolerable burden on thousands of very ill

[5] Wikipedia contributors, "Horse meat," Wikipedia, The Free Encyclopedia, http://en.wikipedia.org/wiki/Horse_meat (accessed July 1, 2010).

individuals who suffer and sometimes die while waiting years until suitable organs become available. Increasing supply through payment would largely eliminate their wait.

There may be a taste factor that makes one repelled by the sale of organs, but that has to be balanced against the benefits from sale. Using simple economics analysis we showed in this essay that what is repugnant depends on the circumstances and it is closely associated with the social economic costs generated by the ban, or regulation.

Conclusions about the morality of using prices to encourage supply or ration demand have changed in the past when they were shown to be effective. One example is a carbon tax to cut pollution; another is the use of willingness to pay to reduce the risk of death to measure the (statistical) value of life.

VIII. References

- Becker, Gary S. and Julio J. Elias, 2007. "Introducing Incentives in the Market for Live and Cadaveric Organ Donations," Journal of Economic Perspectives, American Economic Association, vol. 21(3), pages 3-24, Summer.

- Becker, Gary S., 1997. "How Uncle Sam Could Ease the Organ Shortage." Business Week, January 20.

- Becker, Gary S., 1985. "Public policies, pressure groups, and dead weight costs," Journal of Public Economics, Elsevier, vol. 28(3), pages 329-347, December.

- Borges, Jorge Luis, 1957. “Un Curioso Método,” in Revista Ficcion N° 6.

- Cohen, Patricia. “Economists dissects the “Yuck” factor” The New York Times, January 31, 2008.

- Cronin, David and Julio J. Elias, 2009. "Operational Organization of a System for Compensated Living Organ Providers," in When Altruism Isn't Enough: The Case for Compensating Kidney Donors, Edited by Sally Satel, M.D. AEI Press.

- Elias, Julio J. and Roth, Alvin E., 2007."Econ One on One: A Market for Kidneys?" The Wall Street Journal Online.

- Leider, S. and Alvin. E. Roth. “Kidneys for sale: Who disapproves, and why?,” American Journal of Transplantation, 2010.

- Roth, Alvin E., 2007. "Repugnance as a constraint on markets," November, Journal of Economic Perspectives, vol. 21 (3), Summer, pp. 37-58.

- Roth, Alvin E., 2007. "What Have We Learned From Market Design?," NBER Working Papers 13530, National Bureau of Economic Research, Inc.

- Segev, D. L. and S. E. Gentry. “Kidneys for sale: Whose attitudes matters?,” American Journal of Transplantation, 2010.

Figure 1

Example of a Distribution of δs in the Population

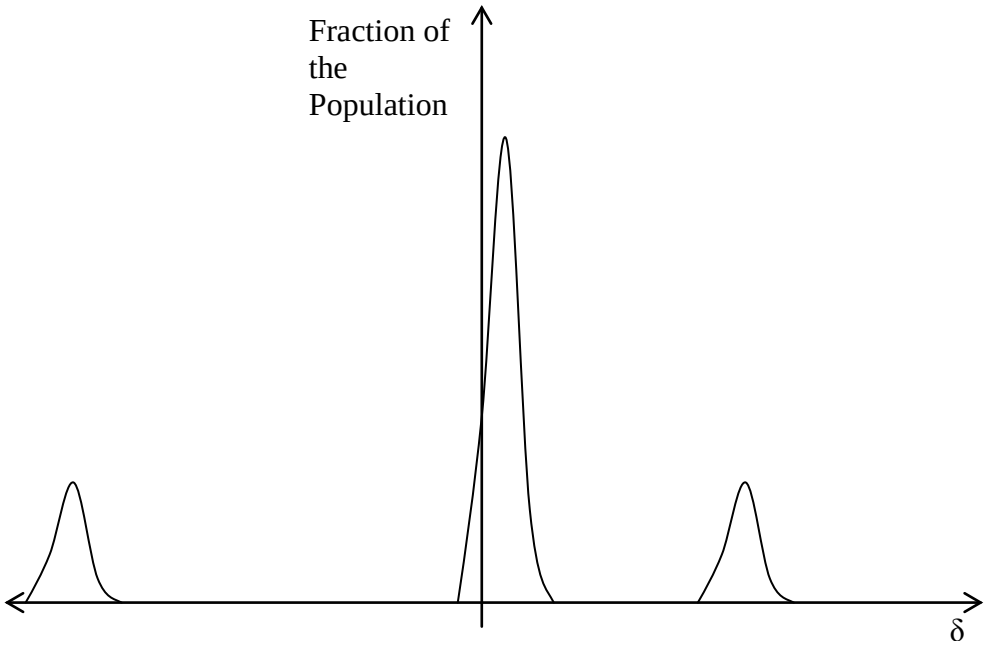

Figure 2

The effect of an Increase in the Waiting List on the Distribution of δs