# Market Design Under Weak Institutions

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As market designers begin to address economic inequality, we will necessarily also begin to engage marginalized populations who have so far not been served well by the markets in which they participate. We will need new market designs for participants who may not trust the people with whom they interact and who may not even trust the market itself to operate as advertised. Put another way, we will need to operate under (perceived) institutional weakness in which the rules of engagement may not be well enforced.

Though it remains to be seen what principles of design will be important for markets in this context, I anticipate that *spot transactions* and *transparency* will each play a role. A market that relies on spot transactions ensures that each time a participant is called to make an exchange (in cash or kind), it occurs in one sitting, and no party is left with a debt towards another. And, as used in this essay, a market is transparent if there is little uncertainty about what is owed to a participant as a function of the action he takes. Transparency may be beneficial in allowing market participants to ensure the rules of engagement are respected. Both principles play an important role in the market designs discussed by Prendergast and Rai, as well as in other market designs in settings with weak institutional enforcement.

## Prendergast (2016): Transparency

To a first approximation, Prendergast and his team helped Feeding America transition from a dictatorial allocation system to a free market economy (implemented through repeated first price auctions) with artificial currency. Doing so not only enabled food bank directors to express their preferences over donations, greatly improving allocative efficiency, but also (Granger) caused an increase in the total supply of food donations. But

despite these large gains, this transition did not come easily. Food bank directors were generally mistrusting of free market systems and initially objected to the perceived intrusion of capitalistic forces. They worried that the transition to a market based allocative system would unfairly reward large food banks at the expense of smaller, poorer ones.

Though an analysis of the fairness of free markets is beyond the scope of this essay, it is natural to distinguish between the way in which free markets determine budgets, and the mapping from budgets to consumer choice that free markets facilitate. To the extent that free markets are unfair, it seems likely to arise from the determination of budgets, rather than the expression of choice. So it is critical to highlight that Prendergast and his team chose budgets in accordance to the priorities that Feeding America had already assigned to food banks rather than leaving budgets to the mercy of the market, thereby isolating the benefits of the expression of demand. Nevertheless, communicating this distinction to food bank directors in the abstract may have been a challenge.[1] It was imperative that Prendergast and his team implemented a market design that overcame the general lack of trust foodbank directors placed in markets.

The transparency of first price auctions may therefore have been instrumental in their adoption. First price auctions are transparent in that, at the time at which a food bank director places a bid, only two outcomes are possible from his perspective; either he receives the good in question and pays his bid, or he doesn't receive or pay anything. In contrast to popular market designs in matching contexts which use opaque algorithms to map preference data to outcomes, at the time at which they place their bid participants in a first price auction face very little uncertainty over the set of outcomes they may achieve. So there is little scope for the director to feel he has been mistreated relative to his expectations. Put in other words, transparency may have facilitated food bank directors' understanding of the mechanism and helped to assuage their concerns about unfairness.

## Rai (2016): Transparency and Spot Transactions

Though Rai describes a very different population – coffee farmers and procurers in various parts of the developing world – many of the same issues naturally arise. He describes a market for coffee beans that is fraught with contracting frictions, which leave coffee farmers with little of the surplus they create. Because the ultimate coffee procur-

[1] Indeed, communicating the nuances of market rules to participants has proved challenging in other contexts as well; see Hassidim, Romm, and Shorrer (2016) for evidence that Israeli psychologists distort their reported preferences in a strategy proof mechanism that determines their initial residency placement.

ers can't trust anonymous producers (there are many opportunities to shirk – picking the beans too early, failing to store the beans in dry place, etc.) they outsource procurement to a smaller set of middlemen who monitor producers in a decentralized fashion. These middle men have sufficient monopsony power over the producers to demand most of the surplus, leaving the small scale coffee producers with little compensation and (therefore) highly vulnerable to market fluctuations.

One of the market designs discussed in this context is a commodity exchange in which coffee is graded and sold in a centralized manner, such as in the Ethiopian Coffee Exchange. Commodification has many advantages; principle among them, the two which are at the center of this essay.

Just as the transparency of first price auctions affords participants a high degree of certainty over the set of outcomes resulting from their bid, a well-operated commodity exchange provides a transparent map from the quality of (various features of) coffee beans to prices. This may be critical to successfully integrating small-scale coffee producers into a centralized market. Such producers, who previously relied on personal relationships to ensure relatively fair treatment, may be wary of new market institutions. The transparency of commodification allows coffee producers to anticipate their earnings as a function of their inputs, and to verify that market prices are being honored.

Standardized commodity grades also facilitate spot transactions. A commodity grade serves as an assurance that the coffee meets pre-specified standards, enabling two anonymous parties to exchange at the centrally determined, market clearing price. Because no coffee farmer or procurer leaves the centralized exchange in another's debt, anonymity poses no hindrance to exchange, despite an inability to enforce long-term contracts.

## Spot Transactions in Kidney Exchange

Spot transactions have proved important in other market designs in which an inability to enforce contracts is a first order barrier to exchange. Kidney exchange may provide the most well known example, see Roth, Sonmez, and Unver (2004). When a patient requires a kidney transplant and has a willing but incompatible donor, the pair can enter a centralized clearinghouse that allows them to be matched with another pair in the same position and facilitates trade. Willing donor A gives his kidney to Patient B and Willing donor B gives his kidney to Patient A. While kidney exchange has saved the lives of many patients who suffer from renal disease, it operates under an important and binding

constraint: with few exceptions, the kidney transplants must transpire simultaneously. This is because kidney exchange cannot be the subject of binding legal contracts — US courts will not enforce an agreement between two parties in which one is to give his kidney to the other. Thus, the legal institutions supporting kidney exchange are weak, and fearing the possibility that one party will renege on his agreement to donate a kidney, hospitals elect to do all surgeries associated with a particular exchange at the same time.[2] While these spot transactions limit the size of potential exchanges, they also eliminate the danger that one donating party will change his mind after his patient has received a kidney.

## Spot Transactions in Community Targeting

One final example comes from my own work (see Hussam, Rigol, and Roth (2017)). Motivated by substantial heterogeneity in returns to capital among small scale entrepreneurs in the developing world (see De Mel, McKenzie, and Woodruff (2008) and Banerjee, Karlan, and Zinman (2015)), we explored the usefulness of community information in targeting high return to capital micro-entrepreneurs in Maharashtra, India. Community members ranked one another along several attributes related to entrepreneurial ability, including profitability, total capital holdings, and marginal return to a $100 grant. Preliminary estimates suggest community information is quite valuable; point estimates indicate that the average entrepreneur in this population enjoyed an 8% monthly marginal return to capital, but those ranked highly by the community had upwards of 25% monthly marginal return to capital. We further find, however, that when respondents knew their reports were used for the distribution of grants, the informational content of their rankings diminished by half. Finally, we explored simple techniques to realign incentives for truthfulness. Monetary payments for accuracy, and eliciting reports in public both proved highly effective in correcting incentives to misreport.

Beyond the headline findings, we drew an important lesson about offering monetary incentives for accuracy. The simplest way to offer such incentives is to peg a respondent's payment to the closeness of his report with ex-post outcomes. However, when we tried to pay people in this manner, the overwhelming response was a skepticism that we would return with the remuneration we owed. Our mechanisms were unfamiliar, and respon-

[2]The exception to this rule is when one party is a non-directed kidney donor (that is, he intends to donate his kidney without a requiring that one should be returned to a particular recipient). In such cases, hospitals allow for sequential exchanges, as if one party were to renege, no other party is worse off than before the exchange was arranged.

dents' skepticism about our own incentives rendered them ineffective. To address their concern we pivoted to a class of payment schemes known as peer prediction mechanisms (e.g. Prelec (2004), Witkowski and Parkes (2012)). These payment schemes reward respondents based on their own reports and the contemporaneous reports of their peers. While they are substantially more complicated to explain, they have the major advantage that payments can be made at the same time as elicitation. In Rigol and Roth (2017) we document a variety of metrics by which peer prediction mechanisms appear to function well in the field. Once again, spot transactions facilitated exchange (in this case, information for money) in the face of weak institutional enforcement.

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