Thoughts on Markets-Mechanisms-as-Experimental Units

Introduction

Very little is know about differing matching market mechanisms. There is some empirical work comparing auction formats, but as far as I know, no true experiments comparing, say a decentralized spot market to a deferred-acceptance matching market. This is presumably the result of the empirical difficulty of experimenting at the market level—not a lack of interest in the questions mechanism comparisons raise.

Broad-Scope Research Questions

1. Who gets paired with whom under different mechanisms? Are matches assortative?
2. Do spot market leads to outcomes that look like matched markets?
3. What is the quality of resultant matches?
    - Work quality
    - Completion rates
4. How do wages compare across mechanisms (assuming buyers/sellers form preferences with knowledge of binding, offered wages)? One critique of centralized markets is that they suppress wages.
5. Can we experimentally create unraveling? When does it happen and why?
6. Does lack of strategy-proofness matter in the small?
7. When do spot markets not clear and why?

Basic Experimental Infrastructure

We would need to build a basic site with browsable profiles of buyers and sellers. Buyers and sellers would only be able to "see" profiles in their experimental unit (recall that the market will be the experimental unit). There would some way for buyers/sellers to (a) make offers (in the decentralized case) and (b) express rank-ordered preferences in the centralized cases. Subjects We would recruit participants to be buyers or sellers, who in turn would log into our site with their oDesk accounts. This would generate a small oDesk-based profile.

Key Challenges

1. Statistical power—experimental units are *marketplaces*, not even individual teams. Some up-front power calculations will be essential. My guess is that on some relatively noisy outcome—like match quality as measured by work product—we will not have much power. Imprecisely estimated zeros are death for a project. We will have to think about what first order things will be affected meaningfully by randomizing mechanisms and then focus on designs that can best illuminate those effects.

2. Logistics—running a very large experiment is just logistically challenging in terms of coordinating with workers, sending annoucements, checking the data etc. I would strongly urge us to take it in steps, with many pilots before the "real" experiments begin.

3. Designing incentives and information structure. In my experience, running employer-as-experimenter experiments or experiments where the judgement of the experimenter has some import (e.g., deciding who gets paid) are often dicey. We want to avoid situations where their beliefs about us matter.

4. Running enough iterations so that any game is being played by savvy buyers and sellers who are not longer making mistakes because they do not understand the game.

Tasks

Buyers and sellers would be pairing up to complete some task. The task would, ideally, be something that was (a) a real task in the marketplace (b) has a more-or-less objective measure of quality. It should also be monitorable in terms of time spent. Some kind of writing or data entry task would seemingly be ideal. The buyer should also perhaps have some role to play, so that seller preferences over buyers are meaningful (though perhaps buyers would post prices).

Incentives

We would give buyers an endowment to spend in the marketplace on sellers. The buyer would be the residual claimant i.e., they can keep whatever they do not spend on wages. We would also need to make their pay-off dependent on the quality of the work produced–otherwise they have an incentive to just find the cheapest contractor.

Basic Experimental Design: Randomizing Workers to Mechanisms

Decentralized Mechansims Buyers view seller profiles and can make offers; if an offer is accepted by seller, a match is formed. Buyers and sellers can only be matched to one sellers are at a time. Buyers have T time to make a match. At time T, matches are announced and work commences. We would have to decide how matches can be dissolved (if at all) before T.

Centralized Buyers and sellers browse profiles and build a rank-ordered list of the other side. At time T, DA is run and matches are announced. We could use variants of deferred acceptance (buyer proposes, seller proposes).

What else could we randomize?

- Number of market participats
- Whether both sides can see others on their "side"
- Time allowed to match - could also be done imposing a budget that is declining to incentivize fast matches
- Incentives for quality and incentives for keeping wages high/low
- Who proposes in DA, who proses in spot market

Software Development

This project would have a very large infrastructural component—we are basically building from scratch an e-commerce platform. That being said, we could potentially re-use much of what id developed in follow-on projects.

Task Performance Interface

I think something like a Etherpad interface with extensive logging might be ideal. We could also insist that work be done with the oDesk team room tracker to get clicks and screen-shots for ex post analysis. The key is going to be excellent instrumentation.

oDesk API integration

This will simplify payments and give us real-world observable characteristics to readily incorporate into profiles

Profile and Offer Interface

This should be relatively straightforward, as it is primarily a crud interface. Proposed Software Development Plan

Next Steps

I think we should try to plan to build a series of more-or-less throw-away prototypes of the market interface and run some pilots. I think there will likely be many issues that will arise when our plans hit reality and it would be good to work on the kinks before we scale anything up.