

Report on Katreniak et al's "Why Not Borrow, Invest, and Escape Poverty?"

Summary

This paper proposes a theory in which the probability of success of an investment project is increasing in the invested amount, which gives rise to a bimodal all-or-nothing distribution of investment. They then run an online "lab" experiment in the Czech Republic using three different games, one which follows their theory, a second which the payoff is increasing in the invested amount, and a third in which agents are given the option to increase the probability of success with lower payoff (decrease the risk) or the payoff conditional on success with lower chance of success (increased risk). They find evidence consistent with optimal behavior, i.e., the first yields a bimodal investment distribution, the second a unimodal distribution, and the third experiment shows that risk averse agents prefer the first option.

Critique

The contribution of the paper as written is not so clear. The paper's stated contribution is (not stated until the last paragraph of the introduction):

"...to propose a theory that could explain why the poor tend to turn down the opportunity to borrow in order to invest in high-return projects. The theory is based on risk aversion, which is central in the life of the poor, without relying on fixed costs or any other nonconvexity in the production technology." p. 6

As stated in the first sentence, this is not a novel contribution: risk aversion alone could explain this, for example. (The authors are clearly aware of this, since the authors choose CARA rather than CRRA in order to negate this.) If the motivation is empirical, so could the idea of heterogeneity in project quality, i.e., the poor simply do not have high returns. So the contribution would be to propose ANOTHER theory. But I think the second sentence is crucial in that the authors additionally want to propose a theory that might explain why we don't see intermediate levels of investment, e.g., their result that "investment is discontinuous in the agent's level of risk aversion: more risk averse agents invest nothing, while less risk averse agents invest the largest amount possible", and do so even if the technology itself does not have s-shaped returns to capital because they feel the evidence is against the latter. They want this bimodal distribution, rather than unimodal distribution. This would then relate to the well-known portfolio result that even a risk-averse agent would like to invest a small amount in a risky asset with positive expected return. I'm not sure they fully succeed in this because although there is a potential continuous investment in improving the probability, the project itself is discrete/indivisible, which already has the feature of a fixed cost, s-shaped return (step function of output). That is they rule out the option (especially important for the poor) of investing with 100% success probability in a scaled down project.

The experiment is interesting, but again the contribution is limited. The applicability of a Czech sample to the microfinance literature they motivate with is small. Wealth levels vary dramatically from the motivating population, and the authors are aware this is a concern. Second, it would seem that proper execution would want the bimodality of the distribution to vary in a three dimensional plot over investment level AND risk aversion. Third, the last part of the experiment is simply testing whether risk averse people are consistently risk averse. I don't see the tight connection of this with the model theory. Finally, there is a question of what we might even POTENTIALLY learn. On some level, we might simply learn whether people behave rationally, but we learn nothing about the relevance of the theory to real world.

In the end, sifting through everything, the paper makes a nice interesting point, but especially

given that there are other existing theories to explain the data, the contribution of the paper is minor.

I do think the execution and especially exposition of the paper could be greatly improved. Indeed, the paper is quite muddled, which is a surprise given the level of accomplishment and experience of most of the authors. The paper is very poorly written. Some examples:

1. The first page of this paper, which is supposed to be motivation/literature review is disastrous. The line of argument is impossible to follow, even for someone who knows the papers referenced quite well. Related, the premise that S-shaped production functions lead to risk aversion but there is a need for a model with a non-S-shaped production function to also lead to risk aversion is unfounded. S-shaped production functions lead to risk-loving even when preferences are inherently risk-averse (see Hopenhayn and Veraschgina, 2009, for example). It is simply not true that the theoretical literature has ignored the idea that people can invest to influence the probability of success rather than payoffs. This is the case of moral hazard, something that was considered in credit markets as far back as Stiglitz and Weiss (at least!) The introduction seems to be arguing with an argument in Banerjee and Duflo's book that is targeted toward a general readership.

2. "The probability as a function of investment was set such that the expected return of the probability game was constant at 50%." I have read this multiple times, and I have no idea what the authors mean.

3. The introduction seems to be arguing with a previous set of criticisms received. It therefore loses focus.

4. The x-axes in the figures are even labeled.

5. Figure 1: "Decision: row at which A dominates B." I had to read this multiple times, but I think you mean that you record the minimum level at which A dominates B.