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# Journal of Economic Behavior & Organization

journal homepage: [www.elsevier.com/locate/jebo](http://www.elsevier.com/locate/jebo)



## Transparency, efficiency and the distribution of economic welfare in pass-through investment trust games<sup>☆, ☆☆</sup>

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### ARTICLE INFO

Available online xxx

#### JEL classification:

C72  
C91  
D72  
G14  
G21

#### Keywords:

Financial intermediation  
Financial market transparency  
Pass through securities  
Multi-level trust games  
Experiments

### ABSTRACT

We design an experiment to examine behavior and welfare in a multi-level trust game representing a pass through investment in an intermediated market. In a repeated game, an investor invests via an intermediary who lends to a borrower. A pre-experiment one-shot version of the game serves as a baseline and to type each subject. We alter the transparency of exchanges between non-adjacent parties. We find transparency of the exchanges between the investor and intermediary does not significantly affect welfare. However, transparency regarding exchanges between the intermediary and borrower promotes trust on the part of the investor, increasing welfare. Further, this has asymmetric effects: borrowers and intermediaries achieve greater welfare benefits than investors. We discuss implications for what specific aspects of financial market transparency may facilitate more efficiency.

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## 1. Introduction

Berg et al. (1995) investigate trust and reciprocity in a two-player investment trust game. Since then, the game has been studied extensively. Ostrom and Walker (2005), among others, review the literature and identify that social distance, communication and reputation all affect the degree of trust and reciprocity. The primary focus is on one-to-one trust and reciprocity behavior.

In reality, many situations require multiple levels of trust. For example, when a person invests in a bond fund, he or she trusts the fund manager not to misrepresent the bonds in the fund. The fund manager, in turn, must trust the bond issuers. Alternatively, consider collateralized debt obligations (CDOs). In the home mortgage market, institutional arrangements emerged in which mortgages were originated by one firm (e.g., Country Wide), sold to an investment banker that assembled

<sup>☆</sup> The authors would like to thank and dedicate this paper to John Dickhaut who brought us together as researchers, inspired our thinking in this area and worked with us in designing the game studied in this paper. We thank an advisory editor and an anonymous referee for valuable suggestions, as well as Shyam Sunder, Charles Plott, and participants at the John Dickhaut Memorial Conference at Chapman University for helpful comments. We would also like to thank the Economic Science Institute at Chapman University for funding this research.

<sup>☆☆</sup> Winner of the “Best Paper by a Young Researcher Award” at Experimental Economics, Accounting and Society: A Conference in Memory of John Dickhaut, Chapman University, January 13–14, 2012.

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them into large packages, and issued Mortgage Backed Securities (a kind of CDO) that were in turn sold to investors. Investors trusted the originators to perform due diligence in evaluating the risk of borrowers, and security issuers to provide adequate data trails and loan servicing arrangements. This chain required multiple levels of trust to justify investment. As the recent financial crisis shows, failures at one level can spread through a multi-level system. Further, the challenges recovering show that the breakdown of serial trust relations can have drastic implications.

Financial market crises frequently prompt calls for reform that include greater transparency. For example, in a letter to the G20 on June 16, 2010, President Obama states: “We should support efforts to enhance transparency and increase disclosure by our large financial institutions.” He further asks for: “More transparency and disclosure to promote market integrity and reduce market manipulation.” (Obama, 2010). Transparency is often one of the goals of regulation ranging from current calls for reform to the Sarbanes–Oxley Act and the Securities and Exchange Act. One of the stated goals of the Securities and Exchange Commission is: “a far more active, efficient, and transparent capital market that facilitates the capital formation so important to our nation’s economy.”<sup>1</sup> Notice that all of these are aimed at the capital markets, not at retail lending markets. The implicit assumption is that capital market transparency will improve outcomes. However, it is difficult to draw clear conclusions about the effects of transparency alone or at what level transparency matters in naturally occurring environments.

A number of laboratory studies have documented that transparency may actually harm market efficiency, reduce economic welfare and produce non-equilibrium behavior. For example, Smith (1991) documents that in continuous double auctions under private information convergence to equilibrium is faster than under complete information. Similarly, Noussair and Porter (1992) report that English and uniform price sealed bid auctions are more efficient when there is a lack of common information. Cason and Plott (2005) find that forced information disclosure about privately negotiated contracts can significantly reduce economic welfare. Transparency can also distort negotiating processes in bargaining games (Roth, 1987) and have unintended consequences on individual behavior in contests and tournaments (Sheremeta, 2010; Mago et al., 2012).

Given the findings of previous literature, it is not clear how transparency is expected to impact financial markets that require multiple levels of trust. On the one hand, transparency may encourage trust between the parties. However, transparency may also discourage investments if investors know that their decisions are being monitored. The problem is even more complicated because, usually, regulation promoting transparency is tied to other reforms and occurs during a time of other changes to the economy (e.g., the Securities and Exchange Act). Therefore, we design an experiment, using a multi-level trust game, to study transparency in a controlled investment/trust environment. Furthermore, our experiment allows us to isolate transparency in what are effectively two levels: the capital market (between the investor and intermediary) versus the retail lending market (between the intermediary and the borrower). Although we do not have clear ex-ante predictions on how transparency will impact trust and reciprocity in the multi-level trust game, we expect for the effect may well be heterogeneous, i.e., transparency impacts investors, intermediaries and borrowers in different ways.

The conventional two-player trust game is commonly interpreted as a (single level) investment game. An investor (the first player) invests money with a trustee (the second player) who employs it productively and chooses how much, if any, to return to the investor. Because each player is involved in each transaction and, hence, observes the play of all players, the game is completely transparent. Our game extends this to include a financial intermediary, creating a three-player trust game by adding a third player (the intermediary). This allows us to control transparency at different levels by changing whether each player can observe the play of all others or only observe transactions involving the player with whom he interacts bilaterally.

In our game, the three players move sequentially. The first player (the investor) initiates the process by sending money (any portion of his endowment) to the second player (the intermediary) with the amount being tripled. One can interpret the tripled amount as the case where the intermediary creates value through the intermediation process (e.g., through pooling investments, diversification and increased liquidity). The intermediary then decides how much of the tripled amount to loan to the third player (the borrower), with the amount being tripled again. This can be interpreted as putting the money to productive resource use. The borrower chooses how much to return to the intermediary who, in turn, chooses how much to return to the investor. This effectively creates an intermediated market, generating gains from specialization and trade from two interactions based on trust and reciprocity.

Our game is repeated, but we use an independent one-shot pre-experiment version to type the behavior of each subject in his or her role and for comparison with the repeated version. In the one-shot setting, we find that transparency has no significant effect. However, in the repeated setting, transparency of exchanges between the intermediary and borrower (the retail market) to the investor increase efficiency and payoffs to all parties. Transparency of exchanges between the investor and intermediary (the capital market) to the borrower has no significant effect upon efficiency (if anything, the effect is negative). Therefore, it appears that transparency regarding the borrower and intermediary transactions matters most. Transparency regarding the investor and intermediary transactions does not matter as much. Further, we find that it is the transparency, and not the specific exchanges, that increase welfare. Last, we find that benefits are asymmetric. While all parties benefit from the ability of investors to view the borrower/intermediary transactions, the borrowers and intermediaries benefit relatively more. Thus, it is the retail borrower who gains when his or her moves are transparent.

<sup>1</sup> <http://www.sec.gov/about/whatwedo.shtml#corpfin> (accessed 10/27/2010).

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