12-14-2020

Financial Reporting and Moral Sentiments

Radhika Lunawat
University of California, Irvine

Timothy W. Shields
Chapman University, shields@chapman.edu

Gregory B. Waymire
Chapman University, waymire@chapman.edu

Financial Reporting and Moral Sentiments

Comments

ESI Working Paper 20-40

Financial Reporting and Moral Sentiments[*]

Radhika Lunawat
University of California-Irvine
Timothy W. Shields
Chapman University and *Economic Science Institute*
Gregory Waymire[†]
Emory University and *Economic Science Institute*

December 14, 2020

ABSTRACT

Dating back at least to Adam Smith (1790), philosophers and researchers expect that people will behave differently when they know their actions are observable to others. We hypothesize that financial reporting reveals managers' actions and leads them to take different actions that are better aligned with investor interests. We posit that the reason why is the activation of our internal mental self-evaluation that Smith refers to as an "Impartial Spectator." We test this hypothesis with an experiment in which we manipulate the availability of a financial report that makes managerial actions transparent. Our evidence shows that financial reporting leads a manager to choose reinvestment and resource sharing actions that are better aligned with investor interests, *even in a sparse experimental setting where the investor can impose no cost or confer no reward on the manager*. This same effect holds in a setting where the investor can shut down the firm at any point and take a sizable portion of the assets. Our evidence is important because it suggests that part of financial reporting's economic value comes from its enabling moral evaluation by the manager in addition to its traditional contracting function

Keywords: Financial reporting, Blameworthy, Praiseworthy, Moral sentiments, Self-regulation
JEL codes: C92, D82, D91, M40

[*] We thank Adam Moinie for his professional programming, Megan Luetje for recruiting experimental participants, and Chapman University, Emory University, and University of California Irvine for their financial support. We also thank workshop participants at Emory University, Chapman University, Georgia Institute of Technology, Lafayette College, University of Texas Arlington, the International Conference on Social Dilemmas, and the Experimental Research in Management Accounting (EXRIMA) conference for their helpful comments.

[†] Corresponding author. gregory.waymire@emory.edu

"*Publicity is justly commended as a remedy for social and industrial diseases. Sunlight is said to be the best of disinfectants.*"

Louis Brandeis (1914, 92)

1 Introduction

Disclosure of a financial report can alter equity prices if the disclosure leads investors to trade differently, or it can result in penalties when contracts are tied to financial statement data (e.g., when low interest coverage triggers default). Indirect costs can also result when a forthcoming financial report leads a manager to act preemptively to avoid a contractual constraint tied to reported numbers. Is it possible also that a forthcoming financial report can lead to differences in managerial behavior even when direct valuation or contracting consequences are absent, and if so, why would such effects occur? We hypothesize that when managers know that a forthcoming report will reveal their actions, the manager's internal moral sentiments will lead their actions to differ favorably for investors. We experimentally test for the presence of such effects in a sparse, clean setting where financial reporting can confer no valuation or contracting benefit.

Our predictions derive from the moral sentiments of individuals that Adam Smith (1759/1780) hypothesized to be the foundation for economic exchange (see also Smith and Wilson, 2017; 2019).[1] In *The Theory of Moral Sentiments* (*TMS*), Smith hypothesizes that individual moral action arises from a hypothetical "Impartial Spectator" that comes

[1] A *sentiment* is an "affection of the heart from which any action proceeds, and upon which its whole virtue or vice must ultimately depend" (Smith, 1759/1780, 18). We thus define a *moral sentiment* as a feeling (both emotional and cognitive) that another person is intentionally benefited or harmed by an action that serves to define the propriety of that action.

to exist within an actor's mind through life experience. This Impartial Spectator judges an action's propriety in light of extant moral customs and norms. We hypothesize that transparent financial reporting enables an investor to judge the propriety of managerial actions; this in turn leads managers to take more investor-beneficial reinvestment, dividend, and self-compensation actions than they would in the absence of reporting.

The assumption at the heart of Smith's *TMS* is that people take self-beneficial actions and avoid self-harmful actions. Personal experience teaches us to recognize and judge like-minded actions by others. Through this we learn which of our actions will likely earn others' praise (blame), and gradually we come to favor (disfavor) taking such actions. Moral sentiments develop because an actor comes to believe that an action (1) is inherently praiseworthy regardless of whether anyone discovers that the action was taken and (2) will actually be praised by others if they learn of the action taken (Smith and Wilson, 2017, 35–36).[2] We argue that a transparent financial report revealing a manager's resource allocation actions activates such moral sentiments within managers and results in manager actions that ultimately increase investor wealth.

Our experiment uses a six-period reinvestment game where, after every period except the final one, the manager divides earnings between an investor dividend, self-compensation, and reinvestment of remaining resources to increase future earnings.

[2] The desire to be viewed positively by others was recognized by foundational Western thinkers before Adam Smith. It is found in the works of Plato, and in modern psychological theories of self-presentation and impression management (we thank an anonymous referee for pointing this out). However, we use the framework of Smith and Wilson because they explicitly model the tradeoff between intrinsic and monetary utility, which allows us to make specific predictions on how financial reporting affects managers' actions about reinvestment and resource sharing.

After the final period, the manager divides remaining resources (i.e., cumulative earnings net of prior dividends and compensation) between the investor and herself.

We manipulate two features of this reinvestment game. One is the availability of a financial report at the end of each period that provides complete information about the manager's actions; the investor can observe earnings and net assets free from bias and noise but cannot directly impose a sanction on a manager for acting contrary to investor interests. We interpret this manipulation as evidence of financial reporting. Financial reporting in real firms can illuminate some, but not all, of the manager's actions, so our first experimental manipulation provides a powerful means for making behavior observable and transparent.

Our second manipulation lessens power differences between the parties by giving the investor a right to end the game at any time and obtain a nearly equal share of the net assets remaining within the firm. This manipulation allows us to test whether investor and managerial actions are robust to differences in the relative power of the manager.

We test two hypotheses. The first is whether a manager's final distribution to the investor is greater when financial reporting is available even if the investor has no recourse against a manager. We test this hypothesis controlling for the prior actions of both the manager and the investor. Our second hypothesis is that financial reporting prompts the manager to increase reinvestments before the final period by reducing either manager self-compensation or investor dividends in earlier periods, or both.

Our evidence supports both hypotheses. First, after controlling for prior compensation, dividends, and investment, managers distribute significantly higher

amounts in the final period when reporting is present compared to when reporting is absent. Statistically, this manifests as a significant main effect for financial reporting in ANOVA models that compare final distribution levels across four treatments that vary by presence of reporting and the investor liquidation option. We also document a qualitative shift toward (away from) praiseworthy (neutral) final distribution levels paid to investors when financial reporting is available.

Consistent with our second hypothesis, financial reporting is associated with higher reinvestment rates in periods 1–5, accompanied by reductions in *both* investor dividends and manager self-compensation. That is, the presence of financial reporting leads both investors and managers to forgo early periods' personal earnings and generate higher earnings in later periods.

Our analysis reveals other interesting behavior beyond what our formal hypotheses predicted. First, investors invest larger amounts when financial reporting is present. This suggests that the economic value of reporting in our experiment lies in the beneficial discretionary behavior it prompts for both investors and managers. Second, in the absence of the investor liquidation option, we find no evidence that a more egalitarian distribution of power increases overall gains. Finally, we note that manager participants are not behaving as pure altruists who passively split gains equally with investors. While managers distribute amounts in the final period that correlate with past investments, managers also capture a larger share of total wealth than investors in all treatments.

Adam Smith's (1759/1790) conception of human morality is central to the development of our hypotheses; we suggest that financial reporting's value arises, at least

in part, from the morality it evokes. The internal Impartial Spectator is admittedly unobservable, as are any moral sentiments activated in our experimental setting. Other experimental research also finds that people act altruistically, and sometimes more so, when they are physically observed in dictator games (e.g., Dufwenberg and Muren, 2006) and public good games (e.g., Andreoni and Petrie, 2004; Rege and Telle, 2004). One of our contributions is that we provide a rationale for this observed behavior.

Competing theoretical candidates for altruistic actions in trust games include reciprocity (Ostrom and Walker, 2003), where trust is repaid with trustworthiness (Rousseau, et al 1998). However, reciprocity alone cannot explain our results. In our experiment, both with and without financial reporting, the manager observes how much has been invested and chooses how to repay the investor's trust; therefore there should be no treatment effects of financial reporting. This is also true of distributional or "other regarding" preferences (e.g., Fehr and Schmit, 1999; Bolton and Ockenfels, 2000), which predict that an idea of what is fair, not the investor's knowledge of what is being distributed, should shape a manager's choices.

Another candidate for behavior in repeated games is reputation building, where one type of manager takes actions to signal their type or to mimic the actions of another type in an attempt to dupe investors (Bertomeu and Marinovic, 2016; Liang, Marinovic, and Varas, 2018). Although this explanation is consistent with the observed differences in a manager's reinvestment with and without financial reporting, it is inconsistent with the observed final distribution, where, again, we should find no treatment differences.

Prior research has documented that financial reporting, or increased disclosure, is correlated with manager behavior (e.g, Bushman and Smith, 2001; Leuz and Wysocki, 2016; Rong, 2018, Roychowdhury, Shroff, and Verdi, 2019). Our findings suggest this result may not be due solely to underlying constraints that result from compensation contracts based on reported accounting numbers (e.g., Gigler and Hemmer, 1998; Dutta and Gigler, 2002); our findings suggest that regardless of how a report is used, financial reporting can encourage a manager to act in owners' interests. That is, we find that financial reporting restricts manager self-dealing, even when investors cannot use reports to directly discipline the manager. This result suggests a deeper complementarity between financial reporting and governance.

The broader meaning of our findings is that financial reporting, at least within the context of our experiment, can have economic value even when opportunities for contracting and settling up through *ex post* sanctions are not feasible. These findings suggest a deeper role for financial reporting linked to the moral underpinnings of trust within modern economies.[3] In this sense, our study complements prior experiments on the foundations of accounting that demonstrate how accounting records and disclosures promote beneficial exchange by improving the memory of past interactions (Basu et al., 2009) and enable discretionary actions that can increase both managers' and investors' wealth (Lunawat et al., 2020). Our study also extends the "humanomics" model and

[3] The usual caveat about the external validity of findings obtained from a controlled laboratory experiment (i.e., student participants, anonymity, scale of compensation) applies in our case too.

evidence in Smith and Wilson (2017; 2019) to settings with core accounting institutions like reporting.

We describe the structure of our experiment and develop hypotheses in the next section. We then describe procedures for running the experiment and collecting data. Empirical evidence is then reported, and the article concludes in a final section.

2 Experimental Structure and Hypothesis Development

2.1 The Reinvestment Game

Consider a game that will last six periods, as depicted in Figure 1A.[4] The manager is endowed with a production technology that yields earnings from investment during the period. The results from investment are represented by a stochastic multiplier that can assume a value of 1, 2, or 3 with equal probability. The total earnings from investment during the period equal the realized multiplier multiplied by the total amount invested at the start of the period.

The total resources invested at the start of a period come from two sources. First, the investor receives a new endowment of capital (5 monetary units, or MUs) every period that can be invested in the firm. Second, beginning at the end of period 1, the manager can choose to reinvest resources rather than take a salary or pay a dividend. Reinvestment generates earnings identical to those generated by new investments from the investor. At the end of every period 1–5, the manager receives earnings from investment and then divides this amount between (1) a salary that is put into the manager's private account, (2) a dividend that is put into the investor's private account,

[4] The reinvestment game is inspired by Lunawat (2009) and LaRiviere, McMahon, and Neilson (2017).

and (3) a reinvestment that is placed in a joint-savings account that can generate earnings in the next period.

At the end of the sixth and final period, the manager receives the earnings and distributes them between the investor and herself. Total investor earnings for the experiment equal the sum of endowments not invested in periods 1 – 6, interim dividends received during periods 1 – 5, and the final distribution in period 6. The manager's total earnings equal the salaries taken in periods 1 – 5 and the final distribution taken in period 6.

We manipulate two factors within a 2×2 between-subjects design where all subject pairs play the Reinvestment Game for a maximum of six periods. In the *Baseline* treatment, only the manager can observe the balance of the manager's personal account, the realized multiplier, earnings, and the joint-savings account balance.

As our primary manipulation, in the *Reporting* treatment, at the end of each period, we make a financial report available to the investor, whereby the investor is also informed of the total earnings for the period, the manager's salary during the period, and the joint-savings balance to be reinvested for the next period. In this respect, observability eliminates all information asymmetry in our experimental setting so that the manipulation provides a powerful test of our hypothesis that transparent financial reporting leads to changes in managerial actions in the absence of contracts and sanctions.[5] In the game (and for public corporations), investors' investment is seen by the

[5] That is, the use of a transparent financial report free from noise eliminates the possibility that a non-result on our main hypothesis is the result of a weak manipulation for reporting. For actual firms, a financial report does not necessarily reveal the manager's choices.

manager with or without financial reporting. Likewise, a dividend paid by a manager is seen by the investor with or without financial reporting.

Our second manipulation, in the *Liquidation* treatment, mostly equalizes the power of the investor and the manager. Specifically, once the manager has made her allocation decision, the investor has the option of terminating the game at the end of any interim period 1–5 and receiving 40% of the joint-savings account balance at the time the liquidation option is exercised. Within the Reinvestment Game, a liquidation option lessens the relative power of the manager over the investor but can entail a cost of forgone earnings since early liquidation removes the possibility of larger earnings in later periods.

The treatment where both reporting and liquidation are present is referred to as the *Both* treatment. Our 2×2 design is summarized in Figure 1B.

Our Reinvestment Game differs from a standard multiperiod investment game in an important way.[6] In the standard game, the earnings generated in a given period must be paid out to either the manager or the investor. Thus, earnings come entirely from new investment; that is, the funds used to generate earnings depend entirely on the investor's decision to continue investing. In the Reinvestment Game, the funds used to generate earnings come from investment by the investor and reinvestment by the manager. The fact that funds can be reinvested implies that earnings are subject to compounding effects – reinvesting an increasing amount of earnings means that the total pie available for multiplication can overwhelm the total available in the standard game after only a few

[6] The repeated version of Berg, Dickhaut, and McCabe's (1995) "Trust Game."

periods.[7] This means that the relative power of the manager increases as reinvestment by the manager grows through time relative to any new investment by the investor.

2.2 Manager behavior in the final period

Experimental economists Vernon Smith and Bart Wilson have incorporated elements of Adam Smith's *TMS* in several experimental research papers (e.g., Smith, 2017; Smith and Wilson, 2017; 2018). In *TMS*, Smith analyzes the ethical drivers of why and how we act as we do. The ethical forces Smith analyzes in *TMS* have been described as "the other invisible hand" (e.g., Ashraf, Camerer, and Lowenstein, 2005; McCloskey, 2006) and provide the foundation for conduct by buyers and sellers in a market (Boulding, 1969).

Smith and Wilson (2019) integrated both invisible hands within a framework that they call *humanomics* – a modernized version of *TMS*.[8] Smith and Wilson's intent was to develop a theory that could account for subject behavior in dictator, ultimatum, and trust games at odds with the predictions of neoclassical economics using utility maximization. A prominent example is the one-shot trust game of Berg, Dickhaut, and McCabe (1995), where an investor can invest up to $10 with a manager, which will triple in value, and which the manager will divide between the investor and herself. The surprising result from Berg, Dickhaut, and McCabe's experiment is that investors make positive investments and managers return positive amounts to the investor; both actions are

[7] To numerically illustrate, assume: (i) the game lasts six periods, (ii) the investor always invests five, (iii) the multiplier equals two in each period, and (iv) the manager reinvests everything in each period. In the Standard Investment Game there would 60 for the investor and manager to split, compared to 630 in the Reinvestment game.

[8] Smith and Wilson's 2019 book *Humanomic*s: *Moral Sentiments and the Wealth of Nations for the Twenty-First Century* is a blend of theory from both of Adam Smith's main scholarly contributions.

inconsistent with the neoclassical economic prediction that investors will not invest because managers will steal all resources and leave the investor with nothing. More generally, humanomics offers a theory of how we conduct ourselves in substantive social interactions where we are aware that our actions can benefit or a harm another person.

Adam Smith's Impartial Spectator is the cumulative result of our experience in judging others' conduct. The Impartial Spectator is a mental construct by which we approve or disapprove of conduct – others' and our own. The Impartial Spectator judges actions and motivations without prejudice and classifies such actions as praiseworthy, neutral, or blameworthy. The Impartial Spectator helps us to see ourselves as others see us – it is an ideal "internalization of what is approved or not approved by others" (Smith & Wilson, 2019, p. 101). Mueller (2016, 313) suggests that Smith's Impartial Spectator is a product of inductive reasoning applied to personal experience and is reflected in "personal tacit knowledge."

Smith and Wilson argue that despite being self-interested, we have three additional desires related to propriety of our actions in economic settings. Beyond personal wealth, we desire to (1) avoid being seen as blameworthy, (2) take inherently praiseworthy actions, and (3) have our actions be viewed by others as praiseworthy. There is heterogeneity in the degree to which different individuals weight these desires.[9] Smith and Wilson argue that actions are not selfless but rather are chosen to satisfy these desires for propriety as perceived by the Impartial Spectator. That is, actions are chosen to jointly satisfy desires for propriety and personal wealth.

[9] See Smith and Wilson (2019, 167) for a formal utility representation of these desires.

Prior experimental evidence is consistent with the aforesaid in single-period settings when agents' actions are always *observable* (Smith and Wilson, 2017; 2018; 2019). Observability of actions (and the related issues of information asymmetry and its resolution via financial reporting) has so far been an unexplored topic in this literature but is the primary focus of this article. By manipulating the observability of managers' actions in the form of a financial report, we disentangle the effects of a desire to take inherently praiseworthy actions and a desire to be viewed as praiseworthy.[10]

A financial report reveals the current period's earnings and assets. The key differences that our experimental manipulation induces are that the investor acquires information about (1) the manager's choice to reinvest the current period's earnings versus take a salary (which reduces reinvestment), and (2) the amount of available resources from which a dividend can be paid in any period.

In general, we expect that investors will earn greater profits in the Reinvestment Game when financial reporting is available. To see this, consider a one-period version of an investment game with possible multipliers similar to those in our experimental setting. That is, the players play a one-shot investment game with multipliers drawn from a distribution with a minimum of 1 and a maximum of 1,092, and the manager then divides the total available between herself and the investor.[11] We expect that an investor would earn more from playing this game with financial reporting since a financial report reveals

[10] Adam Smith (1759) wrote, "The most sincere praise can give little pleasure when it cannot be considered as some sort of proof of praiseworthiness."

[11] The minimum is where the investor invests once and the realized multiplier is 1 in that and subsequent periods. The maximum is where the investor invests the same amount in each period and the realized multiplier in every period equals the maximum of 3, so the effective multiplier is equal to $3^6 + 3^5 + 3^4 + 3^3 + 3^2 + 3^1$.

the total amount of resources that the manager divides. Because financial reporting reveals to the investor the total resources the manager takes, the investor can evaluate the manager's resource-sharing decision in terms of its fairness and the manager's sacrifice of resources. Within the context of Smith and Wilson's humanomics model, the manager's resource-division choice becomes a praiseable action.[12]

Within the Reinvestment Game, the theory in *TMS* suggests that the Impartial Spectator will guide a manager in choosing how to divide resources after the final period. The final distribution to the investor is bounded between zero and the total wealth controlled by the manager at the end of period 6. In the Reinvestment Game, the amount of resources to be divided after the sixth period (W_6) equals $\lambda_6 (INV_6 + REINV_5)$, where λ_6 equals the multiplier in period 6, INV_6 equals the investor's period 6 investment, and $REINV_5$ equals the amount reinvested by the manager at the end of period 5.

If we assume that actions are discretely viewed as praiseable (another is benefited), neutral, or blameworthy (another is harmed), then a manager will be concerned with two points over the interval [0, W_6]. The first is the minimum necessary for avoiding blame (BW). The second is the minimum that must be paid to earn praise (PW). A manager is guided to set these levels according to what her Impartial Spectator believes to be appropriate given available wealth, dividends previously paid by the manager, past

[12] In this thought exercise, as in all treatments, the manager's final-period action entails no pecuniary cost since the investor cannot react to such an action after the game is completed.

salaries taken by the manager, and past investments made by the investor. These alternatives are ordered by amount as follows: $0 \leq \mathrm{BW} \leq \mathrm{PW} \leq W_6$.

Table 1 shows the effect on the manager's desires for propriety and personal wealth at the distribution levels of BW and PW for treatments where no reporting occurs and the treatments where the investor is informed via a financial report of the terminal wealth to be divided by the manager. The level at which the final distribution changes from blameworthy to neutral (BW) or from neutral to praiseworthy (PW) depends on the context, which includes the history of past investment by the investor as well as prior dividends to the investor and salaries taken by the manager. That is, BW and PW are expected to be lower if interim dividends are greater. PW will be higher if prior salary is more positive, as a higher level is needed to reach an appropriate investor share of generated wealth. At the same time, higher salary decreases terminal wealth.

We posit that the blameworthy level (BW) is *at a minimum* equal to the amount where the investor is made financially worse off by interacting with the manager, a definition consistent with Rousseau et al. (1998). This means that the investor took a risk and ceded control to the manager, who succumbed to opportunism and did not reciprocate the investor; that is, the total of all amounts returned is less than the total of all investments. A praiseworthy level (PW) is one where, after the final distribution, the manager has shared an appropriate share of the generated wealth above the investor's total investment.

Comparing the choice between a final distribution of zero and BW indicates that a manager with financial reporting will prefer to pay BW rather than zero only if the utility

that comes from satisfying a desire for propriety is great enough. This same reasoning applies for a manager without financial reporting seeking to avoid being blameworthy, because the investor will know the extent to which dividends have covered the amount invested.

The distinction between a final distribution viewed as praiseworthy and one viewed as neutral is more complicated. The loss of monetary utility in PW is greater than the loss of monetary utility in BW. When the dividend is viewed as neutral, all managers experience nonmonetary utility by satisfying their desire to avoid being seen as blameworthy. However, when the distribution is PW, the managers with financial reporting also experience a utility gain by satisfying their desires to avoid being seen as blameworthy, to take praiseworthy action, and to be viewed as praiseworthy. The last desire is satisfied because the investor can assess the dividend as praiseworthy given knowledge of the wealth generated. Without financial reporting, in the absence of knowledge about the wealth available for distribution, the investor will not likely view the same amount as praiseworthy. In this respect, financial reporting allows others to judge the manager's final decision; without financial reporting, the manager cannot satisfy her desire to be viewed as praiseworthy by increasing the distribution to the PW level.

This logic suggests that managers in treatments with financial reporting are more likely to prefer a final distribution of PW over BW than managers in treatments without financial reporting. This gives us our first hypothesis:

> **H1**: *When financial reports are available that make managerial actions observable, a manager is more likely to reciprocate with a higher final distribution than would a similarly situated manager in a treatment without financial reporting, holding past dividends and salary constant*.

2.3 Manager behavior during interim periods

In a world without financial reporting, the only means for a manager to satisfy the desires to avoid being seen as blameworthy and to be seen as praiseworthy is to take an action visible to the investor. In interim periods 1–5, this means paying a dividend. Yet, paying an interim dividend has ambiguous effects on the manager's utility. Although the manager's current sharing of resources has a positive effect on manager utility, this utility gain could be negated by the opportunity cost of lower future earnings. Thus, the net of these two factors means that paying a dividend may be viewed as either praiseworthy or neutral. If the action is viewed as praiseworthy, it satisfies the desires to avoid being seen as blameworthy, to take praiseworthy actions, and to be seen as praiseworthy. However, if the action is viewed as neutral, paying a dividend increases the manager's nonmonetary utility even in the absence of financial reporting, as the manager avoids being seen as blameworthy.

With financial reporting, the investor knows all manager actions and total available resources at all times, including reinvestment in interim periods. This implies that a manager can satisfy her desires for propriety by either reinvesting current earnings or paying a dividend. From the perspective of the investor, reinvestment increases potential future earnings because earnings are compounded, even though there is no certainty that these will be shared. Assume reinvestment is viewed as neutral. In this case, the manager's nonmonetary utility increases as she satisfies her desire to avoid being seen as blameworthy, and her expected monetary utility will increase. If the investor judges

paying a dividend as neutral, then the manager satisfies her desire to avoid being seen as blameworthy, but her expected monetary utility will decrease. Because reinvestment can be observed, the marginal utility to the manager of paying an interim dividend is likely lower because financial reporting makes her reinvestment choice observable compared to a world without reporting. Thus, a manager desiring propriety will be less likely to pay an interim dividend when financial reporting is present because reinvestment is observable.

From the investor's point of view, siphoning off a salary and reducing reinvestment decrease utility. Decreasing reinvestment results in lower future earnings from compounding – a harmful action that the investor will judge as blameworthy. Furthermore, taking a salary during an interim period decreases the manager's utility, as she has taken a blameworthy action, which, in the presence of financial reporting, is made known to others. Thus, if a manager elects to satisfy her desire for propriety, then the manager will take a lower salary in the presence of financial reporting. In combination, our second hypothesis follows from these predicted effects:

> **H2**: *When financial reports are available, managers will take lower interim salaries for themselves and pay lower interim dividends to the investor, both of which result in increased reinvestment, compared to a setting where financial reporting is absent*.

2.4 Effect of investor right to liquidate

A natural question about our experiment is whether manager behavior within the Reinvestment Game would change if the relative power of the actors to influence total gains were more equal. For example, corporate managers' power in interactions with investors likely differs in the presence of takeover threats or when managers can be fired.

To evaluate this, we created two treatments identical to the *Baseline* and *Reporting* treatments described in Section 2.1, except that the investor was given a decision right to "fire" the manager by liquidating the firm and receiving 40% of the total wealth available in any period 1–5 prior to the end of the experiment. We label these the *Liquidation* and *Both* treatments. We do not offer specific hypotheses about the effects of the liquidation option manipulation, except to note that we expect H1 and H2 also to apply to a comparison between the *Liquidation* and *Both* treatments. Instead of stating a specific hypothesis about the effect of the liquidation option, we instead pose a research question about the effects of financial reporting in the presence of a liquidation option:

> **RQ1**: *Does financial reporting increase manager resource sharing and wealth creation in the Reinvestment Game to the same extent when a liquidation option is available that lessens power differences between the manager and the investor?*

3 Data Collection

The experiment was conducted at a U.S. research university. A total of 286 participants were recruited from a participant pool consisting primarily of undergraduate students; each participant was randomly assigned to a single session. There were three sessions of each of the four treatments. All sessions except one contained 24 participants; a single session of the *Reporting* treatment contained only 22 participants. The authors' institutions obtained institutional review board (IRB) approval for this experiment. The IRB approval required us not to use deception.

In all treatments, participants were informed that the game would last six periods. We used the same set of stochastically generated (realized) multipliers for each treatment so that variation in outcomes would result from variation in behavior. We randomly

generated unique sequences of six multipliers for each investor–manager pair in the *Baseline* treatment and then used these same sequences for investor–manager pairs in the other treatments. This technique provided variation in multipliers between groups within a treatment but no variation in the distribution of multipliers across treatments.

Each session lasted approximately 1 hour. Participants were seated at visually isolated workstations that allowed them to interact anonymously over a local computer network. An experimenter read the instructions aloud while each participant followed along with a printed copy of the instructions. The instructions explained the experimental procedures and payoffs. After reviewing instructions, participants answered several quiz questions (see the appendix for the instructions and quiz). The experimenter privately answered any questions regarding the experimental procedures. Each participant was assigned a role, labeled "Person A" for the investor and "Person B" for the manager, and remained in that role for the entire experiment.[13] In each of six periods, the investor first made an investment decision, then the manager made an allocation decision, and both were given feedback (the extent of which was manipulated between treatments). Finally, the investor had the option to liquidate the partnership (manipulated between treatments).

Each participant was paid a $7 participation fee in addition to payoffs from the Reinvestment Game after signing a receipt. Experimental earnings in the Reinvestment

[13] We described the roles and actions available to participants using neutral terms to minimize the possibility of subjects making implicit assumptions about behavior (Haynes and Kachelmeier, 1998).

Game were exchanged for U.S. dollars at a rate of 10 to $1. On average, subjects earned $16.85, including their participation fee.

4 Results

Our primary independent variables for our two experimental manipulations, *Reporting* and *Liquidation*, are 1 if present, and 0 otherwise. Each firm (investor–manager pair) is treated as an independent unit of observation. The significance level is 5%.

We start with summary measures of wealth and payoffs for the investor and manager. We then examine the manager's final distribution choice to provide evidence on our first hypothesis, concerning the final distribution to the investor. We then examine reinvestment during interim periods (with regard to our second hypothesis). We conclude by examining the effects of the liquation option.

4.1 Summary measures of wealth and payoffs

Our hypotheses predict how wealth and payoffs are increased with financial reporting. Before showing evidence about the particular hypotheses, we first show that wealth and payoffs are indeed greater with financial reporting.

Table 2 shows the wealth generated in each treatment. We conducted an untabulated two-way ANOVA to assess the influence of *Reporting* and *Liquidation* on wealth. The main effect of *Reporting* yielded an *F*-ratio of $F(1,139) = 9.31$, $p < .003$, indicating a significant difference in total wealth generated by firms with reporting (*Mean*

= 257.28) compared to firms without (*Mean* = 137.42).[14] The main effect for *Liquidation* was insignificant, $F(1,139) = 1.05$, $p = .306$, as was the interaction, $F(1,139) = 1.31$, $p < .254$.

We calculate a measure, *efficiency*, that equals the total wealth generated by the firm divided by the maximum wealth that would have been created if (1) the investor had always invested the maximum, (2) the manager had always reinvested the maximum, and (3) the firm were not liquidated. *Efficiency* is shown in the next column of Table 2. We conducted a two-way ANOVA on the influence of *Reporting* and *Liquidation* on *efficiency*. The main effect of *Reporting* yielded an *F*-ratio of $F(1,139) = 6.41$, $p < .013$, indicating a significant difference in *efficiency* between firms with reporting (*Mean* = 45%) and firms without (*Mean* = 31%).[15] The main effect of *Liquidation* on *efficiency* was insignificant, $F(1,139) = 1.05$, $p = .306$, as was the interaction, $F(1,139) = 1.31$, $p < .254$.

Both wealth created and efficiency are greater with financial reporting. As a result, the payoffs for the investor and the manager increased with financial reporting. The *Total Investor Payoff* and the *Total Manager Payoff*, are shown in Table 2. ANOVA results show a main effect of *Reporting*, $p < .013$ for both payoffs; no significant effect of *Liquidation*, $p > .111$ for both payoffs; and no significant interaction, $p > .228$ for both payoffs.

[14] We perform two robustness checks on this result. First, the result is robust to wealth being distributed log-normally. An ANOVA on the log of *Wealth* finds a significant main effect for *Reporting*, $p < .004$, but not for *Liquidation* or for the interaction (both *p*-values > .160). Second, the nonparametric Wilcoxon signed-ranks test indicated that wealth generated by firms with reporting was significantly greater than wealth generated by firms without reporting, $Z = 2.491$, $p = .013$.

[15] For a robustness check, we performed the Wilcoxon signed-ranks test, which indicated that efficiency by firms with reporting was significantly greater than efficiency by firms without reporting, $Z = 2.704$, $p < .01$.

4.2 Hypothesis tests

4.2.1 Effects of financial reporting on the final investor dividend

In the final period, the manager's sole decision is how to divide the final resources between herself and the investor. The manager's choice of the final distribution to the investor is unaffected by the investor's future behavior because the investor cannot react in any observable way to the manager's choice. The manager can only infer any blame or praise the investor assigns. Likewise, if a blameworthy manager were previously mimicking a praiseworthy type in periods 1–5, her choice of final distribution would reveal her blameworthy character.

Our first hypothesis is that a manager will reciprocate past investment to a greater degree when financial reporting is present, as reporting allows an investor to distinguish neutral from praiseworthy behavior. Our data analysis for H1 proceeds in four stages. First, we examine the influence of independent variables *Reporting* and *Liquidation* on the final distribution. Next, we net the final investor distribution (such that the value is negative if the investor was made worse off for trusting a blameworthy manager, positive if made better off for trusting, and zero if made whole) and examine the influence of independent variables *Reporting* and *Liquidation* on the net final distribution. Next, we categorize managers' period 6 distributions as praiseworthy, neutral, or blameworthy and evaluate qualitative differences in manager behavior with and without financial reporting. Last, we test for differences in the level of the final distribution to investors using a regression model that controls for other variables that affect the final distribution.

The final distributions per treatment are reported in panel A of Table 3. The mean and median amounts for the investor's final distribution are more positive when reporting is present. For example, the mean (median) equals 46.9 (9.5) for *Reporting* compared to 21.9 (7.0) for *Baseline*. The results of a two-way ANOVA model of the influence of reporting and liquidation on the final distribution to the investor are shown in panel B of Table 3. The main effect of *Reporting* was positive and significant, $F(1,124) = 7.20$, $p < .008$, but no significant main effect for *Liquidation* or the interaction is observed.[16]

For a given value of the final distribution, it is difficult to judge the appropriateness of the manager's choice without considering the investor's investments and dividends received. For example, assume the investor has invested $25 over time. A final distribution of $20 will be judged differently if the investor's past dividends exceed $25 than if dividends have never been paid. To compensate, we net the final distribution by subtracting all investments and adding prior period dividends and report the amounts by treatment in the second column of panel A of Table 3. The results of a two-way ANOVA model of the influence of reporting and liquidation on the net final distribution to the investor are shown in panel B of Table 3. The main effect of *Reporting* was positive and significant, $F(1,124) = 7.20$, $p < .021$, but no significant main effect for *Liquidation* or the interaction is observed.

We find similar results for the manager's final distribution: a main effect of *Reporting,* but not significant main effect for *Liquidation* or the interaction. Given these results

[16] This result is robust to assuming that the data are distributed log-normally. When the dependent variable is the log of final distribution, we find a significant main effect for reporting, $p < .021$, but not for liquidation, nor for the interaction (both p-values > .35), using ANOVA.

(panel B of Table 3), we analyze final distributions across treatments with and without financial reporting.

Categorizing final investor distributions as praiseworthy or blameworthy requires (1) a measurable threshold for distinguishing between a blameworthy final distribution and one that is neutral (BW) and (2) another threshold where the final distribution shifts from neutral to praiseworthy (PW). One admittedly conservative estimate for BW is the minimum necessary to ensure that the investor was not penalized for having invested resources. For purposes of this analysis, we computed BW as equal to $max\{\sum_{t=1}^{6} INV_t - \sum_{t=1}^{5} DIV_t, 1\}$. Under this categorization, the cutoff BW does not depend on financial reporting, as the investor observes investments and dividends in all treatments. In setting PW, we chose a level such that an investor would be *ex post* indifferent to (hypothetically) liquidating the firm after period 5 or investing in period 6. In this structure, $\mathrm{PW} = 40\%\, REINV_5 + INV_6$ for each manager–investor dyad. Under this categorization, the cutoff does depend on financial reporting, as the investor only sees reinvestment in treatments with financial reporting. This categorization implies that a final distribution less than BW is classified as blameworthy and a final distribution above PW is classified as praiseworthy. Observations between BW and PW are categorized as neutral. This occurred when either an investor invested small amounts and/or the manager paid dividends in periods 1–5 in excess of investment, leaving little for reinvestment.

On the basis of these categories, manager behavior changed qualitatively in the presence of financial reporting. Figure 2 depicts the percentages of observations where

the final distribution to the investor was classified as blameworthy, neutral, or praiseworthy for firms with and without financial reporting. The percentages of distributions classified as blameworthy were similar for firms with and without financial reporting (about 40% in both cases) – there was no significant difference for the economies with reporting per the Wilcoxon signed-ranks test, $Z = 0.56$, $p = .57$. In contrast, financial reporting induced a marked shift in frequency when moving from neutral to praiseworthy, $Z = 2.114$, $p = .034$.[17] The frequency of praiseworthy final distributions is about 40% with reporting versus under 30% without reporting. This finding is consistent with the proposition that the frequency of managers' blameworthy actions is invariant to reporting, as investors do not need reporting to know if they are worse off for trusting; however, managers are more likely to undertake costly praiseworthy actions only when these actions are evident via reporting.

The final stage of our data analysis for H1 examines final investor distributions (reported in panel B of Table 3). The final period's earnings available to be divided between the investor and manager will be an increasing function of past investments and a decreasing function of past dividends and salaries; we control for these effects when testing H1 with a regression model. To test whether a manager greater reciprocates past investment more intensely when financial reporting is present, we estimate the relationship between the level of funds the investor received in period 6 and their prior

[17] We perform three alternative specifications to test the robustness of this shift from neutral to praiseworthy. In the first test, we don't reclassify cases to neutral when PW was less than BW. In the second and third tests, we use 45% and then 50% instead of 40% in calculating PW. All cases show significant shifts in frequency when moving from neutral to praiseworthy with financial reporting (*p*-values of .031, .040, and .041 for the three tests, respectively).

investments, while controlling for dividends received in periods 1–5 and past salaries taken by the manager:

$$\begin{aligned} Investor\ Final\ Distribution \\ = \beta_0 + \beta_1 Reporting + \beta_2 Investments^2 \\ + \beta_3 Reporting \times Investment^2 + \beta_4 PriorDividends \\ + \beta_5 PriorSalary + \varepsilon \end{aligned} \quad (2)$$

Investor Final Distribution equals the dividend paid to the investor in the final period of the experiment (DIV_6). *Reporting* is a dummy variable with a value of 1 if financial reporting is present. *Investments*^{2} is the sum of squared past investments, that is, $INV_1^2 + INV_2^2 + \ldots + INV_6^2$. Ostrom and Walker (2003) report that in standard one-shot trust games, higher investments lead to higher returns on investment (defined as return less investment scaled by investment). The authors comment that participants who trusted more were more likely to gain wealth. The analysis suggests a quadratic relationship between investment and the final dividend returned by the manager. Examining the distribution of returns in a trust game, Gómez-Miñambres, Schniter, and Shields (2020) show superior fit when using a quadratic versus a linear model of investment. *PriorDividends* is the sum of past investor dividends, weighted by the expected effect of dividends on the final-period distributed earnings, that is, $DIV_1 \times 2^5 + DIV_2 \times 2^4 + \ldots + DIV_5 \times 2^1$. *PriorSalary* is the sum of past salaries taken by the manager, also weighted by the expected effect of salary on the final-period earnings, that is, $SAL_1 \times 2^5 + SAL_2 \times 2^4 + \ldots + SAL_5 \times 2^1$.

Regression results are reported in panel C of Table 3. The estimation sample excludes firms that have been liquidated, or firms with zero earnings in the final period, because the manager has no observable choice in these cases. The main coefficient of interest is

β_3, which captures the marginal effect of past investment on the final distribution in the presence of financial reporting. We expect this coefficient to be positive.

Consistent with Ostrom and Walker (2003) and Gómez-Miñambres, Schniter, and Shields (2020), we find that the coefficient on squared investments was positive and significant. Most importantly, the estimated value of β_3 equals 0.456, which was significantly greater than zero at $p < .05$. The total coefficient on investment with reporting ($\beta_2 + \beta_3$) was significantly greater than zero at $p < .001$ and was approximately 73% larger than without reporting (β_2), giving support to H1. The intercept for economies with financial reporting ($\beta_0 + \beta_1$) was not significantly different from economies without reporting (β_0), and the coefficients on prior dividends and prior salaries were both negative and significant, as expected.[18] This result is consistent with managers choosing to transfer more wealth to the investor when reporting allows that choice to be seen as praiseworthy.

4.2.2 Reinvestment in interim periods

Our second hypothesis is that managers will be more likely to reinvest during interim periods when a financial report is available to the investor. Evidence for H2 is shown in Table 4. We conducted a two-way ANOVA to evaluate the influence of reporting and

[18] We evaluated the robustness of these results by estimating models similar to equation (2), where we keep the same functional form but apply different weights to investments and/or prior dividends and salary. Alternative model 1 uses the sum of investments ($INV_1 + INV_2 + \ldots + INV_6$) rather than the sum of squared investments, which results in lower adjusted *R*-squared than the model reported, indicating poorer fit. Alternative model 2 weights prior dividends and salaries by the number of periods left (i.e., $DIV_1 \times 5 + DIV_2 \times 4 + \ldots + DIV_5 \times 1$) rather than the exponential weight used above. This also results in lower adjusted *R*-squared compared to reported results. Despite the alternative weightings, all models have comparable directional effects; that is, prior dividends and salary decrease the final dividend, investment increases it, and the financial reporting increases return on investment.

liquidation on average reinvestment. The main effect of *Reporting* yielded an *F*-ratio of $F(1,139) = 10.74$, $p < .002$, indicating a significant difference between reinvestment in firms with (*Mean* = 40.34) and without (*Mean* = 20.81) reporting.[19] The main effect for *Liquidation* was insignificant, $F(1,139) = 0.02$, $p = .882$, as was the interaction, $F(1,139) = 2.66$, $p = .106$.[20]

We find that not only did managers reinvest more with financial reporting, the proportion of earnings that could be reinvested was greater. We report the average proportion of earnings reinvested in Table 4. We conducted a two-way ANOVA to evaluate the influence of reporting and liquidation on reinvestment. The main effect of *Reporting* yielded an *F*-ratio of $F(1,139) = 5.36$, $p = .022$, indicating a significant difference between reinvestment in firms with (*Mean* = 68.7%) and without (*Mean* = 57.8%) reporting. The main effect for *Liquidation* was insignificant, $F(1,139) = 1.68$, $p = .194$, as was the interaction, $F(1,139) = 0.81$, $p = .371$

Recall that the greater reinvestment hypothesized has to be the result of lower dividends, lower salary, or greater investment. A two-way ANOVA was conducted on the influence of reporting and liquidation on interim dividends. The main effect of *Reporting* yielded an *F*-ratio of $F(1,139) = 5.60$, $p < .019$, and the main effect for *Liquidation* was insignificant, $F(1,139) = 1.05$, $p = .306$. The interaction was significant, $F(1,139) = 4.45$, $p < .037$. Simple main effects analysis showed significantly lower dividends with reporting

[19] For a robustness check, we performed the Wilcoxon signed-ranks test, which indicated that reinvestment for firms with financial reporting was significantly higher than it was for firms without reporting, $Z = 2.530$, $p = .011$.

[20] All untabulated ANOVA results reported in this section are on the average per participant as reported in Table 4. All reported results are robust to examining interim period measures in a repeated measures ANOVA.

when liquidation was possible (comparing the *Liquidation* treatment to the *Both* treatment, $p < .001$) but no significant difference in dividends when liquidation was not possible (*Baseline* treatment vs. *Reporting* treatment, $p = .865$).

We also conducted a two-way ANOVA of the influence of reporting and liquidation on manager salaries. The main effect of *Reporting* yielded an *F*-ratio of $F(1,139) = 3.35$, $p = .069$, indicating a marginal difference between salaries taken when firms had reporting (*Mean* = 3.73) and when they had no reporting (*Mean* = 2.61).[21] The main effect for *Liquidation* was insignificant, $F(1,139) = 0.32$, $p = .306$, as was the interaction, $F(1,139) = 0.05$, $p = .832$.

Although we did not predict any changes in investment, we do find that investors invested significantly more in firms with financial reporting. A two-way ANOVA on the effect of *Reporting* yielded an *F*-ratio of $F(1,139) = 6.78$, $p < .011$, indicating a significant difference in level of investments between firms with (*Mean* = 3.94) and without (*Mean* = 3.37) reporting.[22] The main effect for *Liquidation* was insignificant, $F(1,139) = 0.32$, $p = .306$, as was the interaction, $F(1,139) = 0.05$, $p = .832$. This result is consistent with the trust game of Reitz, Sheremeta, Shields, and Smith (2013), where the ability to observe subsequent outcomes in a three-person trust game resulted in greater investment (although they do not find a difference in trustworthiness with regard to the amounts returned to the investor).

[21] For a robustness check, we performed the Wilcoxon signed-ranks test, which indicated that manager salaries for firms with reporting were smaller than for firms without reporting, $Z = 2.671$, $p < .01$.

[22] For a robustness check, we performed the Wilcoxon signed-ranks test, which indicated that investment for firms with financial reporting was significantly greater than for firms without financial reporting, $Z = 2.498$, $p = .013$.

The effect of greater investment and reinvestment is higher joint savings in treatments with financial reporting. This effect is powerfully obvious in Figure 3, where we plot the average joint-savings account balances of nonliquidated firms across periods. This figure shows that the effect of compounding was greater with financial reporting.

In the Reinvestment Game, investment creates, in part, the upper bound for both dividends and salaries. Yet, despite higher investment in the presence of financial reporting, we find lower dividends and lower salaries. The combined effect of greater investment and reinvestment is shown in Figure 4, where we report the frequency of high investment and high reinvestment relative to a benchmark of 50% of what was possible – the investor investing at least half the endowment and the manager reinvesting at least half of the earnings. There was a significant shift in investment and reinvestment (i.e., to the upper right-hand quadrant) for firms with reporting versus firms without, $Z = 2.586$, $p < .01$.

Cumulatively, these results support H2. The observed manager choices are consistent with a desire to avoid blame and/or to seek praise in interim periods. Without financial reporting, these desires can inhibit reinvestment. With reporting, all else equal, these same desires create wealth for both investor and manager, as shown in Table 3. We next explore the effects of reporting and liquidation on total wealth.

4.3 Effects of investor's right to liquidate

We find no difference in the number of firms liquidated due to reporting. Seven of 36 investors exercised the liquidation option in the *Liquidation* treatment where financial

reporting was not possible, and 6 of 36 investors exercised the option in the *Both* treatment, where financial reporting was present.

As discussed in the prior section, we find no significant main effect of liquidation on wealth, efficiency, investment, or reinvestment. At the same time, we did find a significant main effect for reporting.

To determine the effect of financial reporting controlling for liquidation, we construct three measures of maximum wealth generation and compare results between treatments with and without financial reporting. The first measure, *Maximum Investment*, is a binary measure equal to 1 if the investor invested his full endowment every period, and 0 otherwise. The second measure, *Maximum Reinvestment*, is a binary measure that equals 1 if the manager fully reinvested earnings in periods 1–5, and 0 otherwise. The last measure is *Maximum Efficiency*, which is the cross-product of *Maximum Investment* and *Maximum Reinvestment*. These measures are reported in Table 5.

Table 5 shows that the percentage of managers who consistently reinvested the maximum possible was greater with financial reporting. When liquation was not available, 32.4% of the managers in the *Reporting* treatment reinvested the maximum amount in every period compared to only 8.3% in the *Baseline* treatment, $Z = 2.493$, $p = .013$. A similar effect is observed for treatments where liquidation is possible – 25% of *Both* managers always reinvested the maximum, compared to only 2.8% in the *Liquidation* treatment, $Z = 2.707$, $p = .007$.[23]

[23] This result is robust to running both logit and ANOVA analyses, where we find a significant main effect of reporting but no significant effect of liquidation or interaction.

The percentage of firms for which we observe maximum efficiency, that is, both investment and reinvestment are the maximum possible, is also reported in Table 5. When liquation was not possible, only 2.8% of the firms in the *Baseline* treatment achieved maximum efficiency, compared to 17.1% in the *Reporting* treatment – a significant difference, $Z = 2.016$, $p = .043$. When liquidation was possible, no firm achieved maximum efficiency in the *Liquidation* treatment, but 13.9% of firms did in the *Both* treatment with financial reporting. This difference is significant, $Z = 2.302$, $p = .021$.[24] In regard to RQ1, the results we have obtained here – a higher maximum reinvestment and higher maximum efficiency with financial reporting, both with and without an option to liquidate – show that financial reporting improves wealth creation.

We fail to find a significant difference in maximum investment after controlling for liquidation. When liquidation was not available, 25% and 37% of investors invested their entire endowments in the *Baseline* and *Reporting* treatments, respectively. When liquidation was available, 19% and 28% of investors invested their entire endowments in the *Liquidation* and *Both* treatments, respectively.[25]

5 Conclusion

We experimentally evaluate whether financial reporting has economic value in a sparse setting where contracting is not possible. We posit that financial reporting leads a manager to alter her behavior in anticipation of an investor's evaluation of the manager's

[24] This result is robust to running ANOVA analysis, where we find a significant main effect of reporting but no significant effect of liquidation or interaction. Logit analysis was not appropriate, as the *Liquidation* treatment had no successes.

[25] This result to robust to running both logit and ANOVA analysis, where we find a significant main effect of reporting, but no significant effect of liquidation or interaction.

conduct, as revealed by a report of earnings and amounts reinvested in the firm. The manager's anticipation of the investor's evaluation activates the manager's approval-seeking behavior, and this translates into the manager choosing more efficient resource allocation.

Our finite-period Reinvestment Game is similar to a corporation in that an investor's initial investment provides "seed capital" required for the firm to operate, but reinvestment allows managerial power over firm resources to grow relative to investors' power. Our main experimental manipulation was the presence of a financial report revealing to the investor each period's earnings and assets reinvested by the manager. A second manipulation granted the investor a right to liquidate the firm before the final period, which allowed us to evaluate whether the effect of reporting changes when the investor and the manager have more equal power.

We hypothesized with this experiment that financial reporting has two effects on managerial actions. First, because reporting reveals the manager's final resource allocation, the manager can expect the investor to judge unambiguously whether the manager's choice was generous or selfish. We therefore hypothesize that the manager will pay a higher final distribution to the investor, controlling for past dividends and salaries, when reporting is present. Second, financial reporting makes interim reinvestment observable and subject to the investor's moral evaluation. Thus, a manager under a condition of financial reporting will be more likely to avoid interim dividend payments and personal compensation so they can reinvest funds, thus obtaining higher earnings. We find strong evidence supporting both hypothesized effects – other things

being equal, managers pay higher final distributions and reinvest larger amounts when financial reporting is present.

Our findings provide support for the long-standing view that financial reporting provides "sunlight" that renders managerial behavior transparent and leads to more virtuous managerial conduct (Brandeis, 1914, 92). Economics-based research in accounting assumes a conflict between investors' interests and managers' interests (e.g., Dye, Glover, and Sunder, 2015). Our findings suggest that financial reporting involves more foundational aspects of human ethics and the means we use to infer others' motives based on observable outcomes. Thus, the consequences of financial reporting may result from forces that have a deep evolutionary history in humans. We encourage future research that can evaluate the generalizability and magnitude of the effects we document by extending our work into other experimental and archival settings.

6 References

Andreoni J., & Petrie R., 2004. Public good experiments without confidentiality: a glimpse into fund-raising, *Journal of Public Economics*, 88, 1605-1623.

Ashraf, N., Camerer, C. F. & Loewenstein, G., 2005. Adam Smith, Behavioral Economist. *Journal of Economic Perspectives*, 19 (3): 131-145.

Balliet, D., & Van Lange, P.A.M., 2013. Trust, conflict, and cooperation: A meta-analysis. *Psychological Bulletin*, 139: 1090-1112.

Basu, S., Dickhaut, J., Hecht, G., Towry, K. & Waymire, G., 2009. Recordkeeping alters economic history by promoting reciprocity. *Proceedings of the National Academy of Sciences of the USA* 106 (4): 1009–1014.

Berg, J., Dickhaut, J., & McCabe, K., 1995. Trust, reciprocity, and social history. *Games and Economic Behavior* 10: 122-142.

Berle, A. A., Jr., & Means, G. C., 1932. *The Modern Corporation and Private Property*. New York: Macmillan Press.

Bertomeu, J. and Marinovic, I,. 2016. A Theory of Hard and Soft Information. *The Accounting Review*, 91 (1) 1–20.

Bolton, G. E., & Ockenfels, A., 2000. ERC: A Theory of Equity, Reciprocity, and Competition. *American Economic Review,* 90 (1): 166-193.

Boulding, K. E. 1969. Economics as a Moral Science. *American Economic Review*. 59:1, pp. 1–12.

Brandeis, L., 1914. *Other people's money: and how the bankers use it*. New York, NY: F.A. Stokes.

Bushman, R.M. & Smith, A.J., 2001. Financial accounting information and corporate governance*, Journal of Accounting and Economics*, 32 (1-3), 237-333

Dufwenberg, M., & Muren, A., 2006. Generosity, anonymity, gender, *Journal of Economic Behavior & Organization*, 61(1), 42-49.

Dutta, S., & Gigler, F., 2002. The Effect of Earnings Forecasts on Earnings Management. *Journal of Accounting Research*, 40(3), 631-655

Dye, R. A., Glover, J., & Sunder, S., 2015. Financial engineering and the arms race between accounting standard setters and preparers. *Accounting Horizons* 29(2), 265–295.

Fehr, E., & Schmidt, K., 1999. A Theory of Fairness, Competition, and Cooperation. *The Quarterly Journal of Economics*, *114*(3), 817–868.

Gigler, F., & Hemmer, T. ,1998. On the Frequency, Quality, and Informational Role of Mandatory Financial Reports. *Journal of Accounting Research,* (*36*) 117-147

Gómez-Miñambres, J., Schniter, E., & Shields T. W., 2020. Investment Choice Architecture in Trust Games: When Going "All-in" Is Not Enough. *Economic Inquiry,* forthcoming.

Haynes, C.M. & Kachelmeier, S.J., 1998. The Effects of Accounting Contexts on Accounting Decisions: A Synthesis of Cognitive and Economic Perspectives in Accounting Experimentation. *Journal of Accounting Literature* 17: 97-136.

Jensen, M. & Meckling W., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3: 305–360.

Johnson, N.D., & Mislin, A.A., 2011. Trust Games: A Meta-analysis. *Journal of Economic Psychology*, 32, 865-889.

King-Casas, B., D. Tomlin, C. Anen, C. Camerer, S. Quartz, & P. R. Montague, 2005. Getting to know you: reputation and trust in a two-person economic exchange. *Science* 308: 78-83.

Kurzban, R. & Houser, D., 2005. Experiments investigating cooperative types in humans: A complement to evolutionary theory and simulations. *Proceedings of the National Academy of Sciences,* 102(5), 1803–1807.

LaRiviere, J., McMahon, M. & Neilson, W., 2017. Shareholder protection and agency Costs: an experimental analysis. *Management Science*.

Leuz, C. & Wysocki, P.D., 2016. The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. *Journal of Accounting Research*, 54: 525-622.

Liang, Y., Marinovic, I., & Varas, F. 2018. The Credibility of Financial Reporting: A Reputation-Based Approach. *The Accounting Review*, 93 (1) 317–333.

Lunawat, R., 2009. Disclosure as a tool for building trust and stimulating investment (Doctoral dissertation, Doctoral thesis, University of Minnesota).

Lunawat, R., 2013. An experimental investigation of reputation effects of disclosure in an investment/trust game. *Journal of Economic Behavior & Organization*, *94*, pp.130-144.

Lunawat, R., Waymire, G., & Xin, B, 2020. Do verified earnings reports increase investment? *Contemporary Accounting Research, forthcoming.*

McCloskey, Deirdre N. 2006. *The Bourgeois Virtues: Ethics for an Age of Commerce,* Chicago: The University of Chicago Press.

Milgrom, P. R. & Roberts, J., 1992. *Economics, organization, and management*. Englewood Cliffs, N.J: Prentice-Hall Inc.

Mueller, P. D., 2016. Adam Smith's Impartial Spectator, *Economic Journal Watch*, 13(2): 312–318

Ostrom, E. & Walker, J., 2003. *Trust and Reciprocity: Interdisciplinary Lessons from Experimental Research*. New York: Russell Sage Foundation Publications.

Rege M., & Telle K., 2004. The impact of social approval and framing on cooperation in public good situations, *Journal of Public Economics*, 88, 1625-1644.

Rietz, T. A., Sheremeta, R. M., Shields, T. W., & Smith, V. L., 2013. Transparency, efficiency and the distribution of economic welfare in pass-through investment trust games. *Journal of Economic Behavior & Organization*, *94*(0), 257–267.

Rong, Z., 2018. Transparency and firm innovation, *Journal of Accounting and Economics*, 66(1), 67-93.

Rousseau, D. M., Sitkin, S. B., Burt, D. S., & Camerer, C. F., 1998. Not so different after all: A cross-discipline view of trust. *Academy of Management Review*, *23*(3), 393–404.

Roychowdhury, S., Shroff, N. & Verdi, R.S., 2019. The effects of financial reporting and disclosure on corporate investment: A review, *Journal of Accounting and Economics*, 68(2-3), 101246

Smith, A. 1790. The Theory of Moral Sentiments. Library of Economics and Liberty. Retrieved May 18, 2018 from the World Wide Web: http://www.econlib.org/library/Smith/smMS1.html.

Smith, V. L. 2017. Adam Smith, scientist and evolutionist: modelling other-regarding behavior without social preferences. *Journal of Bioeconomics*, *20*(1), 1–15.

Smith, V. L., & Wilson, B. J. 2017. *Sentiments,* Conduct, and Trust in the Laboratory. *Social Philosophy and Policy*, *34*(1), 25–55.

Smith, V. L., & Wilson, B. J. 2018. Equilibrium play in voluntary ultimatum games: Beneficence cannot be extorted. *Games and Economic Behavior*, *109*, 452–464.

Smith, V. L., & Wilson, B. J. 2019. *Humanomics: Moral Sentiments and the Wealth of Nations for the Twenty-First Century.* New York, NY*:* Cambridge University Press

Shyam, M. & Sunder. S. 2008. Appraising Accounting and Business Concepts in Kautilya's Arthasaastra, in Toraman, C. ed. *Proceedings of the World Congress of Accounting Historians, Vol. I* (pp. 69-81). Istanbul, Turkey: Association of Accounting and Finance Academicians.

Watts, R. L., & Zimmerman, J. L., 1986. *Positive Accounting Theory*. Englewood Cliffs, N.J.: Prentice-Hall Inc.

7 Appendix

7.1 Instructions (Liquidation Treatment)

Introduction
This is an experiment on decision-making. Various research agencies have provided funds for this research. During the experiment you will earn money in an experimental currency unit (ECU). We will denote ECU with the $ symbol. At the end of the experiment earned ECU will be converted to US dollars at a rate of 10 ECU to 1 US dollar. Your earnings are dependent upon your decisions, other's decision, and upon chance. Earnings will be added to your show-up payment. You will be paid in cash at the end of the experiment and nobody except the cashier will know what you have earned. It is very important that you remain silent throughout the experiment and do not look at other people's work. If you have any questions, or need assistance of any kind, please raise your hand and an experimenter will come to you. If you talk, laugh, exclaim out loud, etc., you will be asked to leave and you will not be paid. We expect, and very much appreciate, your adherence with these policies.

Everyone in today's experiment will be randomly assigned into a partnership with an assigned role of either **Person A** or **Person B**. You and the other person in your partnership will make choices that will determine your payoffs. You will be partnered with the same person throughout the entire experiment. You will remain in the role of Person A or Person B for the entire experiment.

The Experiment
You will be asked to make deposits into a **Joint Savings account** and personal accounts in a number of periods. The total amount deposited in the **Joint Saving account** is subject to multiplication every period allowing it to grow over time. The experiment will last 6 periods.

Each period proceeds as follows.

First, Person A receives $5 in new funds and then decides how much of the $5 to send to Person 2 with the remainder going to his/her personal account. Person A can send $0, $1, $2, $3, $4 or $5. The amount Person A does not send to Person 2 is automatically deposited into his/her personal account (denoted as the **Person A account**).

Next, the amount sent by Person A and the **Joint Savings account** balance from the prior period are added together. The total is multiplied by 1, 2, or 3. All values for this multiplier are equally likely. Person B receives the multiplied amount and then decides how to distribute the amount received by making deposits into either (1) the **Person A account**, (2) the **Person B account**, or (3) the **Joint Savings account**. These three deposits must equal the amount received by Person B.

Person A and Person B keep the amounts deposited into their personal accounts.

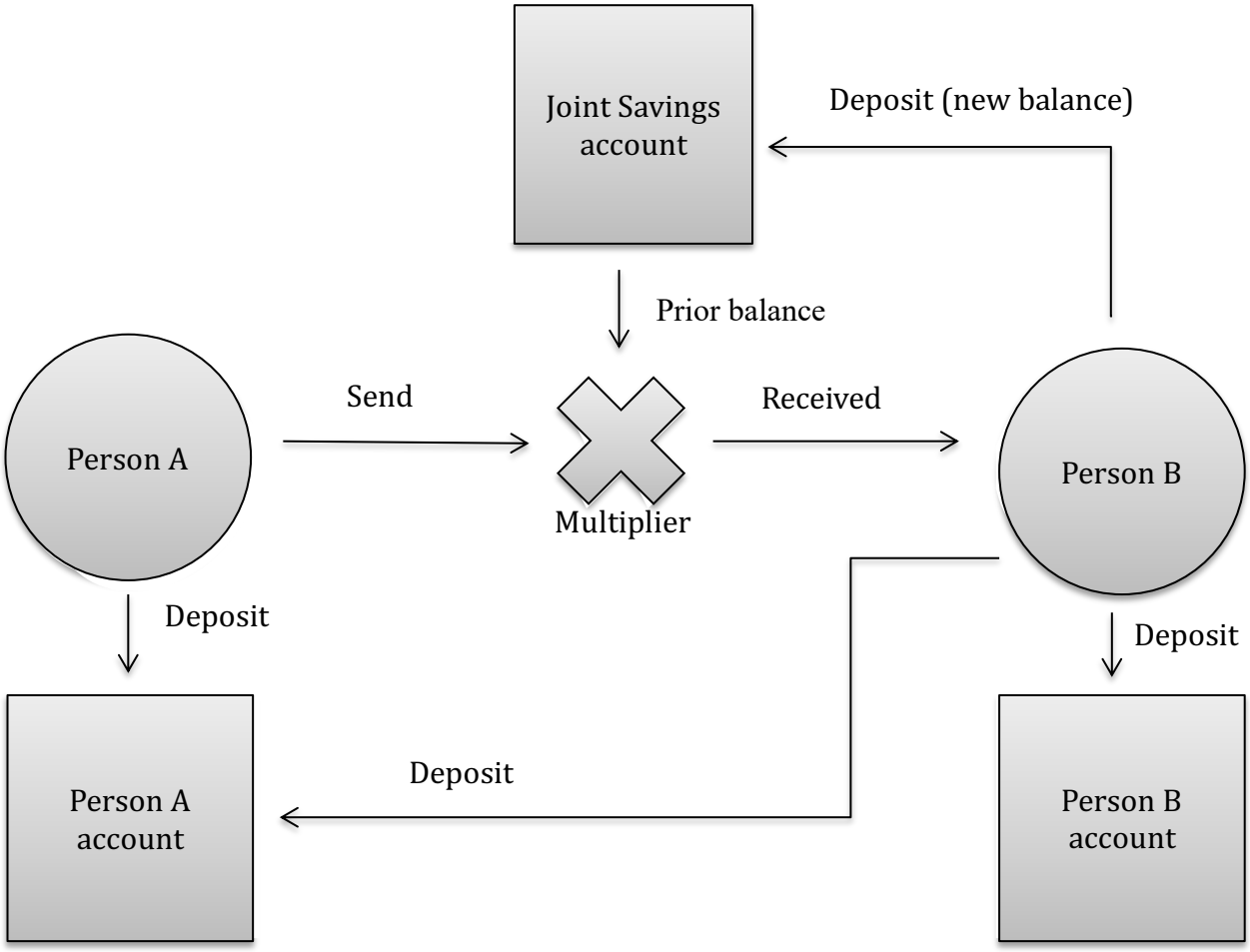
Before describing the stages in detail, we will explain what is meant by **Joint Savings account**.

Joint Savings account.

At the beginning of period 1, the **Joint Savings account** is empty. When Person B receives a multiplied amount in second stage of the first period, Person B decides on a split of the amount received through deposits into three accounts:

(1) **Person A account** (amount returned to Person A),
(2) **Person B account** (amount kept by Person B), and
(3) **Joint Savings account** (amount carried forward and subject to multiplication next period).

The amount carried forward in the **Joint Savings account** at the end of the first period will be added to the amount that Person A sends in the second period. This total will be multiplied and Person B receives the multiplied total. Person B then decides on the 3-way split of the total multiplied amount into the **Person A account**, the **Person B account**, and the **Joint Savings account** to be carried forward into the next period. This process is repeated every period of the experiment and illustrated in the diagram below.



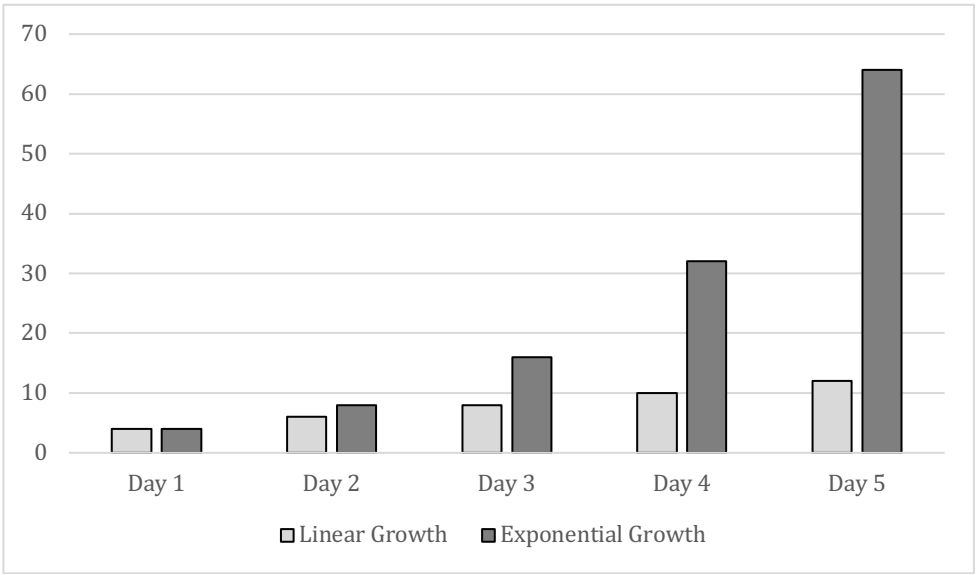
Numerical Example
Suppose Person A sends \$3 to Person B in period 1. Since this is the first period and the **Joint Savings account** is empty, only the \$3 sent by Person A is multiplied. Suppose the random multiplier for period 1 equals 2. Then, the multiplied total that Person B receives is \$6 (\$3 $\times$ 2). Person B next decides on a 3-way split of the total \$6 received. One possibility is for Person B to keep \$1 by depositing this amount into the **Person B account**, return \$3 to Person A by depositing this amount in the **Person A account**, which leaves \$2 to be carried over to the **Joint Savings account** for period 2.

Now the **Joint Savings account** equals \$2 at the start of period 2. If Person A sends \$4 to Person B in period 2, the total to be multiplied is \$6 (\$2+\$4). If the multiplier for period 2 is 3, then the total multiplied amount equals \$18 (\$6 $\times$ 3). If Person B deposits \$4 into the **Person A account** and \$6 into the **Person B account**, then \$8 (\$18 – \$4 – \$6) is the **Joint Savings account** balance to be carried over to the third period.

The **Joint Saving account** grows exponentially, where the rate of growth is the multiplier. Exponential growth differs from linear growth, where the growth amount is just a constant number.

To illustrate the difference, consider the following example of linear growth. Imagine that you invest \$2 today, and every day the investment grows by \$2. It grows today, tomorrow, and so on for 5 days. At the end of the first day you have \$4, tomorrow \$6, the next day \$8, the next day \$10, and on the last day \$12.

Now consider an example of exponential growth, where you put \$2 in the first day, and that doubles each day. At the end of the first day you have \$4, tomorrow you have \$8, the next day \$16, the next day \$32, and \$64 at the end of the day 5. This is depicted below:



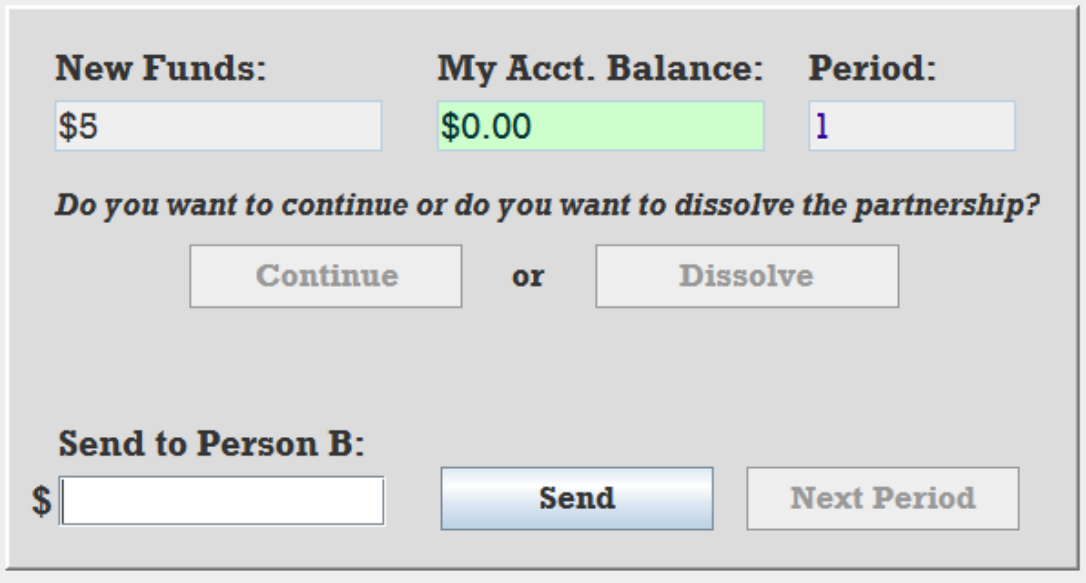
Now we illustrate how Person A's and Person B's will input their decisions.

Person A's Decision
Every period Person A receives $5 new funds and decides how much to send to Person B. The remainder, if any, is deposited into the **Person A account**. For example, if Person A sends $5 to Person B, then nothing can be deposited into the **Person A account**. Alternatively, if Person A sends nothing to Person B, then $5 is deposited into the **Person A account.**

The amount sent by Person A and the **Joint Savings account** at the end of the prior period are added together and multiplied by 1, 2, or 3 (all values are equally likely). The amount received by Person B equals the multiplied amount (multiplier times the total of amount sent and **Joint Savings account**).

Starting in Period 2, Person A must decide whether to continue or dissolve the partnership with Person B. If Person A decides to dissolve the partnership, then Person A receives 40% of the balance in the **Joint Savings account** at that point, which is automatically deposited into the **Person A account**. The remaining 60% is deposited into the **Person B account**. The partnership is now over and both Person A and Person B will not make any further decisions in the experiment. In this, and all future periods, the $5 in new funds is automatically deposited into the **Person A account**. If Person A decides to continue, then Person A decides how much to send to Person B.

Person A will see the following on their screen:



Screen 1

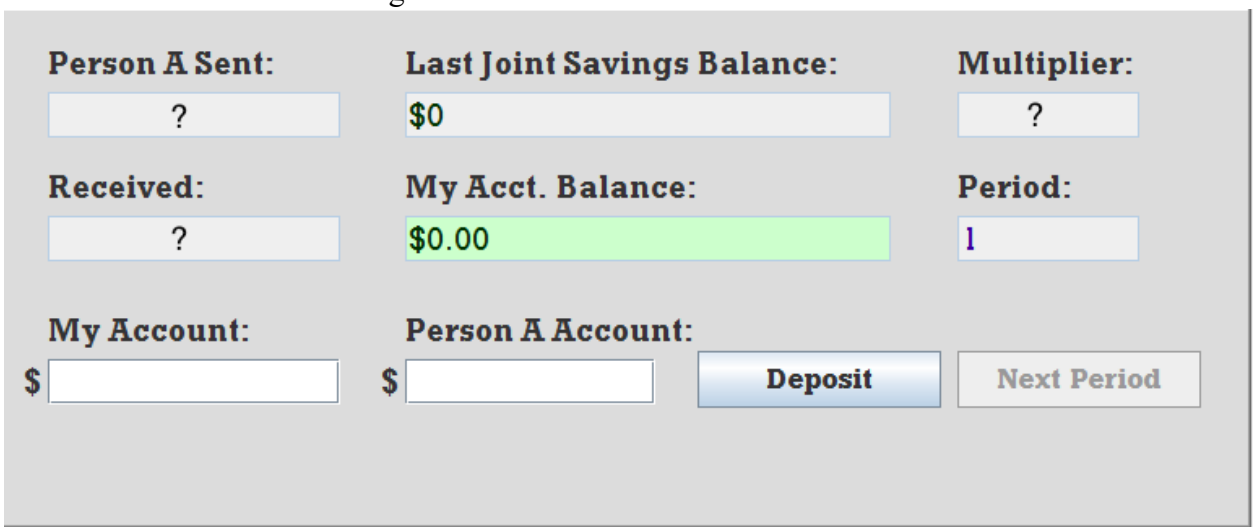
Person A must decide how much to send to Person B by entering an amount in the blank box. Person A can send $0, $1, $2, $3, $4 or $5.

Person B's decision
In stage 1, the amount sent by Person A's is added to the **Joint Savings account** from the prior period. Recall that the **Joint Savings account** at the beginning of period 1 is empty.

The total is multiplied before Person B receives it. The total is multiplied by 1, 2, or 3 (there is an equal chance of each value).

Person B decides on how the multiplied amount received is to be divided between deposits into three accounts. Person B decides how much to deposit in the **Person B account**, into the **Person A account**, and remainder is deposited into the **Joint Savings account**. If the total amount received by Person B equals zero, Person B cannot make any decision except to deposit zero into each account.

Person B will see the following on their screen:



Screen 2

Person B must decide how much to deposit in his/her account and how much into Person A's account by entering amounts in the blank boxes above. Person B can deposit $0, $1, … up to the amount received, into each account, but the total deposited into both accounts cannot exceed the amount received. Whatever is not deposited into the **Person B account** or **Person A account** is automatically deposited into the **Joint Savings account.** For the example screen above, recall the Joint Savings account is empty at the start of Period 1. During the experiment, the amount sent by Person A, the multiplier, and amount received denoted with '?' will be filled in.

In the last period, Person B decides on a 2-way split of the multiplied amount received by him / their instead of the 3-way splits in previous periods. S/he decides how much of the total amount to deposit in to Person A account and how much to deposit in Person B account.

Feedback
Throughout the experiment Person A and Person B will see the history of their decisions. However, the information Person A sees differs from the information Person B sees.

For example, Person A sees the following upon their screen at the end of period 1. Amounts denoted with a '?' will be filled in. Since it is the first period, beginning balances are zero. After each period is complete, the table will be updated with a new row.

Person A History

My Account History

Period #	Beginning Balance	I Deposited	Person B Deposited	Ending Balance
1	0	?	?	?

Screen 3

The information shown to Person B differs. For example, Person B will see the following at the end of period 1. During the experiment, amounts denoted with a '?' will be filled in depending on Person A's and Person B's decisions. Since it is the first period, beginning balances are zero. After each period is complete, the table will be updated with a new row.

Person B History

My Account History

Period #	Beginning Balance	I Deposited	Ending Balance
1	0	?	?

Person A Account History

Period #	Beginning Balance	Person A Deposited	I Deposited	Ending Balance
1	0	?	?	?

Earnings History

Period #	Beginning Joint Savings	Person A Send	Multiplier	Earnings
1	0	?	?	?

Joint Saving Account History

Period #	Earnings	Deposited Into Person A Account	Deposited Into My Account	Ending Balance
1	?	?	?	?

Screen 4

Notice that Person B is shown the multiplier, the Joint Savings Account, and how much they deposited into their own account **(Person B account**). Person A will never be directly told the multiplier, the balance in the Joint Savings Account, or the amount Person B deposited into the **Person B account**. This difference between what Person A sees and what Person B sees is summarized below:

Information	Who sees it
Person A deposits into the **Person A account**	Person A and Person B
Person B deposits into the **Person A account**	Person A and Person B
Balance of the **Person A account**	Person A and Person B
Person B deposits into the **Person B account**	Person B
Balance of the **Person B account**	Person B
Person A sends to Person B	Person A and Person B
Person B deposits into the **Joint Savings account**	Person B
Multiplier drawn	Person B
Multiplied amount received by Person B	Person B

Completion of the Experiment
Once all periods have been completed, you will be paid your earnings in US dollars plus your 7 US dollar show up fee. Experimental currency (ECU) will be converted to US dollars at the rate of 10 ECU to 1 US dollar.

7.2 Quiz Questions

Treatment differences noted in italics. Correct answer denoted in parenthesis.

1. How many people are in the partnership?
   a. 1
   b. 2
   (b)
2. The ending balance in the **Person A account** and the **Person B account** can never decrease from last period?
   a. True
   b. False
   (a)
3. The ending balance in the **Joint Savings account** can never decrease from last period?
   a. True
   b. False
   (b)
4. Will both the amount send by Person A and the last period's **Joint Savings account** balance be multiplied before Person B decides how to split it?
   a. Yes
   b. No
   (a)
5. Is each multiplier value (1, 2, or 3) equally likely in each period?

a. Yes
b. No

(a)

6. Person A will be explicitly told the multiplier and the balance in the **Joint Savings account**?
   a. Yes
   b. No

   (a: *if Reporting or Both treatments*)
   (b: *if Baseline or Liquidation treatments*)
7. Suppose that Person A sends 3 to Person B, and Person B and deposits 5 in the **Person A account**. How much was added to the **Person A account** this period?
   a. 3
   b. 5
   c. 7
   d. 8

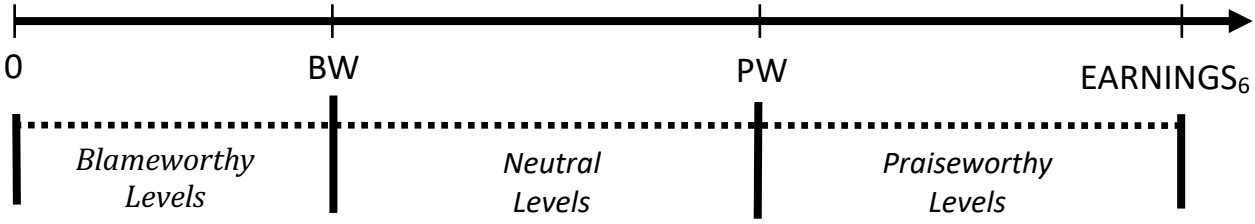
   (c)
8. Suppose Person B receives 9, deposits 2 to the **Person A account**, and deposits 3 to the **Person B account**. What is the **Joint Savings account** balance?
   a. 2
   b. 4
   c. 6
   d. 9

   (b)
9. Suppose the **Joint Savings account** balance is 40 at the start of the period and Person A chooses to dissolve the partnership. How much of the **Joint Savings account** balance gets automatically deposited into the **Person A account**?
   a. 0
   b. 16
   c. 24
   d. 40

   (b: *only asked in Liquidation and Both treatments*)

Table 1
Manager Choices of Final Distribution

Panel A: Possible Values to Investor Chosen by Manager



Legend:

BW = Minimum level need to avoid blame
PW = Minimum level to obtain praise from Impartial Spectator
$EARNINGS_6$ = Earnings in the final period (Maximum Amount to Investor)

Panel B: Comparison of Manager Utility choosing Final Distribution with and without Financial Reporting

LEVEL	Reporting?	Monetary payoffs	Avoiding (or not) seen as blameworthy	Acting praise (blame) worthy	Seen as praiseworthy (blameworthy)
Blameworthy Pay 0	No	> 0	< 0	< 0	< 0
	Yes	> 0	< 0	< 0	< 0
Neutral Pay BW	No	smaller than paying 0	> 0	0	0
	Yes	smaller than paying 0	> 0	0	0
Praiseworthy Pay PW	No	smaller than paying BW	> 0 and equal to paying BW	0 or > 0	0 or > 0
	Yes	smaller than paying BW	> 0 and equal to paying BW	> 0	> 0

Table 2
Summary Measures

Treatment	Wealth	Efficiency	Total Investor Payoff	Total Manager Payoff
Baseline	169.9	36%	44.3	125.6
No Reporting, No Liquidation	104.0	29%	35.0	60.5
N = 36	(26.5)	(4%)	(4.4)	(25.1)
Information	252.3	45%	64.7	187.6
Reporting, No Liquidation	133.0	36%	33.0	97.0
N = 35	(48.3)	(5%)	(13.7)	(44.5)
Liquidation	105.0	26%	46.1	58.9
No Reporting, Liquidation	78.0	19%	36.9	47.5
N = 36	(12.8)	(3%)	(5.1)	(9.3)
Both	262.2	45%	103.9	158.3
Reporting, Liquidation	139.5	35%	37.5	86.0
N = 36	(54.9)	(5%)	(26.8)	(30.6)

Mean, median, (SEM) reported.

Total Investor Payoff: The balance of the Investor's private account at the end of the game. The sum of the 6 periods endowment, less the sum of investments, plus any interim dividends received, plus the amount received in final distribution or liquidation.

$$\text{PAYOFF}_{\text{INVESTOR}} = \sum_{t=1}^{6} 5 - \sum_{t=1}^{T} \text{INV}_t + \sum_{t=1}^{\max\{5,T\}} \text{DIV}_t + \text{INVESTOR\_FIN}_T \text{, where}$$

$$T = \min\{6, \text{period liquidated}\}$$

$$\text{INVESTOR\_FIN}_T = \begin{cases} \text{DIV}_6\,, & T = 6 \\ 40\% \times \text{Joint Savings account}_T, & T < 6 \end{cases}$$

Total Manager Payoff: The balance of the Manager's private account at the end of the game. This equals the sum of the salary kept by the Manager in interim periods (and not reinvested) plus the amount kept by the Manager in the final distribution or liquidation.

$$\text{PAYOFF}_{\text{MANAGER}} = \sum_{t=1}^{T} \text{SAL}_t + \text{MANAGER\_FIN}_T \text{, where}$$

$$T = \min\{6, \text{period liquidated}\}$$

$$\text{MANAGER\_FIN}_T = \begin{cases} \text{SAL}_6\,, & T = 6 \\ 60\% \times \text{Joint Savings account}_T, & T < 6 \end{cases}$$

Wealth: The sum of the Investor payoff and Manager payoff at the end of the game.

$$\text{WEALTH} = \text{PAYOFF}_{\text{INVESTOR}} + \text{PAYOFF}_{\text{MANAGER}}$$

Efficiency: The wealth divided by the hypothetical wealth (given the realized multiplier values) that might have been assuming the Investor invested the maximum amount each period, the Manager reinvested the maximum in the interim periods.

$$\text{WEALTH}/(5 + (5 + (5 + (5 + (5 + 5^{\lambda_1})^{\lambda_2})^{\lambda_3})^{\lambda_4})^{\lambda_5})^{\lambda_6}$$

Table 3
Final distribution

Panel A: Amounts by Treatment

Treatment	Investor Final Distribution	Net Investor Final Distribution	Manager Final Distribution
Baseline	21.9	14.9	110.5
No Reporting, No Liquidation	*7.0*	*5.0*	*45.0*
N = 35	(4.5)	(4.5)	(26.5)
Information	46.9	35.7	180.9
Reporting, No Liquidation	*9.5*	*6.0*	*92.0*
N = 34	(14.9)	(14.0)	(46.5)
Liquidation	22.2	18.6	47.4
No Reporting, Liquidation	*9.0*	*8.0*	*23.0*
N = 29	(6.7)	(6.3)	(11.0)
Both	92.9	77.8	152.0
Reporting, Liquidation	*11.5*	*6.0*	*55.5*
N = 30	(33.0)	(31.9)	(37.3)

Mean, *median*, (SEM) reported.

Investor Final Distribution: The amount the Manager put into the Investor's private account in the final period, if the Manager could choose.

Net Investor Final Distribution: The final distribution shifted such that value positive if made better, negative if worst off, and is zero otherwise.

$$\mathrm{DIV}_6 - \sum_{t=1}^{6} INV_t + \sum_{t=1}^{5} DIV_t$$

Manager Final Distribution: The amount the Manager put into their own private account in the final period. If the final period's earnings where zero, or the firm had been liquidated by the investor, then the Manager could not choose, and as such, the number of observations is reduced.

Panel B: ANOVA results

Results of Reporting and Liquidation on the Investor Final Distribution

Source	S.S.	d.f.	F-ratio	p-value
Reporting	72,867	1	7.20	.008
Liquidation	17,072	1	1.69	.196
Reporting x Liquidation	16,511	1	1.63	.204

Note: The model had an F ratio of F(3,124) = 3.38, p = .020.

Results of Reporting and Liquidation on the Net Investor Final Distribution

Source	S.S.	d.f.	F-ratio	p-value
Reporting	50,918	1	5.44	.021
Liquidation	16,671	1	1.78	.185
Reporting x Liquidation	11,718	1	1.25	.265

Note: The model had an F ratio of F(3,124) = 2.74, p = .047.

Results of Reporting and Liquidation on the Manager Final Distribution

Source	S.S.	d.f.	F-ratio	p-value
Reporting	243,587	1	6.60	.011
Liquidation	67,301	1	1.82	.179
Reporting x Liquidation	9,328	1	0.25	.616

Note: The model had an F ratio of F(3,124) = 2.80, p = .043.

Panel C: Results of best fit model

$$Investor\ Final\ Distribution = \beta_0 + \beta_1 Reporting + \beta_2 Investments^2 + \beta_3 Reporting \times Investments^2 + \beta_4 PriorDividends + \beta_5 PriorSalary + \varepsilon$$

Variable	Coefficient Value
Intercept	25.981***
Report	-25.498
Investments^2	0.625***
Report × Investments^2	0.456**
Prior Dividends	-0.194**
Prior Salary	-0.180***
Number of Observations	128
R Squared	0.279
Adjusted R Squared	0.249

Note: ** p < .05; *** p < .01

F(5, 122) = 4.52, Probability > F = .0008

Reporting: Dummy variable equal one for *Reporting* and *Both* treatments.

Investments^2: sum of squared investments, $INV_1^2 + INV_2^2 + \cdots INV_6^2$.

Prior Dividends: weighted dividends paid to the investor in interim periods, $DIV_1 \times 2^5 + DIV_2 \times 2^4 + \cdots + DIV_5 \times 2^1$.

Prior Salary: weighted salaries kept by the Manager in interim periods, $SAL_1 \times 2^5 + SAL_2 \times 2^4 + \cdots + SAL_5 \times 2^1$.

Table 4
Investment and Reinvestment

Treatment	Average Investment	Average Dividend to Investor	Average Salary Taken by Manager	Average Reinvestment by Manager	Average Percentage Reinvested by Manager
Baseline	3.2	2.5	3.6	26.1	63.0
No Reporting, No Liquidation	*3.2*	*2.0*	*2.9*	*14.5*	*63.4*
N = 36	(0.2)	(0.4)	(0.7)	(4.5)	(5.0)
Information	3.8	2.4	2.4	35.9	69.7
Reporting, No Liquidation	*4.2*	*2.2*	*1.6*	*24.0*	*76.3*
N = 35	(0.2)	(0.5)	(0.5)	(6.0)	(4.9)
Liquidation	3.5	3.4	3.8	15.5	52.6
No Reporting, Liquidation	*3.7*	*3.0*	*3.7*	*8.2*	*49.4*
N = 36	(0.2)	(0.4)	(0.5)	(3.3)	(3.9)
Both	4.1	1.7	2.8	44.7	67.8
Reporting, Liquidation	*4.7*	*1.0*	*2.2*	*22.2*	*71.4*
N = 36	(0.2)	(0.3)	(0.7)	(8.6)	(5.0)

Mean, *median*, (SEM) reported.

Average Investment: The average investment in periods (1-6) if the firm had not been liquidated, else the average investment before the firm was liquidated.

$$\sum_{t=1}^{T} \frac{INV_t}{T}, \text{where } T = \min\{6, \text{period liquidated}\}$$

Average Dividend to Investor: The average amount returned by the Manager in interim periods (1-5) if the firm had not been liquidated, else the average amount returned by the Manager before the firm was liquidated.

$$\sum_{t=1}^{T} \frac{DIV_t}{T}, \text{where } T = \min\{5, \text{period liquidated}\}$$

Average Salary Taken by Manager: The average amount the Manager put into their own private account in interim periods (1-5) if the firm had not been liquidated, else the average amount the Manager put into their own private account before the firm was liquidated.

$$\sum_{t=1}^{T} \frac{SAL_t}{T}, \text{where } T = \min\{5, \text{period liquidated}\}$$

Average Reinvestment by Manager: The average amount the Manager put into the joint savings account in interim periods (1-5) if the firm had not been liquidated, else the average amount the Manager put into the joint savings account before the firm was liquidated.

$$\sum_{t=1}^{T} \frac{REINVEST_t}{T}, \text{where } T = \min\{5, \text{period liquidated}\}$$

Average Percentage Reinvested by Manager: The average amount the Manager put into the joint savings account in interim periods (1-5) as defined above divided by the earnings to be distributed.

$$\sum_{t=1}^{T} \frac{REINVEST_t/EARNINGS_t}{T}, \text{where } T = \min\{5, \text{period liquidated}\}$$

Table 5
Measures of Maximum Efficiency by Treatment

	Percentage of Economies Where in All Periods Maximum:		
Treatment	Investment	Reinvestment	Efficiency
Baseline	25.0	8.3	2.8
N = 36	(7.3)	(4.7)	(2.8)
Reporting	37.1	32.4	17.1
N = 35	(8.3)	(8.1)	(6.5)
Liquidation	19.4	2.8	0.0
N = 36	(6.7)	(2.8)	(0.0)
Both	27.8	25.0	13.9
N = 36	(7.6)	(7.3)	(5.8)

Mean, (SEM) reported.

Maximum Investment: A dummy variable which is one if the Investor invested their entire endowment.

$$MAX\_INVEST_t = \begin{cases} 1, & if\ INV_t = 5 \\ 0, & else \end{cases}$$

Maximum Reinvestment: A dummy variable which is one if the Manager reinvested all earnings she received.

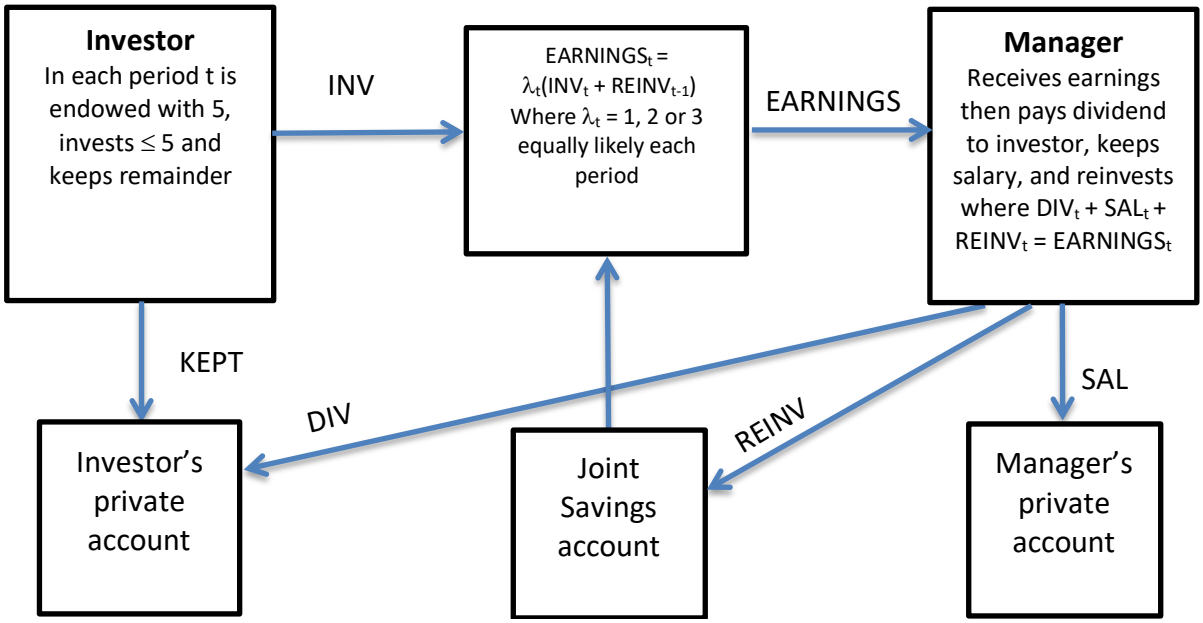
$$MAX\_REINVEST_t = \begin{cases} 1, & if\ REINV_t = EARNINGS_t \\ 0, & else \end{cases}$$

Maximum Efficiency: A dummy variable which is one if the Investor invested their entire endowment and the Manager reinvested all earnings she received.

$$MAX\_INVEST_t \times MAX\_REINVEST_t$$

8 Figure 1

Panel A: Baseline Version of the Reinvestment Game



In the last period reinvestment is not possible due to game's end. The manager thus chooses final distribution such that $DIV_6 + SAL_6 = EARNINGS_6$.

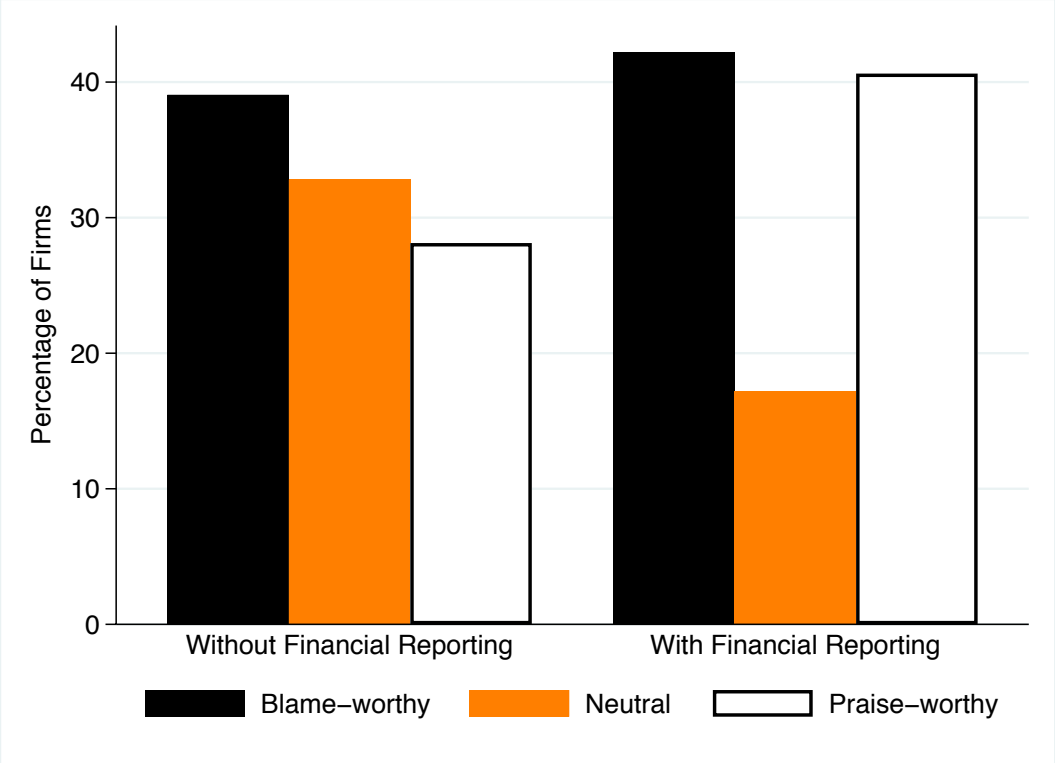
Reporting treatments: Investor sees earnings, reinvestment, balance of the joint savings account, salary, and the balance of the manager's private account. Otherwise, the Investor only sees the investment, the remainder kept, and the dividend.

Liquidation treatments: At the end of periods 1-5, the investor can elect to dissolve the firm, which moves 40% of the joint savings account balance into the investor's private account and moves the remainder into the manager's private account. Future endowments are moved directed into the investor's private account.

Panel B: Experimental Treatments

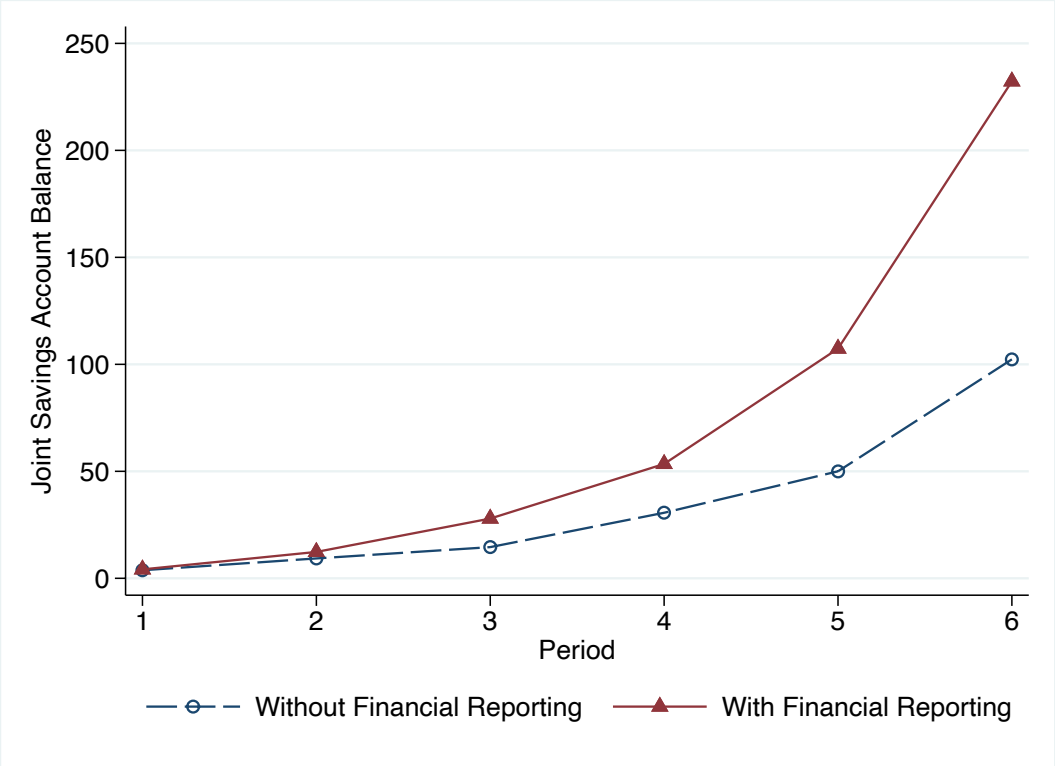
	No Reporting	*Reporting*
No Liquidation	Baseline	Reporting
Liquidation	Liquidation	Both

Figure 2
Categorization of Final Distribution to Investor



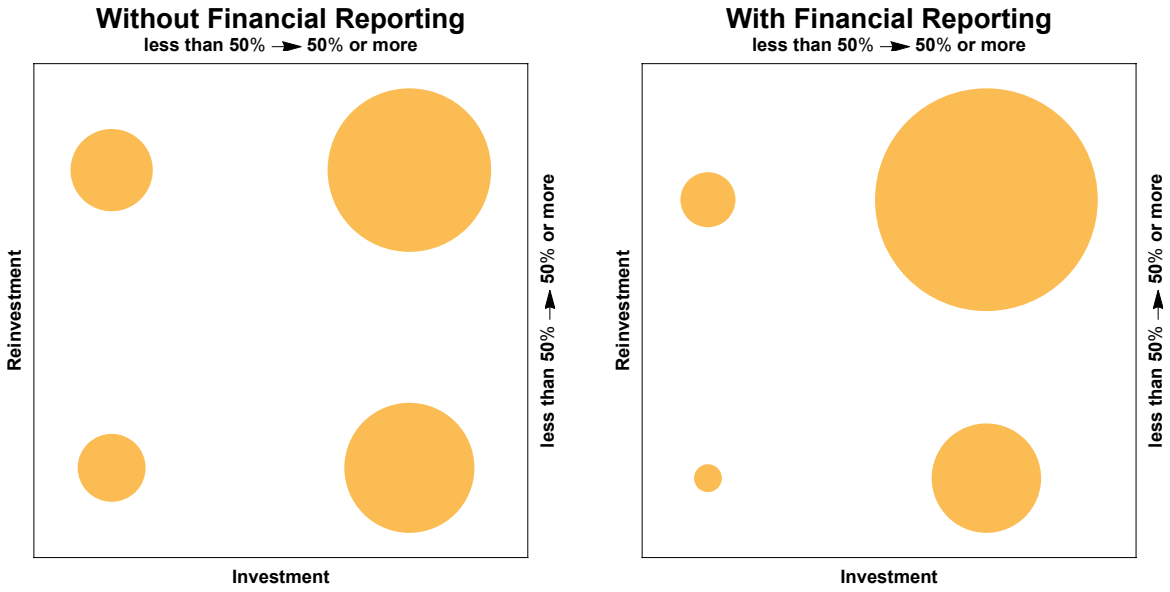
NOTE*:* If the investor distribution was less than $BW = Max\{\sum_{t=1}^{6} INV_t - \sum_{t=1}^{5} DIV_t, 1\}$, then we classify the final distribution as blameworthy; if it was greater than $PW = 40\%\ REINV_5 + INV_6$, then we classify the final distribution as praiseworthy, otherwise we classify the distribution as neutral. In those cases where *PW* was less than or equal to *BW*, we classify the final distribution as neutral.

Figure 3
Joint Savings Account Over Time



NOTE: The average balance of the Joint Savings account of the non-liquidated firms graphed over the six periods. As the firm is dissolved in the last period and managers are required to distribute earnings between themselves and the investors, we report the earnings before the final distribution in the last period.

Figure 4
Bubble Charts of Investment and Reinvestment



Note: Within each chart the firms are classified by investor behavior on the x-axis (average investment was less than or more than half the maximum the investor could invest of their endowment) and manager behavior on the y-axis (average reinvestment the less than or more than half maximum percentage the manager could reinvest of earnings). The bubble size reflects the number of economies falling into the classification, where the smallest bubble is 1.5 percent of firms in the treatment and the largest is 61 percent of firms in the treatment.