
Investment Incentives from Goal-Incongruent Performance Measures: Experimental Evidence

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1 Introduction

We analyze investment incentives of goal incongruent performance measures in an experiment in which ‘managers’ make one-period investment decisions and ‘owners’ predict these decisions. Three alternative performance measures are considered: earnings, ROI, and residual income. These measures serve as archetypes for a wide variety of measures used in practice. Standard theoretical predictions with respect to the investment incentives of earnings, ROI, and residual income are well documented, and they have become part of the management accounting education (e.g., [5]). They illustrate one of the basic principles of management accounting: ‘you get what you pay for’. As is well known, neither earnings nor ROI is a goal congruent performance measure, whereas residual income is goal congruent due to its conservation property.

Empirical (field) studies (e.g. [7]; [4]; [2]) have examined changes in firms’ operating, investment, and financing decisions, and in stock price performance following the adoption of residual income measures. Overall, the studies support the theoretical predictions, although some of the reported effects are not as strong as predicted.

In an organization, every decision is embedded in a social context that influences an individual’s behavior and thus has an impact on the effectiveness of management accounting systems; see [6]. In contrast to standard theoretical predictions, experimental economics has consistently shown that people do not always maximize their individual payoffs (e.g., [3]). Thus, we cannot take for granted the motivational effects of different performance measures derived from standard theory.

In our experiment, we find that, although managers overinvest (underinvest) on average when they are evaluated at earnings (ROI), owners do not get what they pay for from the majority of managers when using these two performance measures. Nevertheless, owners overestimate these measures’ effectiveness in inducing individually rational behavior. When confronted with

managers’ decisions in early rounds, owners consistently revise their beliefs. However, their overall estimation quality remains relatively low.

2 Experimental Design

The experiment consisted of three treatments referring to the performance measures to be examined, earnings (E), Return on Investment (ROI), and residual income (RI), where $E = r(x) - x$, $ROI = E/x$, $RI = E - \kappa x$. x is the amount invested, $r(x)$ is the cash return, and κ is the cost of capital. Participants in the experiment were assigned either the role of a ‘manager’ or of an ‘owner’ in one of the three treatments. Managers received a share of the respective measure, and owners received RI , which equals the project’s terminal value, minus the manager’s payoff. The shares were set such that managers would receive comparable compensations from the experiment if they always maximized their own payoff. Managers and owners were paired randomly and anonymously in every round; owners were passive in that they could not influence managers’ decisions.

A manager’s task consisted in making investment decisions in 12 rounds. In each round, a manager received a decision sheet that displayed 12 amounts x that could be invested, the corresponding cash returns $r(x)$, the ‘net surplus’ (RI), and the manager’s and the owner’s payoffs. Table 1 presents the managers’ decision problem in round 1. In the table, a treatment-specific category index k is added. In order to simplify comparisons we normalize the category that maximizes the manager’s payoff to $k = 0$ and term it as the ‘individually rational category’. The value maximizing category is $k = -4$ in the earnings treatment, $k = 4$ in the ROI treatment, and $k = 0$ in the residual income treatment. Thus, an individually rational choice of $k = 0$ in the earnings/ROI

Table 1. Investment project and owner and manager payoffs in round 1.

Inv. amount	35	42	56	70	84	98	112	126	140	154	160	164
Cash return	55.15	74.30	95.73	116.43	136.63	156.46	173.12	189.77	206.43	223.08	224.70	225.20
category k	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2
Earnings	20.15	32.30	39.73	46.43	52.63	58.46	61.12	63.77	66.43	69.08	64.70	61.20
Man. payoff	3.93	6.30	7.75	9.05	10.26	11.40	11.92	12.44	12.95	13.47	12.62	11.93
Own. payoff	5.72	13.40	15.18	16.38	17.17	17.66	15.60	13.53	11.48	9.41	4.08	0.07
category k	-1	0	1	2	3	4	5	6	7	8	9	10
ROI	0.576	0.769	0.710	0.663	0.627	0.597	0.546	0.506	0.475	0.449	0.404	0.373
Man. payoff	10.36	13.84	12.77	11.94	11.28	10.74	9.82	9.11	8.54	8.07	7.28	6.72
Own. payoff	-0.71	5.86	10.16	13.49	16.15	18.32	17.70	16.86	15.89	14.81	9.42	5.28
category k	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Res. inc.	9.65	19.70	22.93	25.43	27.43	29.06	27.52	25.97	24.43	22.88	16.70	12.00
Man. payoff	4.83	9.85	11.47	12.72	13.72	14.53	13.76	12.99	12.22	11.44	8.35	6.00
Own. payoff	4.83	9.85	11.47	12.72	13.72	14.53	13.76	12.99	12.22	11.44	8.35	6.00