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Effects of bonuses on diversification in delegated stock portfolio management



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ABSTRACT

Our aim is to investigate whether bonuses make stock portfolio managers take higher risks by diversifying less. In two experiments with undergraduates role-playing being professional investors, we test a model implying that they initially anchor on 100% allocation to one of two options delivering the largest bonus payout, then adjust towards allocating equally much to each option (maximal diversification) depending on the degree of perceived uncertainty of the bonus outcome. In Experiment 1 we find as expected that when the bonus is reduced, investment in the preferred option decreases such that diversification increases. Diversification is larger when uncertainty of the bonus outcome is made salient. In Experiment 2 we show that a majority herd strengthens the effect of a bonus for investing in a preferred option despite salient uncertainty of the bonus outcome. In actual stock markets such herding effects would result from investors being similarly rewarded by bonuses.

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Performance-related payments or bonuses are used by investment organizations to incentivize stock portfolio managers (Golec, 1988). An example is that bonuses are awarded conditionally on portfolios producing superior returns relative to an index. An expressed concern is that bonuses based on short time intervals push portfolio managers towards short-term goals even though their organizations (e.g. pension funds) have long-term investment horizons (e.g. Guyatt, 2008; Marginson and McAulay, 2008). In an experiment investigating this issue, Gärling et al. (2015) found that delegated stock purchases were made earlier for a short-term than for a long-term bonus such that it resulted in purchases at higher prices for the clients as well as lower bonus payouts for the traders.

Another drawback with bonuses is highlighted in other experimental research showing that bonuses not penalizing losses lead to increased risk taking (Holmen et al.,

2014). For instance, Kleinlercher et al. (2014) observed that in double-auction experimental markets, a high-risk asset was traded more than a low-risk asset when bonuses not penalizing losses were paid to participants. Our aim here is to follow this up by investigating whether bonuses cause managers of stock portfolios to take higher risks by diversifying less.

We report two experiments with participation of undergraduates who are asked to role-play professional portfolio managers delegated to invest in two stocks. In the experiments a bonus payout is presented that depends on how investments are allocated. The results indicate that diversification is reduced because more is allocated to the stock that delivers a higher bonus payout (Experiment 1). We also find that making salient uncertainty about the bonus payment reduces its effect such that diversification increases. Yet, Experiment 2 shows that this is counteracted by an influence from others investing more in the stock if they are awarded the same bonuses.

In the next section we review previous research showing how risk diversification may decrease by strong preferences for individual options despite a naïve tendency

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to diversify. From this we then develop the hypotheses to be tested in the experiments. Finally, the experiments are reported and their results discussed.

1. Previous research

A strong human tendency is to diversify when allocating resources. This does however not preclude that diversification is naïve. Reviewing studies covering several domains (decision analysis, managerial decision making, consumer choice), Fox and Clemen (2005) conclude that people who allocate scarce resources among a fixed set of options tend to allocate the resources evenly across all options, insufficiently adjusting according to their preferences.

In stock markets diversifying risk is generally considered a sensible strategy (Levy and Sarnat, 1970; Markowitz, 1952). Investors nevertheless often fail to diversify such that their portfolios have a preferred average risk (Baltussen and Post, 2011; Hedesström et al., 2004, 2007). A reason may be that diversification is based on the erroneous belief that any multi-asset portfolio will be well-diversified (Goetzmann and Kumar, 2008; Kroll et al., 1988). This was demonstrated by Hedesström et al. (2006) who conducted experiments in which neglect of the covariance structure among assets made diversification increase instead of decrease risk. Only through providing explicit information was naïve diversification eliminated. In further experiments risk-averse participants tended to choose a portfolio including several specialized funds rather than one generic fund, even though choosing the latter would entail less risk (Hedesström et al., 2009). These findings are in line with the suggestion by Ayal and Zaky (2009) and Ayal et al. (2012) that the level of perceived diversity in a portfolio depends not only on how the selected investments options differ from each other but equally much on how many they are, and that this sometimes results in what they call “pseudo diversification” instead of effective diversification.

Diversification is also susceptible to framing effects (Kahneman and Tversky, 1984), that is, influences of the way options are presented. This was shown by Benartzi and Thaler (2001) who analyzed US employee pension plans and found that participants tended to use a $1/n$ heuristic implying that they allocate their investments evenly across all available investment options. In schemes offering a majority of stock funds most contributions were invested in stocks, while in schemes offering a majority of interest funds most contributions were instead invested in interest funds. In experiments Fox et al. (2005) demonstrated how allocations vary systematically with how options are partitioned. They also showed that strong preferences for individual options reduced susceptibility to partitioning effects. While strong preferences for investment options thus may reduce use of the $1/n$ heuristic, it may conversely lead to less than desired diversification. Strong preferences may arise from familiarity (Huberman, 2001) that reduces perceived risk (Heath and Tversky, 1991) and are, for instance, manifested in the tendency to invest too much in stocks from one's home country (French and Poterba, 1991; van Nieuwerburgh and Veldkamp, 2009), in companies whose headquarters are

located close to one's home and whose CEO shares one's ethnicity (Grinblatt and Keloharju, 2001), and in the employer's stock (Huberman and Sengmueller, 2004). Preferences for individual investment options may also stem from endorsement by others, either by individuals perceived to be knowledgeable (Benartzi and Thaler, 2007) or by large groups of unknown investors, as evidenced by herding in stock markets (Hirshleifer and Teoh, 2003). Investors' preferences for individual stocks are furthermore influenced by analysts' forecasts of future company earnings (Clement and Tse, 2003; Gleason and Lee, 2003).

Why do people diversify despite apparently not knowing how? It has been suggested that people seek variety because they are uncertain about their preferences (Kahn and Lehmann, 1991; Simonson, 1990). Thus, they select a bundle of options that is likely to include the option with the highest utility instead of a single option that has the potentially highest utility. Implied by this reasoning is that diversification should decrease when uncertainty is reduced about what is preferred (Read and Loewenstein, 1995; Salisbury and Feinberg, 2010). Studies accordingly demonstrate that diversification decreases as the relative strength of preferences for individual options increases (Mitra and Lynch, 1995; Salisbury and Feinberg, 2012; van Trijp et al., 1996).

In summary, previous research shows that strong preferences for individual investment options are likely to attenuate diversification while high perceived uncertainty is likely to exacerbate diversification. Since preference strength should be inversely related to uncertainty about what one prefers, perceived uncertainty has in the previous research both referred to this source of uncertainty and uncertainty about the outcome of a preferred option without any clear distinction being made. In the following we distinguish preference strength (inversely related to preference uncertainty) from outcome uncertainty.

2. Overview of experiments

In the experiments our aim is to investigate whether a bonus payout that increases preference for a single investment option counteracts diversification such that risk increases. We next derive a formal model of how preference strength and outcome uncertainty interact in determining allocations of from 100% to the preferred option to equally much to all options (maximal diversification). In this model we thus distinguish strength of preference for a single option (inversely related to preference uncertainty) from uncertainty about the outcome of the preferred option.

A robust finding is that people anchor judgments and choices on an initial value from which they subsequently make adjustments such that the initial value importantly influences the final choice (e.g. Epley and Gilovich, 2006; Mochon and Frederick, 2013; Simmons et al., 2010; Tversky and Kahneman, 1974). We propose that when one investment option is preferred, 100% is initially allocated to this option. Adjustments are then made from this anchor proportional to the degree of uncertainty about how much the option is preferred and the degree of uncertainty about its outcome. Formally, for one preferred option assuming

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