Journal of Corporate Finance 29 (2014) 369–389

Contents lists available at ScienceDirect

Journal of Corporate Finance

journal homepage: www.elsevier.com/locate/jcorpfin

Bonus schemes and trading activity

Elena Pikulina [a,*], Luc Renneboog [b,1], Jenke Ter Horst [c,2], Philippe N. Tobler [d,3]

[a] Tilburg University, PO Box 90153, 5000 LE Tilburg the Netherlands
[b] Department of Finance, Tilburg University, PO Box 90153 5000 LE Tilburg, the Netherlands
[c] TiasNimbas Business School, Tilburg University, PO Box 90153 5000 LE Tilburg, the Netherlands
[d] Department of Economics, University of Zurich, Blumlisalpstrasse 10, 8006 Zurich, Switzerland

ARTICLE INFO

Article history:
Received 18 February 2013
Received in revised form 22 September 2014
Accepted 24 September 2014
Available online 2 October 2014

JEL classification:
G11
J33

Keywords:
Bonus
Compensation
Investment decisions
Trading Behavior

ABSTRACT

Little is known about how different bonus schemes affect traders' propensity to trade and which bonus schemes improve traders' performance. We study the effects of linear versus threshold bonus schemes on traders' behavior. Traders buy and sell shares in an experimental stock market on the basis of fundamental and technical information (past share price evolution, realized earnings, analysts' earnings forecasts, and evolution of the market index). We find that linear and threshold bonus schemes have different effects on trading behavior: traders make more transactions but of a smaller size under the threshold than under the linear bonus scheme. Furthermore, transaction frequency significantly decreases when bonus thresholds are reached but only after building in a safety margin. Under the threshold scheme, the traders' performance is lower (even when there are no transaction costs) than under the linear bonus scheme as a consequence of poorer market timing. This is especially the case when earning money by trading is relatively difficult (i.e., under low profitability conditions). Nevertheless, under low profitability conditions, traders seem to collect more information about the relationships between share price and market returns, earnings, and earnings forecasts, put more effort into understanding those relationships, and thus eventually learn to perform better.

1. Introduction

The proportion of U.S. public equities managed by professional investors has greatly increased over the last three decades, namely from 34% in 1980 to 67% in 2010 (Blume and Keim, 2012). While the main role of professionals is to invest on behalf of others, many of them also trade securities with their company's own money to make profits, i.e., they engage in proprietary trading, which involves extensive return volatility and skewness.[4] To sustain high risk levels, trading divisions usually offer compensation packages with a significant portion paid as a bonus depending on the trader's performance. According to Wall Street Oasis, bonuses account for around 54% of professional traders' total remuneration (WSO, 2013). Thus, bonuses are meant to influence trading behavior and make up a

* Corresponding author at: Department of Finance, Sauder School of Business, UBC, HA865 2053 Main Mall, Vancouver V6T 1Z2, Canada. Tel.: +1 604 822 3314.
E-mail addresses: elena.pikulina@sauder.ubc.ca (E. Pikulina), luc.renneboog@uvt.nl (L. Renneboog), j.terhorst@tiasnimbas.edu (J. Ter Horst), phil.tobler@econ.uzh.ch (P.N. Tobler).
[1] Tel.: +31 13 466 8210.
[2] Tel.: + 31 13 466 8600.
[3] Tel.: +41 44 634 3745.

[4] While proprietary trading typically generates small revenues as a percentage of total revenues, it tends to generate extreme losses during financial downturns. For example, in the period from June 2006 to December 2010, stand-alone proprietary trading activities at the six largest bank holding companies produced combined revenues of $15.6 billion in 13 out of 18 quarters and combined losses of $15.8 billion in the remaining 5 quarters (United States Government Accountability Office, 2011).

http://dx.doi.org/10.1016/j.jcorpfin.2014.09.010
0929-1199/

significant proportion of traders' pay. However, still little is known about how bonus schemes affect traders' propensity to trade and whether different bonus schemes used by the industry differentially improve traders' performance.

To our knowledge, this is the first study to investigate the influence of bonus schemes on traders' willingness to trade and on their performance. We set up two different bonus schemes to study trading behavior – more specifically, we study trading intensity and performance under controlled market conditions. We compare the impact of two different bonus schemes: (i) a linear bonus scheme, which always pays a fixed percentage of the total profit and which we use as a benchmark; and (ii) a threshold bonus scheme, which pays an increased percentage of the total profit when a threshold is reached (after which payment increases linearly until the next threshold is reached). Linear, but especially threshold bonus schemes are widely used by trading divisions of banks and funds, but the amounts, thresholds, and other details seem to be strictly confidential.[5]

The role of compensation schemes as a device to reduce agency costs has raised academic eyebrows over the last fifteen years (Bebchuk and Fried, 2004). The recent financial crisis has intensified this criticism not only in the academic literature but also on the part of investors and regulators. Public opinion is reflected in the observation of Timothy Geithner, the former US Treasury Secretary: "This financial crisis had many significant causes, but executive compensation practices were a contributing factor. Incentives for short term gains overwhelmed the checks and balances meant to mitigate against the risk of excess leverage" (Geithner, 2009). Whereas the relationship between the level and form of executive compensation and company performance has frequently been studied, little is known about how compensation packages and bonus schemes actually create incentives for traders.

Bonus schemes seem to play an eminent role in traders' motivation to trade and to perform well. Sometimes they evoke emotions, aspirations, and risk appetites that result in aberrant behavior, e.g., in the cases of Nick Leeson, Jérôme Kerviel, and Kweku Adoboli, whose fraudulent behavior cost their employers around 8 billion Euro. "Yes, I did it – but all I wanted was a bonus," commented Jérôme Kerviel on his trading loss of 4.9 billion Euros for Societe Generale (The Independent and The Times, 29 Oct. 2008). In a similar vein, Nick Leeson commented, "I suppose, I became indoctrinated by the lure of the salaries that were available and the whispered rumours of bonuses that were available" (Journal, ie, 19 Oct. 2011). These examples show that a misalignment between the interests of traders and their employers (be it investment banks, hedge funds, or corporations) may lead to severe problems. It is likely that specific compensation schemes induce suboptimal trading behavior that may ultimately lead to poor performance and significant corporate losses.

Bonus schemes may serve other purposes than increasing traders' risk taking. For example, they may be designed to increase trading intensity. This would be particularly relevant if a professional market maker earns higher profits by placing more trades or larger trades. However, empirical evidence suggests that such strategies do not necessarily lead to increased performance. Indeed, Garvey and Wu (2010) document that, for professional traders, higher trading activity on the last day of their evaluation period results in poorer performance due to poor market timing and higher transaction costs. Likewise, Barber and Odean (2000, 2001) demonstrate that, for individual investors, higher trading activity is likely to result in poorer performance due to higher transaction costs.

In our experimental study, we employ a two (bonus scheme: linear vs. threshold) by two (session profitability: low vs. high) between-subject experimental design. The linear bonus scheme always pays a fixed percentage of the profit earned by traders as their bonus. The threshold bonus scheme is piecewise linear; it sets two explicit performance goals at which a higher bonus and a steeper performance-bonus relationship can be reached. In particular, under the high-profitability conditions the lower threshold is relatively easy to reach, whereas under the low-profitability conditions, the same threshold is relatively difficult to attain.

We report a set of interesting results. First, under the threshold bonus scheme the traders trade more frequently but make transactions of a smaller size than under the linear one. Moreover, under the threshold scheme, transaction frequency significantly depends on whether or not a threshold is reached. Transaction frequency declines once a threshold is met; this effect is especially strong for the higher threshold. Our main finding is that the threshold bonus scheme fails to induce better performance, which is especially the case under low profitability conditions. Indeed, the quality of the investment decisions and the final performance are significantly lower under the threshold than the linear scheme. In our experiment, trading is costless, so the lower returns earned under the threshold scheme cannot be explained by transaction costs. We argue that reaching a threshold may itself become a target at the expense of optimal trading decisions. Thus, bonuses may be detrimental to performance at least in comparison with linear compensation schemes.

The remainder of this paper is organized as follows. Section 2 describes the experimental design and provides a detailed description of the two bonus schemes. Section 3 presents the results, and Section 4 concludes.

2. Experimental design

During fifty experimental trading rounds the participants in our experiment (henceforth called "traders") acted as the employees of a trading company (see appendix A for the experimental instructions). They bought and sold shares of a particular stock and were provided with fundamental (the company's past earnings and the analysts' earnings forecasts) and technical (the past evolution of the share price and the market index) information about the company and the market. All this information consisted of real data on the US company Praxair, Inc.[6] and on the US-based S&P500 market index. The data processes were linearly rescaled and Praxair's name was

[5] We have verified that our bonus schemes are realistic. Directors and traders of UBS, Goldman Sachs, JP Morgan, Merrill Lynch, and Deutsche Bank London confirmed that our schemes do make sense and are used in practice, although they were not willing to provide details or give examples of the threshold values or profit-sharing rules used in their companies. They also stated that the thresholds and degree of profit sharing not only depend on the individual traders' performance but also on their seniority, hierarchical rank, and the profitability of the department, division, and firm.

[6] We chose a company for which information on the earnings, analysts' forecasts, and share price performance was available for at least ten years. Moreover, the share price process did not experience sharp ups-and-downs and was characterized by a period with a prolonged upward movement and a period with a lower trend.