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Beyond information: Disclosure, distracted attention, and investor behavior[☆]Adrian Hillenbrand^{*}, André Schmelzer

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ABSTRACT

Financial disclosure documents provide investors with product details to facilitate informed investment decisions. We investigate whether the appearance – the visual frame – of disclosure documents impacts risk and return expectations and investment behavior. In our experiment, subjects decide about investments into real-life mutual funds. We find that subjects expect a smaller return variance, invest more and gather less correct information if visual distractors are present in the visual frame. Distracted attention is one potential explanation of our results suggesting that disclosure policies should take the visual frame into account.

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1. Introduction

Good investment decisions require the consideration of relevant information. However, processing this information is a demanding exercise. Most investors have limited capacities for handling it. Providing information in disclosure documents can help facilitate access to and reception of pertinent information.

One regulatory response to the financial crisis of 2007–2008 was aiming at improving consumer financial decision-making by simplifying disclosures (see also [Campbell et al., 2011](#)). More precisely, key investor documents (henceforth KIDs) were introduced as a requirement for investment funds in the European Union (UCITS 2009/65/EC). These mandatory documents aim at increasing understandability and comparability of financial products for retail investors. Present rules regulate content and structure of the information document.

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[Loewenstein et al. \(2014\)](#) highlight the role of attention in decision-making based on information disclosures. They state that psychological factors such as limited attention can severely undermine the efficacy of disclosure as a public policy. [Bhargava and Loewenstein \(2015\)](#) argue that policy makers should protect consumers from firms exploiting their inattention. We examine one consequence of limited attention: the possibility of being distracted. Salience can be regarded as the other side of that coin ([Bordalo et al., 2015](#)). In general, distracted attention and salience presuppose the limited resource of attention studied for instance by [Hirshleifer and Teoh \(2003\)](#) and [DellaVigna and Pollet \(2009\)](#).

If attention is key, we claim that the visual frame of disclosure documents becomes crucial. We define *visual frame* as the frame encompassing information which itself does not contain additional informational value about the product. This visual frame could include firm-specific visual distractors. *Visual distractors* are parts of the frame that distract attention from the content of the document. These could be logos, banners or colors in the document. Attention is prone to distraction in tasks requiring a high working memory load (mental effort), such as reading disclosures ([Lavie et al., 2004](#)). By distracting attention, the visual frame could impact decision-making.

In this paper, we investigate experimentally whether standardizing the visual frame of disclosures impacts risk and return

expectations and investment behavior. We standardize the visual frame by removing firm-related visual distractors. We employ a between-subjects design. In our treatments, we compare investments into real-life mutual funds based on original documents (*original*) with investments based on standardized documents (*neutral*). We use real-life documents complying with the EU regulations.

The laboratory setting enables us to control the information environment and exclude additional distractors and potential confounding factors. Importantly, this allows us to infer a causal relation from changing the visual frame of disclosures on investment behavior. Thanks to this setting, we are also able to elicit data on expected returns and expected variance, to track reading times, and to check subjects' understanding of the documents – valuable information to shed light on the mechanism behind the investment choice.

We find that investments are significantly higher if visual distractors are present in the document. While the expected values are on average similar in both treatments, the expected variance of returns is significantly smaller for investors facing visual distractors.

We provide potential explanations for this behavior. In particular, we propose one potential psychological mechanism based on the literature: distracted attention. Results are in line with the distracted attention mechanism: Individuals spent more time and acquire more correct information when reading standardized documents. The documents are perceived as equally informative, i.e., subjects reading the original documents are not aware that they capture less information.

The main contribution of our paper is to provide experimental evidence that the visual frame itself impacts expectations and choice behavior. This complements the recent literature finding that changing information in the document influences choice behavior mainly through information about finance costs, examples, or a purpose (Bertrand et al., 2010; Bertrand and Morse, 2011; Beshears et al., 2015). In this paper we change the visual frame, while holding information constant.

Our work is related to the financial decision-making and portfolio choice literature. In particular, we contribute to the literature on determinants of mutual fund investment behavior. Here, it is commonly found that individuals do not invest optimally. Current research finds that mutual fund investors disregard costs (Barber et al., 2006; Pontari et al., 2009; Choi et al., 2010). Sirri and Tufano (1998) regard search costs to be a major determinant of investment behavior. Search costs are argued to explain general advertising effects in the mutual fund market (Sirri and Tufano, 1998; Jain and Wu, 2000; Lee et al., 2012). In particular, the marketing literature suggests that strong and familiar brands are able to generate an advantage through advertising (e.g., Hoeffler and Keller, 2003; Stahl et al., 2012). In contrast, we find no interaction effect between familiarity of the fund and the disclosures containing firm-related visual distractors.

One particular line of literature focuses on the impact of changing the quality of information by presenting it in different formats. There is evidence that individuals focus on graphical and salient information (Jarvenpaa, 1989). The perception of risk information in graphical presentations is also found to impact portfolio choice by the degree of aggregation of risk and return information (Kaufmann and Weber, 2013). In line with these findings, de Goeij et al. (2014) claim that graphical representation of risk and return may also have a debiasing effect. Bateman et al. (2016) find that the presentation of risk disclosure influences choices. Weber et al. (2005) find that the presentation format of historical returns and asset name familiarity impact expectations.

A second line of literature focuses on the effect of changing the quantity of information by comparing short and long disclosures.

In particular, there is evidence specifically on KID disclosure documents. Results on the impact of a decreasing quantity of information on mutual fund choice are mixed. Beshears et al. (2011) find that there is no effect on portfolio choice comparing short and long disclosures. In contrast, Walther (2015) finds that there is a positive effect of short information on perceived information quality and a negative impact on information overload. The findings of Kozup et al. (2008) on short disclosures are consistent with the literature on mutual funds. That is, investors are found to discard costs and to focus on historical information. Again, we depart from both lines of literature. In our experiment, we do not change information, but the visual frame.

From a policy perspective, our results indicate that the visual frame needs to be considered in designing disclosure policies. On behalf of the European Commission (EC), specific KID testings have been carried out (IFF Research and YouGov, 2009). The report indicates that individuals prefer a risk indicator, ten years of past performance in a bar chart, and costs displayed in a separate table. These suggestions have been implemented in disclosure policies. The report of Chater et al. (2010), also prepared for the EC, provides representative experimental evidence across EU countries that retail investors are prone to biases and do not decide optimally. However, both reports are silent about the visual frame. The same holds true for a more recent consumer-testing study on packaged retail and insurance-based investment products (PRIIPs) (London Economics and Ipsos, 2015). Similarly to the study above different visualizations of the risk indicator and past performance are tested. However, the overall visual frame of the documents is not discussed.

Finally, our work on the visual frame is also informative for the growing field of robo-advisors. Here, it is important to consider the visual frame because information is only transmitted via visual display.

The remainder of this paper is organized as follows. Section 2 introduces the experimental hypothesis. Our experimental design and the treatment variation is explained in Section 3. Section 4 presents the main findings, namely that individuals expect a significantly smaller return variance and invest more in *original*. Evidence in favor of the distracted attention mechanism is provided. Section 5 concludes.

2. Experimental hypothesis

In our experiment, we investigate how different visual frames influence investment choices. We define visual frame as the frame encompassing information which itself does not contain additional informational value about the product. This visual frame could include firm-specific visual distractors such as banners and logos. We compare a standardized visual frame in which colors, banners, and logos are removed (*neutral*) with a visual frame containing distractors (*original*). From the literature, we derive an experimental hypothesis with regard to the expected value, the variance, and the resulting investment differences between treatments. In the following, we will discuss one potential channel based on distracted attention. We also discuss some other effects potentially impairing the results.

From the psychology literature we know that visual distractors influence choices if the working memory load is high (de Fockert et al., 2001; Lavie et al., 2004). Visual distractors automatically draw attention. Shifting attention voluntarily from these features to relevant information costs effort (Itti and Koch, 2001). We call this effect “distracted attention”.

Investors receiving information have a high working memory load which makes them prone to visual distractors (Lavie et al., 2004). We claim that by being distracted, investors gather less information. In particular, relevant information such as disclaimers

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