Journal of Behavioral and Experimental Finance 9 (2016) 81–87

Contents lists available at ScienceDirect

Journal of Behavioral and Experimental Finance

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

Full length article

On the impact of semantic framing in experimental asset markets☆

Matthias Stefan

University of Innsbruck, Department of Banking and Finance, Universitätsstrasse 15, 6020 Innsbruck, Austria

ARTICLE INFO

Article history:
Received 31 March 2015
Received in revised form 20 November 2015
Accepted 30 November 2015
Available online 18 January 2016

JEL classification:
C91
G02

Keywords:
Experimental finance
Framing
Semantic information
Price efficiency
Asset markets

ABSTRACT

This paper studies how semantic framing affects price efficiency. In an experimental asset market subjects are provided with an overly positive, overly negative or no description of the asset traded. This description provides no information about the asset's value. Prices are neither lower when subjects are negatively framed nor higher when subjects are positively framed compared to a treatment without framing. Furthermore, learning effects and price dynamics are comparable across treatments. I discuss two possible explanations from individual choice experiments, namely, that completely described problems and ratings and judgments are less prone to framing. Furthermore, I discuss an alternative possible explanation that asset markets are able to prevent biases to occur.

1. Introduction

In their seminal paper Tversky and Kahneman (1981) define framing as situations "in which seemingly inconsequential changes in the formulation of choice problems caused significant shifts of preference" (p. 457). Subjects facing a decision problem might have different preferences when the same choice problem is presented differently. In other words, framing describes situations where the same problem is presented in different ways and where these different presentation formats alter the subject's choices.

Assuming fully rational subjects, the presentation format of a problem and its outcomes alone should not influence the choices made. Nevertheless, there is ample evidence of framing effects in individual choice experiments. Tversky and Kahneman (1981) and Kahneman and Tversky (1983) observe framing effects in lotteries with monetary payouts. When outcomes are framed as losses, people act more risk seeking while they act more risk averse when outcomes are framed as gains. They explain their finding with Prospect Theory's prediction of risk aversion in the gain domain and risk seeking in the loss domain. McNeil et al. (1982) show that the framing of medical statistics of mortality rates alters choices based thereon. Kahneman and Riepe (1998) argue that framing is relevant for financial decisions. There is, however, evidence of diminishing framing effects when missing items in the information and thus complete descriptions of the problem are provided (Kühberger, 1995). In a meta-analysis, Kühberger (1998) argues that moderate framing effects are found regularly when reference points are manipulated. In another meta-analysis, Kühberger et al. (1999) find that framing effects interact with very high and very low probabilities and high payoffs.

☆ I thank Michael Kirchler and Jürgen Huber for their ongoing support, an anonymous referee, Stefan Palan, Michael Razen and Thomas Stöckl for their helpful comments, and Lukas Schultze for his help in the lab. Financial support from the Austrian Science Fund (FWF START-grant Y617-G11) is gratefully acknowledged.

E-mail address: matthias.stefan@uibk.ac.at.

http://dx.doi.org/10.1016/j.jbef.2015.11.006
2214-6350/

In asset markets, beliefs about fundamentals are regularly formed on the basis of semantic information about assets. This information is available in the media (Engelberg and Parsons, 2011) and the internet (Barber and Odean, 2001). When reading news about corporations, company analyses or firm assessments, traders are facing qualitative information that they use for estimating the asset's value and subsequently for their pricing behavior. Thus, focusing solely on quantitative information might be insufficient to understand market behavior. Still, the vast majority of asset market models are built on probability distributions where quantitative information on the asset's payoffs are provided.

To the best of my knowledge, there is only one paper that investigates framing effects in an experimental market setting (Kirchler et al., 2005). In this study, the authors avoid semantic variations of the decision problem, but add additional percentile information to the asset description to frame the decision problem either positively or negatively. The study shows that the framing of payoffs influences trading behavior in double auction markets. Positively framed traders tend to buy assets from negatively framed traders and vice versa. While this study tackles an important research gap, it differs from the study presented here in at least two ways. First, Kirchler et al. (2005) avoid semantic variations in framing. In contrast, I specifically investigate *semantic* framing. Second, the study of Kirchler et al. (2005) mainly focuses on individual trading behavior and mentions prices only marginally, since it investigates markets with positively and negatively framed subjects. In contrast, I want to investigate markets with only positively or negatively framed subjects in detail, thereby exploring price efficiency questions.

In particular, I investigate the impact of semantic framing on price efficiency in an experimental asset market. I provide subjects with an overly positive, overly negative or no description of a fictive company whose asset is traded. This description provides no information about the asset's value. I study how semantic descriptions influence pricing behavior irrespective of their contents. Depriving the description of any information value in the laboratory, framing effects can be distinguished from subjects' interpretation of an information content. Since literature shows that framing can have an impact on individual decisions, I conjecture that a positive (negative) description of an asset leads to higher (lower) valuation of the asset. In turn, higher average prices are expected in markets with positively framed subjects and lower average prices in markets with negatively framed subjects.

I find that, on average, there are no differences in prices between the different framing conditions. Furthermore, price trends and learning effects are comparable. Thus, for this experiment I *cannot* reject the null hypothesis that semantic framing has *no* impact on efficiency of prices.

2. The experiment

2.1. Endowments and asset value

Subjects only participate in one session of the experiment. A cohort of eight subjects trade an asset in a period of six minutes in one market. Subjects have an initial endowment of 40 assets and 2000 Talers (cash).[1] Each unit of the asset pays either 15 or 24 with equal probability at the end of the trading period. A random draw decides the payout of the asset, which is multiplied by a subject's end holdings of the asset and added to the end holdings in Taler. Finally, this sum in Taler is exchanged into Euros at the exchange rate of 1000/2. The asset's expected terminal value (ETV) exhibits a standard deviation of 4.5 and a skewness of 0. Furthermore, the two possible payouts of the asset as well as their probabilities are public knowledge.

Table 1
Treatment overview.

Treatment	Information about TV	Semantic description
NO: no framing	Public knowledge	No additional information
POS: positive framing	Public knowledge	Positive
NEG: negative framing	Public knowledge	Negative

2.2. Treatments

In 12 markets (of Treatment NO) subjects get no semantic description in addition to the possible payouts (TV) and their probabilities; in 12 markets (of Treatment POS) subjects get an additional but irrelevant description that is overly positive; in 12 markets (of Treatment NEG) subjects get an additional but irrelevant description that is overly negative. The positive and the negative descriptions are mirrored, such that they describe the same situation in one case positively and in the other case negatively.[2] Table 1 outlines the treatment design with the nature of additional semantic description as treatment variable.

In the instructions it is made clear that the income from the experiment is calculated from the randomly drawn TV. Therefore, all necessary information to price the asset correctly is given and all additional descriptions of the company that constitutes the treatment variable are irrelevant for correctly pricing the asset. The description of the company for the different treatments reads as follows:

"In this period you can trade assets of a company with the following company report:

In Treatment NO: The following payoffs can be expected for the company: with a probability of 50% a payoff of 24, and with a probability of 50% a payoff of 15. The company in question belongs to the IT industry and has developed a new microprocessor technology.

In Treatment POS (NEG): The following, high (low) payoffs can be expected for the company: with a probability of 50% a payoff of 24, and with a probability of 50% a payoff of 15. The company in question belongs to the IT industry and has

[1] Only few subjects hit their cash or asset constraints: at the end of the trading period only 6 out of 288 subjects in all treatments are below 10% of the initial money endowment and only 21 out of 288 are below 10% of the initial asset endowment.

[2] Subjects are not asked how strongly they are influenced by the framing, so as not to call their attention to the framing and the lack of information content of the descriptions.