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## Journal of Economic Behavior &amp; Organization

journal homepage: [www.elsevier.com/locate/jebo](http://www.elsevier.com/locate/jebo)

## Past returns and the perceived Sharpe ratio

Guy Kaplanski<sup>a</sup>, Haim Levy<sup>b</sup>, Chris Veld<sup>c,\*</sup>, Yulia Veld-Merkoulova<sup>c</sup><sup>a</sup> Bar-Ilan University, Israel<sup>b</sup> Hebrew University of Jerusalem, Israel<sup>c</sup> Monash University, Australia

## ARTICLE INFO

## Article history:

Received 15 March 2015

Received in revised form 8 October 2015

Accepted 19 November 2015

Available online 17 December 2015

## JEL classification:

D81

G02

G10

G14

## Keywords:

Expected return

Perceived risk

Perceived Sharpe ratio

Market efficiency

Random walk

## ABSTRACT

We find that human perception contradicts the market efficiency assertions that high expected returns are accompanied by high risk and that past returns are not correlated with future returns. A survey of investors reveals that the last month realized returns are positively correlated with next month perceived returns and that they are negatively correlated with perceived risk. Neither expected return nor perceived risk captures the entire effect. Thus, in the human mind the “perceived Sharpe ratio” is positively correlated with short-term past returns. The effect does not depend on gender, education, income, and portfolio value, but it is more profound among older investors.

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## 1. Introduction

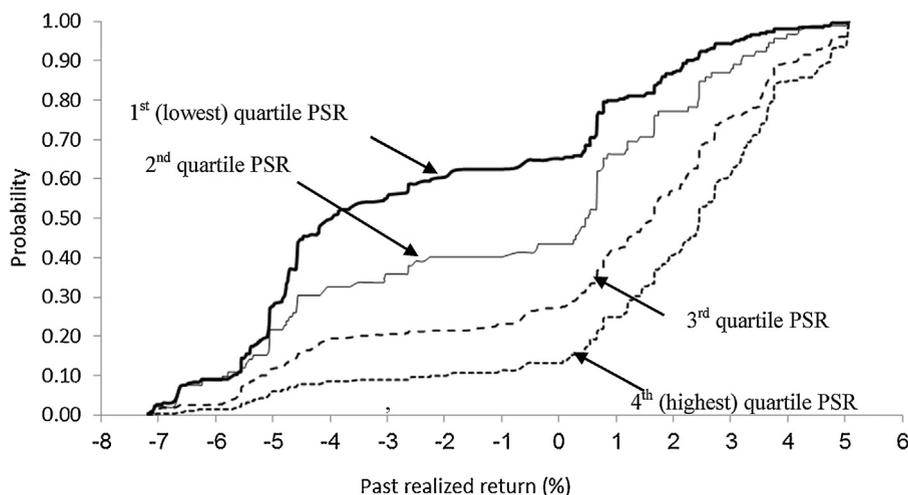
Two major assertions stemming from the Efficient Market Hypothesis are that there are no “free lunch” opportunities, in terms of having higher expected returns accompanied by lower risks,<sup>2</sup> and that the time pattern of historical returns is random. While these two assertions are commonly tested empirically, we use a survey of investors to show that human perception contradicts these two pillars of the market efficiency theory. Specifically, when individuals are confronted with

\* Corresponding author at: Monash University, Caulfield, Melbourne, Vic 3145, Australia. Tel.: +61 399034142.

E-mail address: [chris.veld@monash.edu](mailto:chris.veld@monash.edu) (C. Veld).

<sup>1</sup> The LISS panel data were collected by CentERdata (Tilburg University, the Netherlands) through its MESS project funded by the Netherlands Organization for Scientific Research (NWO). The authors gratefully acknowledge the additional financial support from La Chaire Dauphine – ENSEA – Groupama “Les Particulier face au risque” of the “Fondation du Risque” and L’Agence Nationale de la Recherche in the context of the project ANR Risk. Part of the research for this project was completed when Chris Veld and Yulia Veld-Merkoulova were affiliated with the University of Glasgow in Scotland. The authors are grateful to Seth Armitage, Jo Danbolt, Arie Kapteyn, Igor Loncarski, Bill Rees, Norbert Schwartz, Arthur van Soest, Patrick Verwijmeren, Betty Wu, Jing Zhao, and participants at the 27th Australasian Finance and Banking Conference in Sydney, the FIRN Annual Conference in Lake Crackenback (NSW), the LISS workshop in Scheveningen, the Scottish BAFA Conference in Glasgow, and seminars at the University of Ljubljana, University of Edinburgh, and Stirling University for helpful comments and suggestions. Special thanks go to the editor, William Neilson, and two anonymous referees. In addition the authors thank Marije Oudejans for her help with the panel and Daniel Gyimah for his excellent research assistance.

<sup>2</sup> Our definition of a free lunch does not mean a riskless arbitrage opportunity but rather follows that of Malkiel and Xu (1997) who argue that over the long run it is not possible to achieve exceptional returns without accepting substantial risk.



**Fig. 1.** Cumulative distribution functions (CDFs) of the perceived Sharpe ratio (PSR). The horizontal axis denotes the last month realized return on the Amsterdam Exchange Index (AEX) that each subject faced when filling out the questionnaire. The CDFs correspond to four groups of subjects categorized by their next month AEX perceived Sharpe ratio (PSR).

high past returns they envision investment opportunities with a relatively low risk and a relatively high return. Hence, the “perceived Sharpe ratio” (hereafter PSR) is relatively high and investors believe that there are free lunch opportunities.

In this study we investigate whether short-term past returns are associated with the future expected return and perceived risk of individual investors. We employ the same data-set collected by [Kaplanski et al. \(2015\)](#) for which they survey subjects who actually trade in the stock market.<sup>3</sup> [Kaplanski et al. \(2015\)](#) analyze the relation between the reported mood of subjects and their perceived future return in the stock market after controlling for past realized stock returns. Hence, the effect of mood is measured net of past price changes. This study complements the previous study by focusing on the relation between past market performance and the PSR, which is defined as the investor excessive expected return on the stock market index divided by perceived risk. To calculate the PSR investors were asked their estimate for the next month and next year expected return, expressed in percentages, and perceived risk, expressed in relative terms to normal risk conditions. Subjects were asked for their estimations corresponding to both the domestic Dutch market and the more global U.S. market, where the time they made their estimations is given in a resolution of minutes.

Our analysis shows that the expected return and perceived risk of investors are significantly correlated with past realized returns corresponding to short-term horizons with the strongest correlation at 21 trading days, i.e. exactly at one month. Moreover, expected return and perceived risk are negatively correlated,<sup>4</sup> implying that the PSR is positively correlated with past returns. This perceived risk-return pattern is intact in both the domestic market and the global market.

[Fig. 1](#) illustrates the main results of this study: subjects who are confronted with high realized returns before filling out the questionnaire, on average expect a higher PSR compared to subjects who face low realized returns. The figure juxtaposes the cumulative distribution functions (CDFs) of the last month (21 trading days) realized returns corresponding to subjects categorized in four groups according to their PSR for the coming month. The selection of the past 21 trading days (generally subjects filled out the questionnaire on different days) as the primary past horizon is based on the statistical results of this study, but the main results do not hinge on this horizon and are intact for other close horizons.<sup>5</sup> The CDF corresponding to the highest quartile’s PSR is located in the figure entirely to the right of the next quartile CDF, and so forth. This result implies that for the group of subjects belonging to the higher quartile of PSR, more subjects observed high realized returns before filling out the questionnaire than subjects belonging to the lower quartile. These results are confirmed in our more rigorous statistical analysis. We find that investors who have experienced higher past realized returns (before filling out the questionnaire) predict both higher returns and lower risk for the next month compared to investors who were confronted

<sup>3</sup> The use of survey information to learn about investor behavior is not unique to our study. Previous studies that use investor surveys include [Dorn and Huberman \(2005\)](#) who examine the causes for individual investor failure to hold diversified portfolios, [Graham et al. \(2009\)](#) who study the relation between investor competence, trading frequency, and the home bias, and recently [Weber et al. \(2013\)](#) who investigate individual investor risk taking during the Global Financial Crisis, [Hoffmann and Shefrin \(2014\)](#) who show that the use of technical analysis by individual investors when trading options led to poor portfolio decisions, and [Merkle and Weber \(2014\)](#) who look at stock market expectations and investor behavior.

<sup>4</sup> Economic theory and asset pricing models advocate that high expected return is generally accompanied by high risk. Subjects may be optimistic or pessimistic with regard to the stock market. For example, when there is a chance for signing a peace treaty between two countries, investors may be optimistic. Hence for the near future they perceive both high expected return and low risk. Nevertheless, this result is not in contradiction to economic theory because the new information implies that prices deviate from the equilibrium and a new equilibrium is sought by investors. Once prices instantaneously adjust to the new information, risk-return relations as advocated by economic theory are restored. However, in our study there is no such dramatic new information. Large expected return accompanied by low expected risk is generally in contradiction with economic theory.

<sup>5</sup> We are grateful to the two anonymous referees for bringing up the subject of the horizon that we believe is an important contribution of this study.

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