Journal of Banking and Finance 88 (2018) 52–62

Contents lists available at ScienceDirect

Journal of Banking and Finance

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

Loss aversion around the world: Empirical evidence from pension funds[☆]

Yuxin Xie[a], Soosung Hwang[b,*], Athanasios A. Pantelous[c]

[a] School of Securities and Futures, Southwestern University of Finance and Economics, China
[b] College of Economics, Sungkyunkwan University, 25-2 Sungkyunkwan-ro, Jongno-Gu, Seoul 110-745, Republic of Korea
[c] Department of Mathematical Sciences, University of Liverpool, United Kingdom

ARTICLE INFO

Article history:
Received 14 June 2017
Accepted 10 November 2017
Available online 16 November 2017

JEL Classification:
G11
G12
G15

Keywords:
Loss aversion
Cultural dimensions
Reference-dependent utility
Pension funds

ABSTRACT

We propose a novel method to estimate loss aversion together with risk aversion and subjective probability weighting in a reference-dependent utility. Using multiple asset allocations in the 31 OECD pension funds, we find that our estimates of loss aversion and subjective probability weights are similar to those reported by Wang et al. (2017) and Rieger et al. (2011), respectively, despite the differences in the estimation methods. However, loss aversion increases with wealth and only Hofstede's Individualism is positively related to loss aversion. Countries with high individualism or masculinity prefer high risk and high return assets to bonds, whereas countries that dislike uncertainty prefer bonds to risky assets.

© 2017 Elsevier B.V. All rights reserved.

1. Introduction

Reference-dependent utility has attracted considerable attention in the literature since the introduction of loss aversion (Tversky and Kahneman, 1979) and disappointment aversion (Bell, 1985; Gul, 1991). Despite the difference between these two preferences (Ang et al., 2005), they have a common feature that losses (disappointments) are weighted more than gains (elations). Many studies show that loss aversion can be used to explain decision making in finance and economics (e.g., Barberis and Huang, 2001; Lien and Wang, 2002; Lien and Wang, 2003; Berkelaar et al., 2004; Ang et al., 2005; Fielding and Stracca, 2007; Hwang and Satchell, 2010; Routledge and Zin, 2010; Giorgi and Post, 2011; Pagel, 2015).

Notwithstanding the popularity of reference-dependent utility, its applications in finance are not as straightforward as those of the conventional utility because of unknown parameters inherent in the reference-dependent utility. A typical approach is to estimate loss aversion for given values of other parameters (e.g., Tversky and Kahneman, 1992; Abdellaoui et al., 2007; Fielding and Stracca, 2007; Tom et al., 2007; Booij and van de Kuilen, 2009; Sokol-Hessner et al., 2009; Hwang and Satchell, 2010). Others estimate loss aversion or subjective probability weighting from lottery-choice questions using surveys or experiments (e.g., Rieger et al., 2015; Wang et al., 2017). Although lottery-choice questions have merits that loss aversion can be estimated independently of other behavioral attitudes under a controlled situation, they may not properly simulate monetary incentives or stress in real investment decision making. This may raise concerns for weak correlations between estimated risk attitudes and actual risk-taking behaviors (Lönnqvist et al., 2015).

We investigate loss aversion around the world using asset allocation of pension funds. Pension funds are widely used as a representative agent for asset allocation problems (Canner et al., 1997; Campbell and Viceira, 2002). Their asset allocations reflect strategic decisions of boards of trustees or regulations of countries over

---

[☆] The authors would like to acknowledge the gracious supports of the National Research Foundation of Korea Grant funded by the Korean Government [NRF-2014S1A5B8060964] and the EPSRC and ESRC Centre for Doctoral Training on Quantification and Management of Risk & Uncertainty in Complex Systems & Environments (EP/L015927/1). We would like to thank participants at the Southwestern Finance Association, World Finance Conference, and Korean Securities Association conferences, and at University of Liverpool, University of Glasgow, Sungkyunkwan University, Shanghai University, Xi'an Jiatong-Liverpool University as well as Wilko Bolt, Bahattin Buyuksahin, Eric Cardella, Andros Gregoriou, Chris Florackis, Daniel Folkinshteyn, Chulwoo Han, Vasileios Kallinterakis, Minseong Kim Gulser Meric, and Micaela Pagel for helpful comments.

[*] Corresponding author.
E-mail addresses: yuxinxie@swufe.edu.cn (Y. Xie), shwang@skku.edu (S. Hwang), a.pantelous@liverpool.ac.uk (A.A. Pantelous).

https://doi.org/10.1016/j.jbankfin.2017.11.007
0378-4266/© 2017 Elsevier B.V. All rights reserved.

long investment horizons, and thus are less dependent on the market conditions but would show cultural traits of countries.

For this purpose, we propose a novel method to estimate loss aversion together with other preference parameters in a multiple asset allocation problem where the optimal investment weights in risky assets are jointly influenced by loss aversion, risk aversion, and subjective probability weighting in addition to the performance of each asset class. Without considering the performance of asset classes, the difference in asset allocation may be misinterpreted as difference in investor preferences. We then investigate if the loss aversion we estimate using pension funds is associated with wealth level or cultural dimensions. If the way in which we express emotion is largely connected to our culture (Matsumoto et al., 2008; Mauss and Butler, 2010), then differences in loss aversion may be also motivated by cultural differences defined by Hofstede (2001).[1]

The reference-dependent utility function we use in this study consists of wealth utility as well as gain-loss utility, in which loss aversion, risk aversion, and subjective probability weighting are parameterized. The wealth utility reflects the absolute pleasure of consumption that has been used in the literature, and helps to avoid misleading results by ignoring utility from consumption (Barberis, 2013). Assuming that the gain-loss utility is additively separable for different asset classes as in Koszegi and Rabin (2006), and interpreting the gain-loss utility as a risk measure Jia and Dyer (1996), we obtain a nonlinear relationship among the optimal investment proportions, loss aversion, risk aversion, the expected excess returns, and the sensation of losses or gains. Using the first order conditions of the optimal asset allocation in pension funds, we estimate three parameters (loss aversion, risk aversion, and subjective probability weighting) simultaneously using the Generalized Method of Moments (GMM).

Our empirical results show that the average values (standard deviations) of loss aversion, risk aversion, and probability weighting of 31 OECD countries are 1.74 (0.64), 1.42 (0.13) and 0.78 (0.20), respectively. The estimates of loss aversion and subjective probability weighting are similar to those reported by Wang et al. (2017) and Rieger et al. (2011), respectively. However, due to the differences in the estimation methods and decision makers, pension fund managers show the following distinct preferences with respect to those reported in the literature.

We find that loss aversion increases with wealth. When loss aversion is regressed on GDP per capita (as the proxy for wealth), the coefficient is positive and significant after controlling several other economic variables. This result is different from those of Wang et al. (2017) who do not find a significant relationship between loss aversion and wealth. Our results support that wealthier investors suffer higher disutility from disappointing outcomes.

Individualistic countries are more loss averse than collectivistic countries. This is consistent with the view that individualistic investors tend to be overconfident of their expectations in risky assets, making themselves more disappointed for losses (Beugelsdijk and Frijns, 2010; Chui et al., 2010; Frijns et al., 2013; Breuer et al., 2014). However, we do not find empirical evidence that loss aversion is affected by other cultural dimensions such as masculinity, power distance, or uncertainty avoidance (Wang et al., 2017).

Interestingly, cultural dimensions affect asset allocation in pension funds. Countries whose individualism or masculinity is high prefer asset classes with slightly more risky but higher returns to bonds, whereas countries that dislike uncertainty prefer bonds to risky equities. Although bonds are not risk-free, pension fund managers prefer them as choices of risk-avoiding against equities and other investments.

Our main contribution is to provide a new method that can be used to estimate directly investor preferences. Many studies have conducted surveys or laboratory experiments with students in the fields of decision theory or psychology. However, differences exist in the way the decision makers behave in experiments and in real financial markets (Levitt and List, 2007; Lönnqvist et al., 2015), because it is difficult to design experiments that include important components in practice, e.g., decision making with a large dollar amount of investment. Despite the similarities between our estimates of loss aversion and subjective probability weighting and those reported in the literature, we also find some differences in the preferences.

The remainder of this paper is organized as follows. In the next section, we propose our reference-dependent utility function and show how the optimal asset allocation in risky assets is affected by investor preferences. In Section 3, we report our estimates and investigate loss aversion with respect to wealth and cultural dimensions. Section 4 concludes the paper.

2. Asset allocation with reference-dependent utility

A reference-dependent utility is proposed to investigate how assets are allocated with respect to loss aversion, risk aversion, and subjective probability weighting. As in Koszegi and Rabin (2006), investors' utility depends on multi-dimensional wealth portfolios as well as reference dependent portfolios.

2.1. The model of a reference-dependent utility

The reference-dependent utility, $u(W, \mu_W)$, in this study consists of the typical wealth utility and the gain-loss utility as follows:[2]

$$uW, \mu_W \equiv \mu_W - \varphi\left[A|W-\mu_W|^{\nu}I^{-} - |W-\mu_W|^{\nu}\left(1-I^{-}\right)\right], \qquad (1)$$

where W represents the end-of-period wealth, μ_W is the expected wealth, and I^{-} is an indicator variable that equals one when $W - \mu_W < 0$, and zero otherwise. For loss aversion, $A > 1$ is required to give extra weights on the sensation of loss.

The first component of the reference-dependent utility is the expected end-of-period wealth μ_W, which represents utility from consumption via wealth. As suggested by Jia and Dyer (1996), Koszegi and Rabin (2006), and Barberis (2013), neglecting the absolute pleasure of consumption surely leads to biased conclusions. Our reference-dependent utility increases linearly with the expected wealth, satisfying the non-satiation condition, and allowing our model to be tractable (Barberis, 2013). As required for the utility of consumption bundle of Koszegi and Rabin (2006), the wealth utility (expected wealth) is differentiable and strictly increasing. This linear wealth utility makes the risk-return relationship clear in our reference-dependent frame. For example, when the popular *hyperbolic absolute risk aversion* (HARA) class of utility functions such as power utility or log-utility is used as wealth utility (e.g., Barberis and Huang, 2001; Gomes, 2005; Pagel, 2015), we have two risks in our reference-dependent utility: one from the concavity of the HARA class, and the other included in the gain-loss utility that is explained below.

The second component inside the square brackets in Eq. (1), which we refer to as the *gain-loss utility*, represents utility derived from gains and losses. We use the expected wealth as the

---

[1] Investigating the interaction between risk preferences and cultural measures has been significantly promoted in the last few years (Rieger *et al*., 2011; Rieger *et al*., 2015; Wang *et al*., 2017).

[2] For an application of the reference-dependent utility in the asset allocation problem, we use wealth to represent consumption. When power utility is used in the gain-loss utility, the optimal investment proportion obtained from using wealth is not different from that with consumption because of its constant relative risk aversion (Campbell and Viceira, 2002).

Download English Version:

https://daneshyari.com/en/article/7356612

Download Persian Version:

https://daneshyari.com/article/7356612

Daneshyari.com