Journal of Economic Psychology 32 (2011) 918–939

Contents lists available at ScienceDirect

Journal of Economic Psychology

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

Investment, resolution of risk, and the role of affect

Frans van Winden [a,*], Michal Krawczyk [b], Astrid Hopfensitz [c]

[a] University of Amsterdam, CEPR, CES-ifo and Tinbergen Institute, Netherlands
[b] Faculty of Economic Sciences, University of Warsaw, Poland
[c] Toulouse School of Economics (GREMAQ), University of Toulouse 1, Toulouse, France

ARTICLE INFO

Article history:
Received 9 November 2010
Received in revised form 18 July 2011
Accepted 23 July 2011
Available online 3 August 2011

JEL classification:
C91
D81
G11

PsycINFO classification:
2340
2360

Keywords:
Investment decision
Delayed resolution of risk
Emotions
Experiment

ABSTRACT

This experimental study is concerned with the impact of the timing of the resolution of risk on investment behavior, with a special focus on the role of affect. In a between-subjects design, we observe the impact of a substantial delay of risk resolution (2 days) on investment choices. Besides the resolution timing all other factors, including the timing of payout, are held constant across treatments. In addition, state-of-the-art experimental techniques from experimental economics and psychology are used for eliciting preferences and to explicitly measure emotions and personality traits. Participants put their own money at stake. Our main finding is that the timing of the resolution of risk matters for investment, modulated by the probability of investment success. Emotions are found to play a significant role in this respect and explain our main finding. Our results support recent models of decision making under risk trying to incorporate anticipatory emotions but also uncover some important shortcomings related to the dynamics of emotions.

1. Introduction

The recent financial and subsequent economic crisis has fuelled the discussion in economics regarding the rationality of financial markets and investment behavior. Instead of cold calculations, emotions like greed and fear are often referred to as motivational factors in debates about the crisis. The "animal spirits" that Keynes alluded to when he discussed the role of expectations in investment in his *General Theory* are back in business (see Akerlof & Schiller, 2009; Greenspan, 2008). In this paper, we will investigate the role of emotions in risk taking in a much simpler but controlled setting, focusing on the time it takes for risks to materialize.

Whenever we take a risk time passes between the decision to take the risk and the resolution of that risk. This time can be very short, as with on-the-spot lotteries, but it can also be very long, like in research for new drugs. Other examples can be found when looking at decisions concerning medical examinations or health and safety related activities. In mainstream economics this time dimension has received little attention. Only planning motives related to consumption smoothing facilitated by prior knowledge of outcomes have been considered (Dreze & Modigliani, 1972; Spence & Zeckhauser, 1972).

* Corresponding author. Address: CREED, Amsterdam School of Economics, University of Amsterdam, Roetersstraat 11, 1018 WB Amsterdam, Netherlands. Tel.: +31 20 5254251.
E-mail address: f.a.a.m.vanwinden@uva.nl (F. van Winden).

0167-4870/$ - see front matter © 2011 Elsevier B.V. All rights reserved.
doi:10.1016/j.joep.2011.07.007

However, there is a small but growing literature acknowledging that the timing of the resolution of risk can be important for other reasons. Kreps and Porteus (1978) proposed a theoretical formalization of preferences for early or later resolution. More recently, economists have begun to emphasize and to explore the role of anticipatory emotions in this context. Anticipatory emotions are emotions like hope and fear that are experienced while awaiting the resolution of an uncertain event. In a series of papers Pope has argued that economists have neglected these emotions because they failed to make a proper distinction between (anticipated) experiences before and after risk is resolved, between pre- and post-outcome stages of decision making (Pope, 1983, 1995, 2004; Pope & Selten, 2010). For example, the arousal felt when looking at a spinning roulette wheel may add to the attractiveness of a gamble with delayed resolution. On the other hand, fear may induce some people to avoid medical testing (see Hoel, Iversen, Nilssen, & Vislie, 2006). Long-lasting uncertainties can even have long term health effects due to stress and anxiety (Lazarus, 1991).

Although emotions related to risk have received attention in economics in the past, these studies typically focused implicitly on anticipated emotions, particularly, regret and disappointment experienced in the post-outcome stage, after outcomes are observed (Bell, 1982, 1985; Loomes & Sugden, 1982, 1986; for a recent study, see Filiz-Ozbay & Ozbay, 2007).[1] These studies lack the epistemic distinction between pre-outcome emotions (like hope and fear) and post-outcome emotions (like regret and disappointment).[2]

Kreps and Porteus (1978) made an important contribution to the modeling of the timing of the resolution of risk. However, they and their successors such as Caplin and Leahy (2001) maintained the basic tenets of expected utility theory. The axioms they propose (specifically the temporal consistency axiom and the temporal substitution axiom) impose unrealistic and contradictory restrictions on how utility is reaped (see: Pope, Leitner, & Leopold-Wildburger, 2007; Pope & Selten, 2010). Loewenstein (1987) introduced a novel factor into decision models of intertemporal choice by, distinguishing between the anticipation of future emotional states (e.g., regret) and the (anticipatory) emotions experienced while awaiting outcomes (like excitement); see further Loewenstein, Weber, Hsee, and Welch (2001) on "risk-as-feelings".[3] The latter may induce reversals of individual preferences as the time of risk resolution draws near, a phenomenon that is not allowed for by the axioms of Kreps and Porteus.

Supported by substantial psychological and neuroscientific evidence (e.g.: Chua, Krams, Toni, Passingham, & Dolan, 1999; Critchley, Mathias, & Dolan, 2001; Isen & Geva, 1987; Kuhnen & Knutsen, 2005; Lo, Repin, & Steenbarger, 2005; Loewenstein et al., 2001), economists have recently picked up the challenge to develop new models incorporating anticipatory emotions, focusing on anxiety (Caplin & Leahy, 2001; Wu, 1999). These models, which will be discussed in greater detail below, offer a novel perspective on important issues like the equity premium puzzle and the simultaneous occurrence of insurance and gambling.

Likewise, it is crucial for advancing our understanding of the impact of (anticipatory) emotions, to develop a rich set of experimental data. Experiments enable us not only to test theoretical hypotheses and predictions but also to explore the role of different (anticipated and experienced) emotions and how these are affected by the delayed resolution of risk. In short, they can assist in testing and improving theoretical models. Moreover, by a systematic and gradually more complicated experimental approach fundamental knowledge may be gained about the typically complex and dynamic emotional patterns occurring in the 'wild'.[4]

A few experimental studies exist that have investigated people's preferences regarding the timing of the resolution of risk, arguing in favor of a significant role of (anticipatory) emotions (Ahlbrecht & Weber, 1996; Chew & Ho, 1994; Kocher, Krawczyk, & van Winden, 2009; Lovallo & Kahneman, 2000; Noussair & Wu, 2006). We will discuss these papers in greater detail below. However for various reasons the design of these studies can be seen as problematic. They either use hypothetical scenarios or lack a research design leaving all factors except risk resolution constant. Furthermore, they all lack an explicit measure of emotions. We therefore think that the verdict is still out, and aim to fill this gap with our study.

The main goal of our experimental paper is to investigate the impact of the timing of the resolution of risk on investment behavior and the role of affect with a thorough experimental design. In a between-subjects design we observe the impact of a substantial delay of risk resolution (2 days) on investment choices. Besides the resolution timing all other factors and especially the timing of payout are held constant across treatments. In addition we use state-of-the-art experimental techniques for eliciting preferences and information about emotions. Doing so makes our experimental design novel in several respects. First of all, participants put their own money at risk in the investment task. Thus, not only monetary incentives were provided, but also real (out of pocket) losses were made possible, which is actually quite exceptional in economic experiments. Second, we used standard incentivized methods to measure participants' preferences with respect to risk, the timing of the resolution of risk, and the time of payment (i.e., their discount rate). Third, we employed a standard procedure in experimental psychology to explicitly measure anticipated as well as experienced emotions (as in Hopfensitz & van Winden, 2008). Moreover, anticipatory emotions experienced during the waiting period under delayed resolution – which involved 2 days – were elicited. Finally, we administered a web-based questionnaire before the experiment to obtain data on personal traits – related to anxiety, sensation seeking, and risk propensities – using well validated scales.

[1] For a recent study referring to experienced emotions, see Charness and Levin (2005).

[2] Bell (1981) implicitly includes emotions anticipated before risk is resolved.

[3] Loewenstein et al.'s "risk-as-feelings" hypothesis concerns experienced emotions at the moment of decision making. In fact, their Fig. 3 – which illustrates their approach – does not even mention the anticipatory emotions that occur in the time interval between decision (behavior) and outcome.

[4] See, in this context, Cubitt and Sugden (2001).