



ELSEVIER

Contents lists available at ScienceDirect

Journal of Forest Economics

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



Faustmann vs. real options theory – An experimental investigation of foresters' harvesting decisions



Philipp A. Sauter^{a,*}, Oliver Mußhoff^a, Bernhard Möhring^b, Stefan Wilhelm^b

^a Faculty of Agricultural Sciences, Department for Agricultural Economics and Rural Development, Georg-August-Universität Göttingen, Platz der Göttinger Sieben 5, 37075 Göttingen, Germany

^b Faculty of Forest Sciences and Forest Ecology, Department of Forest Economics and Forest Management, Georg-August-Universität Göttingen, Büsgenweg 3, 37077 Göttingen, Germany

ARTICLE INFO

Article history:

Received 15 June 2015

Accepted 31 January 2016

JEL classification:

Q23

C93

D22

Q28

Keywords:

Experimental economics

Forest harvesting decision

Real options approach

Faustmann–Pressler–Ohlin theorem

Risk attitude

Forest management

Policy support

ABSTRACT

Among the most complex decisions in forestry is the decision of when to harvest a stand. Many investment theories have been established and adjusted to maximize profit, yet limited knowledge is available regarding the predictive power of theories. Understanding foresters' harvesting behavior, however, is important for forest management and policy support. Thus, the question arises as to what extent risky harvesting decisions comply with economic theories. Therefore, we conduct an incentive-based economic experiment with 107 forestry decision makers in order to analyze this research question. This approach is well-established in the field of behavioral economics since it has the advantage of analyzing certain economic parameters isolated from further aspects of the decision situation. We use the Faustmann–Pressler–Ohlin theorem and a real options approach as normative benchmarks. The present study provides evidence that none of the examined theories fully comply with the observed behavior. However, the harvesting behavior coincides significantly more with the real options theory than with the Faustmann–Pressler–Ohlin theorem. It can thus be stated that a higher degree of education leads to decisions that are more in accordance with the real options theory.

© 2016 Department of Forest Economics, SLU Umeå, Sweden.

Published by Elsevier GmbH. All rights reserved.

* Corresponding author. Tel.: +49 551 39 9321; fax: +49 551 39 22030.

E-mail address: philipp.sauter@agr.uni-goettingen.de (P.A. Sauter).

Introduction

One of the most important decisions in forestry is determining the optimal harvest time. This decision is influenced by many parameters and is therefore very complex (Jacobsen, 2007). While the literature on forest economics provides many approaches for optimizing the harvesting decision (cf. Newman, 2002), there is still a lack of knowledge regarding the extent to which investment theories¹ are actually applied in forest management (cf. Moog and Borchert, 2001; Yousefpour et al., 2012). For analyzing foresters' behavior, Shogren (2007) pointed out that the integration of behavioral economics in forest economics is needed to establish thorough comprehension (cf. Gong, 1998; Amacher et al., 2003). A deeper understanding of foresters' thinking habits in relation to investment decisions helps to provide more valuable recommendations for policies, as well as forest enterprises, e.g., incorporating the influence of socio-demographic parameters and preferences on harvesting decisions (cf. Gong, 1998; Duku-Kaakyire and Nanang, 2004; Shogren, 2007). In this context, we analyze the question of whether investment theories are intuitively applied in investment decision situations, such as the harvesting decision, and which parameters explain potential deviations.

In the field of behavioral economics, the classical methodology for analyzing such research questions is through the utilization of an economic experiment. Thus, appropriate data without influence from non-controllable external variables, such as silvicultural issues, can be generated. Economic experiments cannot entirely replicate the real decision situation; they can, however, replicate certain aspects of interest from the real harvesting decision situation by simulating a controlled decision situation (Binmore, 1999; Davis and Holt, 1993, p. 14–18). For analyzing the application of investment theories, it is necessary to focus on the economic perspective of harvesting decision behaviors. Financial incentives are therefore used in the present experiment in order to achieve purely economic-orientated decisions (cf. Davis and Holt, 1993, p. 24–25). In this context, (Kant et al., 2013, p. 6) suggests that the “integration of behavioral economics in forest economics may totally change the landscape of forest policies and forest management practices”. While this approach has been well-established in economics (cf. Binmore, 1999), as well as in closely related disciplines such as agricultural economics (e.g., Ihli et al., 2014) or energy economics (e.g., Szolgayova et al., 2008), only a few publications apply experimental economics in the field of forest economics. A few studies in particular are using discrete choice experiments in this context (e.g., Joshi et al., 2013). Furthermore, Brunette et al. (2014) applied a lottery choice experiment for eliciting foresters risk attitude, McEvoy et al. (2014) experimented with land use conversion, and Musshoff and Maart-Noelck (2014) designed a disinvestment experiment. The approach that is closest to ours is that of Musshoff and Maart-Noelck (2014). In contrast to their disinvestment experiment that focused on selling a stand, our focus is on harvesting, including the possibilities of reusing the soil after harvest which leads to the application of different investment theories. Furthermore, we conduct a forestry-framed experiment in an effort to promote a corresponding environment.

By analyzing this issue while conducting an economic experiment, the scientific contribution of this article is threefold. First, our results provide empirical information regarding the extent of accordance between investment theories and investment decision behavior. This study is among the first to experimentally analyze foresters' investment decisions with regard to investment theories. By examining this issue under controlled circumstances, the results of this study provide insight into fundamental economic decision-making processes. Second, our results provide evidence on how selected socio-demographic and forest-enterprise-related parameters explain deviations from investment theory. This insight is an important aspect for forest management, as well as for policy support. Third, to the extent of our knowledge, we are among the first researcher to conduct an incentive-based experiment with respect to forest harvesting decisions using real forestry decision makers. Thus, we contribute toward closing the methodological gap by integrating behavioral economics into forest economics (cf. Shogren, 2007; Kant et al., 2013; Brunette and Couture, 2013).

¹ Investment theories in this article refer to theories about the investment and disinvestment of real assets.

Download English Version:

<https://daneshyari.com/en/article/6545163>

Download Persian Version:

<https://daneshyari.com/article/6545163>

[Daneshyari.com](https://daneshyari.com)