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Transport firms' inefficiency and managerial optimism: A stochastic frontier analysis

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ABSTRACT

This paper presents an original essay that explains the correlation between transport firms' technical efficiency and managerial optimism. We initiate a debate concerning the potential role of Chief Executive Officers' (CEO) irrationalities in explaining the inefficiency of public transport operators, such as the shortfall between the optimal production function and the observed production level. Stochastic frontier analysis (SFA) methods are applied to our sample over a twelve-year period from 2000 to 2011, where we aim to detect the potential effect of a well-documented bias in behavioral economic and finance theory: the managerial optimism bias. Using two proxies of managerial optimism based on the 2005 work of Malmendier and Tate as well as following recommendations of cognitive psychology and using an SFA approach, we find strong evidence of the negative impact of CEOs' optimism bias on transport firms' technical efficiency, meaning that managerial optimism decreases transport firms' technical efficiency.

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1. Introduction

Traditional economic and financial literature raises some restrictive hypotheses, such as the rational agent hypothesis, as is well documented by Simon (1980). A rational decision is when agents are described as following certain norms and respect the steps of the decision-making process (Kahneman and Tversky, 1979; Aggarwal, 2014). Oliveira (2007) confirms that rational theories of decision-making are based on fundamental axioms. If

these established principles are accepted, then it becomes possible to infer a normative theory of choice. The problem is that this normative decision theory also assumes that economic agents are intelligent enough and have enough capacity to interpret and evaluate all possible alternatives to make their best final choice.

A key feature in standard economic theory is that economic agents are also risk averse. They are always assumed to have a concave utility function that describes their attitude toward risk aversion (Kahneman and Tversky, 1979). The validity of theoretical models in this framework is strongly related to the validity of the risk aversion hypothesis. However, the emergence of a new approach in economic and finance literature can considerably affect

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decision-making theories. This approach takes its departure from Kahneman and Tversky (1979) work that shows that individuals have an S-shaped utility function reflecting the existence of two risk attitudes: individuals are risk averse in the domain of gains while they are risk seeking in the domain of losses.

Other psychological theories demonstrate the effect of CEOs' psychological and emotional biases on the practice of decision making. Our aim in this paper is to introduce a new approach that until now remains unexplored in transportation literature. We will translate the results of previous research from behavioral corporate finance (Aggarwal et al., forthcoming; Aggarwal, 2014; Aggarwal and Zong, 2008) to the study of transport firms' technical efficiency. This paper is an essay in behavioral transport literature. It intends to explain why firms suffer from inefficiency in their production frontier.

This will be an attempt to propose a new explanation for technical efficiency distortions that derive from CEOs' psychological biases. This paper examines whether this can be explained by behavioral factors such as CEO optimism, developing Aggarwal and Zong's (2008) approach to allow for investor risk aversion. This research focuses on the effect of managerial optimism to explain how such psychological biases influence transport firms' technical efficiency. Managerial optimism is one of the most documented biases in economic literature and in recent years, there has been a wave of papers that investigate its effect on firms' decisions (Heaton, 2002; Malmendier and Tate, 2005b,c, 2008; Lin et al., 2005; Campbell, 2000; Huang et al., 2011). Throughout this paper, we will discuss the potential effect of a CEO's irrationality as a logical explanation for his/her optimism to influence transport firm efficiency.

The remainder of this paper is developed as follows: in the first section, we begin by showing the implications of decision making in transport firms. In the second section, we focus on studying the effect of managerial optimism on firms' technical efficiency. Managerial optimism measures are presented in section three. The fourth section presents our methodology and modeling inefficiency. Section five presents output and input measures. Section six presents our data. Section seven is oriented toward elucidating and interpreting our results, and conclusions are drawn in the final section.

2. Implications for decision-making in transport firms: behavioral versus rational decision making

Following a review of the revolution in economic literature from standard theory to behavioral theory, we discuss some implications for decision-making (Jarboui and Boujelbene, 2012; Aggarwal, 2014). We can simply discuss what is commonly known as "behavioral decision making". Tamura (2005) and Mantel et al. (2006) define behavioral decision models as descriptive models that account for seemingly paradoxical outcomes not accounted for under economic models of expected utility. A person's decisions are influenced by even subtle changes in the task, the environment or their own personal perspective. Payne et al. (1993) and Simon (1997) argue that these influences

on human behavior and the resulting decisions have been termed behavioral decision making and have been studied in psychology, economics, consumer behavior and many other fields in the past thirty years.

Mantel et al. (2006) state that we can classify previous studies on behavioral decision making into three major classes of effects: task, context and personal characteristics of the decision maker. They claim that task effects relate to any change in complexity as perceived by the individual, or the presentation of the task to the human decision maker. These include the number of alternatives considered, time pressures, information formality and presentation, or the type of response needed. Context effects concern the way in which the task relates to itself or to the environment.

Masini and Menichetti (in press) states that, as opposed to efficient market theory, behavioral economy and finance theory argue that individuals are not fully rational, as demonstrated by Akerlof and Yellen (1987), Barberis and Thaler (2003). He also argues that they do not deviate from rationality randomly, but rather that most agents do so in similar ways. In his work, he studies the impact of behavioral factors on the renewable energy investment decision-making process. He concludes that those agents are not fully rational and that behavioral factors can strongly affect human decisions.

Aggarwal and Zong (2008) evaluate pessimism/optimism and under/over-reaction in revisions of forward rates as forecasts of the future spot rate for the currencies of the nine major industrialized countries. They found that for forward rates as forecasts of future spot rates, the rationality hypothesis is firmly rejected and revisions in forward rates as forecasts of future spot rates reflect significant systematic pessimism and systematic underreaction to new information.

Odean (1998) examines how the overconfidence (as a psychological bias) of different managers affects markets differently. Kent et al. (1998) develop models in which, due to a self-attribution bias, overconfidence increases with success. Wang (1997) argue that mutual funds may prefer to hire overconfident money managers, because overconfidence enables money managers to "pre-commit" to taking more than their share of duopoly profits. While we conclude that there are advantages to hiring overconfident managers in a corporate setting, our reasoning is quite different from that of Wang (1997). Empirical studies in psychology have shown that individuals tend to overestimate their capabilities and the accuracy of their knowledge. Optimism is an unrealistic overestimation regarding future events related to personal skills, while excess of confidence reflects an overestimation of the latter. Formally, in the modeling of these two biases, optimism is seen as a mean error (overestimation) and excess of confidence as underestimation of the variance, but both terms are frequently used interchangeably (Aggarwal, 2014).

Beyond the study of the effect of traditional variables (Jarboui et al., 2013a,b, in press), such as market imperfections, there is research that is oriented toward the study of the effect of CEOs' personal characteristics (Malmendier and Tate, 2005c; Graham et al., 2009; Lin et al., 2005).

The aim of this paper is to study the effect of CEOs' optimism (as a psychological bias) on corporate firms'

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