



# The index of agency cost and the financial accelerator: the case of Japan

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## Abstract

*An index of the agency costs is constructed using the Kalman Filter, and an example of this index, pertaining to small Japanese manufacturing firms is estimated for the period 1976–1998. The results indicate the index reflects macroeconomic fluctuations and it is appropriate for use as a proxy for agency costs instead of the cash flow proxy that most empirical studies have adopted to date. Employing this index, the author demonstrates via a Markov-switching model that a steep rise in agency costs occurred immediately before the depression of the 1990s. These results provide support for the financial accelerator theory.*

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## 1. Introduction

Recent studies<sup>1</sup> suggest that, like *Tobin's marginal q*, the presence of *asymmetric information* between entrepreneurs and investors in capital markets plays a crucial role in the investment decisions of entrepreneurs who do not have sufficient internal funds.

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<sup>1</sup> Hubbard (1998) offers an excellent survey of recent empirical studies in this field.

Asymmetric information, one of the causes of imperfections in capital markets, generates *agency costs*, i.e., the extra entrepreneurial capital costs incurred by investors, which include monitoring costs and the risk of default. To reduce their agency costs, investors could provide funds, set within a limit, according to the entrepreneurs' *net worth*; alternatively they could require collateral. Assuming that investors do seek to reduce their costs in this manner, the magnitude of agency costs is thought to indicate the level of asymmetric information in, or the imperfection of, financial markets. Unfortunately, however, we cannot directly observe agency costs. Thus, the objective of this paper is to estimate agency costs and to analyze them from a macroeconomic point of view.

In an effort to analyze unobservable agency costs, most earlier empirical work focused on classifying groups of firms in terms of various characteristics, depending on agency costs; these studies used panel data to study the relationship between the imperfections in capital markets and investment from a microeconomic point of view.<sup>2</sup> Furthermore, such studies usually chose cash flow, which is regarded as a measure of agency costs, as a proxy for net worth. However, according to Hubbard (1998), cash flow is likely to include information on a firm's future profit, such as Tobin's  $q$ . In addition, agency costs depend on other factors, e.g., on whether a given firm is young or mature, on whether it is a member of an industrial group,<sup>3</sup> or on whether its ownership is concentrated or dispersed.<sup>4</sup> The findings of these studies suggest that cash flow is not appropriate as an exact proxy for net worth or agency costs.<sup>5</sup> On the other hand, little empirical work has been done that considers the aggregate level of agency costs in macroeconomic activity, and the changes in agency costs over time, although Bernanke et al. (1996, 1999) have argued that the study of aggregate agency costs is very important for facilitating the analysis of the relation between agency costs and the business cycle. This study will fill this knowledge gap.

To compose our index of aggregate agency costs, we focus on the approach proposed by Stock and Watson (1991) for the construction of a coincident index of the business cycle. More specifically, using a Kalman Filter, unobservable agency costs are estimated from the co-movement of several observable variables that are closely related to agency costs, in terms of both cause and effect. Here, as an example, we estimate this index for the period 1976–1998 with respect to small Japanese manufacturing firms, as these firms face financial constraints when carrying out their projects and their investments are very much affected by their agency costs. For purposes of estimation, we use Bayesian inference via Gibbs sampling, one of the Markov chain Monte-Carlo (MCMC) simulations, following Carter and Kohn (1994); Kim and Nelson (1998). Furthermore, we compare the results of this estimation with those of analyses using cash flow, the most popular choice, thus far, of a proxy for agency costs. We focus on the size of the resulting coefficients, in order to

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<sup>2</sup> For example, Fazzari et al. (1988); Hoshi et al. (1991) constitute studies that are representative of this approach.

<sup>3</sup> Hoshi et al. (1991) examined the Japanese Keiretsu (corporate affiliations) and agency costs and showed that the existence of Keiretsu increased the investment of its members by reducing their agency costs.

<sup>4</sup> Himmelberg et al. (1999) constitutes an example of an empirical study focused on the relation between firm ownership and performance using panel data.

<sup>5</sup> Kaplan and Zingales (1997) and Cleary (1999) concurred with this assertion, but Hubbard (1998) disagreed.

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