



Market perception on cloud computing initiatives in organizations: An extended resource-based view



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ABSTRACT

This study aims to investigate the economic value of cloud computing from the perspective of the stock market. More specifically, we conceptualize the relationship between the cloud computing initiatives of firms and the market reaction based on resource-based and extended resource-based views. For this study, we analyze 212 firm-level cloud computing announcements between 2006 and 2011 by employing the event study methodology. Our empirical results indicate that the market positively reacts to the cloud computing initiatives of firms. Moreover, the market reactions to cloud computing initiatives depend on three key characteristics of cloud computing, namely, firm-specific, resource-specific, and vendor-specific factors.

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1. Introduction

The importance of managing IT continues to grow as the business environment becomes increasingly uncertain. Cloud computing is being widely used as a new IT provision model in response to the growing need for greater IT business integration, increased IT agility and flexibility, and more economized IT use. In this model, various types of Internet-mediated IT capabilities are offered as on-demand services [4,53]. This relatively nascent IT service model has great potential to reduce IT operational costs and transform the IT management strategies of firms. For instance, cloud computing offers various types of off-the-shelf IT capabilities that can be instantly deployed in an organization. In addition, cloud computing eventually increases a firm's slack resources that can be channeled to business-centric activities. Therefore, firms can launch their new business initiatives with less time needed for preparing the related IT infrastructures.

However, the early adoption of cloud computing has raised concerns regarding the success of this new IT service model. Several IT researchers and practitioners questioned the validity of this model as a competitive alternative to traditional IT management. Their concerns are primarily attributable to data security,

quality of cloud services, availability of service offerings, and capabilities of cloud service providers [39]. Unsurprisingly, business managers tend to hold a conservative position toward the adoption of this emerging technology [42,67].

Prior studies on cloud computing have focused either on its conceptual and technological aspects [8] or on the organizational perception on its adoption [39]. To the best of our knowledge, few studies have empirically assessed the benefits of cloud computing. Accordingly, the economic value of cloud computing is often questioned because of limited empirical evidence [7]. With the growing interests in this new IT service model, the value of cloud computing and the factors that drive its value need to be examined.

This study investigates the business value of cloud computing from the perspective of stock market evaluation by identifying the plausible conditions under which firms can benefit from cloud computing initiatives. Specifically, we explored both resource-based view (RBV) and extended resource-based view (ERBV) in conceptualizing our research model. RBV emphasizes the role of proprietary resources within a firm in developing a sustainable competitive advantage. ERBV extends the theoretical boundary of RBV and thus posits three sources of a firm's competitive advantages, namely, capacity of the focal firm, networked (relational) resources, and capability of the partner, which are collectively analogous to the basic components of cloud computing business (i.e., client firm, cloud computing service, and service vendor). We employ the event study methodology, which enables

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us to assess the business value of a firm's cloud computing adoption, to empirically validate our model [44]. We first identify the critical factors related to the returns from cloud computing use in organizations by synthesizing the theoretical and methodological backgrounds. We then conduct a cross-sectional analysis to examine whether these factors are related to the increase in a firm's market value using 212 cloud computing announcements from 2006 to 2011. To the best of our best knowledge, this study is one of the earliest attempts to conceptually identify the critical contextual factors related to cloud computing and empirically assess its potential value.

The rest of the paper is organized as follows. Section 2 discusses the research model with hypothesis development. Section 3 describes the data obtained for analysis and the event study methodology. Section 4 presents the results of the hypothesis testing. Section 5 discusses implications for researchers and practitioners; the limitations and future research directions are also explained. Finally, Section 6 summarizes the contributions of this study.

2. Theoretical development

2.1. Extended resource-based view (ERBV)

RBV has been adopted as a major theoretical background for understanding the influences of IT investments on business competence in the market. RBV suggests that firms can achieve a competitive gain or improve operational efficiency by effectively combining IT resources with their internal IT capability [46]. Therefore, IT studies adopting RBV seek to conceptually explain whether IT resources contribute to a firm's competitive advantage and how a firm utilizes its IT assets to achieve efficient performance [69]. For instance, Andreu and Ciborra [2] argue that organizational learning capability strengthens the positive role of IT in developing firm competence. In accordance with the theoretical arguments, many studies have shown that firms can improve their performance by effectively leveraging their IT investments; such endeavor can be achieved by developing strong IT capabilities [55].

However, traditional RBV does not sufficiently explain the emerging use of cloud computing in organizations because RBV assumes that the generation of competitive advantage is based on the accumulated resources owned and controlled by the firm itself [5]. This proprietary assumption may result in an inaccurate evaluation of a firm's competitive advantage generated from externally delivered IT services (i.e., cloud computing services in the present study) [35].

Thus, researchers extended the resource boundary to external entities to complement the limitation of traditional RBV. Compared with traditional RBV, ERBV can explain the gaining of competitive advantage in a more integrated manner. ERBV emphasizes the network aspect of interconnected firms by conceptualizing how firms can reinforce their competitive advantage under interorganizational settings [35]. ERBV posits that a dyadic network exists between a focal firm and a partner in the form of a strategic alliance or any other business relationship specified by contractual agreements [18]. These allies interact through network resources for their own business purposes. Network resources refer to external resources that are available through a firm's interorganizational relationship with partners or outside vendors [25]. These resources are distinct from those that securely reside within a firm's internal boundary [5]. External resources can provide focal firms with strategic opportunities with less risk and cost [56]. These studies collectively support the significant role of external resources in generating the competitive advantage of firms [36].

2.2. Structure of the research model

A dyadic network is used to structuralize our research model and specify the contextual factors for improving firm performance. In the context of cloud computing, a *focal firm* refers to a client firm that uses cloud computing services. Such services comprise the *network resources* offered by the contractual relationship between a client firm and its cloud computing service provider. The *partner* is analogous to a cloud computing vendor who delivers IT resources in an "as-a-service" format through its own cloud computing infrastructure. We investigate how these three components collectively contribute to the market value of a firm from the ERBV perspective. Specifically, we hypothesize the following domains to understand the association of cloud computing investments with a firm's increased market value: (1) client firm's internal characteristics (i.e., firm-specific factor); (2) features of cloud computing services as IT resources (i.e., network resource-specific factor); and (3) service provider's characteristics (i.e., vendor-specific factor).¹

First, the *firm-specific* factors are correlated to the unique characteristics of an individual firm. Previous IT studies suggest that firms are required to build the associated capabilities in extracting additional value through internally or externally delivered IT resources. These studies argue that heterogeneous IT value is eventually attributable to organizational characteristics [65]. Therefore, the firm-specific factors can elucidate how the market reacts to cloud computing initiatives with respect to the unique traits of firms. Two major contextual factors, namely, *firm size* and *prior experience*, are derived from the intensive review of previous studies; such factors are commonly displayed across the sample announcements.

Second, the (*network*) *resource-specific* factors refer to a set of technology-related features and potential benefits embedded in IT resources acquired from external vendors. In particular, ERBV emphasizes the rent-yielding feature (i.e., benefit factors for a firm's enhanced business competence) of network resources in the business relationship between focal firms and partners. Previous studies argue that the superiority of external resources from the partner side (e.g., faster implementing time, less operation cost) can potentially contribute to the performance of a focal firm with less risk and cost, consequently affecting the firm's market value [35,56]. Therefore, the technological characteristics and benefits derived from service vendors should be included as major elements that result in various levels of market expectations against the announcement of cloud computing initiatives. This study identifies three cloud computing characteristics, namely, *cloud service types*, *implementation types*, and *cloud computing benefits*, to investigate how the technological features of cloud computing are related to the market value of adopting firms. Cloud service types refer to the three subsets of cloud computing services commercialized as on-demand services in the market. These subsets include software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS) [62]. Implementation types indicate the alternative ways by which firms deploy cloud computing services in their business operations. Our study

¹ Similar to previous event studies (e.g., [27,44,49]), we follow standard approaches in identifying the critical contextual factors of clouding computing in the three major domains. We start with an in-depth literature review to theoretically identify the contextual factors for each domain. Then, we derive the best available factors from the pool of our announcement data within the boundary of relevant theoretical background. For instance, although firm-level capabilities such as internal IT maturity and internal process management capability can be used to represent firm-specific factors, capturing such variables from publicly announced data is virtually impossible. Refer to Appendix A and Appendix B for more details about the literature and sample announcements for the derivation of our key factors (e.g., firm size, prior experience, etc.).

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