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R&D productivity following first-time CIO appointments

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ABSTRACT

Prior studies find that firms announcing the appointment of a new chief information officer (CIO) are rewarded by stock price increases, suggesting that the market expects new CIOs to add longterm value to the firm. In this paper, we examine whether first-time CIO appointments result in improved R&D productivity. We focus on R&D investments because one role of IT management is to aid in discovery and management of growth opportunities. Successful R&D activities are designed to create the type of knowledge-based, growth-critical assets (new or improved products, better distribution methods, etc.) that effective IT management would be expected to assist. After controlling for industry performance, we find that the productivity of R&D improves significantly after the appointment of a new CIO for appointments before 1999 (1997–1998) but not for appointments in later years (1999–2007), and that productivity improvements over the entire sample period occur for CIO appointments by firms with superior IT capabilities. Our results for R&D investments suggest that new CIOs improve the way IT is managed and improve their firms' approach to knowledge management.

1. Introduction

Firms create the position of Chief Information Officer (CIO) with expectations that CIOs add value to business organizations. Prior studies, using event-study methodologies (Chatterjee et al., 2001; Khallaf and Skantz, 2007), find that the market reacts positively to the creation of a CIO position and to the appointment of a CIO from an IT leader firm. The behavior of stock returns around CIO appointment announcements suggests that market participants view CIO appointments as a commitment to new and effective competitive

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strategies. In a recent study, Khallaf and Skantz (2011) show that firms' accounting-based measures of performance improve, relative to their industry peers, following CIO appointments. Similarly, CIO appointments may increase their research growth and organizational relationships (Nicolaou, 2008).

While prior studies suggest that CIO appointments increase firm value in the long-run, those studies do not identify why CIOs have an effect on firm performance. This paper argues that one way that CIOs will affect firm performance is through improvements in the productivity of R&D activities. We view a first-time CIO appointment as a strategic change in a firm's management, wherein the CIO is expected to assist his or her firm's overall business strategy. In this view, the CIO serves in a strategic position as a process innovator rather than a mere service provider (Luftman and Kempaiah, 2008). In short, CIOs are expected to manage their firm's IT resources to support strategic initiatives (Chun and Mooney, 2009) and provide a competitive advantage. Thus, because research and development (R&D) is fundamentally a strategic activity and because R&D is critical to obtaining and maintaining a competitive advantage in a knowledge-based economy, we predict that CIO appointments will be associated with higher returns to R&D activities. In summary, we argue that the productivity of R&D investments will be enhanced when IT management is part of the top management team.

IT professionals suggest that R&D productivity is influenced by IT-management practices. For example, Gartner EXP research director, Andy Rowsell-Jones, included technology development (R&D, technology tracking, and prototyping) as one of four key responsibilities of CIOs.[2] Similarly, when discussing the CIO's role in enabling innovation in 2007, Rebecca Jacoby, Chief Information Officer for Cisco, points out that, "Leading organizations recognize that the strategic deployment of technology can be the critical enabler of virtually every business growth opportunity, especially those fueled by innovation."[3] Chun and Mooney (2009), through CIO interviews and an analysis of CIO job listings, find that CIO responsibilities include assisting with strategic planning, developing strategic processes, and seeking innovative ways to reduce costs and increase revenue through technology that focuses on innovation and new opportunities.

Academic research argues that R&D investment generates new strategic options for business organizations (Bowman and Hurry, 1993) and provides a source of competitive advantage (Lev and Sougiannis, 1996). A review of prior studies shows that CIOs play a critical role in creating superior knowledge, spurring innovation, and enhancing technological capabilities. In a study of CIO compensation over 1993 to 2005, Yayla and Hu (2008) find a significant positive association between industry-level R&D intensity and CIO compensation, suggesting that a CIO's value is increasing with the importance of R&D to a firm's success. Weill and Aral (2005) find that firms classified as IT savvy have more innovation from strategic IT initiatives (i.e., those designed to create growth through new products, new markets, etc.).[4] Similarly, Dedrick et al. (2003) argue that IT has the greatest impact on firm performance through strategic initiatives that enable fundamental changes and allows innovation throughout all business processes. Bharadwaj (2000) states that firms with effective IT implementation capabilities can better "… innovate valuable new product features before competitors."

In this study, we examine the association between appointments to newly-created CIO positions and R&D productivity. We predict that first-time CIO appointments will improve strategic IT management and, in turn, will result in an increase in the productivity of R&D investments. We focus on first-time CIO appointments because the appointment of CIO at the top-management level represents a commitment to integrate information technology with other functions inside the organization and to better support the organization's strategy (Medcof, 2008). We focus on R&D productivity because strategic IT activities, in the sense of Weill and Aral (2005), should support the development of new products, markets, and processes.

To identify whether and how first-time CIO appointments are associated with R&D productivity in the long term, this study examines the change in R&D productivity in the period following the CIO appointment compared to the period before the CIO appointment. We control for firm size and industry performance because both factors could potentially affect R&D productivity. We find that the productivity of R&D activities increases following the first-time appointment of a CIO for pre-1999 appointments and for IT-capable firms.

To our knowledge, this is the first paper to study the effect of newly-appointed CIOs on the productivity of innovative activities. The lack of research is somewhat surprising given the perception that the CIO is

[2] http://www.gartner.com/press_releases/pr30sept2003a.html.

[3] http://www.cisco.com/en/US/solutions/collateral/ns340/ns857/ns860/CIO-Role-in-Enabling-Innovation.pdf.

[4] Weill and Aral (2005) classify IT activities and investments into four portfolios—infrastructure, informational, transactional, and strategic. See Section 3 below for details.