Chapter II

Research Issues of the IT Productivity Paradox: Approaches, Limitations, and a Proposed Conceptual Framework

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Abstract

Although corporations in the western world, especially those in the United States, have spent generously on information technology (IT) and information systems (IS) in recent decades, many empirical studies have found limited evidence for the payoffs of surging IT expenditures. In some cases, measures of IT spending were found to be either uncorrelated, or negatively associated, with the productivity or financial performance of the sample firms. To the dismay of the researchers and business executives, the phenomenon of the IT productivity paradox lingers on to this day. A review of the literature on this subject has pointed out several possible reasons underlying such inconsistencies, which include data and methodological
problems and limitations of research models. Moreover, many of these studies have been criticized as weak in theoretical underpinning when they simply fed data into statistical models for the independent (IT spending), and dependent (productivity or financial performance) measures in order to empirically ascertain the relationships that might exist. In this chapter, a research model is proposed. With expectation to mitigate the shortcomings of some of the prior studies, this model incorporates improvements in business process as an independent construct in parallel to the capabilities of IT and enterprise systems. Competitive capabilities are included as an intermediate construct to help conceptualize the linkage between the independent constructs and the dependent construct of organizational performance. Theories and empirical evidence are drawn from associated management disciplines such as operations management and from a resources-based view of the firm to illustrate and explain that investment in IT and business processes will eventually contribute to organizational performance through the creation and enhancement of competitive capabilities. Finally, the theoretical and managerial implications of this research model are highlighted.

Introduction

Business enterprises in the western world have invested generously in information technology (IT) since the 1970s. Among them, corporations in the United States are the leading spenders, whose total expenditure in IT within the 10-year period between the late 1980s and 1990s was estimated to be around U.S. $500 billion (Strassmann, 1997). Paradoxically, such a surge in IT spending has not been accompanied by a consistently measurable increase in productivity, especially in the service sectors (Brynjolfsson, 1993). Many micro-level studies conducted in the last decades showed that the IT spending of business firms seemed to be uncorrelated with productivity and profitability, and the term of IT productivity paradox was, therefore, coined to describe such a phenomenon (Strassmann, 2002). A review of the extant literature in this subject reveals several possible reasons for the contradictory findings, including data and methodological problems (Brynjolfsson, 1993; Hu & Plant, 2001; Strassmann, 1990). Some researchers criticized the theoretical weakness of the extant studies (Shin, 1999), and pointed out the incompleteness of research models that have neglected relevant contextual constructs (Grover, Teng, Segars, & Fiedler, 1998).

In view of the contradictory findings, two interesting research questions arise. Does IT genuinely contribute to performance at the firm level? Can the extant research models be remedied or enhanced to overcome the limitations just alluded to? Specifically, the objectives of this chapter are three-fold. First, a literature review is conducted to pinpoint possible shortcomings in the existing studies, with results
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