

# Chapter 11

## The Effects of Investments in Information Technology on Firm Performance: An Investor Perspective

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### **ABSTRACT**

*Analyzing the beneficial effects of investments in information technology (IT) is an area of research that interests investors and academics. A number of studies have examined whether investments in IT have a positive effect on some measure of earnings or other form of financial return. Results from these studies have been mixed. This paper extends the literature by adopting an investor's perspective on firm performance when IT investments are made, using the preservation of capital as a performance measure. The authors examine companies that made public announcements of their investments in technology to see if they were able to mitigate losses to investors by reducing their downside risk to investors. This study further discusses whether different types of IT investments have different impacts on firm risk from an investor's viewpoint. Findings suggest that IT investments impact a firm's downside risk, and the authors offer an alternative perspective on the benefits of IT investments, particularly where no positive incremental financial results are evident.*

### **INTRODUCTION AND BACKGROUND**

Comprehensive evidence of the impact that investments in information technology (IT) have on firm performance continues to elude researchers and investors (Mittal & Nault, 2009). Labeled the

“productivity paradox” by Nobel Laureate Robert Solow, this phenomenon has been blamed on a number of factors, including the mismanagement of IT resources and the use of the wrong performance measures. Carr (2003) has even suggested that investments in IT have become so common-

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place that they are now similar to other ordinary business investments that offer no distinguishable competitive advantage.

A majority of the studies that have examined the relationship between IT investments and firm performance have used traditional measures of firm performance (i.e., productivity and profitability) that best meet the needs of management (Kohli & Davaraj, 2003). However, results of these studies have been mixed. For example, Brynjolfs-son and Hitt (1993), Bharadwaj, Bharadwaj, and Konsynski (1999), and Stratopoulos and Dehning (2000), among others found a positive association between investments in IT and firm performance. On the other hand, researchers such as Loveman (1994) and Roach (1987) found a significantly negative association between investments in IT and resulting firm performance.

We contribute to the literature by examining the relationship between investments in IT and a firm's risk profile using a non-traditional measure of firm performance that is not captured in either productivity gains or increased profitability. Although IT investments may allow firms to achieve superior profits relative to their competitors, we believe that IT investments also serve to reduce a firm's financial risk profile, or its downside risk. Downside risk has been proposed by economists as the perspective that characterizes investor sentiment towards making investments (Nawrocki, 1999). Economists have posited that the disutility incurred by a loss outweighs the utility of a gain of the same amount. Our research should be of interest to both researchers and investors (Heine, Grover, & Malhotra, 2003; Melville, Kraemer, & Gurbaxani, 2004).

Our study provides evidence that there is an association between reductions in downside risk following the announcement of IT investments. We also find evidence that suggests the type of IT investment affects the degree of downside risk following the announcement of the investment, as well as whether the firm is a leader in defining IT strategies for their industry.

In the following section, we briefly discuss literature related to IT investments relevant to this study. The next section develops our hypotheses relating firms' investments in IT to downside risk and discusses the model we use to test these hypotheses. We then focus on methodological issues and discuss the results of our study. We conclude and summarize the paper, comment on limitations of our study, and discuss and directions for future research in the final section.

## **LITERATURE RELATED TO IT INVESTMENTS AND FIRM PERFORMANCE**

Prior literature relating investments in IT to the effect on firms has focused primarily on positive outcomes such as productivity gains or financial returns. Kohli and Davaraj (2003) and Melville et al. (2004) have noted that the results of studies focusing on the specific organizational performance and productivity improvements have been mixed. Given the mixed results of past studies, our use of the investor's perspective provides an alternative explanation about how IT investments may have a positive effect on firm performance. We will briefly discuss some of the key studies related to measuring the impact of IT investments on firm performance and then explain why using downside risk as an alternative measure makes sense.

Research has documented a positive performance associated with the announcements of certain types of IT investments. Dos Santos, Pefers, and Mauer (1993) investigated the effect of IT investments on the market value of firms. Two particular attributes, industry type and IT investment type, were examined to see if either had an effect on the cumulative abnormal returns (CARs) near the dates of the announcements. Evidence indicates that only announcements of innovative IT investments were (positively) associated with CARs. Im, Dow, and Grover (2001) extended the literature by investigating whether industry size

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