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Exploring the Impact of a Firm's Performance on Its IT Investment: The Role of IT Intensity

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EXTENDED ABSTRACT

A substantial and long-standing body of information systems (IS) research has examined the impact of information technology (IT) investments on firm performance or the business value of IT investments (Guo et al. 2022; Sabherwal and Jeyaraj 2015). The key finding from this literature is that IT investments allow firms to develop organizational capabilities which in turn results in superior firm performance and competitive advantage (Luo et al. 2012; Wamba et al. 2017). These studies primarily have focused on the consequences of IT investments and treated the level of IT investment as a given (Dong et al. 2021). In practice, firms have limited financial resources and must decide how to allocate these resources to the different competing areas. Therefore, it is important to study what determines the amount of financial resources that firms are ready to commit to IT in light of competing priorities (Salge et al. 2015).

In reviewing the literature, we found two streams of research that determine the antecedents of IT investments. These streams of research identify firm performance as an important predictor of a firm's IT investment level. However, empirical results regarding the relationship between firm performance and IT investments produce mixed results. One stream of research argues that when firms experience poor performance, they view IT investment as a cost (Hall 2005; Loh and Venkatraman 1992). Thus, it is likely that those firms engage in IT outsourcing to decrease the cost of IT investments (Lacity et al. 2009). In contrast, another stream of research builds on the behavioral theory of the firm (BTOF) (Cyert and March 1963) and contends that such firms are more likely to augment their IT investments. According to BTOF, if a firm faces performance challenges, it undertakes a problematic search to find a solution and restore the performance to satisfactory levels (Shapouri et al. 2022). In this search process, firms tend to increase resource inputs rather than decrease them (Dong et al. 2021). By extension, as IT is considered a key resource input in contemporary firms, the problematic search should motivate firms to augment IT investments to address the performance gap (Salge et al. 2015).

In addition, the changes in the level of IT investments when firms experience performance gains remain unclear. In particular, prior research adopting the BTOF perspective argues that performance gains accumulate excess resources that motivate firms to initiate the slack search (Iyer and Miller 2008; Xu et al. 2019). As IT is considered a key resource input in contemporary firms, the slack search should motivate firms to augment IT investments to engage in digital experimentation and explorative innovations that further underpin their competitive advantage (Salge et al. 2015). However, prior research found no support for the above argument.

These conflicting results suggest that there is a boundary condition that affects the firm performance-IT investment relationship. In this regard, it can be argued that IT investment is not a strategic decision for every firm (Xue et al. 2012). IT performs dissimilar roles and has different levels of influence on business outcomes depending on the characteristics of the industry where firms conduct their business (Chae et al. 2018). Firms operating in high IT-intensity industries are more dependent upon IT than others and use IT extensively for the competition (Bandodkar and Grover 2022). Accordingly, IT investments, compared to other investments, may bestow substantive value for those firms due to the higher ceiling for IT-driven value generation in such industries (Bandodkar and Grover 2022). Thus, it is more likely that firms operating in high IT-intensity industries, consider IT investments as strategic investments when they undertake problematic or slack searches. In contrast, firms that operate in less IT-intensity industries may not opt for augmenting their IT investments as IT is not their competitive advantage. These firms instead may decide to outsource their IT services and/or invest in non-IT-based competitive approaches like marketing, research and development (R&D), and building up production capacity (Ho et al. 2017). Thus, it is the focus

of this study to examine whether and how the industry IT-intensity of a firm influences the relationship between firm performance and IT investment.

To empirically examine the role of industry IT-intensity in the firm performance- IT investment relationship, we will collect and compile a dataset of U.S. firms across different industries over the period 2011–2019 using two data sources. First, we use Computer Intelligence Technology Database (CITB) to extract information regarding the performance and IT investments of firms. Second, we use Tangible Wealth Survey by the US Bureau of Economic Analysis to measure the industry IT-intensity of a firm. We then develop econometric models to estimate the impact of industry IT-intensity on the firm performance- IT investment relationship.

The potential findings of this study have implications for research and practice. From a theoretical standpoint, this study contributes to the stream of IS research examining the firm performance-IT investment relationship by adding an important and theory-driven boundary condition, i.e. – the industry IT-intensity of a firm. By introducing IT intensity and examining how this industry characteristic affects the behavior and decision of firms regarding IT investments, this study deepens our understanding of how a firm's performance could contribute to the level of IT investment. From a practical standpoint, this study helps managers and decision-makers to make more intelligent IT investment decisions based on the characteristics of the industry they belong to.

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