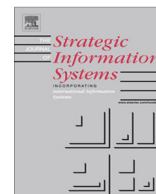




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Do shareholders favor business analytics announcements?

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ABSTRACT

Despite the growing acceptance of business analytics (BA) as a tool for making smarter business decisions, past research has rarely investigated shareholder reactions to BA announcements. We use signaling theory and resource-based theory (RBT) as our theoretical lens. The results show that BA announcements generate positive abnormal returns, thereby providing empirical evidence that shareholders view BA as beneficial. The results also suggest that characteristics that are more salient to shareholders are rewarded. Specifically, firms implementing BA systems from market-leading vendors obtain more positive stock market reactions compared with other firms. Announcements convey more benefits to overbought stocks than oversold stocks, and generate higher positive return in firms with high sales growth and high return on assets (ROA). Overall, empirical evidence favors signaling theory over RBT.

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Introduction

The term “business analytics” (BA) is often used synonymously with “business intelligence” (BI)¹ which can be defined as methodologies, processes, architectures, and technologies that transform data into meaningful and useful information (Evelson, 2012). BA promises to enable faster reactions to a changing environment, provide new insights, and facilitate smarter decisions. BA systems have evolved into important systems for integrating structured and unstructured information (Sabherwal, 2007, 2008), giving managers access to timely and relevant information for making decisions (Hannula and Pirttimaki, 2006). Past literature has provided case studies of firms that successfully used BA (Davenport and Harris, 2007; Wixom et al., 2008) and explored the business value of BA systems based on accounting measures such as productivity, sales, return on equity (ROE), profit margin, and asset utilization (Aral et al., 2012; Brynjolfsson et al., 2011). Past research has also focused on decision support functionalities and technical aspects of BA (Chen et al., 2012).

Another stream of research uses the event study methodology (e.g. Dobija et al., 2012; Hendricks et al., 2007) to examine the impact of different types of technology investments. The underlying assumption is that market reaction to technology investment announcements is an important indication of how shareholders view the investment, which in turn could affect how corporate boards and executives decide on such investment. To our knowledge, only one study has applied event study in the context of BI. Specifically, Rubin and Rubin (2013) found that BI systems could help reduce a firm’s stock volatility.

In contrast, we delve deeper into shareholder reactions to BA announcements and make several contributions. First, while Rubin and Rubin focus on stock return volatility, we focus on abnormal returns from BA announcements. By using an event

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¹ BI focuses more on reporting tools and dashboards, whereas analytics focuses more on answering predictive questions (Kassa, 2010).

study method, we diverge from prior studies of BI systems value from the organizational performance perspective, which typically uses perceptual surveys (e.g., Popovič et al., 2012).

Investments in BA require a combination of technical and statistical skills compared to general IT investments that require technical skills. Further, BA focuses predominantly on accessing different data sources (structured data such as financial and operational performance, and unstructured data such as text, social media, and visual data) and tools to analyze them (Gartner, 2014). Conventional business management softwares such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) focus on relatively simple analysis and interpretation of data. Also, BA includes emerging approaches such as data visualization, process simulation, text and voice analytics, social media analysis, and predictive and prescriptive techniques (LaValle et al., 2011).

Theoretically, we contribute to the IS literature on the market value impact of IT announcements by comparing resource-based theory (RBT) with signaling theory. Specifically, we show that while RBT often suggest positive impacts of BA on market returns, signaling theory often suggest null impacts as investors fail to respond to various characteristics of BA announcements. Unlike past studies, which often used RBT to explain the impact of IT announcements, our empirical evidence suggests that such announcements are also signals for specific attributes. We also show that the specific characteristics of announcements as well as a firm's characteristics (individually as well as jointly) increase the strength of such signals.

Second, we examine whether the type of vendor (leading vendors vs non-leading vendors), the type of BA (basic vs advanced) and the extent of implementation (function-specific vs enterprise-wide) are associated with market returns. This is the first study that examines the effect of these variables on abnormal returns. Our results provide valuable insights by showing that the type of vendor is important, but the sophistication of BA adopted and the extent of implementation do not affect shareholder reactions.

Third, unlike past studies that rarely examined stock characteristics, we examine whether overbought and oversold stocks affect the value of BA announcements. Our results suggest that BA announcements convey more benefits to overbought stocks than normal or oversold stocks by mitigating market correction for overbought stocks. Further, our post hoc results provide valuable insights by showing that firm-specific characteristics such as sales growth and ROA complement each other, and generate high positive returns. Thus, attributes of the signaler affect the strength of the signal.

The rest of the paper is organized as follows. We present our theory and hypotheses, then describe our dataset and analysis procedures, and finally we provide results, discussion, limitations, and implications for research and practice.

Theory and hypotheses

Resource-based theory (RBT) and signaling theory

Reviews of IS event studies (see Appendix A) have highlighted that past studies have examined market reaction to IT investment as well as specific technologies (Roztocki and Weistroffer, 2009), and have often used RBT to explain the business value of IT (Konchitchki and O'Leary, 2011). According to RBT, firms potentially derive competitive advantage from resources that are valuable (V), rare (R), inimitable (I) and nonsubstitutable (N) (Chatterjee et al., 2002; Doherty and Terry, 2009).² RBT also considers the importance of managerial strategies for developing new capabilities. Because they are the owners of such resources, firms could lower their costs and thus realize higher returns relative to their peers (Seddon, 2014).

IS literature has often emphasized a firm's capabilities rather than IT assets as a source of competitive advantage (Wade and Hulland, 2004). IT assets are often imitable, and therefore unlikely to be source of competitive advantage. But IT assets coupled with savvy IT managerial skills could provide the capabilities essential for sustained competitive advantage. Past research suggests that information assets that emerged from firms' digitization could provide insights after analysis, thereby enabling firms to compete more effectively (Kohli and Grover, 2008). Such information assets include BA solutions that could identify trends and patterns in the firm's data. Further, Davenport and Harris (2007) show that BA could be a source of competitive advantage as capabilities such as evidence-based management could eliminate authority-based and ad-hoc decision-making, and facilitate data-driven decision-making. Such specific capabilities are valuable (V) as they improve decision-making and reveal previously unobserved facets of firms' performance to management.

Firms could purchase or develop in-house BA solutions. Vendor implementation capabilities are important in helping firms to better leverage BA for competitive advantage. The specific manner in which firms transform data to create high quality and integrated data, and utilize insights make BA capability rare (R). Further, such capabilities are not easy to acquire and require change management, flexibility and agility in firms, as well as having the firm's BA well embedded within its social fabric (Cosic et al., 2012). Since such capabilities are firmly embedded in a firm's context, they cannot be easily imitated (I). Conventional IT assets such as CRM and ERP cannot substitute BA, as they primarily emphasize collecting rather than analyzing data to deliver strategic insights. Advanced capabilities such as predictive analytics are unique to BA solutions and hence are difficult to substitute (nonsubstitutable (N)). Thus, BA announcements could indicate the acquisition of IT assets and capabilities that are potentially valuable, possibly rare, difficult to imitate and difficult to substitute (VRIN).

² IS studies such as Aral and Weill (2007) define resources as the combination of IT assets (hardware and software) and capabilities (practices, skills and competencies to use IT).

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