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Winter 12-10-2016

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Obi Ogbanufe

University of North Texas, obi.ogbanufe@unt.edu

Atiya Avery

University of Illinois at Chicago, aavery@uic.edu

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Recommended Citation

Ogbanufe, Obi and Avery, Atiya, "Breaching News: Does Media Coverage Increase the Effects of Data Breach Event Disclosures on Firm Market Value?" (2016). *WISP 2016 Proceedings*. 9.

<http://aisel.aisnet.org/wisp2016/9>

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Breaching News: Does Media Coverage Increase the Effects of Data Breach Event Disclosures on Firm Market Value?

Research-in-Progress

Obi Ogbanufe

University of North Texas, Denton, TX 76201, USA. {obi.ogbanufe@unt.edu}

Atiya Avery

University of Illinois at Chicago, Chicago, IL 60607, USA. {aavery@uic.edu}

ABSTRACT

Characterized as negative events, data breaches can disrupt an organization's operations and lead to financial losses. Media coverage is often seen as exacerbating negative events such as data breach disclosures, and have also been found to influence financial markets. This research in progress presents a theoretical framework and methodology to empirically test the moderating and mediating influences of media coverage on the impact of data breach events on firms. We articulate the research gap, present hypotheses, and discuss the implications of this research for theory and practice.

Keywords: data breach, media coverage, firm market value, event study

INTRODUCTION

Data breach events can be characterized as negative events, which can disrupt organizations' operations, leading to financial losses for the breached firm. Media coverage is often seen as exacerbating negative events. For example, increases in media coverage have been associated with increases in copycat suicides, decreases in a country's tourism following a crime, decreases in FDA approval times for pharmaceutical drugs, and influencing public opinion (Brown 2015; Carpenter 2002; Gould 2001; Huebner et al. 1997). In addition, there is evidence that publicly traded firms suffer increased damages to their market value and financial performance when

there is more media coverage following a negative event or crisis situation (Bednar et al. 2015; Liu and Shankar 2015; Solomon et al. 2008). In terms of its signal, this research considers media coverage as negative. Prior studies have consistently found that data breach event disclosures lead to statistically significant negative abnormal returns of the breached firms' market values (see Spanos and Angelis (2016) for a review of the literature). While several studies have focused on evaluating publicly disclosed data breach events from news reports (Bose and Leung 2014; Goel and Shawky 2014; Gordon et al. 2011), and some have considered media coverage as a potential factor in the focal firm's market value after a data breach disclosure (Acquisti et al. 2006; Zafar et al. 2012), to the best of our knowledge none have considered the mediating and moderating impacts of media coverage on the breached firm's market value following a data breach event disclosure. The objective of this study is to investigate the moderating and mediating effects of media coverage on firm market value following a data breach disclosure. By evaluating media coverage as both a mediator and moderator, this research presents an opportunity to examine the impact of data breach events on firm market values under different boundary conditions. More recently, advancements in social media platforms have increased the expansion and reach of traditional media outlets. An understanding of the moderating and mediating effects media coverage could guide breached firms to better strategically allocate resources in managing and reducing their losses. Hence, our research question is: "*To what extent does media coverage increase the impact of data breach disclosures on firm market value?*" In the following sections, we present our theoretical framework and hypotheses, followed by a proposed methodology, and future directions and implications.

THEORETICAL FRAMEWORK AND HYPOTHESIS

Media Coverage and Data Breach Event Disclosures: Media outlets such as newspapers, social media, and television play an important role in how information is disseminated to a firm's stakeholders (Fang and Peress 2009) which can include investors; where negative events within firms are associated with increased media coverage (Ahern and Sosyura 2014; Graffin et al. 2013; Kuhnen and Niessen-Ruenzi 2011; Liu and Shankar 2015; Zavyalova et al. 2015). Data breach event disclosures are public announcements made by the breached firm typically to a state government organization (Harris 2016; Sen and Borle 2015). Researchers have already theorized that specific characteristics (breach event type, sensitivity of breached records, and breach

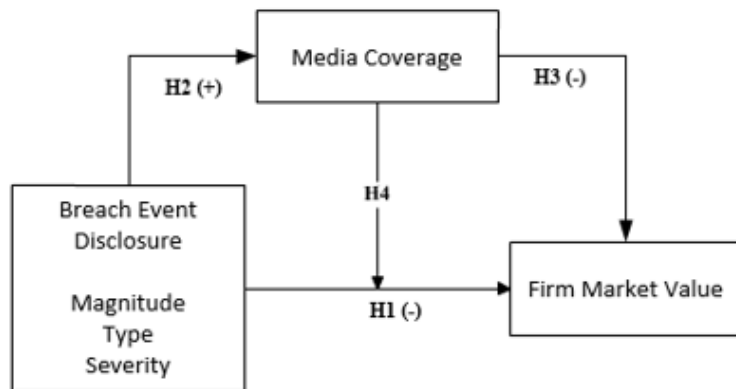


Figure 1: Proposed Theoretical Framework

magnitude) surrounding data breach event disclosure directly impact changes to the firm's market value (Bose and Leung 2014; Cavusoglu et al. 2004; Hovav and D'Arcy 2003). Our classifications of the characteristics of the breach (type, sensitivity, and magnitude) is obtained from prior studies and Privacy Rights Clearinghouse (2016). Breach event type can be classified as hacking, insider abuse, unintended disclosure, physical loss etc. Breach magnitude refers to the number of records exposed in the data breach event. Sensitivity of breached records refers to whether the breached records included protected health information (sensitive) (Anderson and Agarwal 2011) or not. Although there could be other factors that could help explain drops in firms market value, such as general trends in the stock market, this study focuses on the impact of media coverage. We extend the current

literature by proposing that media coverage is both a mediator and moderator in the relationship between data breach event disclosures and changes to firm market value. See Figure 1.

Media Coverage as a Mediator: A mediator is a variable which accounts for the relationship between a predictor variable and a dependent variable. A variable is considered a mediator when changes in the predictor variable account for changes in the mediator variable and changes in the mediator account for changes in the dependent variable (Baron and Kenny 1986). Prior research findings in management find that increase in negative media coverage decreases market value and brand (Bednar et al. 2015; Liu and Shankar 2015). We hypothesize that the intensity of media coverage is a mediator of the relationship between the data breach event disclosure and expected changes to firm market value. The disclosure announcements can be picked up by the media where many times this is one of the primary ways that shareholders even learn of the data breach event. Following prior research, we hypothesize that characteristics of the breach (breach magnitude, sensitivity of the breached records, and type of breach) are associated with changes in the firm market value. Characteristics of the breach are associated with changes in media coverage and changes in the firm market value. We also hypothesize that the intensity of the media coverage is partially responsible for changes in firm market value.

- **Hypothesis 1:** An increase in breach event characteristics (magnitude, type, sensitivity) are associated with a decrease in firm market value after a data breach disclosure.
- **Hypothesis 2:** An increase in breach event characteristics (magnitude, type, sensitivity) is associated with an increase in media coverage intensity.
- **Hypothesis 3:** Media coverage intensity is associated with a decrease in firm market value after a data breach disclosure.
- **Hypothesis 3A:** Media coverage intensity mediates the relationship between breach event characteristics (magnitude, type, sensitivity) and firm market value.

Media Coverage as a Moderator: A moderator variable is a categorical or qualitative variable that affects the direction and strength of the relationship between predictor variable and a dependent variable (Baron and Kenny 1986). Media coverage can be considered a moderator

because the intensity of media coverage can increase or decrease the expected changes to the market value of the firm following the data breach event disclosure. Having established that increases in the characteristics of the data breach (magnitude, type, sensitivity) may reduce firms' market value, we also expect that an increase in negative media coverage on the data breach event will further strengthen the negative association between breach characteristics and firm market value. Such that increases in media coverage may force the breached firms to utilize additional resources and capabilities, and this may lead to decreases in firm market value.

- **Hypothesis 4:** Media coverages moderates the relationship between breach event characteristics (magnitude, type, sensitivity) and firm market value, such that the relationship is strengthened.

PROPOSED RESEARCH METHODOLOGY

We utilize event study methodology to test our model. Previous research have estimated the financial impact of data breach event disclosures on firms by using this method (Acquisti et al. 2006; Campbell et al. 2003; Goel and Shawky 2014; Malhotra and Malhotra 2011). Event study methodology is an empirical method that isolates the impact of the data breach event disclosure on the firm by measuring changes to firm market values typically in the 1- 3 days after the event. The idea behind the event study methodology is that the stock price of publicly traded firms represent the true value of the firm, as determined by all relevant public information about the firm available at the time. Our unit of observation is publicly traded firms which have suffered privacy related data breach events from 2010-2015 as reported by Privacy Rights Clearinghouse (2016). We will utilize and merge two secondary datasets, and one primary dataset to test our model. This includes data from COMPUSTAT and Privacy Rights Clearinghouse. To measure media coverage, we will devise a primary dataset utilizing Factiva and LexisNexis, following in the methodology of Liu and Shankar (2015).

FUTURE DIRECTION, IMPLICATIONS AND CONCLUSION

Further steps in this research include model specification with a special focus on determining an optimal data collection period for our hypotheses testing and time lags in the model. In addition, we identify other characteristics of the data breach event disclosure we specifically want to study in the context of media coverage. Thus far, we have identified that data breach event disclosure characteristics such as breach magnitude, sensitivity of records breached, and breach type may play role in our model. This research in progress addresses a longstanding gap in the literature on data breach event disclosures and firm market value. Future work has implications for both practitioners and researchers. In an era of increasingly continuous media coverage, research that considers the impact of media on firm market values in the context of breach events is important. In this paper, we contribute to this by operationalizing media coverage in the context of event study research and propose a research model for the variables impact on firm market value. In practice, our hope is that this research allows firms to better strategically allocate resources in managing and reducing their losses. In the era of continuous media coverage, reducing the impact of such events on firm market value may rely heavily on savvy reputation management initiatives.

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