

## Traditional Media, Twitter, and Four Business Scandals

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We examine how traditional media and Twitter cover four business scandals: Wells Fargo fake accounts, EpiPen pricing hikes, Samsung Note 7 faulty battery, and Volkswagen's cheating in emission tests. There are over 500 articles from *The Wall Street Journal*, *The New York Times*, *The Washington Post*, and *USA Today*, and over 400,000 tweets related to these events. We find that traditional media are highly influential. Media organizations, including newspapers, TV networks, and other media outlets, only sent 1% of the scandal-related tweets, but they account for 39% of Twitter users who follow all scandal-related tweets. Newspaper articles rather than individual tweets drew politicians' attention and preceded additional responses from the troubled firms. The troubled firms also choose TV instead of social media to speak to the public. In contrast, social media appear to play a discovery role. Individual tweets precede newspaper articles but not vice versa. Overall, we conclude that the rise of social media such as Twitter does not diminish the role of traditional media in covering business scandals.

*Keywords: Twitter; social media; business scandal; media coverage*

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Date submitted: 2022-09-10

## Introduction

Traditional media, including newspapers, have historically played a pivotal role in monitoring corporate misconducts such as financial fraud (e.g., Dyck et al. 2008; Dyck et al. 2010; Miller 2006). However, with the advent of digital technology over the past two decades, traditional media platforms have faced significant declines in readership, revenues, and profits (e.g., Mitchell et al. 2016; Sullivan, 2020). This shift has raised concerns regarding potential leniency in corporate misbehaviors, especially if social media platforms do not actively cover business news (Miller and Skinner 2015).

Our study aims to explore how traditional media and emergent social media platforms, such as Twitter, differ in their coverage of corporate misconducts. We also aim to understand how traditional media leverage social media platforms to expand their outreach, and which media platforms are preferred by corporations under scrutiny to communicate with their stakeholders.

For this study, we selected four notable business scandals involving public companies that received extensive coverage in both traditional and social media: Wells Fargo's fraudulent account scandal, EpiPen's pricing hikes, Samsung Note 7's faulty battery issue, and Volkswagen's emissions test manipulation. This selection was made considering the prominence of these cases and their extensive coverage in both domains. However, we acknowledge the potential for selection bias and, as such, the findings may not be representative of all business scandals.

We further categorized Twitter accounts into individual accounts and those belonging to traditional media, including four major newspapers, *The Wall Street Journal*, *The New York Times*, *The Washington Post*, and *USA Today*, ten TV channels such as CNBC, Fox News, and Bloomberg, and 15 business media outlets such as Yahoo!, Business Insider, and FastCompany.

We identified newspaper articles that covered these scandals through keyword searches on ProQuest and Factiva. For these events, we identified 516 articles published by the four newspapers. Despite their significant Twitter presence, these newspapers only tweeted 71 times about these scandals. They tend to tweet important articles (i.e., on the front pages), short articles, and articles with less negative tones. The results suggest that newspapers use Twitter to cater to a different readership demographic.

TV networks and other business media outlets play a crucial role in disseminating business news. However, due to unavailability of TV program transcripts, most business research has focused on the press. To bypass this limitation, we used Twitter accounts of these media outlets to identify their coverage of the business scandals in our sample. We find together the traditional media sent less than 500 tweets related to the four business scandals. In contrast, individuals sent more than 417,000 tweets or retweets discussing these events. Despite the small number of tweets, the media are highly influential on Twitter. These media tweets and retweets potentially reach 3 billion Twitter users<sup>2</sup>, while individual tweets and retweets potentially reach 5 billion Twitter users.

Miller (2006) noted that newspapers were the first to report the news in one-third of the accounting irregularity cases, even before the SEC or the involved firm. In our study, we conducted a similar analysis, tracing the origin of news discovery for the four business scandals. Our findings revealed that in three out of four scandals, smaller media outlets and Twitter users were the first to expose the wrongdoing. For instance, an online media outlet reported in 2013 that a Wells Fargo depositor had filed a lawsuit alleging that local branch managers had forged customer signatures to open new accounts to meet sales quotas. Similarly, within five days of Samsung releasing Galaxy Note 7, Twitter users began discussing an instance of the device exploding in South Korea. Even the price hike of EpiPen was first flagged by Twitter users before major news media picked up on it. The only exception was the Volkswagen (VW) emission scandal, where The Washington Post was the first to report that the US Environmental Protection Agency discovered VW used a “defeat device” to cheat emission tests. Furthermore, we examined the chronological relationship between individual tweets and newspaper articles. The analysis revealed that individual tweets often precede newspaper articles, not the other way around.

Taken together, these findings suggest that social media platforms, such as Twitter, tend to discover business scandals earlier than traditional media. However, it should be noted that this finding is based on a limited set of cases and may not be applicable universally. Further research is needed to validate this pattern across a broader range of business scandals.

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<sup>2</sup> These numbers could overestimate the audience size since many Twitter accounts could have overlapping followers.

We also note the significant role traditional media play in drawing public and policymaker attention to business scandals. To illustrate, comprehensive coverage of Wells Fargo's fake account scandal by major news outlets only began after Wells Fargo arrived at a settlement with regulators to rectify its wrongdoings. By then, Wells Fargo had already terminated over 5,000 employees for unauthorized account openings, closed these unauthorized accounts, and compensated affected customers. Despite the Consumer Financial Protection Bureau, the Los Angeles City Attorney, and the Office of the Comptroller of the Currency expressing satisfaction with these measures, traditional media scrutiny persisted, questioning the bank's aggressive culture and senior executives' responsibilities. This media attention prompted U.S. Congress to initiate investigations and hearings, fueling further media coverage that only subsided once Wells Fargo's CEO was replaced. This example underscores how traditional media often play a more critical role than social media in amplifying and escalating business scandals.

Lee, Hutton, and Shu (2015) suggested that firms could use social media to mitigate negative stock market reactions following product recalls. We investigated this claim in our context, examining how companies manage negative publicity. We found that substantive actions often spoke louder than words. For example, both Volkswagen and Wells Fargo replaced their CEOs in response to their respective scandals. Volkswagen ceased selling diesel cars in the U.S., recalling millions across the U.S. and Europe. Samsung, in response to the Note 7 scandal, halted sales and production of the model and recalled all sold units. Mylan, the EpiPen producer, introduced a more affordable generic alternative to EpiPen and paid \$465 million to the Department of Justice to settle overpricing accusations.

In our study, we observed that embattled firms often favored television appearances as a platform to address the public. For instance, the CEOs of Wells Fargo and Mylan defended their companies on CNBC. On the other hand, the four companies in our sample did not leverage Twitter significantly to manage their reputations. Samsung was the only one to issue a formal apology via Twitter, with its messages taking a more personal tone. For instance, following the recall of Note 7 phones on September 2, 2016, Samsung tweeted on September 5th: "Your safety is #1. We encourage you to participate in the US #GalaxyNote7 exchange program." Meanwhile, Wells Fargo, Mylan, and Volkswagen used Twitter mainly to issue brief updates on their actions,

without expressing regret or apology. As a result, in the context of these cases, social media appeared to play a minor role in companies' responses to negative publicity.

Our study's findings suggest that, despite the growing influence of social media, traditional media continue to play a vital role in reporting business scandals. Furthermore, our analysis indicates that traditional media, through their Twitter accounts, can reach a broader audience of Twitter users. However, individuals and smaller media outlets tend to uncover business scandals faster on Twitter. Still, traditional media's coverage is indispensable in galvanizing politicians and pressuring firms to take definitive action.

Though our analysis is based on a limited sample size of four cases, it allows us to meticulously trace the evolution of each scandal. We adopt a mixed-method approach, combining qualitative discussions with quantitative analyses, to assess the relative importance of Twitter and traditional media in reporting the same event. This leads us to recommend future research to explore the generalizability of our findings.

### **Related Literature**

Previous studies underscore the crucial role of media in disseminating corporate news and influencing firm behavior and stock returns (Jiang and Kong 2023). Given the constraints on investor attention and processing capacity, the widespread distribution of corporate news across diverse media platforms aids investors in promptly integrating firm news into stock prices (Bushee et al., 2010; Hirshleifer and Teoh, 2003). For instance, Tetlock (2007) found that negative press sentiment forecasts a downward trend in market prices. Similarly, Fang & Peress (2009) noted that newspaper coverage can reduce information friction by reaching a wider audience, even if it does not provide new information. Other studies have shown that press coverage can correct mispricing and accelerate the integration of management forecasts into stock prices (Drake et al., 2014; Twedt, 2016). This aligns with the conclusions of Bennett (2013) and Leskovec et al. (2009) that emerging digital platforms and the dynamics of news cycles shape narratives and influence public discourse.

Separating the effect of media coverage from the events being covered is challenging. To isolate the impact of media coverage, Engelberg and Parsons (2011) studied investors' trading activities under varying media coverage for the same information event. They found local media

coverage to be a strong predictor of local trading activities, even when earnings surprises are held constant. Further, Peress (2014) discovered a significant decrease in trading volume and dispersion of stock returns during national newspaper strikes, although aggregate returns were unaffected. Using the closure of local newspapers as an exogenous change of media coverage, Jiang and Kong (2023) examine how local media influence the toxic emissions from local plants.

In addition to news dissemination, media also plays a key role in corporate governance. Newspapers have been found to expose accounting fraud through independent investigation and analysis (Miller, 2006). Journalists have been responsible for about 13% of corporate fraud detections between 1996 and 2004 (Dyck et al., 2010). Furthermore, newspapers have been found to curtail future trading profits of corporate insiders by broadcasting insider trading information (Dai et al., 2015).

With the advent of the internet and social media, investors' access to financial information and corporate news has transformed. Social media differs from traditional media in several ways. First, they reach a more comprehensive range of audiences than traditional media. For example, the worldwide monthly active users on Twitter as of 2/9/2017 are about 319 million, close to the U.S. population of 324 million. Second, social media allow users to interact with each other and with the elite (e.g., opinion leaders, politicians, and public firms) directly. Third, the rebroadcasting cost is much lower for social media. It is easy for users to retweet a piece of news on Twitter or post a link on Facebook.

Like traditional media, social media coverage has been linked to changes in stock returns. For example, views expressed on prominent investor platforms, like Seeking Alpha, have been found to predict a firm's future stock returns and earnings surprises (Chen et al., 2014). Moreover, aggregate opinions expressed in tweets have been found to predict firms' earnings surprises and announcement returns (Bartov et al., 2015).

There's also evidence that firms strategically use social media to manage their image. Many firms have corporate accounts on Twitter or Facebook, and they selectively disseminate corporate news through these platforms. Negative news is less likely to be shared through a firm's social media account (Jung et al., 2015). Other studies have shown that using social media to disseminate earnings releases can reduce information asymmetry, particularly for smaller and less

visible firms (Blankespoor et al., 2014). It has also been noted that firms that engage directly with customers on social media experience less negative stock market reactions to product recall news (Lee et al., 2015). Gans et al. (2017) report that U.S. airlines respond to customers' complaints through Twitter. They conclude that the rise of social media such as Twitter facilitates the ability of customers to influence a firm's actions directly through voice rather than exit (i.e., Hirschman 1970).

In 2009, Leskovec, Backstrom, and Kleinberg initiated a significant line of research, exploring the question of whether traditional or new media holds precedence in news coverage. This foundational work has formed the basis for numerous subsequent studies. These later investigations typically conduct empirical analyses centered on specific issues, including the Transatlantic Trade and Investment Partnership (Von Nordheim et al., 2018), climate change (Olteanu et al., 2015), social topics like abortion and the Iraq war (Gruszczynski & Wagner, 2017), War and Terror (Bennett, D., 2013), Covid-19 (Gozzi et al., 2020), mass shooting incidents (Guggenheim et al., 2015), and the European refugee crisis (Nerghes & Lee, 2019).

These studies collectively underline the influential role of traditional media in shaping public discourse, while also emphasizing the potent capacity of social media to generate unique perspectives and narratives. For example, Nerghes & Lee (2019) document during the European refugee crisis, Twitter disseminated an alternative, multifaceted narrative, unencumbered by geopolitical boundaries, promoting solidarity and empathy for those impacted. Moreover, these studies document a dynamic interplay between traditional and social media, demonstrating that they mutually influence each other.

### **Data Sources and Sample Selection**

We aim to assess the role of social media, as compared to traditional media, in monitoring and exposing public firms' misconduct. We have chosen Twitter as our measure of social media impact, given the availability of data for analysis. Our data source is ForSight, a Twitter Certified Product by Crimson Hexagon, which provides comprehensive access to all historical tweets. ForSight also calculates the influence of each tweet, taking into account the total followers of the sender and potential reach through retweets. However, we acknowledge that our study might

underestimate the overall power of social media, as we exclude Facebook due to a lack of similar comprehensive data analysis products.

For traditional media representation, we have selected four major newspapers: The Wall Street Journal, The New York Times, The Washington Post, and USA Today, due to their significant influence (Miller 2006; Fang & Peress 2009). These outlets also maintain a strong presence on Twitter, allowing us to discern their selective coverage and compare their behaviors with individual Twitter users.

Although TV networks and online business media outlets, like CNBC, Bloomberg TV, Yahoo Finance, and Business Insider, play a significant role in business news coverage, their influence is difficult to measure due to the unavailability of comprehensive TV program transcripts. To address this, we use their Twitter accounts as a proxy for their coverage, recognizing that this may underestimate their full impact. Our analysis includes ten major TV stations and fifteen other media outlets: CNBC, Fox News, NBC News, CBS News, MSNBC, ABCNews, CNN, NBC, PBS, and Bloomberg; and 15 other media outlets: Yahoo!, Yahoo! News, Yahoo! Finance, FastCompany, Huffington Post, The Associated Press, Business Insider, CNNMoney.com, The Democrats, Entrepreneur, Reuters Top News, Fortune Magazine, MarketWatch, MSN, and Forbes.

Our study focuses on four major corporate scandals, selected from Fortune Magazine's list of "The 5 Biggest Corporate Scandals" in 2015 and 2016. We specifically chose scandals involving publicly listed organizations, not primarily for investigating the relationship between media coverage and changes in stock prices and trading volumes, but for several other compelling reasons.

Public companies, due to their visibility and broad shareholder base, are under heightened scrutiny, making them an ideal subject for investigating the role of media in exposing misconduct. These firms are required to disclose a wide range of information, offering ample material for media coverage and comprehensive investigation. Further, any misconduct by these companies often has a wide-ranging impact, affecting stakeholders from shareholders to employees and customers, thereby attracting significant media attention.



Additionally, these public companies operate under strict regulatory oversight, and any misconduct can result in notable legal and regulatory implications. Media coverage often plays a critical role in highlighting such issues to regulators and influencing public perception of these actions. The comparability across public companies and readily available comprehensive data also aid in a more detailed and accurate analysis of media coverage and its effects.

The scandals we scrutinize involve Wells Fargo's fake accounts, Mylan's EpiPen pricing, Samsung's Note 7 battery fault, and Volkswagen's emission tests deceit. While the sample size may seem small, it enables a more thorough exploration of each event and the media's role in their unfolding.

Prior research either uses ProQuest Newspapers (e.g., Engelberg and Parsons 2011) or Factiva (e.g., Miller 2006; Solomon et al. 2014) to search for news articles. However, we find that both databases are incomplete in covering the four newspapers in our sample period. For example, ProQuest includes 133 articles from *The Wall Street Journal*, *The New York Times*, *The Washington Post*, and *USA Today* reporting Volkswagen's emission scandal between September 16 and November 16, 2015; Factiva only includes 42 articles. Only 30 articles are included in both databases. To get complete coverage, we searched both sources to locate all articles from the four major newspapers that cover these four events. We also searched Crimson Hexagon to find all tweets related to the four scandals. The specific keywords we used include wells AND fargo AND (scandal OR scam OR (sham and account) OR unauthorize) AND NOT (mortgage); epipen AND (price OR gouging OR pricing); samsung AND battery and (explode OR fire OR explosion) AND NOT (kindle); and (volkswagen OR VW) AND (emission) AND (scandal OR cheat).

### **Overview of the Four Scandals**

Wells Fargo is the third-largest bank in the US by assets. It was viewed as “the big bank least tarnished by the scandals and reputational crises” (Aspan 2013). Its Chairman and CEO John Stumpf was named *Banker of the Year* in 2013 by *American Banker*. It was 7<sup>th</sup> on Barron's list of *Most Respected Companies* in 2015. However, this perception was shattered on September 8, 2016, when the bank announced that it would pay \$185 million to settle allegations with the Consumer Financial Protection Bureau (CFPB), the Los Angeles City Attorney and the Office of the Comptroller of the Currency (OCC) that its employees had opened about 2 million accounts

without customer authorization over five years between May 2011 and July 2015. The bank has closed all fake accounts and refunded customers for associated fees (i.e., on average, \$25 per account). It fired over 5,300 employees related to these accounts. The \$185 million fine was also much smaller than other banks paid to settle improper behavior in the financial crisis (e.g., Bank of America paid over \$16.65 billion to settle financial fraud litigations). Despite the small financial impact of closing the fake customer accounts and the fine, the media, the politicians, and the public questioned the bank's culture and demanded accountability from the top management. After two harsh Congressional hearings and a 10% stock price drop within a month, Wells Fargo CEO and Chairman John Stumpf announced his resignation without severance pay on October 12<sup>h</sup>, 2016. Table 1 details the key events related to Wells Fargo's fake account scandal.

**Table 1 Timeline for Wells Fargo & Co. (WFC)'s Fake Account Scandal**

Date	Key Event	Corporate's Twitter Responses
20130913	Courthouse News Service, an internet publication focusing on civil litigation, reported that a WFC depositor claimed in a lawsuit that branch managers of WFC forged customers' signatures on applications for new accounts to meet quotas.	
20131221	<i>Los Angeles Times</i> reported that the city of Los Angeles filed a lawsuit against WFC for allegedly opening customer accounts and issuing credit cards without authorization and then charging those customers with fees for unwanted services.	
20160908	Regulators fined WFC \$185 million, alleging that more than 2 million bank accounts or credit cards were opened or applied for without customers' knowledge or permission between May 2011 and July 2015.	Wells Fargo has issued a statement regarding definitive settlement agreements. Read more: <a href="http://spr.ly/6016BfqEr">http://spr.ly/6016BfqEr</a>
20160913	WFC would end its controversial employee sales goals program effective Jan. 1, 2017. CEO John Stumpf was interviewed on CNBC.	
20160914	FBI and federal prosecutors in New York and California were probing the bank over the alleged misconduct.	
20160920	CEO John Stumpf testified before the Senate Banking Committee.	
20160923	Six senators criticized WFC for using forced arbitration clauses in its customer account agreements.	
20160927	WFC's independent directors announced that CEO John Stumpf would forgo \$41 million worth of promised compensation as well as his usual salary.	
20160929	CEO John Stumpf testified before the House Financial Services Committee.	
20161003	Hillary Clinton criticized WFC during a campaign stop in Ohio.	
20161005	Fourteen senators urged the Department of Justice (DOJ) to "thoroughly investigate the culpability of senior executives" of WFC.	
20161012	CEO John Stumpf stepped down.	Wells Fargo Chairman, CEO John Stumpf retires; Board of Directors elects Tim Sloan CEO, Director: <a href="http://spr.ly/60178BTVT">http://spr.ly/60178BTVT</a>
20161014	CBS News reported that John Stumpf sold \$61 million of WFC stock in the month leading up to the CFPB investigation.	

*Note:* Key events are compiled from *Forbes*, *ABC News*, and *Wikipedia*.

Mylan Pharmaceuticals, the producer of EpiPens, a lifesaver for individuals with severe allergies, stirred controversy in May 2016 when it hiked the price of a two-pack EpiPens from under \$100 to over \$600. In July 2016, an actress, Mellini Kantayya, started an online petition campaign to ask Congress to stop Mylan's price gouging.<sup>3</sup> The online coverage has caught the attention of the Democratic Party's presidential candidates, Senator Bernie Sanders and Secretary of State Hillary Clinton, and Senator Amy Klobuchar, who has a daughter carrying EpiPens. Traditional media outlets started to cover the event, too. Mylan responded quickly to the negative media coverage by launching a generic version of EpiPen and agreeing to pay \$465 million to US governments to settle disputes related to EpiPen. Table 2 details the key events associated with EpiPen's pricing scandal. As examples of tweets from different parties, in Table 3, we list a couple of tweets related to EpiPen from regular Twitter users, the Media, Senator Sanders, and Secretary of State Clinton.

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<sup>3</sup> <http://www.petition2congress.com/20720/stop-EpiPen-price-gouging>

**Table 2 Timeline for Mylan's EpiPen Pricing Gouging Scandal**

Date	Key Event	Corporate's Twitter Responses
20160711	Mellini Kantayya, an actress, initiated an online petition to Congress.	
20160721	Robyn O'Brien, a parent-activist, wrote a post about EpiPen pricing gouging on her public Facebook page.	
20160817	Robyn O'Brien developed the #EpiGate hashtag on twitter, which quickly went viral.	
20160818	Senator Bernie Sanders (D-VT) criticized the EpiPen pricing on Twitter and Facebook.	
20160821	Major national press such as <i>New York Times</i> started to cover the issue.	
20160824	Presidential candidate Hillary Clinton posted on Twitter and Facebook.	
20160825	Mylan CEO Heather Bresch attempted to justify the price of EpiPen during an interview on CNBC.	1. First on CNBC at 8:30a ET: The CEO of EpiPen maker Mylan will join @SquawkCNBC. 2. Mylan Taking Immediate Action to Further Enhance Access to EpiPen® (Epinephrine Injection, USP) Auto-Injector
20160829	Mylan launched a generic version of EpiPen.	Mylan to Launch First Generic to EpiPen® Auto-Injector at a List Price of \$300 per Two-Pack Carton
20160921	Mylan CEO Heather Bresch testified before the House Oversight and Government Reform Committee.	
20160926	Mylan's EpiPen profits were 60 percent more than it told Congress.	
20161007	Mylan paid \$465 million to settle Medicaid claims.	Mylan Agrees to Settlement on Medicaid Rebate Classification for EpiPen® Auto-Injector

Note: Key events are compiled from *New York Times*, *Polecat.com*, and *Wikipedia*.

**Table 3 Examples of Tweets in Mylan's EpiPen Pricing Gouging Scandal**

Regular Twitter Users	Media	Politicians
<p><b>Bill Hunt</b> @krues8dr</p> <p>While y'all are getting upset over Daraprim (AIDS drug), please note that EpiPen did the *same* thing. 400% price hike.</p> <p>RETWEETS: 30 LIKES: 16</p> <p>5:14 AM - 24 Sep 2015</p>	<p><b>The New York Times</b> @nytimes</p> <p>In light of the EpiPen controversy: An explanation of the complex world of drug pricing</p>  <p><b>The Complex Math Behind Spiraling Prescription Drug Prices</b> How much Americans pay at the pharmacy depends on a complicated system of list prices, discounts, fees and deductibles, with the sickest often paying the most.</p> <p>RETWEETS: 159 LIKES: 206</p> <p>10:50 PM - 25 Aug 2016</p>	<p><b>Bernie Sanders</b> @SenSanders</p> <p>There's no reason an EpiPen, which costs Mylan just a few dollars to make, should cost families more than \$600.</p>  <p><b>EpiPen's 400 Percent Price Hike Has Parents Scrambling</b> The cost of saving your child's life has gotten a lot more expensive.</p> <p>RETWEETS: 9,135 LIKES: 13,828</p> <p>6:19 AM - 18 Aug 2016</p>
<p><b>President Obama</b> @POTUS44 - 14 Jan 2016</p> <p>Looking forward to hearing your ideas about what we can accomplish this year &amp; beyond. I'll answer your questions on #AskPOTUS at 12:30p ET.</p> <p>RETWEETS: 1.1K LIKES: 1.3K</p> <p><b>Monica Villafuentes</b> @MonVillafuentes</p> <p>@POTUS how about lowering the price of medications? \$570 for a child's EPIPEN is pure INSANITY #AskPotus</p> <p>9:47 AM - 14 Jan 2016</p>	<p><b>Fox News</b> @FoxNews</p> <p>EpiPen price hike puts bipartisan heat on Democratic senator's daughter</p>  <p><b>EpiPen price hike puts bipartisan heat on Democratic senator's daughter</b> The mounting congressional scrutiny of pharmaceutical giant Mylan over its 400 percent price hike for EpiPen has created an awkward situation on Capitol Hill fo...</p> <p>RETWEETS: 145 LIKES: 197</p> <p>4:51 AM - 26 Aug 2016</p>	<p><b>Hillary Clinton</b> @HillaryClinton</p> <p>EpiPens can be the difference between life and death. There's no justification for these price hikes. <a href="http://hrc.io/2c7/hrs">hrc.io/2c7/hrs</a> -H</p> <p>RETWEETS: 3,903 LIKES: 9,889</p> <p>11:02 AM - 24 Aug 2016</p>
<p><b>Eva M.S.</b> @Eva4organizing</p> <p>@US_FDA @SEC_News Mylan Pharmaceuticals doubled the price of EpiPen, even with insurance and copay discount card it's \$\$\$\$\$. Price gauging!</p> <p>RETWEET: 1 LIKE: 1</p> <p>12:10 PM - 2 Feb 2016 from South Carolina, USA</p>	<p><b>MarketWatch</b> @MarketWatch</p> <p>People with severe allergies are balking at the Valeant-like price increase of Mylan's EpiPen</p> <p><b>Mylan's EpiPen price increases are Valeant-like in size, Shkr...</b> Some patients have started buying the device from Canada.</p> <p>RETWEETS: 23 LIKES: 16</p> <p>7:13 PM - 20 Jul 2016</p>	

Samsung Electronics is the biggest smartphone vendor globally, with a market share of over 20% in 2016.<sup>4</sup> On August 19<sup>h</sup>, 2016, Samsung released Galaxy Note 7, a much-anticipated improvement to Note 5. The demand was high: it had broken pre-order records in South Korea and had delayed international release due to shortages in supply. However, a few days later, users started to report a fire accident caused by Note 7's battery on Twitter. On Sep 2<sup>nd</sup>, 2016, Samsung suspended the sales of Note 7 and issued an informal recall to exchange the device for a replacement. After some Note 7 caught fire or exploded, Samsung discontinued production and sales of Note 7 globally on October 11<sup>h</sup>, 2016. Three days later, the U. S. Federal Aviation Administration banned Note 7 from any flights. Perhaps due to Samsung's swift response, the company's stock market and reputation didn't suffer much. Table 4 details the key events related to the Galaxy Note 7 battery scandal.

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<sup>4</sup> <http://www.idc.com/promo/smartphone-market-share/vendor>

**Table 4 Timeline for Samsung's Faulty Battery Scandal**

Date	Key Event	Corporate's Twitter Responses
20160819	Samsung released Galaxy Note 7.	
20160824	Twitter cited a report that a Galaxy Note 7 caught fire in South Korea.	
20160831	WSJ reported that Samsung delayed shipment to South Korean carriers.	
20160902	Samsung suspended sales of Galaxy Note 7 and informally recalled the device.	
20160905		Your safety is #1. We encourage you to participate in the US #GalaxyNote7 exchange program: <a href="http://smsng.us/Exchange">http://smsng.us/Exchange</a>
20160908	The US Federal Aviation Administration (FAA) advised passengers not to use Note 7 in flights.	
20160909	The US Consumer Product Safety Commission (CPSC) urged Galaxy Note 7 users to stop using their phones.	US #GalaxyNote7 Exchange Program update: We ask you to power down your Note7 & return it to where purchased. Info: <a href="http://smsng.us/Exchange">http://smsng.us/Exchange</a> .
20160915	The US CPSC and Samsung formally recalled Note 7 in the US and asked customers to exchange the old device for a new replacement.	#GalaxyNote7 Safety Recall: Exchange at your carrier for a new Note7, Galaxy S7, S7 edge or to get a refund. <a href="http://smsng.us/N7Recall">http://smsng.us/N7Recall</a>
20160916	Samsung's president issued an official apology.	
20160922	A replacement Galaxy Note 7 caught fire in Virginia.	
20160923		We're sorry for the inconvenience. The #GalaxyNote7 has a new battery, the green icon tells you it's ready to use. <a href="http://smsng.us/N7Recall">http://smsng.us/N7Recall</a>
20161004	A Galaxy Note 7 owner was hospitalized due to a battery explosion.	
20161005	A replacement Galaxy Note 7 caught fire on a Southwest Airlines flight.	
20161009	The US major wireless carriers suspended sales of Note 7.	
20161011	Samsung halted production and sales of Note 7 globally.	
20161012	Samsung cut its third-quarter earnings guidance.	In light of recent cases, we are putting your safety first and have stopped sales/production of the Galaxy Note7.
20161013	The US CPSC announced the second recall of Note 7 and banned the sale of Note 7.	
20161014	The US FAA banned the Galaxy Note 7 from any airline flight.	

Note: Key events are compiled from *Reuters*, *Forbes*, and *Wikipedia*.



Volkswagen (VW), the world's largest automaker, was embroiled in a major scandal in 2015. On September 18<sup>t</sup>, 2015, the US Environmental Protection Agency (EPA) issued a notice of violation against VW for violating the Clean Air Act by cheating in the emissions test for diesel engines in the 2009-2015 model years. VW installed engine control unit software that detected emissions testing and allowed a car to pass the test. However, the software shut off emission controls during normal driving conditions to achieve better fuel economy, leading to 40 times more pollution than allowed by the law (Linkov 2015). The fallout was immediate and severe: Volkswagen's stock price plummeted over 40% in the next few days. It stopped selling all US diesel cars on September 21<sup>t</sup>. Two days later, VW Group CEO Martin Winterkorn resigned, and several other managers were suspended. On October 15<sup>h</sup>, 2016, Volkswagen recalled 8.5 million cars across Europe. The detailed development of Volkswagen's emissions cheating scandal is described in Table 5.

**Table 5: Timeline for Volkswagen (VW)'s Emissions Cheating Scandal**

Date	Key Event	Corporate's Twitter Responses
20150918	<i>The Washington Post</i> reported that the US Environmental Protection Agency (EPA) issued a notice of violation of the Clean Air Act to Volkswagen Group alleging that VW cheated in diesel emission tests.	
20150921	VW stopped sales of all US diesel cars.	
20150923	VW Group CEO Martin Winterkorn resigned, and several other managers were suspended.	
20150924		Update from Volkswagen regarding the EPA investigation
20150925	Porsche chief Matthias Mueller became V.W.'s new CEO. The EPA announced plans to toughen diesel emissions tests.	
20150928		Visit <a href="http://VWDieselInfo.com">http://VWDieselInfo.com</a> for information regarding affected TDI vehicles.
20151001	VW US sales grew modestly in September, about 10% lower sales growth compared to other top five brands.	
20151008	VW US CEO Michael Horn testified before the House Committee on Energy and Commerce Subcommittee.	
20151015	VW recalled 8.5 million cars across Europe.	
20151016		Use our VIN look up tool to find out if your 2.0L TDI is affected by the emissions issue. <a href="http://www.vwdieselinfo.com">http://www.vwdieselinfo.com</a>
20151028		Owners of affected 2.0L TDI vehicles can sign up on <a href="http://vwdieselinfo.com">http://vwdieselinfo.com</a> to receive communications & updates.
20151104	The scandal widened beyond what was previously disclosed and would cost VW at least an extra \$2 billion.	
20160309	VW US CEO Michael Horn resigned.	
20170111	Six VW executives were charged. VW agreed to pay \$4.3 billion in criminal and civil penalties.	

*Note: Key events are compiled from Reuters, The Guardian, and Wikipedia.*

### **Who Uncovered a Business Scandal?**

In the Wells Fargo fake accounts scandal, initial alerts were raised by Courthouse News Service, an internet publication focusing on civil litigation, which reported that a Los Angeles depositor sued the bank and four branch managers for opening accounts without his knowledge to meet new-account quotas (Kearn 2013). This was followed by an investigative piece by the Los Angeles Times (LA Times) in December 2013, which exposed the bank's aggressive sales quotas (Reckard 2013). Based on reviews of the bank's internal documents, court records, and interviews with employees, the LA Times claimed that the aggressive daily sales quotas "battered employee morale and led to ethical breaches, customer complaints, and labor lawsuits." Despite both these pieces, national media outlets did not pay attention to the issue. However, the LA Times' investigation did motivate local regulators to act. It prompted the City of Los Angeles to file a civil complaint against Wells Fargo on May 4<sup>h</sup>, 2015, claiming that the bank had driven employees to engage "in unfair, unlawful and fraudulent conduct" (Reckard 2015). It is not until Wells Fargo announced its agreement with various regulators in September 2016 that national media and Congress acted.

In the cases of EpiPen's pricing hikes and Samsung's Note 7 faulty battery, social media platforms were the first to raise alarms. The EpiPen pricing issue had been noted by some media outlets (e.g., Koons & Langreth 2015) but didn't receive widespread national coverage until it went viral on social media. Twitter, in particular, provided a platform for customers to voice their complaints. Table 3 lists some examples of tweets from different Twitter users. A tweet by Senator Bernie Sanders criticizing the EpiPen price hike was retweeted over 9,000 times, potentially an estimated 2.4 million Twitter users.

Volkswagen's emission tests scandal was initially flagged by the International Council on Clean Transportation, a not-for-profit organization that conducts independent analyses on environmental issues.<sup>5</sup> They forwarded the test results to environmental regulators, and the news was eventually made public by the Washington Post when the EPA formally notified VW of its Clean Air Act violation.

These cases collectively suggest that smaller media outlets and social media platforms like Twitter are effective in uncovering localized news. Friedrich Hayek famously claimed that dispersed knowledge could not be gathered and conveyed to a central authority (Hayek 1945). The rise of the

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<sup>5</sup> [https://en.wikipedia.org/wiki/Volkswagen\\_emissions\\_scandal](https://en.wikipedia.org/wiki/Volkswagen_emissions_scandal)

internet and social media has made knowledge transfer much easier. In the case of EpiPen, for example, parents, and activists were able to use social media to express their concerns. With the support of influential politicians, they successfully pressured the pharmaceutical company to provide a more affordable alternative. This victory exemplifies how social media has lowered the barrier for customers to assert their *voice* in response to corporate behavior (Hirschman 1970; Gans et al. 2017).

### **Compare Coverages by Various Media Outlets**

#### ***Newspaper Articles, Media Tweets, And Individual Tweets***

While newspapers may not always break a story first, their investigative journalists often bring depth and detail to the unfolding events. They leverage interviews and other investigative techniques to provide a comprehensive narrative. Furthermore, newspapers can use social media platforms, such as Twitter, to amplify their coverage. In examining the four scandals, we found that national newspapers and other traditional media outlets have a substantial presence on Twitter. Table 6 presents the total coverage of the four business scandals across different media outlets.

For each scandal, our analysis period spanned from two days before the event marking the scandal's inception to two days after the event marking its resolution, as outlined in Tables 1-5. We identified 516 unique articles in the four largest national newspapers. Intriguingly, only 71 tweets related to these scandals were sent out by these newspapers. Considering the low cost of tweeting, it's unclear why these outlets didn't promote their coverage more on Twitter. We delve deeper into the characteristics of articles that were tweeted versus those that weren't in the next section.

Though the four national newspapers only issued 71 tweets, their reach was considerable: they potentially reached 902 million Twitter users. Ten TV channels posted 166 tweets, potentially reaching over 1 billion users. Additionally, 15 other media outlets, including Yahoo! Finance, Huffington Post, and The Associated Press, issued 228 tweets, potentially reaching another 1 billion users. Overall, while the media accounted for only about 1% of tweets related to the four business scandals, they reached 39% of all Twitter users. In contrast, other Twitter users sent approximately 417,000 tweets, potentially reaching 5 billion Twitter users.

**Table 6 Media Coverage of Four Scandals across Different Channels**

	Press	Media Tweets (N in numbers; Influence (Inf). in millions)								Individual Tweets			Total Tweets		
	Articles	Press		TV.		Other Media		Total		N	Inf.	%Inf.	N	Inf.	
	N	N	Inf.	N	Inf.	N	Inf.	N	Inf.	%Inf.	N	Inf.	N	Inf.	
SAMSUNG (2016/08/29-2016/10/16)	85	1	12	4	18	5	34	10	64	25%	13,641	194	75%	13,651	258
MYLAN (2016/08/16-2016/10/09)	102	44	542	77	392	88	378	209	1,312	58%	180,863	940	42%	181,072	2,252
VW (2015/09/16-2015/11/06)	145	3	23	2	24	7	40	12	87	3%	132,419	2,600	97%	132,431	2,687
WFC (2016/09/06-2016/10/16)	184	23	325	83	606	128	599	234	1,530	60%	90,971	1,032	40%	91,205	2,562
Total	516	71	902	166	1,040	228	1,051	465	2,993	39%	417,894	4,766	61%	418,359	7,759

This table presents the media coverage of four scandals in our sample across different media channels. The Press-Articles category includes four major newspapers: *The Wall Street Journal*, *The New York Times*, *The Washington Post* and *USA Today*. The *Tweets-Press* category consists of the tweets by the official Twitter accounts of the four major newspapers. The *Tweets-TV* category includes the tweets issued by ten major TV news channels: CNBC, Fox News, NBC News, CBS News, MSNBC, ABCNews, CNN, NBC, PBS, and Bloomberg. The *Tweets-Other Media* category includes the tweets issued by the following media: Yahoo!, Yahoo! News, Yahoo! Finance, FastCompany, Huffington Post, The Associated Press, Business Insider, CNNMoney.com, The Democrats, Entrepreneur, Reuters Top News, Fortune Magazine, MarketWatch, MSN, and Forbes. *The Individual Tweets* category includes all tweets other than those in the previous three media categories. N counts the total number of articles or tweets. Influence (Inf) expressed in millions, quantifies the potential reach of tweets by estimating the total number of times these tweets could have been viewed by Twitter users.

The media and ordinary Twitter users appear to have differing interests in covering the four business scandals. For instance, newspapers and other media outlets showed significant interest in the Wells Fargo fake account scandal, which accounted for over a third of all news articles and about half of all media tweets related to the four scandals. In contrast, non-media Twitter users sent only one-fifth of all individual tweets on these scandals.

For the Volkswagen emissions cheating scandal, despite many articles (one quarter of the total), the four newspapers only issued three tweets. Other media outlets were similarly inactive on Twitter, posting only nine tweets. However, other Twitter users were more engaged, with tweets about this scandal making up one-third of all scandal-related tweets.

Both media and individuals demonstrated less interest in the Samsung faulty battery issue. However, both groups showed substantial interest in the EpiPen pricing scandal. The media and individual Twitter users seemed to place differing levels of importance on the Wells Fargo and Volkswagen scandals.

### **Which Types of News Articles Were Tweeted By Newspapers?**

We conducted an analysis to understand why newspapers did not tweet all their articles. Our focus was primarily on the coverage of Wells Fargo's fake account scandal and Mylan's EpiPen pricing scandal, given the relatively low tweet volume related to the other two scandals. Out of 286 news articles, a mere 41 were tweeted by the respective news organizations' Twitter accounts.<sup>6</sup>

Table 7 reports the results from a logit model. We found that articles featured on the front page (like on pages A1 or B1) were more likely to be tweeted. Interestingly, shorter articles and those with less negative tones also had a higher likelihood of being tweeted. This suggests that newspapers might be attempting to cater to a different audience through their Twitter accounts.

Additionally, it emerged that *The New York Times* and *The Washington Post* were more likely to tweet their articles compared to *The Wall Street Journal*.

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<sup>6</sup> Some articles were tweeted multiple times.

**Table 7 What Type of Articles Did the Press Tweet?**

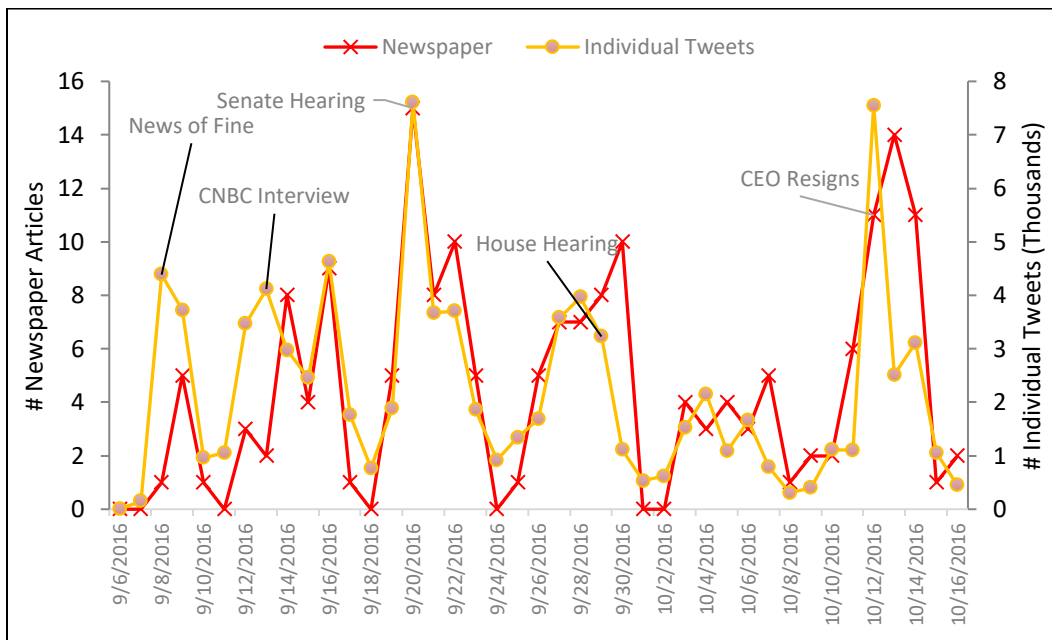
	(1) Logit Coefficient	(2) Marginal Effect
Front Page (A.1 or B.1)	0.17** (0.07)	0.04* (0.02)
Number of Words	-0.04*** (0.01)	-0.01* (0.00)
Negative Tone	-0.12*** (0.02)	-0.03*** (0.01)
Online	-0.04 (0.52)	-0.01 (0.11)
New York Times	0.28*** (0.07)	0.05*** (0.00)
Washington Post	0.37*** (0.05)	0.07*** (0.00)
USA Today	0.41 (0.28)	0.08 (0.08)
Constant (WSJ)	-0.69*** (0.10)	
Observations	286	
Pseudo R-squared	0.03	

*Note:* This table presents the logit regression results to examine what article the press tweeted. The sample includes all 286 articles related to Wells Fargo's fake account scandal and Mylan's EpiPen scandal by the four major newspapers (*The Wall Street Journal*, *The New York Times*, *The Washington Post*, and *USA Today*) in our sample period. Excluding multiple tweets, only 41 out of 286 articles were tweeted. The dependent variable is 1 if an article was tweeted. *Front Page (A.1 or B.1)* indicates whether an article is on Page A.1 or B.1 in printed newspapers. *Number of Words* measures the word count of each article. *Negative Tone* measures the negative tone of each article. *Online* measures whether an article is available online. Detailed variable definitions are provided in Appendix A. Standard errors are reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

### Did Twitter Lead Newspaper Coverage?

We plot the daily volume of individual tweets and the number of newspaper articles for the four scandals in Figures 1 to 4. These figures suggest that for certain instances, both news articles and individual tweets hit peak volume on the same day. Instances such as the Senate hearing for the Wells Fargo scandal (Figure 1) and the launch of the generic version of EpiPen (Figure 2) exemplify this pattern.

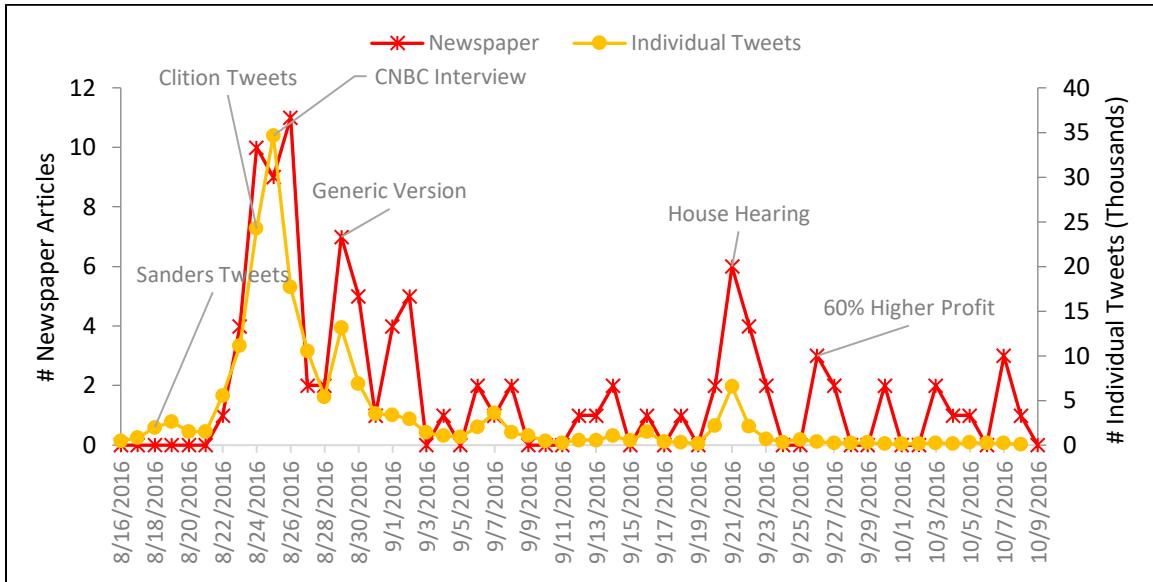
Moreover, these figures generally indicate that the peak number of individual tweets often precedes the peak number of newspaper articles. This pattern can be observed during key moments like the CNBC interview with Wells Fargo’s CEO, his subsequent resignation, and the TV appearance of Mylan’s CEO. This seems to suggest that Twitter enables individuals to react to significant news events in real time.



**Figure 1 Twitter Conversations and Newspaper Coverage on the Wells Fargo Account Fraud Scandal**

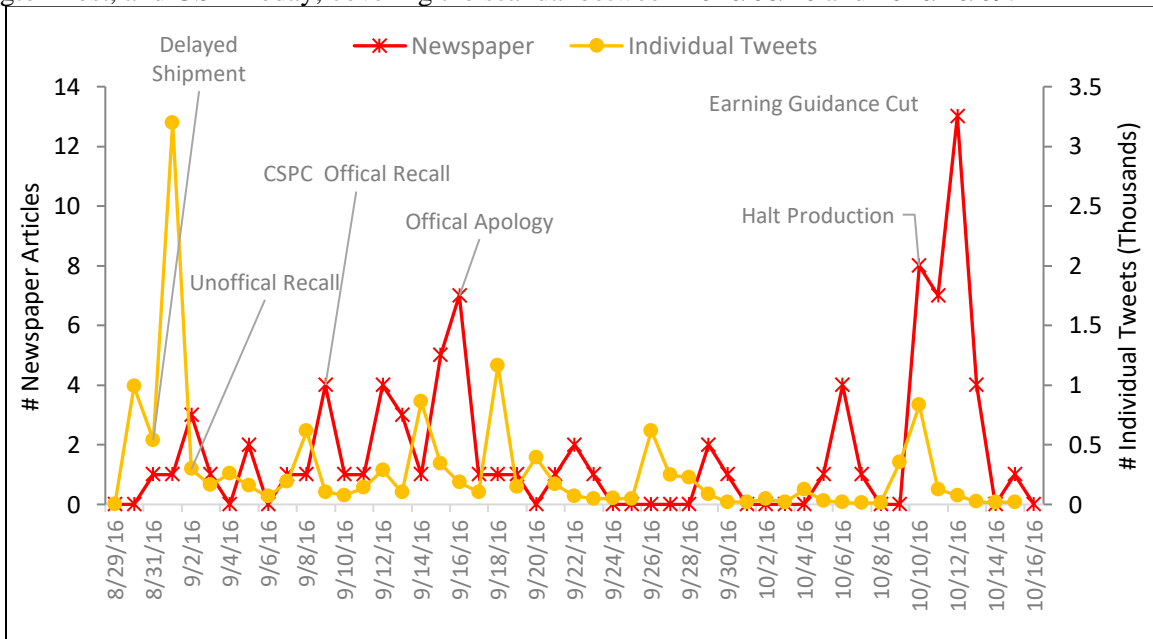
*Note:* This figure plots daily volumes of individual tweets related to the Wells Fargo fake account scandal and daily volumes of news articles in in the four national daily newspapers, The Wall Street Journal, The New York Times, The Washington Post, and USA Today, covering the scandal between 2016/09/06 and 2016/10/16.





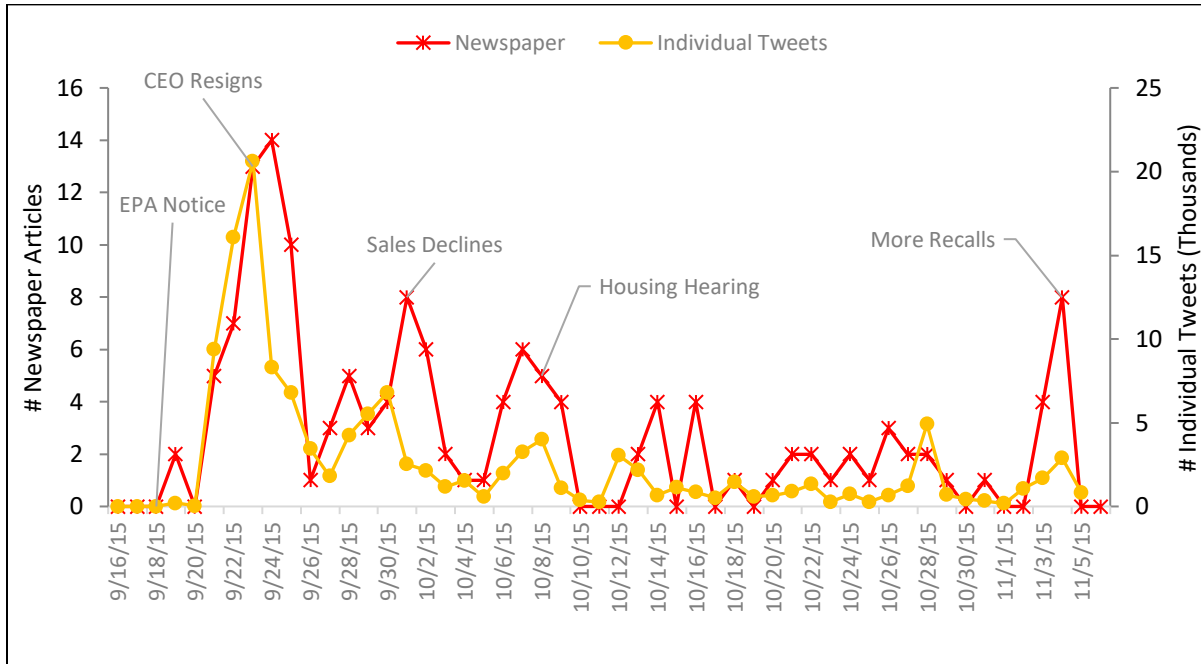
**Figure 2 Twitter Conversations and Newspaper Coverage on the EpiPen Scandal**

*Note:* This figure plots daily volumes of individual tweets related to the EpiPen pricing gouging scandal and daily volumes of news articles in the four national daily newspapers, The Wall Street Journal, The New York Times, The Washington Post, and USA Today, covering the scandal between 2016/08/16 and 2016/10/09.



**Figure 3 Twitter Conversations and Newspaper Coverage on the Samsung Scandal**

*Note:* This figure plots daily volumes of individual tweets related to the Samsung battery explosion and daily volumes of news articles in the four national daily newspapers, The Wall Street Journal, The New York Times, The Washington Post, and USA Today, covering the event between 2016/08/29 and 2016/10/16.



**Figure 4 Twitter Conversations and Newspaper Coverage on the Volkswagen Scandal**

*Note:* This figure plots daily volumes of individual tweets related to the Volkswagen emission-cheating scandal and daily volumes of news articles in the four national daily newspapers, The Wall Street Journal, The New York Times, The Washington Post, and USA Today, covering the scandal between 2015/09/16 and 2015/11/06.

To better understand the lead-lag relation between daily coverage of newspaper articles, newspaper tweets, and individual tweets, we conduct a panel vector autoregression analysis. Based on the Akaike information criterion, we chose one lag in the analysis. We regress the number of daily newspaper articles on its own lagged value and the lagged value of individual tweets or total media tweets. We take the log of 1 plus each number to reduce the influence of extreme values.

The descriptive statistics are reported in Table 8, while Table 9 reports the results from the panel vector autoregression analysis. The one-day lagged value of individual tweets could successfully predict the present day’s newspaper articles and total media tweets. However, yesterday’s newspaper articles on the business scandals do not predict today’s individual tweets.

**Table 8 Descriptive Statistics**

	N	Mean	SD	Min	25%	Median	75%	Max
Newspaper	197	2.62	3.28	0	0	1	4	15
Log(1+Newspaper)	197	0.94	0.82	0	0	0.69	1.61	2.77
IndividualTweet	197	2,121	4,123	0	215	767	2,154	34,749
Log(1+IndividualTweet)	197	6.38	1.92	0	5.38	6.64	7.68	10.46
MediaTweet	197	2.37	5.2	0	0	0	2	45
Log(1+MediaTweet)	197	0.64	0.93	0	0	0	1.1	3.83
IndividualInfluence (millions)	197	24.43	56.01	0	0.71	5.5	19.1	498.9
MediaInfluence (millions)	197	15.41	34.01	0	0	0	8.9	215

*Note:* This table presents the descriptive statistics of variables used in subsequent tests. All variables are measured by calendar days. Detailed variable definitions are provided in Appendix A.

**Table 9 Panel Vector Autoregression Analysis**

	Log(1+Newspaper)	Log(1+IndividualTweet)	Log(1+MediaTweet)
Lag.Log(1+Newspaper)	0.19** (0.09)	-0.04 (0.28)	
Lag.Log(1+IndividualTweet)	0.12** (0.05)	0.61*** (0.14)	0.20** (0.09)
Lag.Log(1+MediaTweet)			0.20*** (0.03)
N	189	189	189

*Note:* This table displays the findings derived from a panel vector autoregression analysis aimed at understanding Granger causality among three variables: *Newspaper*, *MediaTweet*, and *IndividualTweet*. We chose a one-day lag based on the consistent model and moment selection criteria (Andrews and Lu 2001). The panel vector autoregression uses two lags as instrument variables for each scandal firm, so only 189 (=197-4\*2) observations are used in the final regression. Detailed variable definitions are provided in Appendix A. Standard errors are clustered by firm and reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

These results not only confirm the observations from Figures 1-4, that individual tweets tend to precede newspaper coverage, but also reflect the timely nature of Twitter as a platform for participants to share information. Moreover, it suggests the potential for journalists to utilize Twitter as a tool to gauge public interests and subsequently tailor their articles to cater to these interests.

### **How Did Firms Respond After a Scandal Broke Out?**

Prior research documents that firms suffer more from a loss of reputation than the penalty paid to regulators when committing accounting fraud (Karpoff et al. 2008). In response to such misconduct,

firms are more likely to replace their CEO, CFO, board of directors and accounting professionals (e.g., Desai et al. 2006; Srinivasan 2005; Jiang and Shen 2023). Additionally, Lee et al. (2015) find that firms can leverage social media to mitigate negative stock market responses during product recalls. However, it is unclear how firms utilize social media to rebuild their reputations following other types of adverse events. We document firms' responses, including their use of Twitter, in Tables 1-4 and make the following observations:

1) The media and the public are often eager to pinpoint culprits and ensure they face consequences. CEOs, as the public face of a company, are frequently cast as the villains in these situations. In the instances of the EpiPen pricing hike and the Wells Fargo fake accounts scandal, the media spotlighted the CEOs' compensation levels, implying that they profited personally at the expense of customers and lower-tier employees. Their appearances before Congress received extensive coverage from both traditional and social media. Replacing the CEO seems to be an effective response to a company-wide scandal. While Wells Fargo's CEO John Stumpf may not have been aware of the fake accounts and his successor continued his strategy, media coverage dwindled only after his resignation. Volkswagen's Group CEO Martin Winterkorn resigned shortly after the emission cheating scandal was reported. However, both Samsung and Mylan managed to recover swiftly without replacing their CEOs, which leads us to our second observation:

2) Prompt and decisive actions are essential to manage reputational damage. Mylan introduced a generic version of EpiPen just ten days after Senator Bernie Sanders criticized the company. It also quickly reached a settlement with the US Government regarding charges related to EpiPen. Samsung halted Galaxy Note 7 sales and issued a recall for sold units within a few days of discovering the faulty battery issue. There was no attempt to suppress the bad news or cover up the issue. The media largely reported on the Galaxy Note 7's faulty battery as a product failure, and due to the absence of a clear "villain" or other dramatic elements, the Samsung scandal attracted considerably less media attention than the other three scandals.

3) We observe that both the Wells Fargo and Mylan CEOs chose television as their medium to communicate with investors, appearing on CNBC to defend their respective companies. Wells Fargo, Mylan, and VW scarcely used Twitter as a communication tool with their stakeholders, each exhibiting distinct communication styles when they did.

Samsung's tweets, in particular, adopted a more personal tone. For instance, when informing customers about the Note 7 recall, Samsung tweeted on September 5, 2016: "Your safety is #1. We encourage you to participate in the US #GalaxyNote7 exchange program: <http://smsng.us/Exchange>." On September 23, Samsung tweeted: "We're sorry for the inconvenience. The #GalaxyNote7 has a new battery, the green icon tells you it's ready to use. <http://smsng.us/N7Recall>." The company emphasized the importance of customer safety in subsequent tweets. On October 12, Samsung tweeted: "In light of recent cases, we are putting your safety first and have stopped sales/production of the Galaxy Note7."

In stark contrast, other firms' tweets adopted a more neutral tone, eschewing any acceptance of responsibility. For instance, when recalling diesel cars equipped with defeat devices, Volkswagen tweeted on October 16, 2015: "Visit <http://VWDieselInfo.com> for information regarding affected TDI vehicles." On October 28, it further tweeted: "Owners of affected 2.0L TDI vehicles can sign up on <http://vwdieselinfo.com> to receive communications & updates." Future research might find it intriguing to investigate if there are systematic differences among companies' communication styles on Twitter.

### **Conclusion**

In this study, we have scrutinized the roles of traditional media and Twitter in the coverage of four business scandals. We found that Twitter was the earliest source of information for three out of the four cases. Additionally, individual tweets tend to anticipate newspaper articles when it comes to scandal reporting. We discovered that various media organizations, encompassing newspapers, TV networks, and other media outlets, have a substantial presence on Twitter with a significant follower base. Even though they only posted 1% of the scandal-related tweets, these media organizations' tweets reached 39% of Twitter users who followed all scandal-related content.

In terms of corporate responses to scandals, we observed that actions often carry more weight than words. Companies preferred to use television as a medium for communication with stakeholders, rather than Twitter. These observations underscore the still vital role traditional media plays in the context of business scandals. Although Twitter has become an increasingly influential platform for sharing and receiving information, it does not eliminate the significance of traditional media. Rather, it serves as a complement, offering a more immediate and interactive platform for discourse. This dual dynamic between traditional media and social media provides a rich landscape for the coverage and understanding of business scandals.

By understanding these dynamics, companies can better manage their reputations during crises, and consumers and regulators can stay better informed. Future research could delve deeper into the nuances of different companies' communication styles on social media platforms like Twitter, potentially revealing systematic differences and best practices. In a world where information is increasingly disseminated digitally, understanding the interplay between these mediums is more critical than ever.

### Acknowledgements

We express our gratitude to Andy Guess, and the two anonymous reviewers for valuable feedback. Jiang would like to acknowledge the generous research support from the Eli Broad College of Business and the Eli Broad Professorship.

### Funding

The authors declare that this study received no external financial support.

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**Appendix**

**Appendix A: Variable Definition**

Variable	Definition	Sources
Newspaper	The total number of news articles related to the corporate scandals in the Top 4 newspapers (Top 4 Newspapers): <i>The Wall Street Journal</i> , <i>The New York Times</i> , <i>The Washington Post</i> and <i>USA Today</i> .	Factiva/ProQuest
Log(1+Newspaper)	The natural log of the sum of 1 plus the total number of news articles related to the corporate scandals in the Top 4 newspapers.	Factiva/ProQuest
IndividualTweet	The total number of non-media tweets related to the corporate scandals.	Crimson Hexagon
Log(1+IndividualTweet)	The natural log of the sum of 1 plus the total number of non-media tweets related to the corporate scandals.	Crimson Hexagon
MediaTweet	The total number of media tweets related to the corporate scandals.	Crimson Hexagon
Log(1+MediaTweet)	The natural log of the sum of 1 plus the total number of media tweets related to the corporate scandals. The media accounts are listed in Appendix B.	Crimson Hexagon
IndividualInfluence	The total number of times individual tweets could have potentially been read by Twitter users. According to Crimson Hexagon, Influence = sender's followers + followers of all users who have <i>Retweeted</i> the post.	Crimson Hexagon
MediaInfluence	The total number of times media tweets could have potentially been read by Twitter users.	Crimson Hexagon
Number of Words	The natural log of the word count of each article.	Factiva/ProQuest
Negative Tone	The negative tone of each article. We use Loughran-McDonald Master Dictionary to measure the negative tone (Loughran and McDonald 2011).	Factiva/ProQuest
Front Page (A.1. or B.1)	Whether an article is printed on page A.1 or B.1 in printed newspapers.	Factiva/ProQuest
Online	Whether an article is available online.	Factiva/ProQuest

### Appendix B: Media Classification

Twitter Handle	Media Name
<b>Panel A: Four Newspapers</b>	
@nytimes	The New York Times
@washingtonpost	The Washington Post
@USATODAY	USA TODAY
@WSJ	The Wall Street Journal
<b>Panel B: Ten T.V. Channels</b>	
@CNBC	CNBC
@FoxNews	Fox News
@NBCNews	NBC News
@CBSNews	CBS News
@MSNBC	MSNBC
@ABC	ABCNews
@CNN	CNN
@NBC	NBC
@PBS	PBS
@business	Bloomberg
<b>Panel C: 15 Other Media Outlets</b>	
@Yahoo	Yahoo!
@YahooNews	Yahoo! News
@YahooFinance	Yahoo! Finance
@FastCompany	FastCompany
@HuffingtonPost	Huffington Post
@AP	The Associated Press
@businessinsider	Business Insider
@CNNMoney	CNNMoney.com
@TheDemocrats	The Democrats
@Entrepreneur	Entrepreneur
@Reuters	Reuters Top News
@FortuneMagazine	Fortune Magazine
@MarketWatch	MarketWatch
@MSN	MSN
@Forbes	Forbes

Note: We categorize the media based on the type of publication. For the *Newspaper* category, we only include the four major newspapers to be consistent with the traditional media press we used in the rest of paper. For the TV category, we include the top 10 TV news channels. For the *Other Media* category, we only include 15 prominent media outlets that are in the most influential Twitter accounts ranked by Crimson Hexagon.