

**Who is Leading Whom in the General Motors Recall:
Understanding Media Impacts on Public Relations Efforts, Public
Awareness, and Financial Markets***

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Abstract: Through theoretical sampling, this study adopts Vector-Auto Regression (VAR) modeling and the Granger causality method of case-study research to study the 2014 General Motors (GM) recall. This approach allows for a discussion of multiple interrelationships using GM press releases, media coverage about GM and its products, public awareness data, and GM share price and trading volume. Results reveals that within the context of the GM recall, media coverage is a useful predictor and plays a strong role as an agenda-setter. Future public relations practitioners may proactively and consistently monitor media coverage on both corporations and products to prevent and manage crises through both online and offline communication.

Key Words: Agenda-setting; Agenda-building; Crisis; Time series; Public relations

EXECUTIVE SUMMARY

This study investigated the antecedents, process, and consequences of news coverage in the 2014 General Motors (GM) recall. To assess causality, a Vector-Auto Regression (VAR) model was applied to examine relationships among GM press releases, media coverage on GM and its products, public awareness, share price, and financial indicators such as trade of volume. The purpose of this research is to yield contributions to a more general understanding of the antecedents, process, and consequences of media news coverage and broaden the scope of agenda-setting and building approaches in a corporate crisis context. The research model, shown in Figure 1 was designed to assess the relationships between the antecedents (i.e., GM trading volume and press release) and media agenda in H1 and H2; test the agenda-setting effects in H3; compare the differences between corporate and product media agendas on amount, visibility, and tonality in H4; examine the stakeholder agenda-setting between media coverage and financial share price in H5, new media agenda-setting between public awareness and share price in H6, and finally measure GM’s public relations impact in H7.

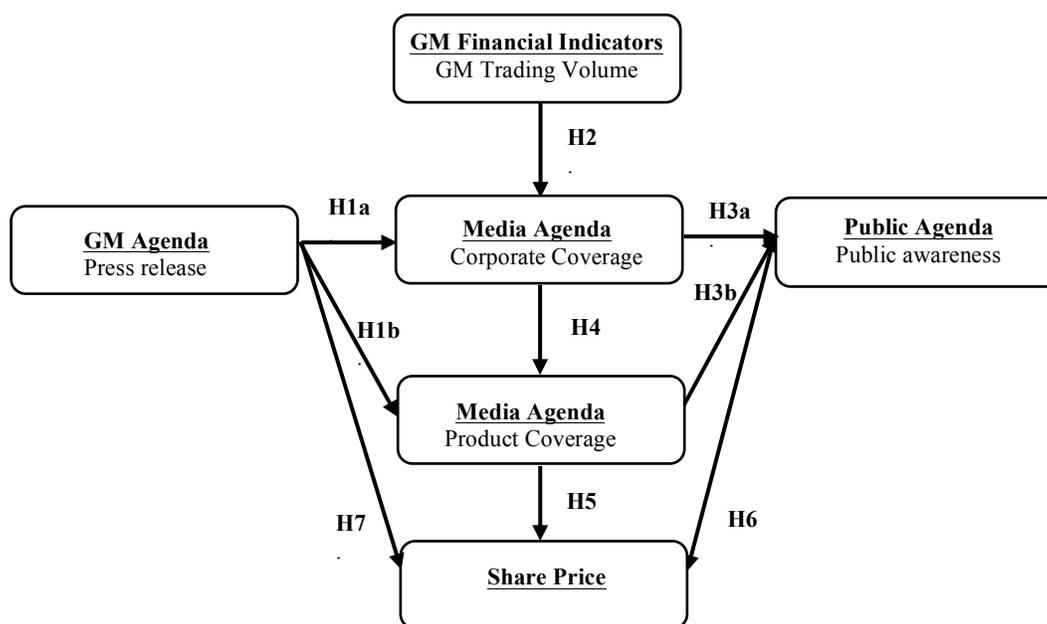


Figure 1. The Research Model of the General Motors (GM) Recall

Data were collected through January 1 to December 31, 2014 that spanned over 365 days from four searchable database including trading volume and share price on Yahoo Finance, press releases on the GM official website, news coverage from *Factiva*, and public awareness on Google trends. In specific, data on news coverage were available from PRIME Research, which was one of global leading companies in media analysis since 1987 (PRIME, 2015). To analyze the casual relationships among GM trading volume, press releases, news coverage on products and corporations, public awareness, and share price in this crisis, the vector auto regression (VAR) model (Freeman, William, & Lin, 1989; Sims, 1980) and pairwise granger causality test (Granger, 1969) were applied for data analysis, which have been widely applied in time series analysis of agenda-setting research (Soroka, 2002).

Figure 2 examines the development of the six major time series over the entire course of the GM recall. Some major features are readily notable. With the exception of GM press releases, all other five variables showed large peaks at some moments. For example, the trading volume of GM stock reached its highest point on January 15, while the media attention for GM and its products already peaked on January 13.

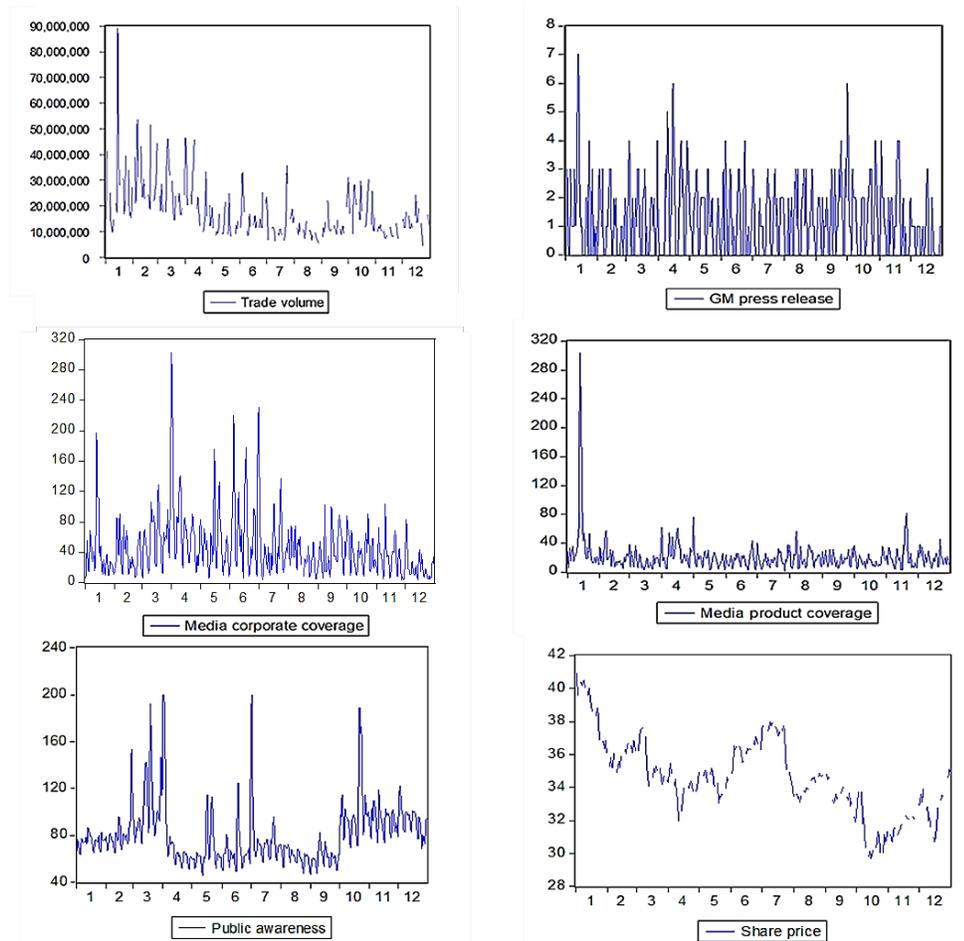


Figure 2: Daily counts for GM’s trading volume, press release, media corporate and product coverage, public awareness, and share price time series (January 1-December 31, 2014).

H1 tested the agenda building effects between GM news releases and media coverage on GM and its products. Table 1 shows that in the recall crisis, the amount of GM's responses did not lead the increase of media coverage on both GM ($\chi^2 = 11.91, p > .10$) and its products ($\chi^2 = 10.26, p > .10$), but instead, media coverage on GM ($\chi^2 = 22.25, p < .01$) significantly shaped the organization's public relations efforts. Thus, the agenda building effects were reversed in the GM recall crisis. Interestingly, when we further tested the relationship between the trading volume of GM stock and news coverage in H2, it was found that increasing amount of media corporate coverage on GM ($\chi^2 = 7.66, p > .10$) could not lead the increase of trading volume of GM. Thus, both H1 and H2 were not supported. The GM trading volume and press releases as the proposed antecedents of news coverage did not influence the media coverage in this crisis.

Table 1. VAR Granger Causality Tests Results.

Dependent variable		Coefficient Block	Chi-square	p-value
GM press release	←	Media corporate coverage	22.25	.00
Media corporate coverage		GM trading volume	7.66	.36
		GM press release	11.91	.10
Media product coverage		GM press release	10.26	.17
Public awareness	←	Media corporate coverage	26.31	.00
	←	Media product coverage	17.94	.01
GM share price		Media product coverage	11.23	.13
	←	Public awareness	20.69	.00
		GM press release	12.28	.09

Note: Arrows indicate Granger causality from coefficient block to the dependent variable. Seven lags of each independent variable are included in the model. VAR results satisfy stability test; all variables after root transformation are normally distributed; model residuals are white noise. N = 365. Analyses were done using EViews 5.1.

H3a and H3b examined the classical agenda-setting effects between the corporate media coverage, product media coverage, and public awareness. Data showed that both the corporate media ($\chi^2 = 26.31, p < .001$) and product media ($\chi^2 = 17.94, p < .05$) agendas significantly predicted the public agenda. Thus, H3 was supported. H4 was proposed to examine the causality between the product media coverage and corporate media coverage on three dimensions: volume, tonality, and visibility. Figure 3 presents the change of media (corporate and product) tonality and visibility over the year of 2014. For the visibility, both the total and average of corporate media visibility were larger than those of the product visibility. For the tonality, the large quantities of negative coverage on GM itself influenced the overall media tonality.

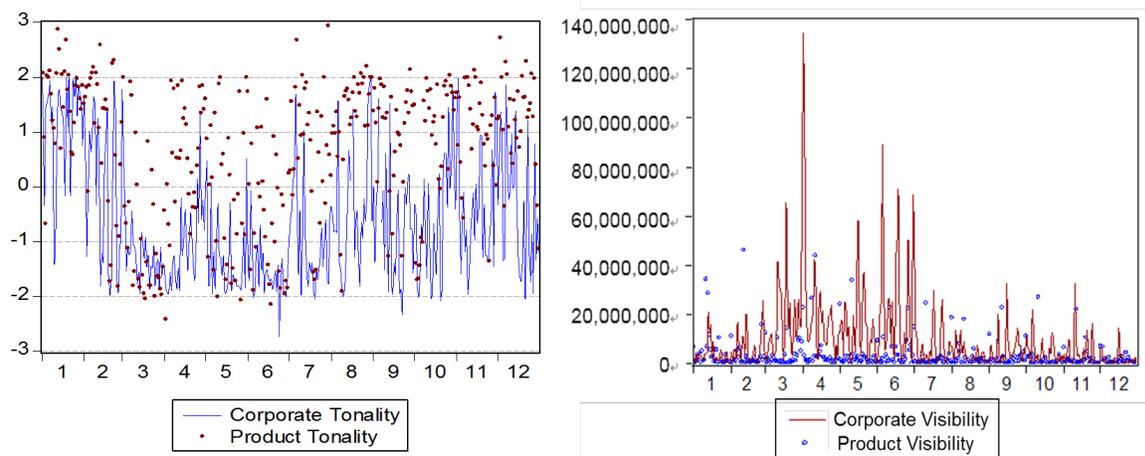


Figure 3: Daily counts for media tonality and visibility on the corporate (GM) and products (January 1-December 31, 2014).

A further pairwise Granger causality analysis was run to test the H4. The F-statistic probabilities from Table 2 indicated that the first null hypothesis was rejected and MCA (media corporate amount) caused a change in MPA (media product amount) ($F = 2.76, p < 0.01$). For the tonality, the corporate news tonality significantly caused product news tonality ($F = 3.14, p < 0.01$) at the lag length of 7. For the visibility, the media corporate visibility significantly predicted the product visibility ($F = 3.41; p < 0.01$). In sum, the H4 was supported. In the GM recall, corporate news led the product news on the dimensions of volume, tonality, and visibility.

Table 2. Pairwise Granger Causality Tests Results

1. Media Amount (Corporate Amount—Product Amount)			
Null Hypothesis	Obs	F-Statistic	Probability
MCA does not Granger Cause MPA	356	2.76	0.01
MPA does not Granger Cause MCA		1.34	0.23
2. Media Tonality (Corporate Tontology—Product Tontology)			
Null Hypothesis	Obs	F-Statistic	Probability
MCT does not Granger Cause MPT	342	3.14	0.00
MPT does not Granger Cause MCT		1.76	0.10
3. Media Visibility (Corporate Visibility—Product Visibility)			
Null Hypothesis	Obs	F-Statistic	Probability
MCV does not Granger Cause MPV	290	3.41	0.00
MPV does not Granger Cause MCV		0.94	0.48

Note: Seven lags of each variable are included. Granger causality results satisfy stability test. N = 365. Analyses were done using EViews 5.1.

H5 examined the stakeholder agenda setting between media coverage and GM share price. Results from Table 1 did not show a significant predication from product coverage to share price ($\chi^2 = 11.23, p = .13$), and thus H5 was not supported. However, a further test of new media agenda setting showed a direct and significant influence from public awareness to share price (χ^2

= 20.69, $p < .01$), after controlling the effects from the media and GM agenda. In this way, H6 was supported. Finally, we measured GM's public relations impact on the financial market. Statistics did not support the significant prediction of GM press releases on share price ($\chi^2 = 12.28, p = .09$), so H7 was not supported.

In sum, results revealed that media coverage was a useful predictor, playing a strong role as an agenda-setter, and could lead to setting of public and organizational agenda in the context of the GM recall. Future public relations practitioners may proactively and consistently monitor media coverage on both corporations and products to prevent and manage crises through both online and offline communication. Findings also showed GM lacked influence on media coverage, which challenged the traditional wisdom of agenda-building theory. Several contingent factors such as restructuring of the company, changes in corporate culture, and the high cost of recalls restrained GM from an active and timely response to the ignition-switch problem.

Last but not least, Corporate should avoid becoming the "Bull's eye". It was well known that this recall occurred because of the quality of products. However, data showed it was not the products that were most frequently reported by the media: but, media coverage on GM corporate led its product coverage in this crisis with larger quantities, more negativity, and higher visibility of reports. Future GM crisis communication strategies should diverge attention from the corporate brand to products by providing a transparent disclosure of information on certain types of products and minimizing the media coverage on the whole corporation.

Introduction

Most agenda-setting research focuses on the process in which the media leads the public to think what is important at a point in time (Zhu & Blood, 1997). Accordingly, the agenda-building research discusses how information institutions such as corporations have the power of setting the media agenda. However, agenda-setting and building theories originated from political election studies. In this regard, what was the degree of the theoretical explanatory power when applied in a corporate context? What might be the antecedents (e.g., trading volume) and consequences of news coverage (e.g., share price) in a recall such as GM's?

This study was motivated as a theoretical reflection on the traditional paradigm of agenda-setting and building in the context of an organizational crisis (Kiousis & McCombs, 2004; Kiousis, Popescu, & Mitrook, 2007; McCombs & Shaw, 1972). The recall crisis of General Motors (GM) was theoretically chosen since it was one of the largest recall crises in the history of the automotive industry (Wallace, 2014). On February 13, 2014, GM announced its first recall of 778,000 small cars in North America due to faulty ignition switches, which could cause the engine to shut off suddenly and prevent airbags to inflate in time (Smith, 2014). The company continually recalled its cars within the next few months. As of August 2014, 16.5 million cars had been recalled for ignition-related defects (Ivory, 2014). As the US Attorney Kenneth Feinberg announced, 229 deaths and 1,986 injury claims had been made in December 2014; at least 36 people had died and 44 had been seriously injured in crashes due to problematic ignition switches (Guardian, 2014). Most importantly, this ignition fault was known to GM since 2001 (Ivory, 2014), but the company did not announce any relevant recalls until 2014 when several investigations were conducted. GM was blamed by the public for hiding the facts of ignition switches and delaying a product recall. GM's reputation quickly came into focus in 2014's large-scale and costly recall.

This study investigated the antecedents, process, and consequences of news coverage in the 2014 General Motors (GM) recall. To assess causality, a Vector-Auto Regression (VAR) model was applied to examine relationships among GM press releases, media coverage on GM and its products, public awareness, share price, and financial indicators such as trade of volume. The ultimate goal of this study was to provide relevant theoretical and practical implications based on the following four dimensions: a) to extend the crisis communication field by exploring not only the effects of organizational crisis communication on publics (e.g., Jin, Liu, & Austin, 2011) or mediated public perceptions (Utz, Schultz, & Glocka, 2013), but also the causal relationship among corporate public relations, stakeholders, media, publics, and financial markets, and the interplay between corporate and product media coverage in crises, b) to engage a call of developing a more process-specific method to illuminate the interactions among the corporation, media, and public agenda. As Strömbäck and Kiousis (2010) stated, in nature, agenda-setting was a temporal process of which the effects should be studied over time. Conway and Patterson (2008) also suggested self-reported survey data could be too suggestive in agenda-setting research. This current study applied a longitudinal, 365-day timeframe to collect data and utilized Granger causality analysis to draw inferences about directional, time-order relationships between media and public agendas settings, c) to provide more context-sensitive perspectives in the agenda-setting and building research (Cheng & Chan, 2015; Curtin & Gaither, 2005; Pompper, 2005; Whetten, 2009). The GM recall was a context-sensitive case which occurred in a unique setting with specific media, public, and corporate context. This study should shed light to agenda-setting and building theory by proposing the contextual factors that may induce peculiar

media effects and guide the agenda-setting or building process, and d) to offer corporate managers practical implications on the interplay between PR efforts, corporate, and product media coverage, public awareness, and financial indicators in a recall crisis.

LITERATURE

Theory of agenda building

Earlier in 1980s, Gandy suggested that we should look beyond classic agenda-setting to focus on the process of agenda-building, and to understand “who sets the media agenda, how and for what purpose it is set, and with what impact on the distribution of power and values in society” (p. 266). In turn, several scholars examined the interactions between media and other institutions (Curtin, 1999; Kiousis & Wu, 2008) and developed two levels of agenda building: one was discussing the transfer of issues salience from the organization to the media; the other was focusing on the attributes of the issues or objectives transformed from the organization to the media.

In the public relations field, agenda-building “refers to the sources’ interactions with gatekeepers, a give-and-take process in which sources seek to get their information published and the press seeks to get that information from independent sources” (Ohl, Pincus, Rimmer, & Harrison, 1995, p. 90). Public relations practitioners usually played the role of leading the media agenda and providing journalists information through press releases, conferences, and issue advertisements. Furthermore, “journalists respect their official sources, reporting what these sources tell them” (Gans, 2003, p. 46). Through empirical studies, scholars (Kiousis et al., 2007; Ohl et al., 1995) found that news releases from public relations practitioners could significantly predict the media coverage of corporate takeovers. Cameron, Sallot, and Curtin’s (1997) study also showed that public relations practices influenced an average of 53% news coverage.

In this study, the agenda building effect of General Motors public relations efforts on media coverage was tested. Most importantly, as many existing studies have discussed, corporations may lose the trust from media institutions and receive negative coverage from journalists under a crisis situation which acts as the conditional factor affecting the agenda-building process (Cancel, Cameron, Sallot, & Mitrook, 1997; Cheng, Huang & Chan, 2016). In this study, I theoretically chose a recall crisis and posited Hypothesis 1a (H1a) and Hypothesis 1b (H1b) to test the causal relationship between PR efforts and media coverage of GM and its products.

H1a: GM news releases could significantly predict the media’s corporate coverage during the recall.

H1b: GM news releases could significantly predict the media’s product coverage during the recall.

Beyond discussing the public relations impact on media coverage, other influences such as trading volume of GM stock was considered. Previous research showed that the amount of news may be predicted by trading volume (Kleinnijenhuis, Schultz, Utz, & Oegema, 2013a; Scheufele, Haas, & Brosius, 2011). Thus, in the second hypothesis, the relationship between GM’s stock volume and media coverage were examined.

H2: The trading volume of GM stock could significantly predict the news coverage.

Theory of agenda setting

Earlier, scholars on agenda-setting research focused on the political election contests in which the salience of issues or attributes of issues of media agenda could influence those in the public agenda (Kiousis & McCombs, 2004; McCombs & Shaw, 1972; McCombs, Lopez-Escobar, & Llamas, 2000). In turn, this agenda-setting theory was applied in corporate communication as well (Carroll, 2011; Kiousis et al., 2007). Scholars found that the media agenda could raise public awareness in an organizational crisis context (Kleinnijenhuis et al., 2013a). The attributes of the issue emphasized by the news media affected the salience of those attributes in the public's mind by influencing how people think about a topic (Kiousis et al., 2007). Following the agenda-setting approach, we proposed H3 to test the correlation between media coverage and public awareness.

H3a: The corporate media coverage could predict public awareness.

H3b: The product media coverage could predict public awareness.

Meanwhile, we examined the inter-correlation between media coverage on the corporation and its products. When crises with quality issues occurred, the media covered news for both corporations and their products. For example, in the 2009 Domino's YouTube crisis (Veil, Sellnow, & Petrun, 2012) and 2008 Sanlu milk contamination crisis (Veil & Yang, 2012), both the corporations and their products were widely reported. However, few previous research efforts differentiated the two types of media coverage and tested the correlation between reporting on corporate brand coverage and product quality problems. In this study, H4 proposed that the coverage on GM might influence the coverage on its products from three dimensions, which included media volume, tonality, and visibility.

H4: The coverage on GM itself might influence its product coverage on volume, tonality, and visibility.

Besides examining the classical and intra-media agenda-setting effects in corporate communication, scholars also proposed the concept of stakeholder agenda-setting (Kleinnijenhuis et al., 2013a) and tested the consequences of news coverage on corporate financial performance such as share price and profits. For example, Wu, Stevenson, Chen, and Guner (2002) found that there was no direct relationship between news coverage and financial markets. However, in the 2007 financial crisis, Kleinnijenhuis, Schultz, Oregma, & Atteveldt (2013b) found that negative media coverage could predict the decrease of share price among publicly traded banks. In the 2010 BP oil crisis, Kleinnijenhuis et al. (2013a) also found that the increase of news amount had a negative effect on the share price. In this study, H5 was proposed to test the influence of news coverage on stock price. Meanwhile, research findings also suggested that public awareness as measured on new media such as Twitter (Bollen, Mao, & Zen, 2010) and Google activities (Kleinnijenhuis et al., 2013a) could also predict the corporate financial share price. In line with these findings, we proposed H6 to test the direct relationship between public awareness and share price.

H5: The news coverage on GM could predict its share price.

H6: The public awareness of the recall crisis could predict the GM share price.

Finally, as Kiousis et al. (2007) suggested, public relations efforts might influence media coverage and further predicted the profits of corporations. In this study, H7 asked whether GM press releases exerted a positive effect on the share price or a spurious impact due to the influence of media coverage on share price.

H7: The press releases of GM could significantly predict the share price.

To recap, it was expected that this research would yield contributions to a more general understanding of the antecedents, process, and consequences of media news coverage and broaden the scope of agenda-setting and building approaches in a corporate crisis context. The research model, shown in Figure 1 was designed to assess the relationships between the antecedents (i.e., GM trading volume and press release) and media agenda in H1 and H2; test the agenda-setting effects in H3; compare the differences between corporate and product media agendas on amount, visibility, and tonality in H4; examine the stakeholder agenda-setting between media coverage and financial share price in H5, new media agenda-setting between public awareness and share price in H6, and finally measure GM’s public relations impact in H7.

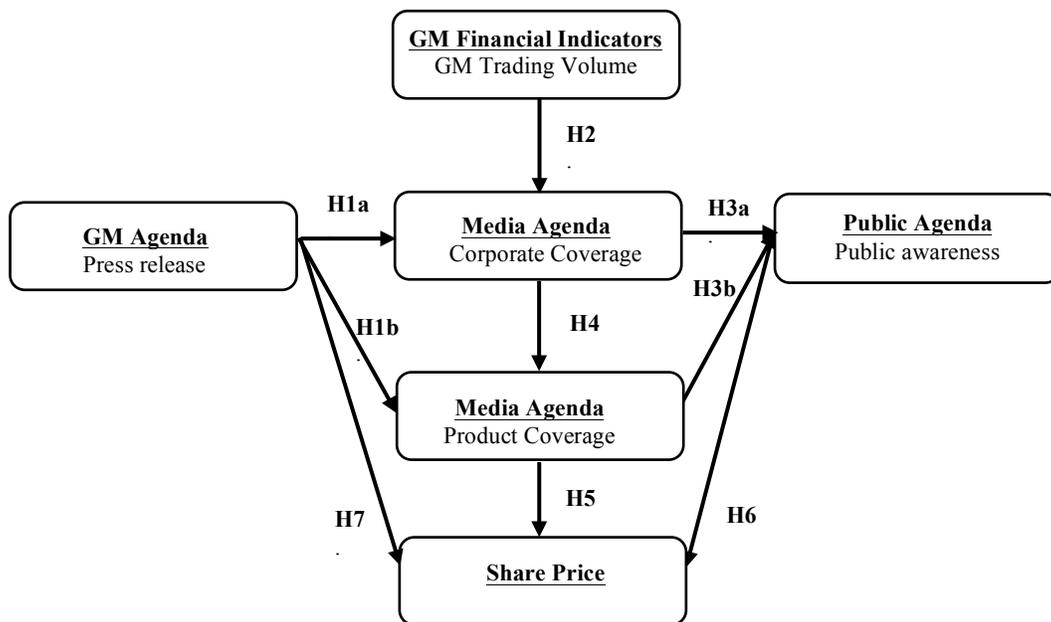


Figure 1. The Research Model of the General Motors (GM) Recall

METHOD

Concerning how agenda-setting and building theories could be applied to a crisis context, this paper used a case study approach to investigate how the trading volume, GM public relations efforts, media coverage, public awareness, and share price interrelated. Data were collected through January 1 to December 31, 2014 that spanned over 365 days from four searchable database including trading volume and share price on Yahoo Finance, press releases on the GM official website, news coverage from *Factiva*, and public awareness on *Google trends*.

Data collection and measure

GM trading volume and share price. Based on the daily data of GM on Yahoo Finance (2015), we collected all the data of trading volume of GM stock and share price at the close of the trading day.

GM press releases. By researching on GM's official website, the number of press releases from January 1 to December 31 in the year of 2014 were tracked. A total of 458 news articles directly posted by GM were collected for final analysis.

News coverage¹. Data on the news about GM were collected from *Factiva*, with "GM" or "General motors" as the keywords for research. To include all relevant news on GM and its products in the year of 2014, we opted for 6,707 news items originating in 102 examples of print media (i.e., national and regional dailies, car magazines, industry magazines, news magazines, and business magazines) such as *USA Today*, *New York Times*, *Los Angeles Times*, *Car and Driver*, and *Forbes*, 4,496 news items originating in 54 examples of TV programming (i.e., cable networks, newscasts, and news magazines car shows) such as *ABC*, *BBC America*, and *CNN*, and 13,193 news items originating in 68 different examples of online media (i.e., online outlets, online only sites, portals, and social Media/blogs) such as *USAToday.com/Money/Autos*, *AP.org*, *ABCNews.com*, and *AutoBlog.com*. In sum, a total of 24,391 media articles from 224 media were collected for final data analysis. To differentiate the media coverage on GM and its products, we also coded each paragraph in each individual article according to the coverage on GM or its products (e.g., Serial models, Turner models, Green models, Hero car, Batmobile, Precept, and autonomy). It was found that among the total 24,391 articles, 7,658 of them (31%) covered GM's products and 16,733 articles (69 %) reported GM itself.

To code the media tonality, a seven-point scale from -3 (*very negative*) to +3 (*very positive*), with 0 indicating neutral statement was applied. Through specially trained human coding rather than software or automated content analysis, the reliability from PRIME coders was as high as .96 (Lee, 2012). We also generated the media visibility for both corporate and product coverage by weighting the following variables such as the reach of each medium, the position, size and prominence of each news article.

Public awareness. Following Kleinjenhuis et al. (2013a)'s measurement of public awareness, we used *Google Trends* to track the daily variations of Internet research for GM recall crisis. By using this instrument instead of survey studies, we could track daily measurement of public responses to this recall crisis through the whole year of 2014 from January 1 to December 31.

¹ Data were available from PRIME Research, which was one of global leading companies in media analysis since 1987 (PRIME, 2015).

VAR modelling strategy

To analyze the casual relationships among GM trading volume, press releases, news coverage on products and corporations, public awareness, and share price in this crisis, the vector auto regression (VAR) model (Freeman, William, & Lin, 1989; Sims, 1980) and pairwise granger causality test (Granger, 1969) were applied for data analysis, which have been widely applied in time series analysis of agenda-setting research (Soroka, 2002). In a VAR model, a measure *y* is regressed against its lagged values as well as the lagged values of all other variables in one equation. If the measure *y* can be better predicted from past values of measures *x* and *y* together than the past values of *y* alone, then *x* is said to have Granger causality for *y* (Freeman, 1983). In the current study, GM's share price was regressed against its lagged values as well as the lagged values of all other measures. The same was done with other variables in the VAR model such as media corporate/product coverage and public awareness. Thus, there are four simultaneous equations, with each measure serving as the dependent variable in one equation. When the relationship between each pair of variables was considered, the VAR model also helped to constrain the influence of other variables included in this model.

Besides building the VAR model, pairwise Granger causality tests were used for testing casual relationships between a pair of time series (Matukhno, 2005) without considering influences from other variables. For example, in the current study, if the media tonality of GM corporate coverage could cause media tonality on its product coverage, the causal path should run from corporate tonality to product tonality, not vice versa.

Regarding the optimal effect span or number of lags in the VAR model, previous research had different findings depending on different types of media and publics. For example, Wanta and Hu (1994) found that the time lags varied among newscasts: for national network newscasts, the time lag was one week; for local newscasts, it could take two weeks for issues of salience in the media to be fully transmitted to the public agenda. Winter and Eyal (1981) suggested that around 4-6 weeks, media might have the most influence on the public agenda. For the relationship between traditional news media agenda and online public opinion, Roberts, Wanta, & Dzwo (2002) found that the time lags could be shorter. In this current study, the time series analysis examined each variable with time lags ranging from one day to seven days.

FINDINGS

Figure 2 examines the development of the six major time series over the entire course of the GM recall. Some major features are readily notable. First, with the exception of GM press releases, all other five variables showed large peaks at some moments. GM published an average of one press release per day in the year of 2014, with 140 (38%) days without any releases and two days in January covering the most activities such as receiving NACTOY awards, achieving sales, and applying new technologies to cars (seven releases per day).

Second, the trading volume of GM stock reached its highest point on January 15, while the media attention for GM and its products already peaked on January 13. As time went on, when GM released its first official recall in 2014 on February 13 and continuously announced several recalls on its official website each month later, significant amount of attention from the public were drawn and several peaks occurred in February, March, April, July, and October. The trading volume could never sustain its peak (89,207,600) in January and dropped to the lowest point (4,496,000) in December with a 95% decrease. Figure 2 also shows that the stock change

rate of GM almost halved during the recall, dropping from 40.95 on January 2 to 29.79 on October 13.

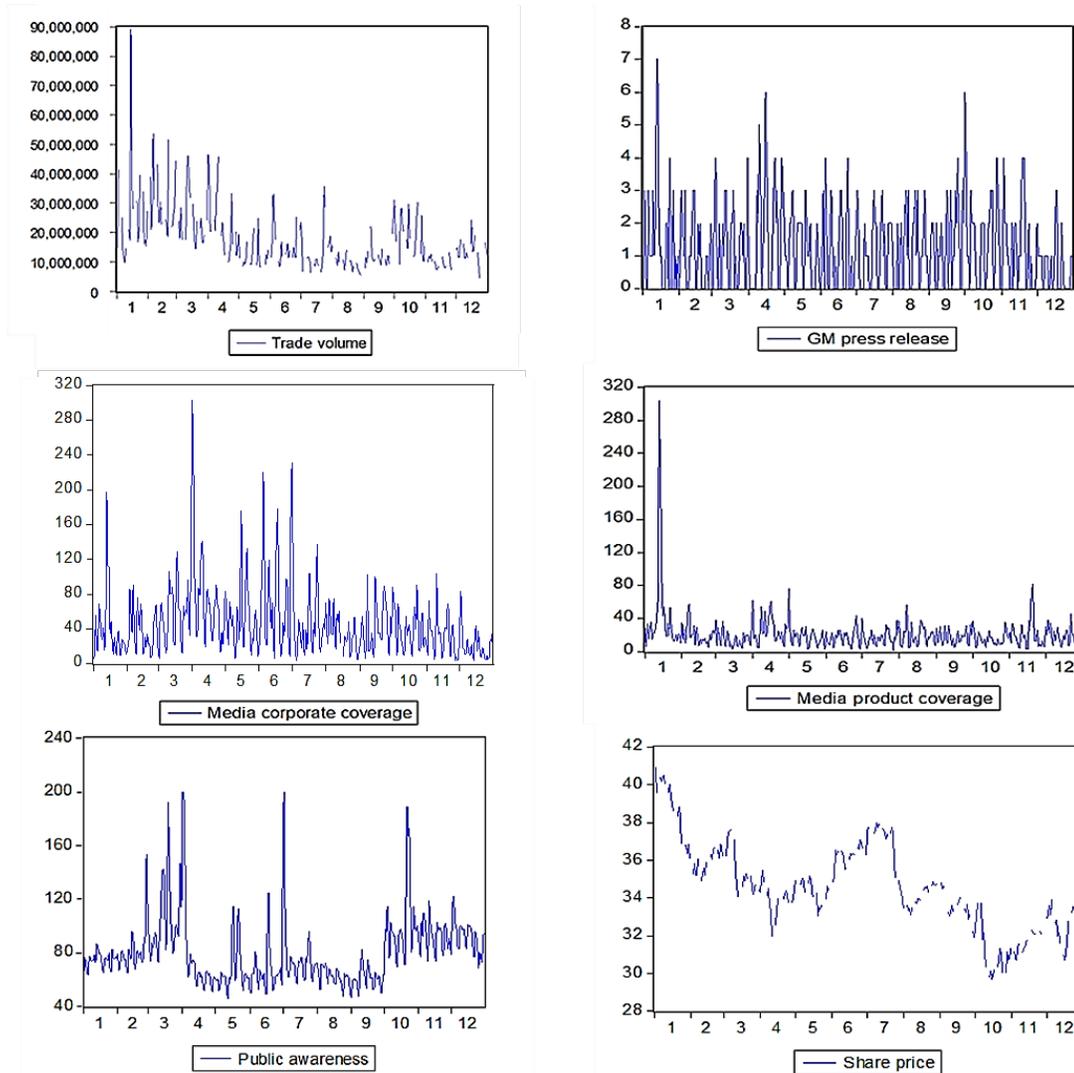


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GM. Thus, both H1 and H2 were not supported. The GM trading volume and press releases as the proposed antecedents of news coverage did not influence the media coverage in this crisis.

Table 1. VAR Granger Causality Tests Results.

Dependent variable		Coefficient Block	Chi-square
GM press release	←	Media corporate coverage	22.25
Media corporate coverage		GM trading volume	7.66
		GM press release	11.91
Media product coverage		GM press release	10.26
Public awareness	←	Media corporate coverage	26.31
	←	Media product coverage	17.94
GM share price		Media product coverage	11.23
	←	Public awareness	20.69
		GM press release	12.28

Note: Arrows indicate Granger causality from coefficient block to the dependent variable. Seven lags of each independent variable are included in the model. VAR results satisfy stability test; all variables after root transformation are normally distributed; model residuals are white noise. N = 365. Analyses were done using EVIEWS 5.1.

H3a and H3b examined the classical agenda-setting effects between the corporate media coverage and product media coverage and public awareness. Data showed that both the corporate media ($\chi^2 = 26.31, p < .001$) and product media ($\chi^2 = 17.94, p < .05$) agendas significantly predicted the public agenda. Thus, the agenda-setting effects between the media and public agenda successfully existed. H3 was supported.

H4 was proposed to examine the causality between the product media coverage and corporate media coverage on three dimensions: volume, tonality, and visibility. First, Figure 1 shows the pattern that the increase of product news might predict the increase of corporate news. Initially on January 13, 2014, the amount of product and corporate coverage both reached their peaks, as time went on, the corporate trending line escalated several times (e.g., in April, June, and July) with 46 articles per day, while the line of product amount remained steady and did not show much activity during the crisis with only 21 articles per day.

Second, Figure 3 presents the change of media (corporate and product) tonality and visibility over the year of 2014. Some major patterns shown in Figure 3 were consistent with the findings in Figure 1 between the corporate media and product media volumes. For the visibility, the corporate trending hit the summit several times in March, April, June, and July, while the product trending line remained stable over the year as shown by the blue dots in Figure 3. Both the total (3,656,986,886) and average (10,046,667) of corporate media visibility were larger than those of the product visibility (total: 1,231,252,256; average: 3,373,294). For the tonality, statistics showed that the average tonality of corporate coverage was negatively oriented ($M = -.62, SD = 1.27$) with 74% falling below the zero line (blues lines). In contrast, the product tonality was positive oriented ($M = .65, SD = 1.27$) with 72% falling above the zero line (red dots). The overall tonality of media coverage was negatively oriented ($M = -.24, SD = 1.21$),

suggesting that in the GM recall, the large quantities of negative coverage on GM itself influenced the overall media tonality.

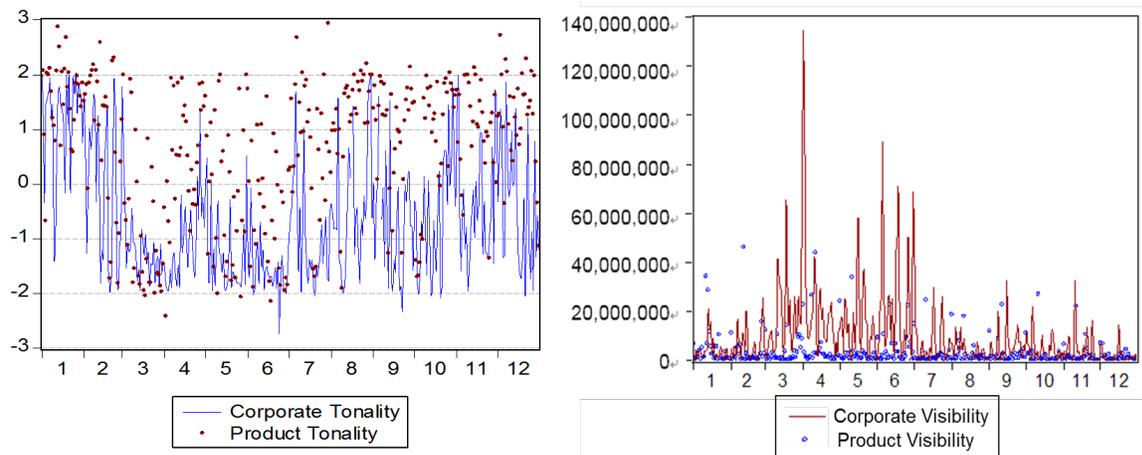


Figure 3: Daily counts for media tonality and visibility on the corporate (GM) and products (January 1-December 31, 2014).

Third, a further pairwise Granger causality analysis was run to test the H4. The F-statistic probabilities from Table 2 indicated that, the first hypothesis that MPA (media product amount) did not granger cause MCA (media corporate amount) was more likely to be rejected ($p < 0.01$) than the second hypothesis that MCA did not granger cause MPA ($p = 0.23$). In other words, this implied that the first null hypothesis was rejected and MCA (media corporate amount) caused a change in MPA (media product amount) ($F = 2.76, p < 0.01$). For the tonality, results showed a dominant direction of influence in the relationship between corporate and product news tonality. The corporate news tonality significantly caused product news tonality ($F = 3.14, p < 0.01$) at the lag length of 7. For the visibility, the media corporate visibility significantly predicted the product visibility ($F = 3.41; p < 0.01$). In sum, the H4 was supported. In the GM recall crisis, corporate news led the product news on the dimensions of volume, tonality, and visibility.

Table 2. Pairwise Granger Causality Tests Results

1. Media Amount (Corporate Amount—Product Amount)			
Null Hypothesis	Obs	F-Statistic	Probability
MCA does not Granger Cause MPA	356	2.76	0.01
MPA does not Granger Cause MCA		1.34	0.23
2. Media Tonality (Corporate Tonality—Product Tonality)			
Null Hypothesis	Obs	F-Statistic	Probability
MCT does not Granger Cause MPT	342	3.14	0.00
MPT does not Granger Cause MCT		1.76	0.10
3. Media Visibility (Corporate Visibility—Product Visibility)			
Null Hypothesis	Obs	F-Statistic	Probability
MCV does not Granger Cause MPV	290	3.41	0.00
MPV does not Granger Cause MCV		0.94	0.48

Note: Seven lags of each variable are included. Granger causality results satisfy stability test. N = 365. Analyses were done using EVIEWS 5.1.

H5 examined the stakeholder agenda setting between media coverage and GM share price. Results from Table 1 did not show a significant predication from product coverage to share price ($\chi^2 = 11.23, p = .13$), and thus H5 was not supported. However, a further test of new media agenda setting showed a direct and significant influence from public awareness to share price ($\chi^2 = 20.69, p < .01$), after controlling the effects from the media and GM agenda. In this way, H6 was supported. Finally, we measured GM's public relations impact on the financial market. Statistics did not support the significant prediction of GM press releases on share price ($\chi^2 = 12.28, p = .09$), so H7 was not supported.

DISCUSSION AND CONCLUSION

Through theoretical sampling, the current study adopted VAR modeling and Granger causality method of case-study research in a corporate crisis context, which allowed for discussion of multiple relationships among GM press releases, trading volume, media coverage on GM and its products, public awareness, and GM share price over an extended timeframe. Results revealed that with the context of the GM recall, media coverage was a useful predictor, playing a strong role as an agenda-setter, and could lead to setting of public and organizational agendas. Theoretical and practical implications of the results are three-fold.

Strong impact of media agenda

Data supported the impact of media coverage on public opinion and corporate brand reputation in a crisis (Fan, Geddes, & Flory, 2013). First, the increasing amount of corporate and product news effectively predicted the increase of public attention towards this recall. The media coverage demonstrated a statistically-significant relationship with public awareness which supported the agenda-setting effects in a corporate crisis context (Carroll & McCombs, 2003). Second, results also showed the media coverage on GM seemed to influence the organization's public relations efforts, which contradicted with the traditional agenda-building theory (Sweetser & Brown, 2008). With the heated discussion on controversial issues (e.g., cost- or customer-oriented GM culture) and an increasing amount of negative news (Himsel, 2014), the media coverage on GM superseded the organization's desire to lead the agenda under high-risk conditions.

Lack of effects on media agenda

This study also found that GM lacked influence on media coverage, which challenged the traditional wisdom of agenda-building theory. That is when GM began to conduct more accommodative activities such as expanding recalls significantly in February, apologizing to the public in March, and compensating the victims in June, the tonality of media coverage actually became more negative and attracted a larger visibility from the general public. Several factors listed below could help explain this phenomenon and proposed a supplement to contingency theory (Cancel et al., 1997) and situational crisis communication theory (Coombs, 2007).

The first factor influencing the agenda building process could be the time for crisis responses. As Huang and Su (2009) suggested, timely crisis responses could successfully improve crisis response effectiveness. In the GM recall crisis, this ignition switch problem first occurred in 2001, however, the company did not report this issue officially. Thirteen years later, the increasing deaths and claims could not be minimized and thus GM and its manager announced continual recalls. These delayed crisis responses left enough time for large quantities

of news reporting for the framing of this crisis. For example, before the official recall announcement from GM on February 13, the media attention for GM and its products already peaked on January 13. Meanwhile, because of the long response time, journalists questioned the response time and set the headline as “Why did GM take so long to respond to a deadly defect” or “GM accused of deadly recall delay, which led the GM agenda. As a result, GM and other automotive companies such as Toyota might consider applying a more transparent, consistent, thematic, and dialogic communication model at the earliest stages of communication and system building in order to gain trust and retain good stakeholder relationships (Balsler & McClusky, 2005; Huang, 2008).

Second, as an organization, GM went through bankruptcy in 2009, reorganized itself, and became a company with new culture. As the new CEO Barra promised, the new GM was focusing on the safety of customers instead of the cost-driven production in the old GM (Himsel, 2014). However, the restructuring of the company, changes in corporate culture, and the high cost of recalls restrained GM from an active and timely response to the ignition-switch problem, which led to a large amount of negative news coverage before its official responses (Business Insider, 2015).

Third, the nature of the crisis event could constitute another important contingency factor. In the crisis situation, especially within which increasing death occurred, the corporation could easily lose its credibility and draw attention from both media and publics (Sweetser & Brown, 2008). Journalists also attributed the product problem to the corporation itself, intensifying the crisis or conflict, and taking the active role to lead the agenda (Putnam & Shoemaker, 2007).

Comparison between corporate and product media coverage

It was well known that this recall occurred because of the quality of products. However, data showed it was not the products that were most frequently reported by the media: but, media coverage on GM corporate led its product coverage in this crisis with larger quantities, more negativity, and higher visibility of reports. Moreover, the corporate media coverage led the organization’s agenda through the crisis and journalists framed this crisis as a corporate management issue rather than only reporting it as a product issue. In this way, although GM had differentiated its brands such as GMC, Buick, and Chevrolet the public awareness was still aroused towards the whole company instead of specific products. Future GM crisis communication strategies should diverge attention from the corporate brand to products by providing a transparent disclosure of information on certain types of products and minimizing the media coverage on the whole corporation.

DIRECTIONS FOR FUTURE RESEARCH

As a single case study with a time span of 365 days, the study covered a comparatively short period of time within the long period of GM’s recalls since 2001. Future research could include a longer time-span for analysis of relationship between the organization, media, and publics. Most importantly, since current principal theories of communication were primarily developed in a Western cultural context that might be problematic in explaining the communication behavior of non-Western people adequately. Multinational comparative study could be conducted to further explore the found media’s agenda-setting and building power in non-democratic countries such as crises in China. Understanding how media emerged as a

powerful agenda setter or builder in different contexts would be an important step to explore the agenda-setting or building process in the contemporary world of today.

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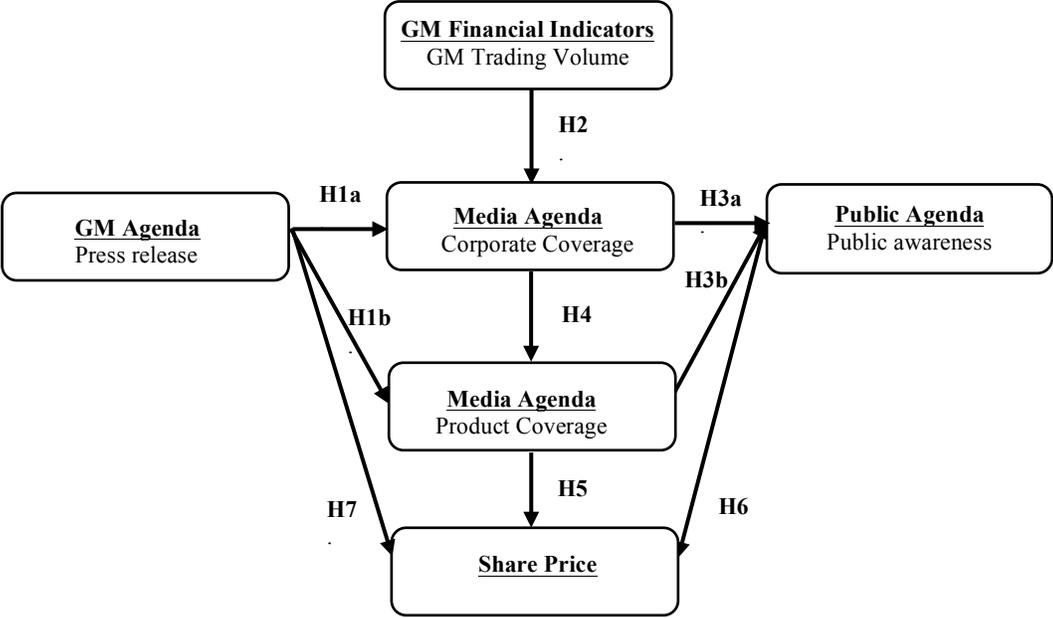


Figure 1. The Research Model of the General Motors (GM) Recall

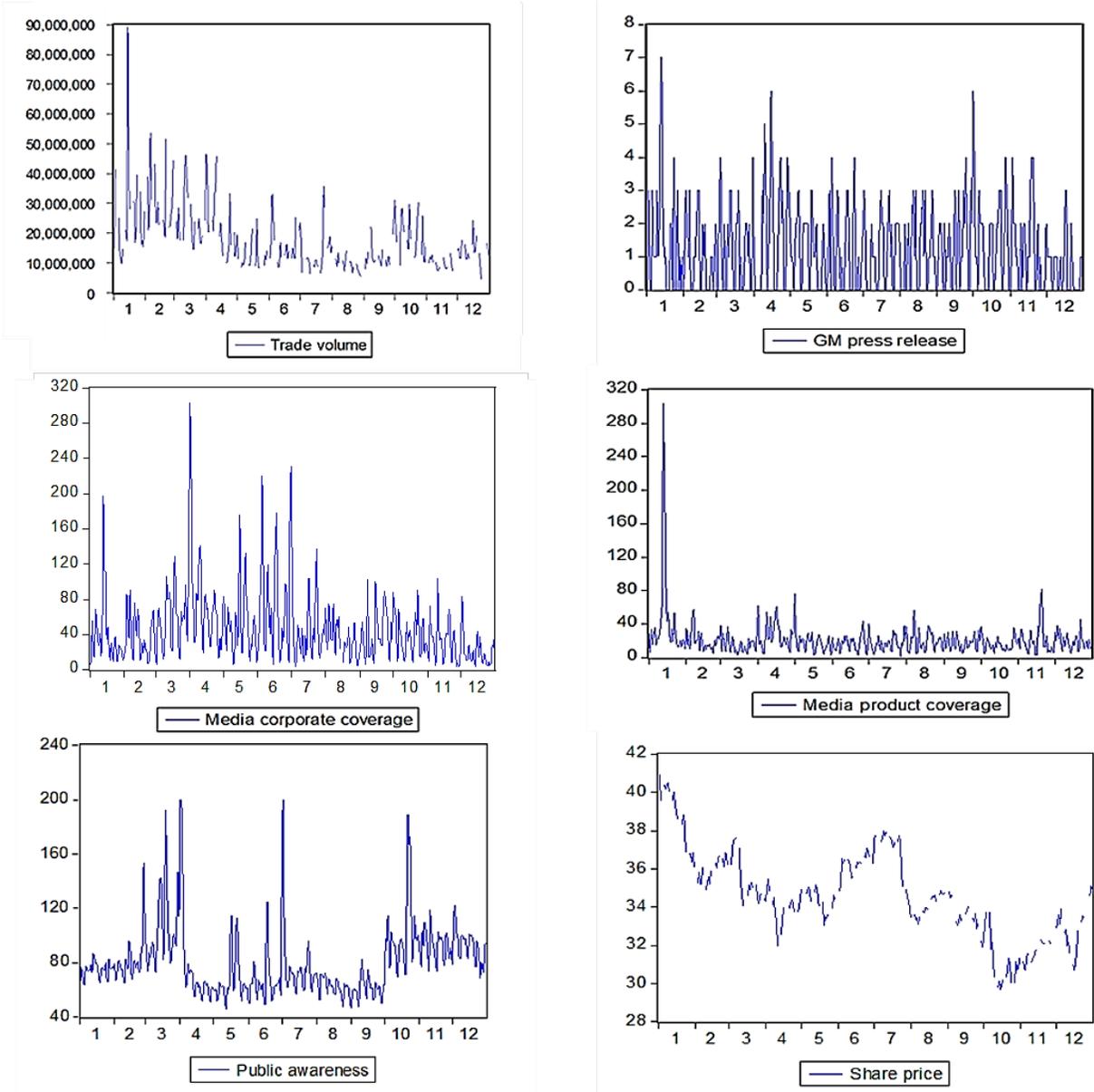


Figure 2: Daily counts for GM’s trading volume, press release, media corporate and product coverage, public awareness, and share price time series (January 1-December 31, 2014).

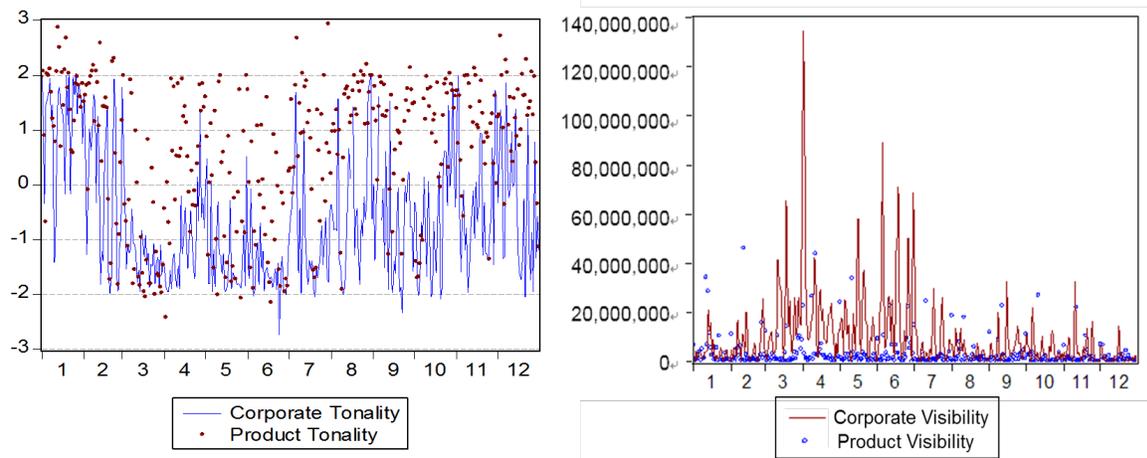


Figure 3: Daily counts for media tonality and visibility on the corporate (GM) and products (January 1-December 31, 2014).

Table 1. VAR Granger Causality Tests Results.

Dependent variable		Coefficient Block	Chi-square	p-value
GM press release	←	Media corporate coverage	22.25	.00
Media corporate coverage		GM trading volume	7.66	.36
		GM press release	11.91	.10
Media product coverage		GM press release	10.26	.17
Public awareness	←	Media corporate coverage	26.31	.00
	←	Media product coverage	17.94	.01
GM share price		Media product coverage	11.23	.13
	←	Public awareness	20.69	.00
		GM press release	12.28	.09

Note: Arrows indicate Granger causality from coefficient block to the dependent variable. Seven lags of each independent variable are included in the model. VAR results satisfy stability test; all variables after root transformation are normally distributed; model residuals are white noise. N = 365. Analyses were done using EViews 5.1.

Table 2. Pairwise Granger Causality Tests Results

1. Media Amount (Corporate Amount—Product Amount)			
Null Hypothesis	Obs	F-Statistic	Probability
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3. Media Visibility (Corporate Visibility—Product Visibility)			
Null Hypothesis	Obs	F-Statistic	Probability
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Note: Seven lags of each variable are included. Granger causality results satisfy stability test. N = 365. Analyses were done using EViews 5.1.