Quantifying the long-term effect of social media

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Abstract: The retail industry is ripe with uncertainties despite making significant strides in the past few years, particularly, since the recent economic downturn. The social media landscape has further complicated the customer connections with retail brands, creating serious challenges for retailers. Marketers are baffled by the constant urgent call by practitioners regarding the social media trend among customers, and they are finding it difficult to determine whether the social media effects can have a long term impact on both the customer perception of a brand and on the long-term trends in brand value. Quantifying the influence of social media in the long-run is essential for the development of branding and marketing strategies that lead to sustained competitive advantage. Empirical assessment includes vector autoregressive econometric modelling to determine whether a brand’s value is stable or trending over time and quantify the persistent effect of social media factors using the real-world data available on social media. Further, implications for both marketing theory and practice are outlined.

Keywords: social media marketing; social advocacy; relationship marketing; brand value.


Biographical notes: Manisha Mathur is an Assistant Professor of Marketing at Augusta University. She completed her PhD in Business Administration (Marketing) at the University of Mississippi. Her research interests include social media marketing, marketing strategy, brand management, relationship marketing, and business ethics. She has published her research in top peer-reviewed journals and presented her research work at several conferences. She is a recipient of Thomas Ponzurick Top Paper in Conference Award and the Graduate Achievement Award. She is currently working on developing new marketing approaches by using social media.

1 Introduction

The retail industry is characteristically seasonal and highly competitive (Khan and Rahman, 2015; Krafft and Mantrala, 2006), having suffered significant losses during the 2009 economic downturn; yet the recent Consumer Confidence Index (CCI, 2015) demonstrates renewed customer preference for spending and borrowing, which brightens
the landscape for retailers. Despite conduciveness of the retail environment to building
strong customer connections, department stores such as Gap and Abercrombie & Fitch
have failed miserably to garner positive associations with its customers. Abercrombie &
Fitch has a long history of customer criticism, which has gained prominence with the
popularity of social media. In the past few years, both Gap (Gap, 2015) and Abercrombie
& Fitch have announced the closing of their stores.

The shaky performance and struggling brands create a need for marketers to achieve
superior competitive advantage via novel ways that are arising from the change in the
current business landscape. The current retail landscape emphasises superior customer
experience rather than pricing strategy as critical to gaining a sustainable competitive
advantage (Khan and Rahman, 2015; Levy et al., 2004). Calvin Klein’s turnaround in the
jeans business due to millennial targeting strategy (Aboutaleb, 2015) and the recent
forecasted rise in the US retail industry digital ad spending (emarker, 2013) point
marketers to seek unique and novel ways to sustain their competitive advantage. In this
respect, social media has rapidly emerged as a game changer for managing retail brands
and our research makes a significant contribution by quantifying the accumulative effects
of social media factors such as engagement, relationship quality, and advocacy on brand
value using a time-series approach known as the vector autoregressive model (VAR).
Our research fills an important lacuna in the current research in marketing that
investigates the role of social media in effectively managing brands. This is particularly
important since brand relationships are keys to brand value and social media allows and
promotes brand relationships, however in novel ways. When considering social media
strategies to building brand relationships, it is important for marketers to determine if
these strategies can be maintained to obtain a competitive advantage. In this respect,
quantifying the long-lasting effects of aspects of social media that have enduring and
accumulative effects on brand value becomes imperative. Thus, our research advances
recent studies on brand management on social media and emphasises the power of social
media by evaluating the long-lasting enduring effect of social media. VAR is a robust
time-series econometric approach that can assess the long-run, enduring effects of social
media factors on brand value.

Despite numerous drivers of retail competitive advantage (pricing strategy,
advertising, customer experience, innovations, etc.), it is imperative that retailers
consistently find inimitable yet easily expendable sources of competitive advantage. Yet
what is lost in this advertising frenzy and price wars is the role of social advocacy in a
retailer’s success. With that in mind, the research objectives of this study are threefold:
First, to establish the key role of social advocacy in accounting for a retailer’s success in
a highly discerned consumer-controlled world of social media. In this research, we
demonstrate that both social media engagement and social sentiments of customers
positively influence the development of social advocacy. Next, we propose and establish
the existence of endogeneity among constructs examined in this study. With little prior
research on the direction of relationships among constructs studied in the context of
social media, it is important that we examine the potential endogeneity. Finally, we
determine the role of social media aspects related to both firms and customers in
influencing a brand’s value. This empirical examination is theoretically grounded in
relationship marketing (Morgan and Hunt, 1994) and modern sociological perspective on
social network theory. Evaluating proposed relationships within the framework of diverse
yet integrated theoretical perspectives enables this research to highlight newer ways to
seek competitive advantage without radical spending and changing of organisational policies. Research in marketing has yet to explore relationships among variables that are recently becoming critical for our understanding of divergent and conflicting events in retail industries.

The econometric analysis is used in this study to evaluate possible inter-dependencies and dynamic relationships among variables across retail brands. Prior similar theoretical and empirical investigations and contexts are inadequate in examining relationships explored in this contemporary study of the current business landscape characterised in terms of social media since social media emerged in a big way for marketers only a few years ago. Thus, nomological validations of relationships proposed in this study are best empirically examined using Vector Autoregressive (VAR) modelling technique. This research provides direction to marketing managers to how to define and delineate newer marketing concepts and how to evaluate marketing phenomenon using sophisticated econometric technique-vector autoregressive modelling.

2 Theoretical framework

With the profound impact of social media on marketing practice and academics, firms have included social media as an integral aspect of their marketing strategy to improve their marketing programs. Social media is a term that refers to a group of online applications that enable users to produce and exchange content (Kaplan and Haenlein, 2010). The way people communicate and interact with each other has radically changed since the past decade with the emergence of social media phenomenon (Mangold and Faulds, 2009). With the expeditious adoption of social media by consumers to convey their opinions, sentiments, tastes, preferences, and experiences, marketers are dawdling to determine their social media goals and means to effectively leverage social media. Recent explorations in social media marketing report that the value of social media to businesses requires extensive empirical examinations (Nam and Kannan, 2014). Research in this area highlights the important role of social media in different types of industries ranging from the music (Dhar and Chang, 2009) and movie industry (Chintagunta et al., 2010) to publishing industry (Chevalier and Mayzlin, 2006). Prior work in this area has investigated diverse aspects of social media such as consumer rationales to use social media (Toubia and Stephen, 2013), improving traditional marketing programs with integration of social media (Stephen and Galak, 2012), product recommendations through social media (Godes, 2011), improvement in product quality perceptions via social media (Tirunillai and Tellis, 2014), and role of social media on organisational leadership and governance (Deans, 2011).

Social network theory from the field of modern sociology provides the most insight into the complex nature of relationships, such as in an organisation, among human beings, and between a firm and its customers (Lusher et al., 2010). The insights provided by relationship marketing from marketing literature offer an understanding of successful relational exchanges (Morgan and Hunt, 1994). Drawing from the tenets on relationship marketing literature and juxtaposing them with perspectives from social network theory, we develop a conceptual model to demonstrate how firms can leverage social media through social media engagement and relationship quality to enhance a brand’s social advocacy and ultimately, value.
The persistent question that constantly challenges marketers, however, is how best to determine the effectiveness of social media marketing campaigns (Hoffman and Fodor, 2010). The current retail landscape is conducive to building profitable customer relationships (De Wulf et al., 2001; Huang, 2015) and consumer activities on social media platforms reflect networked relationships (Paine, 2011). Some studies have evaluated the role of social media in influencing a firm’s return on investment (Kumar et al., 2013), building equity (Gensler et al., 2013), and customer profitability (Danaher and Dagger, 2013). In the recent past, research in the field of social media is more focused on understanding the outcomes of consumer generated content rather than on understanding mechanisms that can account for marketing effectiveness. Understanding the path to revenues is critical for managers to effectively leverage social media marketing to sustainably achieve competitive advantage in the aggressively competitive market environment.

In this article, we augment and advance this stream of literature by evaluating the long-term effect of engagement, advocacy, relationship quality, and brand value on social media to provide more consequential insights for firms seeking to understand how best to influence customer mind-set and behaviour to improve their brand’s success. Our research makes a significant contribution to the field of social media marketing by distinctively demonstrating the long term value of social media networks of consumers and their interactions with brands in influencing the brand’s value.

3 Development of the conceptual framework

The conceptual framework with potential for endogeneity among social media engagement, social advocacy, social media relationship quality, and social brand value is theoretically grounded in a combination of social network theory from the field of modern sociology, relationship marketing literature, and brand management literature from the field of marketing. These three research streams converge to provide us with a framework for expanding marketing knowledge about the new market phenomenon such as social networking and brand associations with consumers.

Our research is a significant step forward in conceptualising a framework that addresses long-term impact on social brand value using the vector autoregressive time-series econometric modelling approach. Quantitatively assessing the long-lasting, accumulative effects are keys to understanding and determining the role of social media in influencing social brand value and focusing only on short-term impact would severely undermine the power of social media. Thus enabled with the VAR approach, our research demonstrates the long-term and enduring effect of social media factors such as engagement, relationship quality, and advocacy on social brand value. The VAR approach to model the dynamic associations among social media engagement, social media relationship quality, social advocacy, and social brand value empowers us to flexibly estimate a system of equations addressing endogeneity, serial correlations, omitted variables, and reversed causality (Trusov et al., 2009). Our research is presented in the paper in a pattern consistent with VAR applications in the marketing field (Dekimpe and Hanssens, 2010; Trusov et al., 2009; Bronnenberg et al., 2000; Srinivasan et al., 2004), which includes the development of the conceptual model, econometric modelling approach, empirical analysis, followed by results and discussion.
3.1 Social media engagement and social media brand relationship quality

Recently, academicians and practitioners have emphasised the role of customer engagement with brands via social media and assessment of engagement effectiveness via novel metrics as key to successful social media marketing activities (Hollebeek et al., 2014). Many firms, such as Starbucks, have benefitted from using social media, particularly by listening and learning from customers (Gallaugher and Ransbotham, 2010; Panagiotopoulos, 2012). Furthermore, it was found that branded conversations among consumers was catalysed by at least one consumer in the network showing an interest in the brand (Keller, 2007). The role of consumers, their ties, and the strength of a tie are integral to any social media-based conversations centred on a brand. Accordingly, engaging consumers in such a way that they incorporate brands in their social conversations are critical to successful social media marketing efforts. Social media engagement is a behavioural concept which we define as the extent to which consumers view, create, and exchange brand-related content. Social media engagement encompasses the variety of ways by which consumers communicate, articulate, and share their views on social media, and build content on social media. The vast repertoire of opportunities for consumers to use social media has led to a wide range of influence of consumers on brand-related content on social media.

Social media brand relationship quality reflects consumer perceptions about their relationships with brands as manifested on social media. Social media brand relationship quality refers to the extent of customer approving, liking, and supporting the positive association, and reflects the level of exchange performance (e.g. Palmatier et al., 2006). Accordingly, relationship quality is a critical concept that offers deep insights into an exchange that occurs particularly between a brand and its consumer. Further, relationship quality portrays commitment, trust, and relationship satisfaction and is a composite assessment of the both relationship intensity and intimacy (Akçura and Srinivasan, 2005; DeWulf et al., 2001). Consistent with prior literature in relationship quality (Crosby et al., 1990; Palmatier et al., 2006), relationship quality on social media reflects expressions of consumer trust and satisfaction toward a brand. Accordingly, in this study the measures of relationship quality are consumer sentiments for brands. From a consumer’s standpoint, relationship quality is high, when consumers are more confident about the brand’s future performance, and believe in the brand’s integrity (Hunt and Morgan, 1994). The extent to which social media engagement is achieved and maintained, the quality of consumer relationships with the brand will strengthen and exhibit consumer trust and satisfaction. The social media engagement of a brand generates consumer trust, confidence, and provides a sense of satisfaction with the brand, thus enhancing quality of consumer-brand relationships on social media platforms.

3.2 Social media engagement and social advocacy

Social media use is growing massively across the globe (Mindruta, 2015), leading to a huge onslaught of firms scrambling to engage consumers using social media (Barwise and Meehan, 2010; Schulze et al., 2014). Social media engagements of consumers occur at different levels. It involves the extent to which consumers assimilate, exchange, and create brand related content on social media (Keitzmann et al., 2012; Muntinga et al., 2011). With a variety of social media platforms such as Facebook, Twitter, YouTube, consumers’ interaction with brands and brand-related content is hugely diverse (Kaplan
Consumers not only view, watch, read, and download brand-created social media content (Barwise and Meehan, 2010), but they also rate brands, join branded online communities, converse with brands on social media, comment on brand-related content on social media (Kaplan and Heinlein, 2010), and create and publish their views on brands (You et al., 2015). These diverse consumer activities on social media involve brand-consumer engagement, which has a profound impact on consumer propensity to favour a brand on social media.

Social advocacy of brands is the extent to which consumers recommend a brand favourably, resist negative information about the brand, and favour new product categories of the brand (Pai et al., 2015). Consumers interact on social media extensively, and their exchanges also centre on brands (Kaplan and Heinlein, 2010). Furthermore, consumers trust brand recommendations from those they engage with through their social media platforms (Kozinets et al., 2010). In the recent past, research studies have noted that brands engaging consumers through earned and owned media are better able to foster trust and advocacy for their brands among consumers (You et al., 2015; Neilsen, 2015). Brand advocacy by consumers on social media is critical for firms. Without brand advocates, brands struggle to achieve favourable word-of-mouth (Pai et al., 2015). With brand-consumer engagement on social media, consumer behaviour related to brands involves how consumers favour brands on social media platforms.

### 3.3 Social media brand relationship quality and social advocacy

The theoretical and empirical literature from the field of relationship marketing suggests that level of relationship quality is critical for developing customer loyalty (Parasuraman et al., 1991). Relationship quality encompasses trust, satisfaction, and commitment, which lead to increase in sales (Crosby et al., 1990).

From a consumer’s viewpoint, quality of relationship is heightened when brands deliver on the promise, operate with integrity, and foster consumer trust and satisfaction (Crosby et al., 1990). Relationship quality substantially influences the extent to which customers seek future contact with the firm and its representatives (De Wulf et al., 2001). In this respect, social media platforms tremendously facilitate and catalyse interactions between a brand and its consumers. An interaction and association between a brand and its consumers allow brands to have the opportunity to develop deep bonds with their consumers. As a result, consumers’ level of trust and satisfaction with the brand enhances and progresses to a higher level. Greater level of consumer satisfaction and trust results in greater level of consumer commitment, loyalty, and lesser level of negative word-of-mouth (Sysmanzki and Henard, 2001). The quality of a relationship provides profound understanding of the complex nature of consumer perspectives (Crosby et al., 1990) enabling brands to foster strong bonds with consumers and addressing negative perceptions about the brands. While relationship quality lowers negative word-of-mouth and fosters relational bonds (Palmatier et al., 2006), it remarkably enhances the potential of positive comments from the consumers on social media as it assists in fostering and nurturing strong and positive associations with brands.

### 3.4 Social advocacy and social brand value

This research expounds the key role of social advocacy for retailers among consumers as one of the key aspects of social media usage among consumers. Additionally, the
influence on a brand’s value as a result of social media behaviour of consumers is key to understanding how firms should manage brands in the current business landscape.

Advocacy of a brand by consumers is key to its growth and greater acceptance by consumers (Keller, 2007). While customer advocacy has been defined “as an advanced form of market orientation that responds to the new drivers of consumer choice, involvement and knowledge” (Lawer and Knox, 2006, p.123), social advocacy considers advocacy of brands by consumers among their networks such as Facebook, Twitter, etc. The market-oriented concept of social advocacy aims to develop strong customer relationships by gaining trust and commitment and by catalysing conversations, involvement, participation, and transparency. Thus, the passion with which consumers approach certain brands becomes a measure of social advocacy in this study.

Brand value refers to the incremental earnings and cash flows emanating as a result of branding relative to unbranded products (Kerin and Sethurman, 1998). Prior research in the field of marketing, financial economics, and financial accounting has explored and determined the association between brand value and shareholder value (Kerin and Sethuraman, 1998). Thus, higher brand values are keys to a firm’s ability to build shareholder wealth. In a rapidly advancing digital world, brand value is created through consumer experiences and consumer inputs (Ramaswamy and Ozcan, 2016). In this research, positive influence on brand value is considered in terms of the extent of the brand’s reach among the customers’ social networks. Recent findings have reported that the extent to which consumers engage in electronic word-of-mouth has a tremendous impact on sales (You et al., 2015).

4 Econometric modelling approach

The econometric modelling technique of Vector Autoregression employed in this study allows for empirically investigation of the presence of potential endogeneity among the variables. Social media engagement with a brand may be endogenous because it not only affects the customer advocacy of a brand, positive customer relationship with a brand, and a brand’s value but is itself affected by them. Similarly, positive customer relationship with a brand may foster customer advocacy of a brand and brand value as well as social media engagement with a brand. Furthermore, prior investigations and contexts are inadequate in examining relationships explored in this contemporary study of the current business landscape characterised in terms of social media, making it difficult to nomologically validate the relationships proposed in this study (Hair et al., 2006). VAR modelling techniques allows us to consider bidirectionality among the variables (Stock and Watson, 2001).

Theoretical foundations for formal hypotheses are key to nomological validation of research studies (Hair et al., 2006; Peter, 1981), and investigating a recent phenomenon of social media marketing that is assuming greater relevance in the current business landscape require researchers to establish novel theoretical principles and newer ways of empirical validation (Kohli et al., 2015; Moore et al., 2015). VAR modelling enables us to empirically investigate relationships among variables without hypothesising the direction of association between each set of variables and the researchers only need to have prior information on the list of variables that can be hypothesised to influence each other in a time series manner (Hamilton, 1994).
For the sake of brevity, we have provided further details and technical specifications of the VAR modelling in the technical appendix. Our modelling approach also require to assess the possibility of the permanent effects of social media engagement, relationship quality, brand advocacy and brand value as a result of expediency and influence of social media on the decision-making process of customers.

5 Empirical analysis

5.1 Data and measures

This research investigates how prevalent and enthusiastic social media behaviours in conjunction with brand attitudes of consumers can be optimised to improve a retailer’s success on social media platforms. To empirically investigate our hypotheses, we examine consumer data in reference to publicly-traded companies in the retail industry. There are two major reasons for investigating companies in the retail industry. First, the retail industry is a sector of the economy that includes businesses engaged in the selling of finished products to end user consumers, and second, the retail industry has been one of the largest contributors to the US and world economy (Krafft and Mantrala, 2010). Moreover, the retail industry is largely a consumer-driven industry (NRF, 2012) allowing us to examine consumer perceptions and consumer-based assessments of retail brands that form the basis of our research. Furthermore, retailers have rapidly adopted important aspect of initiating effective marketing campaigns to successfully reach out to its current and potential customers with the aim of improving repeat business (Fisher and Raman, 2010). The increasing use of social networking systems and other social media approaches have positioned the retail industry farther ahead in driving retention and brand equity (Krafft and Mantrala, 2010). Hence, retail companies lend themselves well to our research objectives.

We selected six brands from the retail industry in order to balance the number of retail companies that are publicly-traded (NAICS Numbers: 44–45) with the number of observations in the data set to have sufficient statistical power (Hair et al., 2010; Nickelsburg, 1985). To remain consistent with prior research studies in the marketing literature (Li and Kannan, 2014) that examine only two months of daily data, we wanted to examine the effects for around six months to obtain methodological robustness. The six brands chosen were Wal-Mart, Dollar Tree, Kohl’s, Belk, Gap, and Nordstrom, which enable us to capture differential consumer perceptions, attitudes, and opinions towards these brands. Consistent with prior research, it has been demonstrated that retailers exhibiting strong awareness, perceptions of quality, associations, and loyalty tend to have stronger retail brand equity (Yoo et al., 2000; Pappu and Quester, 2006). In correspondence with previous work in retail industry (e.g. Pappu and Quester, 2006), the six brands selected reflect aspects of brand awareness, levels of perceived quality, associations, and elements of loyalty, thus, appropriate in examining the constructs of our study.

The dataset consists of 26 weeks of the daily metrics for six retail brands in terms of mentions, sentiments, unique mentions, etc. The data cover the period from September 2014 to May 2015. The data covers daily information for six different companies in the retail industry including varying types of stores (department stores and discount stores). Daily data enables us to capture consumer fickleness and varying consumer views on a
daily basis. This information is critical to our study in examining and optimising social media consumer behaviour particularly due to the speed with which consumers communicate and influence each other via social media platforms. The daily data for each of the six retail brands are sourced from Twitter, Facebook, FriendFeed, YouTube, Digg, Google etc. and aggregated in a single stream of information. Table 1 provides descriptive statistics for the variables.

Table 1  Descriptive statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM Engagement</td>
<td>0.36</td>
<td>0.07</td>
<td>0.12</td>
<td>0.56</td>
</tr>
<tr>
<td>Rel. Quality</td>
<td>30.73</td>
<td>12.71</td>
<td>7.33</td>
<td>65.33</td>
</tr>
<tr>
<td>Brand Advocacy</td>
<td>0.31</td>
<td>0.10</td>
<td>0.16</td>
<td>1.36</td>
</tr>
<tr>
<td>Brand Value</td>
<td>0.33</td>
<td>0.07</td>
<td>0.16</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Information for the constructs was computed from the daily data on social media characteristics derived from a social media search platform (anonymous) that collects and combines user generated content available across social media. Social media engagement reflects consumers’ activities including creating and sharing of brand-related content, and represents the extent to which their communication centres on a brand and builds brand-related content on social media. Accordingly, the social media engagement measures reflect the extent to which a retail brand is being discussed in various social media outlets. Relationship quality reflects consumer perceptions about their positive associations with brands as portrayed on social media. Therefore, relationship quality on social media incorporates range of magnitude of customer comments that are generally positive. Social advocacy of brands represents the extent to which consumers offer favourable comments and remarks on social media and recommend a brand generously. Accordingly, measure of social advocacy of a brand includes the likelihood that customers discussing a retail brand on social media will continue with fervour and passion. Social brand value reflects the value of a brand emerging from human experiences, consequently, brand value measures reflect the number of unique customers who are involved in referencing a retail brand. The retail brand refers to a retailer that has awareness, loyalty, perceived quality, and associations in the marketplace.

Table 2 provides correlations for the variables.

Table 2  Correlation matrix

<table>
<thead>
<tr>
<th>SM Engagement</th>
<th>Rel. Quality</th>
<th>Brand Advocacy</th>
<th>Brand Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM Engagement</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rel. Quality</td>
<td>0.06</td>
<td>–0.12*</td>
<td>–0.13*</td>
</tr>
<tr>
<td>Brand Advocacy</td>
<td>–0.12*</td>
<td>1</td>
<td>–0.19**</td>
</tr>
<tr>
<td>Brand Value</td>
<td>0.82**</td>
<td>0.22**</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: ** Correlation is significant at the 0.01 level (2-tailed).

5.2  Econometric model

This study uses a powerful econometric modelling technique to evaluate possible interdependencies and dynamic relationships among variables across retail brands. The
potential presence of endogeneity among the variables in this study requires the use of Vector Autoregression (VAR) modelling technique to evaluate bidirectional nature of relationships among the variables of this study (Srinivasan et al., 2004). Thus, VAR econometric modelling enables us to model our constructs appropriately, such that we can take into account the novel associations examined in this study (Dekimpe and Hanssens, 2010; Trusov et al., 2009) and allows us to effectively conduct empirical validation of our conceptual model. The VAR modelling techniques allows us to account for the potential endogeneity in social media engagement, brand advocacy, brand value, and relationship quality (Srinivasan et al., 2004).

6 Results

6.1 Unit root tests

The unit root tests allow us to examine whether the variables are evolving or stationary. Prior to performing the VAR model it is required to establish the stationarity of each endogenous variable (Dekimpe and Hanssens, 1999; Dickey and Fuller, 1979; Enders, 1995). If a variable is not stationary or evolving, the application of standard VAR modelling becomes erroneous and we have to consider error correction models (Luo, 2009). The variable is considered stationary when it deviates temporarily around a fixed mean level or trend and is considered evolving when the variable departs permanently from its previous levels (Hamilton, 1994). We performed Augmented Dickey-Fuller (ADF), DF-GLS, and Phillips-Perron unit root tests to evaluate and confirm stationarity of variables.

The results are provided in Table 3. All three tests reveal that each variable is stationary and exhibit no unit root at the 5% confidence level. The results are provided in Table 3. In all three tests we find that for social media engagement (ADF test statistic = –11.77, DF-GLS test statistic = –9.54, and Phillips-Perron test statistic = –12.49), relationship quality (ADF test statistic = –8.77, DF-GLS test statistic = –5.83, and Phillips–Perron test statistic = –9.63), brand advocacy (ADF test statistic = –10.80, DF-GLS test statistic = –8.01, and Phillips–Perron test statistic = –10.79), and brand value (ADF test statistic = –9.80, DF-GLS test statistic = –8.69, and Phillips-Perron test statistic = –12.33) exhibit no unit root and are stationary since we reject the null at p<.05.

Table 3

<table>
<thead>
<tr>
<th></th>
<th>ADF Test</th>
<th>DF-GLS Test</th>
<th>Phillips-Perron Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Test Statistic</td>
<td>5% Critical Value</td>
<td>Test Statistic</td>
</tr>
<tr>
<td>SM Engagement</td>
<td>–11.77</td>
<td>–1.65</td>
<td>–9.54</td>
</tr>
<tr>
<td>Brand Advocacy</td>
<td>–10.80</td>
<td>–1.65</td>
<td>–8.01</td>
</tr>
<tr>
<td>Brand Value</td>
<td>–9.80</td>
<td>–1.65</td>
<td>–8.69</td>
</tr>
</tbody>
</table>

Notes: ADF is Augmented Dickey-Fuller test, DF-GLS is Dickey-Fuller Generalised Least Squares. The ADF, DF-GLS, and Phillips-Perron tests reveal that all the four variables are stationary and exhibit no unit root at the 95% confidence level.
6.2 Granger causality tests

To investigate the presence of causality and causal direction between variables, we conducted Granger causality tests. Specifically, through Granger-causality statistics we assess whether lagged values of a variable help to predict another variable (Stock and Watson, 2011). The tests reveal the presence of dual causality among variables. The results provided in Table 4 show the minimum p-values obtained from the Granger causality tests as performed from one lag to 20 lags. The results reveal endogeneity among variables in our study. We find that social media engagement is Granger caused by lagged values of brand advocacy and brand value, while relationship quality is Granger caused by lagged values of brand value. However, Granger causality is not detected for relationship quality on brand advocacy. Furthermore, the tests show that brand advocacy is Granger caused by social media engagement and brand value, and brand value is Granger caused by social media engagement, relationship quality, and brand advocacy considering the minimum p-values across seven lags.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>SM Engagement</th>
<th>Rel. Quality</th>
<th>Brand Advocacy</th>
<th>Brand Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM Engagement</td>
<td>–</td>
<td>.001</td>
<td>.001</td>
<td>.001</td>
</tr>
<tr>
<td>Rel. Quality</td>
<td>.001</td>
<td>–</td>
<td>.002</td>
<td>.001</td>
</tr>
<tr>
<td>Brand Advocacy</td>
<td>.007</td>
<td>.970</td>
<td>–</td>
<td>.007</td>
</tr>
<tr>
<td>Brand Value</td>
<td>.001</td>
<td>.001</td>
<td>.001</td>
<td>–</td>
</tr>
</tbody>
</table>

Notes: Minimum p-values are provided across 20 lags. Significant p-values for all variables show endogeneity among variables.

The results also indicate the influence of lagged variables in determining causality and the extent of endogeneity existing in our VAR model. In totality, the findings from the Granger causality tests point out the need to regard the full dynamic system (VAR model) and the need to consider the indirect effects of the variables.

6.3 Lag selection

In order to fit the VAR model in correct order, we select a lag order. There are several lag selection criteria and in this study we use four different information criteria to determine the lag length for the VAR model. The selection-order statistics of final prediction error (FPE), Akaike’s information criterion (AIC), the Hannan and Quinn information criterion (HQIC), and Schwarz’s Bayesian information criterion (SBIC) are used to determine the appropriate lag length for running the VAR model. The optimal lag length of the VAR model was selected using the SBIC and the HQIC criteria as these provide theoretical advantage over the AIC and the FPE methods (Lütkepohl, 2005). Based on SBIC and HQIC criteria, the lag length was found to be 15.

6.4 VAR model selection and estimation

In order to determine whether the proposed four endogenous variables provide the best model fit, we used model-selection statistics, particularly the Akaike information criterion (AIC) and the Bayesian information criterion (BIC), which indicate that the best
model should minimise the values of test statistics. First, we estimated the model-selection statistics for two variables, excluding brand advocacy and brand value. Next, we selected a model with three variables excluding only brand value. Finally, we chose a model with all the four proposed variables. The smaller values obtained for AIC and BIC statistics suggest the appropriateness of including all four variables. The results are presented in Table 5 and Table 6.

**Table 5** Results of VAR model equations

<table>
<thead>
<tr>
<th>Equation with DV</th>
<th>RMSE</th>
<th>R-sq</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM Engagement</td>
<td>0.06</td>
<td>0.37</td>
<td>102.69</td>
<td>0.0000</td>
</tr>
<tr>
<td>Rel. Quality</td>
<td>10.87</td>
<td>0.45</td>
<td>140.78</td>
<td>0.0000</td>
</tr>
<tr>
<td>Brand Advocacy</td>
<td>0.09</td>
<td>0.28</td>
<td>67.81</td>
<td>0.0313</td>
</tr>
<tr>
<td>Brand Value</td>
<td>0.06</td>
<td>0.37</td>
<td>103.94</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

**Table 6** VAR model fit results

<table>
<thead>
<tr>
<th></th>
<th>AIC</th>
<th>BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model with SM Engagement and Relationship Quality</td>
<td>1004.06</td>
<td>1101.78</td>
</tr>
<tr>
<td>Model with SM Engagement, Relationship Quality, and Brand Advocacy</td>
<td>638.34</td>
<td>850.52</td>
</tr>
<tr>
<td>Model with SM Engagement, Rel. Quality, Brand Advocacy, and Brand Value</td>
<td>−128.25</td>
<td>244.68</td>
</tr>
</tbody>
</table>

**Figure 1** VAR model fit: tracking plot

![Tracking Plot](image-url)
The plot of predicted versus actual values demonstrates the appropriateness of the VAR system model to represent the data. Hence, we plotted the predicted versus actual values of the variable-social media engagement proposed in this study to demonstrate the suitability of the VAR model to represent the data. The plots suggest that the predicted values closely track the actual values of the social media engagement variable, which is depicted in Figure 1.

6.5 Examining dynamic effects

The VAR model provides a systematic approach to portray the rich dynamics of multiple time series variables. However, the complicated nature of the VAR model dynamics requires us to examine the impulse response functions (IRFs) using the VAR model parameter estimates. To evaluate the influence of social media engagement, relationship quality, and brand advocacy on a brand’s value over time, we calculate impulse response functions using the statistics derived from the VAR modelling. IRFs track the long-term effects over time and enable us to assess the build-up effects of each activity on brand value in conjunction with consideration of indirect effects of these activities. Specifically, impulse response functions (IRFs) trace the effect of the 1-standard deviation shock in a variable on another variable (Stock and Watson, 2011). Hence, IRFs track the impact of shocks (1-standard deviation impulse) in values of social media engagement, relationship quality, and brand advocacy on the future values of brand value. Figures 2, 3, and 4 plot the impulse response functions for the effects of social media engagement, relationship quality, and brand advocacy on brand value over time.

Figure 2 IRF: response of brand value to shock in social media engagement
Figure 3  IRF: response of brand value to shock in relationship quality

Figure 4  IRF: response of brand value to shock in brand advocacy
As the plots display, the social media engagement and brand advocacy effects on brand value stay significantly different from zero for about three weeks. In comparison, the effects of relationship quality sustain significance for at least four weeks. The social media effects with regard to a customer’s engagement and relationship with a brand and a customer’s penchant for advocating a brand on social media induce both short-run response and noticeably longer carryover effect. According, IRF findings underscore the need for researchers to not only investigate the immediate effects but also to develop and analyse models that allow the estimation of longer-run effects of social media customer features.

### 6.6 Impact of social media on firm performance

In order to examine the direct effect on financial outcome, we examined the effects of social media engagement, social media brand relationship quality, social advocacy, and social media brand value on stock returns. The results indicate that social media engagement ($\beta = 0.26$, $p < .05$) and social media brand value ($\beta = 0.24$, $p < .05$) positively and significantly influence stock returns. Based on the findings, we conclude that social media strongly enhances firm performance. The recent business reports suggest that total spending on social media has risen sharply across the globe (33.5% increase from 2014) and that social media is a key catalyst for firm sales (eMarketer, 2015; Li and Kannan, 2014). By examining the effect of social media on stock returns, this study unifies the evolving social media studies in the marketing literature and demonstrates the value of social media in the current business landscape. Given the recent thrust in both academic and practitioner literature on evaluating the returns on investment from social media, our study investigates this issue and our findings support ramping up social media marketing efforts to effectively improve firm performance.

### 7 Discussion

The findings from estimating the VAR model demonstrate the endogeneity among social media engagement, relationship quality, social advocacy, and brand value with important implications for both marketing theory and practice. Alternative models were tested and it was found that the VAR model provided the best fit to the data.

#### 7.1 Theoretical implications

Our study significantly contributes to marketing theory and offers a number of important theoretical implications. Marketing researchers draw insights form diverse fields of study (Hunt, 2002), such as psychology which significantly enhances marketing literature (Nam and Kannan, 2014). Thus, our study’s integration of perspectives from modern sociology with insights from relationship marketing advances our understanding of ways by which social media marketing activities can be effectively leveraged. The extant marketing literature on social media marketing has not yet developed a conceptual model based on the two diverse theoretical perspectives drawn from the fields of modern sociology and relationship marketing to evaluate a brand’s value. Consequently, our
research emerges from the opportunity to resolve this deficiency in the marketing literature and significantly progresses and advances marketing literature.

Our study further augments marketing literature by empirically evaluating and validating the proposed conceptual model and provides new insights for the area of social media marketing. Our research fills an important gap in this regard as the literature on social media marketing is still evolving and lacking in clearly established attributes required for effective social media marketing activities. Additionally, the recent calls for research in marketing to develop quantitative models (Joshi and Hanssens, 2010) to methodologically demonstrate the value of social media marketing activities, it is a prime imperative to quantitatively model our concepts and empirically illustrate and advance our understanding of ways to improve brand value. In this respect, our research further advances understanding of how brands can leverage and improve key metrics such as brand value, and further contributes to marketing literature.

Next, the recent emphasis on quantifying the role of social media (Joshi and Hanssens, 2010), has overlooked and discounted the important role qualitative aspects of social media (Goldfarb, 2014) play in influencing a brand’s value. Moreover, brand relationships are the cornerstone of successful branding strategies (Fournier, 1998) and relationships are essentially qualitative in nature (Paine, 2011), which influence a brand’s success in marketplace (Stephen and Toubia, 2010). Considering the importance of relationships and consumer perceptions on social media, we fill a significant gap in the current marketing literature by developing a conceptual model illustrating the key roles of social media engagement, relationship quality on social media, and social advocacy of consumers on a brand’s value on social media.

7.2 Managerial implications

The promising technical performance of the model provides several benefits for marketing managers. Growing demands for marketing accountability in the field of social media marketing have created a need to develop and empirically evaluate frameworks that expound on ways by which firms can improve their credibility and value in the marketplace. The results of our study imply that social media engagement, quality of customer-firm relationships, and social advocacy are critical to successful improvement of a firm’s social brand value. Furthermore, a firm’s social brand value should be given new consideration as it indicates future firm value. Without consumer experiences and inputs, brand value creation is a hugely daunting task for brand managers. Thus, brand value on social media necessitates brand managers to focus on co-creating brand value involving consumers in the process. Our study provides direction and focus to brand managers in this respect and suggests engaging, involving, and understanding consumers using social media to create brand value and enhance firm performance in terms of stock returns.

While all constructs reflect potential for endogeneity, our findings help marketing executives build a case to top management and analysts that the goal should be develop a firm’s social brand value when concentrating on social media marketing activities. The importance of our results is evident from the current ambiguities on the empirical and managerial value of developing and incorporating social brand value in an integrated model that combines social engagement, relationship quality, and social advocacy to explain how firms can capitalise on social media marketing efforts.
First and foremost, unit-root based econometric tests suggest that all proposed variables in this study follow a mean-stationary process. The results imply that variables in our study are stable and do not differ permanently from previous levels. Thus, time-dependent examination of the variables becomes important to understand the patterns and influences among variables.

The transient impact of social media engagement, relationship quality, and brand advocacy on brand value highlight the need to develop conceptual frameworks that take into account the carryover effects as long-run impact over a specific time period informs researchers about the possible marketing strategies with potential to help improve a firm’s value. Additionally, our results inform marketing practitioners the time period until which the effect of each variable will remain in effect and the need to figure out how to enhance or diminish the impact of variables over time.

The Augmented Dickey-Fuller test procedure suggested by Enders (1995) yields greater confidence in our variable classification and we can further estimate our conceptual model with the variables using VAR model to determine the dynamic interactions among the variables. Next, the VAR model illustrates endogeneity among variables and the IRFs allow us to provide estimates for the variables in the VAR model as interpretation of estimated VAR-coefficients is not directly viable. The IRF depicts the impact of a change in one variable and its influence on the full dynamic system and illustrates the outcome of all relationships in our conceptual framework. The long term impact seen in IRFs enables managers to evaluate the potential value and impact of strengthening social media engagement, social advocacy, and relationship quality.

7.3 Limitations and future research

Our research has some limitations and scope for further research. Our data is for a period of less than one year and this prevents us from understanding patterns of variables in our study for the next five years. In our future research, we plan on collecting information for at least five years to determine the extent to which efforts of firms to enhance their social media engagement, relationship quality, social advocacy, and social brand value would remain in effect and help firm performance. In our current study, we demonstrate the positive influence of improving social media engagement, relationship quality, social advocacy, and social brand value and a future study will determine the time-period during which the positive influence of these variables remains in effect and after how long should managers plan for next phase of improvement of these variables.

Another limitation is that our data set tracks social media engagement, relationship quality, social advocacy, and social brand value at the retail industry level and the results may not be generalisable to other industries, specifically software industry in which industry dynamics change quickly. In our future research, we would examine different industries such as software industry, consumer-packaged goods industry, and automotive industry to compare and highlight social media marketing efforts to enhance marketing knowledge and provide beneficial insights to marketing managers.

In conclusion, our objective has been to provide new insights into the most challenging but most novel and innovative marketing strategy that incorporates social media marketing efforts and also to demonstrate the value of using social media in improving firm value. We accomplish our objective by quantifying the dynamic performance effects of social media engagement, relationship quality, social advocacy, and social brand value in an Internet social media setting. An internet social media
setting provides researchers and marketing executives to observe social media characteristics directly (Trusov et al., 2008). We illustrate the significant role of social media engagement by firms in enhancing a firm’s social brand value and the positive impact of a firm’s relationship with its customers and social advocacy. Garnering social advocacy through engagement and social sentiments of customers sets the stage for a retailer to achieve success in a highly discerned consumer world of social media. Additionally, our IRF results foster support for the view that social advocacy is critical to generate social brand value and social media engagement and relationship quality are major factors for firms seeking to improve the return on efforts to optimise their social media marketing activities.

References
Quantifying the long-term effect of social media


