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ORIGINAL ARTICLE

Defining and measuring social customer-relationship management (CRM) capabilities

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Abstract Companies find it necessary to develop new social customer-relationship management (CRM) capabilities to facilitate their customer-related performance. This study seeks systematically to conceptualize and measure social CRM capability, defined as a firm's efficiency in integrating and converting social media marketing resources into desired sales revenue and customer-relationship outcomes. This definition focuses on the firm's competency in obtaining, generating, organizing, and integrating information from customers' social media engagement to maintain and improve the custome-relationship and its own financial performance. Adding to the conventional input–output stochastic frontier model, this study proposes including social media resource inputs and customer-related outcomes to measure social CRM capabilities. An empirical application suggests that social CRM capability is critical; investing in social media technology can lead to substantial CRM benefits and greater market value for the firm. Marketers should focus on developing strategies that emphasize customer-relationship building through social media, which allows for more customer involvement and interactions between the customer and the business.

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Introduction

The popularity of social media has meant that companies must develop new customer-relationship management (CRM) capabilities, beyond traditional format and tactics (Pansari and Kumar 2017; Rapp et al. 2013; Reimann et al. 2010; Trainor 2012; Trainor et al. 2011, 2014; Wang and Kim 2017). By integrating social media with the existing CRM systems, they can develop new capabilities for enhancing customer satisfaction and effectively leverage these collaborative, interactive platforms to manage their customer-relationships (Trainor et al. 2014). In turn, marketing expenses devoted to social media grew by 234% between 2009 and 2016 (Moorman 2016). However, little research has specifically defined or measured social CRM capabilities to specify how they might influence business performance. Therefore, this study pursues several seemingly simple but critical questions: What are social CRM capabilities, and why are they important?

Trainor (2012, p. 321) defines social CRM as "the integration of traditional customer-facing activities with emergent social media applications to engage customers in collaborative conversations and enhance customer-relationships." Social CRM capabilities, as unique combinations of emerging technological resources and customer-centric management systems, extend traditional CRM capabilities by integrating the social functions and processes that emerge from firm–customer interactions, as well as customer–customer interactions (Greenberg 2010). Thus, to measure social CRM capabilities, we propose

extending the conventional input–output stochastic frontier model, which represents a common tool to measure capabilities in a conventional sense (Battese and Coelli 1992; Dutta et al. 1999, 2005; Xiong and Bharadwaj 2013). To specify the firm's inputs and desired outcomes, we include social media resource inputs, in addition to traditional resource inputs, which derive from customers who actively participate in beneficial relationships with firms (Malthouse et al. 2013). Rather than focusing solely on sales outcomes (Dutta et al. 1999; Xiong and Bharadwaj 2013), we also measure the firm's relationship with current and potential customers as a critical output of social CRM capabilities, with the realization that customer engagement is one of the most important benefits of social media. Accordingly, we test possible social CRM capabilities measures that feature both financial and customer-relationship outcomes.

With these contributions, we extend the extant literature by systematically defining and conceptualizing new social CRM capabilities that firms can build through social media. The proposed social CRM capability measure builds on an input–output stochastic frontier model. Furthermore, we test and verify our proposed measure with cross-industry panel datasets, which helps expand the generalizability of the findings about the relationship between firms' social CRM capabilities and performance. Accordingly, in the next section, we begin by conceptualizing and defining social CRM capabilities. We then review existing measures and apply our proposed measure of social CRM capabilities to firms in various sectors and industries, using actual corporate data about 232 companies gathered from the Facebook, COMPUSTAT North America, and Global Fundamentals annual databases over 2004–2014. After we detail our analyses and results, we conclude with some insights for theory and practice and potential areas for further research.

Conceptualizing/defining social CRM Capabilities

CRM and social media

Market fragmentation and rapid change are ubiquitous; traditional communication channels are being supplemented by social media networking, as well as other novel marketing techniques (Day 2011). Rather than struggling to obtain feedback from customers, marketers today must find ways to keep up with the floods of data coming to them from innumerable channels. Modern firms must track and understand what is being said about them, their products, and their competitors in user-generated content and social media channels, as well as establish and manage their own social media sites (Day 2011). Social media, which encompass a series of technological innovations (Web 2.0) in both hardware and software that facilitate inexpensive content creation, interaction, and interoperability by creative online users (Berthon et al. 2012), establish platforms for consumers to interact with and influence one another easily. They exert direct impacts on brand communities and produce high response rates and customer engagement, relative to traditional marketing methodologies (Trusov et al. 2009). Researchers also indicate that social media interactions or activities can influence both financial performance (Li and Stacks 2015) and customer-relationship (Buhalis and Mamalakis 2015; Hudson et al. 2016).

In a traditional CRM framework, an organization uses its knowledge of customers to manage customer-relationships (Payne and Frow 2005; Verhoef et al. 2010). Reinartz et al. (2004, p. 295) define this sort of CRM as a procedure that "entails the systematic and proactive management of relationships as they move from the beginning (initiation) to the end (termination), with execution across the various customer-facing contact channels." Boulding et al. (2005, p. 157) also identify key elements: "CRM relates to strategy, the management of the dual creation of value, the intelligent use of data and technology, the acquisition of customer knowledge and the diffusion of this knowledge to the appropriate stakeholders, the development of appropriate (long-term) relationships with specific customers and/or customer groups, and the integration of processes across the many areas of the firm and across the network of firms that collaborate to generate customer value." Thus, CRM provides a strategic framework and method for embedding information technology (IT) into marketing activities in support of the effort to create and maintain customer-relationships (Trainor 2012). Rapp et al. (2010) propose in turn that CRM capability entails a combination and integration of various technology, human, and business resources. Their multidimensional CRM capability construct consists of static, operational, and strategic dimensions. Furthermore, research suggests that technology resources need to link with strategic resources, to achieve their interactive effects on customer-relationships (Bharadwaj 2000; Chang et al. 2010; Coltman 2007). An organization cannot improve its performance simply by investing more in IT; it needs to combine its CRM technology with customer-centric strategies to develop a new, valuable capability (Coltman 2007; Trainor 2012).

This traditional view of CRM technology highlights systems that provide support for various firm functions, such as sales (sales force automation), marketing (planning and budgeting, campaign, and promotions management), data analysis (customer retention, customer lifetime value, customer satisfaction), and data integration (Jayachandran et al. 2005; Rapp et al. 2010; Trainor 2012). The rapidly growing popularity of social media in both consumer and

business markets suggests a need to reconsider this traditional view though (Trainor 2012). Consumers participate actively in the co-creation of their experiences with firms, using social media to connect with other consumers and firms (Berthon et al. 2012; Hanna et al. 2011; Reimann et al. 2010; Trainor et al. 2014). Changing customer behavior also encourages more customer–business interactions, achieved with the new capabilities developed through social media (Trainor 2012; Trainor et al. 2014). Social, creative consumers who generate value-added content in social media also fall outside traditional CRM frameworks (Berthon et al. 2012; Greenberg 2010). This expanded concept of CRM reflects new capabilities enabled by the technological and social shifts brought about by social media networking (Trainor 2012; Trainor et al. 2014). Greenberg (2010) attempts to incorporate these technological and social changes, suggesting the terms "CRM 2.0" or "social CRM" to reflect the more collaborative, network-focused approach to managing customer-relationships and describe new ways to develop and maintain customer-relationships (Trainor 2012).

Social CRM capabilities

Social CRM studies generally focus on the boundary between traditional and social CRM (Malthouse et al. 2013). Social CRM is an extension, not a replacement, of traditional CRM and comprises new capabilities associated with both firm–customer and customer–customer interactions (Greenberg 2010). A few studies that adopt a resource-based view (RBV) indicate that investments in IT can be integrated to form new capabilities that ultimately enhance firm performance (Malthouse et al. 2013; Mithas et al. 2011; Nath et al. 2010; Rapp et al. 2010). Previous studies also demonstrate that marketing capabilities (Morgan et al. 2009), e-marketing capabilities (Trainor et al. 2011), and CRM capabilities (Srinivasan and Moorman 2005) all can positively influence both customer-relationships and organizational performance. Trainor et al. (2014) propose social CRM capabilities, as a unique combination of emerging technological resources and customer-centric management systems that lead to customer satisfaction, loyalty, and retention. As they demonstrate, social CRM capabilities are positively associated with customer-relationship performance (Trainor et al. 2014).

Dutta et al.'s capabilities definition as the efficiency

Dutta et al. (1999, 2005) define capabilities in general as the efficiency with which a firm uses the inputs or resources available to it and converts them into whatever outcomes it pursues or its objectives. As this definition makes clear, capabilities represent an intermediate transformation step, between inputs (e.g., resources) and desired outcomes (e.g., objectives, such as sales). Their definition is consistent with the RBV. However, because it is difficult to observe capabilities directly, it requires inferences about how they convert resources into outcomes.

In addition, a marketing capability is not merely the possession of marketing-related resources; it requires the efficient integration and conversion of those resources into desired marketing outcomes. It depends on a firm's prior and consistent, ongoing investments (Bharadwaj et al. 1993; Dutta et al. 1999, 2005). Recent studies also predict that investors consider firms' marketing capabilities when appraising firm value (e.g., Bahadir et al. 2008). Stock market investors gain insights into the firm's marketing capabilities by reviewing its historical marketing outcomes, relative to its marketing resources. For example, if two firms exhibit similar marketing and promotional efforts and comparable product technologies, the one that generates more sales revenue likely has greater marketing capability than the other. Social media also allow investors to observe the firm's efficiency in responding to market changes (e.g., how much and how quickly it learns from customers).

Network technology capability

Networking capability is a major benefit of Web 2.0. Consumers can control how information gets generated, created, organized, and shared (Bell and Loane 2010; Okazaki and Taylor 2013). As we noted previously, social media feature multiple technological innovations (Web 2.0) that have facilitated inexpensive content creation, interactions, and interoperability among users online (Berthon et al. 2012). Social networking sites also facilitate the effectiveness and spread of electronic word of mouth (eWOM), whether to support information exchanges, provide recreational pleasure, or bring users together (Hennig-Thurau et al. 2004; Lee and Youn 2009). In turn, users rely on social media platforms to exchange brand- and product-related information (Chakravarty et al. 2014; Kumar 2013). Because users can interact with and influence each other, develop brand communities, and engage with firms on social media platforms (Pansari and Kumar 2017; Trusov et al. 2009), they can influence others' activities within their social network too. These social media influences create a ripple effect that extends beyond a customer's immediate social network, potentially creating chain reactions (Hogan et al. 2003) that might ultimately determine the firm's profits (Kumar 2013; Lee and Grewal 2004).

Personal extensibility capability

Social media differ from traditional media in terms of the mobility they enable, due to their design and capacity (Parameswaran and Whinston 2007). Personal extensibility refers to a person's ability to overcome the friction of distance through communication (Okazaki and Taylor 2013). Researchers cite the impact of distance factors for international marketing (Malhotra et al. 2009). The concept of extensibility spans both distance (mobility) and time (immediacy) (Bluedorn et al. 1992; Harvey et al. 2008). Social media users can overcome both physical distance and time gaps by using personal electronic devices.

A definition of social CRM capability

Combining these insights, we propose the following definition of social CRM capability: Social CRM capability refers to a firm's efficiency in integrating and converting social media marketing resources into desired sales revenue and customer-relationship outcomes. With this definition, we extend Trainor et al.'s (2014) definition and discussions of marketing capability. That is, Trainor's version of social CRM capability focuses on customer interactions through social media technologies; we instead include it as a part of marketing capabilities, reflecting the firm's competency in obtaining, generating, organizing, and integrating information from customer engagement on social media, facilitated by the network technology and personal extensibility capabilities of social media, and then leveraging the customer information to maintain and improve its customer-relationships, with efficient effects on its financial performance.

Measuring social CRM capabilities

Survey approach

Trainor et al. (2014) took a survey approach to measure social CRM capabilities, using a scale from Srinivasan and Moorman (2005). Their measure of social CRM capabilities assumed an organization-wide system for acquiring, disseminating, and responding to customer information, such that three items assess information generation, four items refer to information dissemination, and six items assess responsiveness. Trainor et al. (2014) modified these scale items to refer to customer information generated from social media applications, then aggregated the items for each latent variable into single-scale scores to establish individual indicators of capabilities.

Input–output stochastic frontier model

A social CRM capability likely aims to achieve increased sales and improved customer satisfaction, through a better understanding of customer needs and distinctive targeting of appropriate customers. We propose measuring social CRM capability with an input–output stochastic frontier model that can predict the efficiencies of individual firms (Battese and Coelli 1992; Dutta et al. 1999; Xiong and Bharadwaj 2013). This approach also provides an appropriate econometric technique to model the firm's functional activities as an efficient frontier, relating productive resources to its functional objectives as long as the firm deploys those resources efficiently (Dutta et al. 1999, 2005). The model includes two random components: the presence of inefficiency and a traditional random error (Battese and Coelli 1992). Previous studies use the inverse of a firm's functional inefficiency to measure its functional capability (Dutta et al. 1999, 2005; Narasimhan et al. 2006; Xiong and Bharadwaj 2013). We specify the model items next and summarize them in Table 1.

Social media resource inputs

In line with our definition, firms generate social CRM capabilities when they invest in technological resources to support social media and integrate those resources with customer-centric management systems. Organizations can adapt to rapidly changing market environments by introducing technical innovations, which lead to enhanced performance (Han et al. 1998). In this sense, organizations with high levels of social media usage are more likely to adapt to the social media environment and achieve an advantage by acquiring customer information and trust, before their competitors.

However, the interactivity inherent to social media has not been defined clearly except the two contrasting interpretations: "interpersonal view" and "machine interactivity" (Burton and Soboleva 2011). An interpersonal view (Macias and Lewis 2003) suggests that interactive communication occurs between individuals and organizations and ranges from noninteractive, one-way communications to quick reactions to messages to fully interactive communications in which communication roles are totally interchangeable (Burton and Soboleva 2011; Rafaeli 1988). A machine interactivity view (Hoffman and Novak 1996) instead argues that interactivity is the extent to which users may modify messages they receive (Steuer 1992). Websites and social networking sites thus might offer different levels of interactivity, depending on whether they feature links, chat functions, or hyperlinks to external websites, for example (Burton and Soboleva 2011). Companies also can use social media sites to achieve interpersonal interactivity

Table 1 Items used in the stochastic frontier model of social CRM capabilities

	Item	Description
1	Social media resource inputs (SMR): HasTag, HasLink, HasVideo, IsReply, HasImage	HasTag: Number of posts that contain tags HasLink: Number of posts that contain superlinks HasVideo: Number of posts that contain videos IsReply: Number of posts that are replies to others HasImage: Number of posts that contain images
2	Sales, general, and administrative stock (SGAS)	Sales, general, and administrative expense
3	Receivable stock (RCS)	Accounts receivable
4	Industry and market conditions (MC)	Dummy variables based on the four-digit SIC code of firm i
5	Sales outcome	Total sales
6	Customer satisfaction outcome	ACSI indexes

and support the exchange of messages between corporations and users by embedding hashtags/tags or replying to individual posts. Different types of social media posts created by companies also might vary in their level of machine interactivity, according to whether they use embedded hyperlinks in posts that users can click to access information or alternative media (e.g., video).

Therefore, in addition to traditional resource inputs, we add social media resource inputs to emphasize the various activities and interactions that take place between companies and individual consumers through social media. Because social CRM implies that customers engage actively with these companies, these inputs effectively represent social media resources (Malthouse et al. 2013).

Desired outcomes of social CRM capabilities

We start by identifying reasonable objectives of a firm. Focusing on CRM activities in social media, some objectives might include maximizing both financial and marketing performance; the inputs available for achieving these objectives include current and past social media usage. Social CRM capabilities emphasize the firm's ability to engage customers in collaborative conversations and enhance customer-relationships, so we include relational outcomes such as customer satisfaction, loyalty, and retention in our research model. Hooley et al. (2005) and Rapp et al. (2010) have shown that marketing capabilities lead to stronger customer-relationships, which then improve customer satisfaction and loyalty. Technology-based literature also suggests that IT has empowered efficient, effective interactions between organizations and customers (Ahearne et al. 2005; Coviello et al. 2001) and allows for coordinated captures and uses of customer information, which should lead to more effective responses (Jayachandran et al. 2005). Marketing technologies in particular positively influence customer satisfaction and relationship development through improved internal communications and information sharing (Wang and Kim 2017; Wu et al. 2003). For the resulting model, following Dutta et al. (1999), we use a Koyck lag function with higher weights for more recent years to derive measures of stock variables; resources from prior years can exert cumulative impacts on current outcomes (Dutta et al. 1999). For example, we define SGASTOCK for period t as $\text{SGASTOCK}_t = \sum_{k=1}^{k=t} \gamma^{t-k} \times \text{SGAExpense}_k$, where γ represents the weight attached to the past value of selling, general, and administrative expenses. We apply a 0.5 weight (Dutta et al. 2005) and also confirm that the results are robust to different weights. Other stock variable calculations feature similar methods.

We also control for industry and market conditions. We divide the firms by four-digit standard industrial classification (SIC) codes, and then for the estimation, we specify dummy variables reflecting each firm's four-digit SIC code. We use the stock variables as inputs in Eq. 1. In addition, we derive the maximum likelihood estimate of the inefficiency term η_{it}, then rescale the estimate η_{it} to be between 0 and 100, and use $100 - \eta_{it}$ as the marketing capability measure (Xiong and Bharadwaj 2013). Thus,

$$\ln(\text{Outcomes}_{it}) = \alpha_0 + \alpha_1 \ln(\text{SGAS}_{it}) + \alpha_2 \ln(\text{RCS}_{it}) + \alpha_3 \ln(\text{SMR}_{it}) + \alpha_4 \text{MC}_i + \varepsilon_{it} - \eta_{it}. \quad (1)$$

Empirical application

We apply our proposed measure of social CRM capabilities to firms in different sectors and industries, using actual corporate data. To illustrate this estimation and explain how firms benefit from the capabilities, in the form of improved financial performance, we turn to an empirical model that establishes the direct relationship between

social CRM capabilities and firm performance. We also consider potential moderating effects of social media usage on the relationship between social CRM capabilities and firm performance, as we depict in Fig. 1.

Social media data

We collected our primary social media data from Facebook. Some companies had multiple Facebook accounts, in which cases we selected those accounts that appear on each company's official website. To account for organizational policies regarding the use of social media, we included both the company's Facebook accounts and its main brands' Facebook accounts in our analysis. We also collected all different types of postings, such as plain text, photos, images, videos, or links from the Facebook accounts, starting with the day each company began using Facebook until December 31, 2014.

COMPUSTAT

We collected financial statement data from the COMPUSTAT North America and Global Fundamentals annual databases for a 34-year period (1980–2014). Then, we used the time span of the firms' social media activities for the seven-year period from 2007 to 2014. We also collected control variables from COMPUSTAT, such as firm size, leverage, total sales, and industry categories.

ACSI

We collected customer satisfaction data from the American Customer Satisfaction Index (ACSI), which provides a customer-based measurement system to evaluate and enhance customer-related firm performance. It collects individual-level survey data for more than 300 major companies in more than 40 industries. The ACSI is designed to represent the economy as a whole, for which aggregated individual-level data produce customer satisfaction benchmarks at the company-, industry-, and national levels (Anderson et al. 1994, 2004; Fornell et al. 1996), such that an individual firm's index represents its served market's overall evaluation of total purchases and consumption experiences.

After we matched the ACSI list with COMPUSTAT data, we excluded companies that did not have Facebook accounts. The final sample thus includes 232 companies.

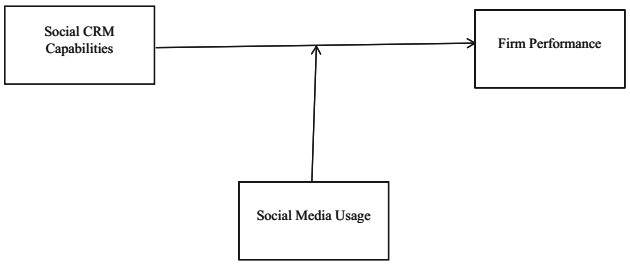

Fig. 1 Empirical model

Measures

Social CRM capabilities

In line with our conceptualization of social CRM capability measures, we use information from corporate disclosures to inform our input–output stochastic frontier model (Battese and Coelli 1992; Dutta et al. 1999, 2005; Xiong and Bharadwaj 2013) and predict the efficiencies of individual firms in an industry:

$$\ln(\text{Sales}_{it}) = \alpha_0 + \alpha_1 \ln(\text{SGAS}_{it}) + \alpha_2 \ln(\text{RCS}_{it}) + \alpha_3 \ln(\text{SMR}_{it}) + \alpha_4 \text{MC}_i + \varepsilon_{it} - \eta_{it}. \quad (2)$$

Social CRM capabilities, which also reflect the firm's ability to engage customers in collaborative conversations and enhance customer-relationships, require the inclusion of relational outcomes of customer satisfaction, loyalty, and retention in the research model. Therefore, we measure social CRM capabilities, using both customer satisfaction and sales as outcomes:

$$(\ln(\text{Customer Satisfaction}_{it}) + \ln(\text{Sales}_{it}))/2 = \alpha_0 + \alpha_1 \ln(\text{SGAS}_{it}) + \alpha_2 \ln(\text{RCS}_{it}) + \alpha_3 \ln(\text{SMR}_{it}) + \alpha_4 MC_i + \varepsilon_{it} - \eta_{it}. \quad (3)$$

Social media usage

Social media technologies create environments that can engage customers in collaborative conversations and enhance customer-relationships. Social media usage represents how much an organization uses social media technologies. Firms that actively use social media can increase awareness and emphasize their intentions to involve customers in interactive dialogue, which should increase the influence of their social CRM capabilities. Therefore, we include social media usage as a potential moderator. We measure social media usage with data collected from companies' Facebook accounts each year, namely, the number of posts by the company in each year.

Firm performance

We calculate Tobin's q by summing the market value of equity and the book value of debt, divided by the book

value of the total assets for that period. All these financial data come from COMPUSTAT.

Control variables

We control for firm size, leverage, industry categories, total sales every year, and year-fixed effects for firm and industry heterogeneity. We use the average total number of employees as an indicator variable for firm size and nine industry categories, with dummy variables.

Results and discussion

Descriptive statistics and results of panel regressions

We used STATA 14.0 to generate descriptive statistics and conduct panel regressions. Table 2 contains the statistics of the inefficiency term η_{it} and the efficiency index $100 - \eta_{it}$ associated with sales outcome. Table 3 lists the results for both sales and customer satisfaction outcomes. As we noted, we derived the maximum likelihood estimate of the inefficiency term η_{it} and efficiency $100 - \eta_{it}$ for social CRM capabilities.

Table 4 presents the correlation matrix with the descriptive statistics (means, standard deviations, and correlations) for all variables. These results suggest that social CRM capabilities with sales outcomes relate positively to firm performance ($r = 0.5$) and customer satisfaction ($r = 0.06$). We also note similar correlations between social CRM capabilities and the combined sales and customer satisfaction outcomes for firm performance ($r = 0.11$) and customer satisfaction ($r = 0.01$). When we estimate the parameters using a fixed-effect panel regression (Table 5), we use Model 1 to represent the relationship of social CRM capability with sales outcomes and firm performance, as well as to test the moderating effect of social media usage that may strengthen or weaken the relationship between social CRM capability with sales outcomes and the firm performance. Model 2 reflects the relationship of social CRM capability with both customer satisfaction and sales outcomes and firm performance, again adding social media as a potential moderator. In both models, social CRM capabilities have positive, statistically significant effects ($p < 0.01$) on firm performance. The coefficient of social CRM capabilities when we consider both customer satisfaction and sales outcomes is larger than that for only sales outcomes. The R^2 values are similar across the two models; overall, all the results are similar.

Table 2 Inefficiency and efficiency index, sales outcomes

Term	Sample size	Mean	SD	Min	Max
Inefficiency index (η_{it})	232	11.96	1.90	7.39	16.19
Efficiency index ($100 - \eta_{it}$)	232	88.04	1.90	83.80	92.60

Table 3 Inefficiency and efficiency index, customer satisfaction, and sales outcomes

Term	Sample size	Mean	SD	Min	Max
Inefficiency index (η_{it})	232	7.47	0.69	5.57	8.94
Efficiency index ($100 - \eta_{it}$)	232	92.53	0.69	91.05	94.42

Table 4 Correlation matrix and descriptive statistics

No.	Variable	Mean	SD	1	2	3	4	5	6	7	8	9
1	Firm performance (Tobin's *q*)	4.11	8.06	1.00								
2	Year	2009	3.16	0.06	1.00							
3	Social CRM capabilities[a]	88.04	1.90	0.05	0.01	1.00						
4	Social CRM capabilities[b]	92.52	0.69	0.11	0.02	0.92	1.00					
5	Social media usage	11.37	17.87	0.01	0.38	− 0.17	− 0.11	1.00				
6	Sales	9.30	2.47	− 0.10	− 0.02	− 0.92	− 0.98	0.11	1.00			
7	Employee	3.64	1.84	− 0.18	− 0.03	− 0.65	− 0.77	0.03	0.80	1.00		
8	Leverage	0.22	1.37	− 0.15	− 0.01	− 0.25	− 0.27	− 0.02	0.27	0.15	1.00	
9	Customer satisfaction	76.55	5.71	− 0.11	0.07	0.06	0.01	0.05	− 0.04	0.01	0.27	1.00

[a]Sales outcomes

[b]Customer satisfaction and sales outcomes

Table 5 Results of fixed-effect (within) panel regressions

Models	1		2	
Dependent variable	Tobin's q	Tobin's q	Tobin's q	Tobin's q
Constant	− 429.921	− 526.561	− 1,135.774	− 1,148.376
	(131.726)**	(137.439)***	(374.327)**	(378.724)**
Social CRM capability	4.085	5.044	11.69	11.82
	(1.380)**	(1.432)**	(3.940)**	(3.987)**
Social media usage		− 0.226		− 0.007
		(0.023)		(0.016)
Social media usage × Social CRM capability		0.812		0.108
		(0.367)*		(0.404)
Sales	8.244	8.800	5.376	5.558
	(2.023)***	(2.024)***	(1.771)**	(1.767)**
Employee	− 2.954	− 2.798	− 0.877	− 0.786
	(1.216)*	(1.210)*	(1.011)	(1.009)
Leverage	− 8.948	− 6.653	− 12.144	− 12.706
	(7.142)	(7.174)	(5.997)*	(5.987)*
Customer satisfaction	0.075	0.751	0.128	0.135
	(0.072)	(0.723)	(0.062)*	(0.062)*
Industry fixed	Included	Included	Included	Included
Year fixed	Included	Included	Included	Included
R^2	0.12	0.14	0.10	0.10

*$p < 0.10$; ** $p < 0.01$; *** $p < 0.001$

Thus, social CRM capabilities appear critical when companies merge social media into their marketing strategies to improve firm performance.

In addition, the statistically significant, positive coefficient of social media usage × social CRM capabilities with sales outcomes ($p < 0.1$) confirms that social media usage positively moderates the relationship between social CRM capabilities and firm performance. However, we do not find statistical evidence of moderating effects by social media usage on the relationship between social CRM capabilities with the combination of customer satisfaction and sales outcomes and firm performance.

Contributions and implications for future research

This study conceptualizes and defines the new construct of social CRM capabilities, which represent a new form of CRM capabilities that leverage social media. It also validates the role of social CRM capabilities in determining business performance. We examine and test the effects of social CRM capabilities on firms' financial performance, as well as contingent effects of social media usage, thus confirming that social CRM capabilities offer a strong predictor of firm performance. Firms should not treat social media investments as net costs; rather, social media provide significant resources for building a new form of CRM capabilities that can support organizational transformation and enhance firm value.

In turn, our research contributes to prior literature in three main respects. First, we systematically define and conceptualize new social CRM capabilities. Previous literature included social CRM capability among marketing capabilities and focused on customer interactions through social media technologies; our definition instead details the firm's competency in obtaining, generating, organizing, and integrating information from customer engagement, facilitated by network technology and personal extensibility capabilities of social media; using customer information to maintain and improve customer-relationships; and efficiently influencing the firm's financial performance.

Second, we offer an alternative to survey approaches to measuring social CRM capabilities. Our more quantitative method relies on the input–output stochastic frontier model (Battese and Coelli 1992; Dutta et al. 1999; Xiong and Bharadwaj 2013). In addition, we propose a social CRM capability measure in accordance with this input–output stochastic frontier model that reflects its capacity to enhance both the perceived value of the firm's products and the firm's relationships with current and potential

customers. These goal can be manifested as sales growth and improved customer satisfaction, with better allocations and uses of both traditional marketing resources and social media resources. The input–output conceptualization of firm capabilities makes the stochastic frontier estimation methodology well suited to our definition and study.

Third, we verify the proposed measure and expand the generalizability of the relationship between firms' social CRM capabilities and performance using the cross-industry panel datasets. With Tobin's q as the outcome variable, this study validates the role of social CRM capabilities as leading determinants of business performance.

However, our approach to measuring social CRM capabilities also entails some limitations, which suggest directions for further research. First, the social media resource inputs in our dataset refer to only one social media website (Facebook), so the results cannot be generalized to all social media. Continued research should include other leading social media sites, which may produce a more accurate, comprehensive measure. Researchers also may identify differences across social media (e.g., Facebook, Twitter, YouTube) when it comes to measuring social CRM capabilities. Such analyses could shed light on the different social CRM capabilities that accrue when companies operate multiple accounts on various sites. Second, because we sought comparable data, the firms that we examined are large, publicly traded corporations, and the findings may not be representative of private corporations or small firms. If data permit, it would be fruitful to examine our social CRM capabilities measure among smaller or private companies. Third, this study should be extended to different countries. Social media use may tend to be greater, with more active information exchanges, in collectivist cultures, in which people pursue greater connectedness (Okazaki and Taylor 2013). A potential next step might be to incorporate our proposed social CRM capabilities measure into the theoretical or empirical models that underlie international social media marketing strategy studies. Cross-country research may produce stronger validations and evidence of the generalizability of our proposed measure.

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