A Text Mining-Based Review of Cause-Related Marketing Literature

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Abstract Cause-related marketing (C-RM) has risen to become a popular strategy to increase business value through profit-motivated giving. Despite the growing number of articles published in the last decade, no comprehensive analysis of the most discussed constructs of cause-related marketing is available. This paper uses an advanced Text Mining methodology (a Bayesian contextual analysis algorithm known as Correlated Topic Model, CTM) to conduct a comprehensive analysis of 246 articles published in 40 different journals between 1988 and 2013 on the subject of cause-related marketing. Text Mining also allows quantitative analyses to be performed on the literature. For instance, it is shown that the most prominent long-term topics discussed since 1988 on the subject are "brand-cause fit", "law and Ethics", and "corporate and social identification", while the most actively discussed topic presently is "sectors raising social taboos and moral debates". The paper has two goals: first, it introduces the technique of CTM to the Marketing area, illustrating how Text Mining may guide, simplify, and enhance review processes while providing objective building blocks (topics) to be used in a review; second, it applies CTM to the C-RM field, uncovering and summarizing the most discussed topics. Mining text, however, is not aimed at replacing all subjective decisions that must be taken as part of literature review methodologies.

Cause-related marketing (C-RM) is an increasingly popular strategy among corporate social responsibility (CSR) initiatives. It offers consumers the opportunity to engage in altruistic acts that benefit a social cause satisfying individual and organizational objectives (Varadarajan and Menon 1988). According to IEG Sponsorship Report (IEG 2013), in 2013, companies channeled $1.78 Billion to charities, an increase of 4.8 % in relation to 2012 in the United States alone. Success of C-RM campaigns is partly due to the positive effect it elicits on sponsors, charities, and consumers. Sponsors improve their corporate image and long-term customer relationship, thus increasing the likelihood that cause-related products are purchased (Hoeffler and Keller 2002; Barone et al. 2000; Strahilevitz and Myers 1998). Charities increase their donation budget, thus helping more people, more often. Consumers also benefit as they are offered opportunities to fulfill their need for pride, self-satisfaction, and prestige (Kim and Johnson 2013). American Express was one of the first companies known to engage consumers in an altruistic move to renovate an iconic symbol through sales. In 1983, the Ellis Island Foundation partnered with American Express to help bring back the Statue of Liberty to its original glory. American Express donated one cent for each credit card transaction, and one dollar for a new credit card issued, in a total effort of $1.7 Million (Adkins 1999). Since then, companies and researchers have tried to uncover drivers of philanthropic behavior. After the first accepted definition of

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C-RM, suggested by Varadarajan and Menon (1988), articles have flourished in academic journals, discussing which variables influence C-RM effectiveness.

Although CSR research has been reviewed by Vaaland et al. (2008) up until 2005, no study has analyzed the plethora of contributions that have surfaced in the last decade concerning C-RM. The assembling of all the constructs that influence one given subject requires in-depth examination of texts where some of such constructs may easily be missed, especially where interdisciplinary areas of research are involved. This study employs text mining (TM) to support the analysis of 246 articles on C-RM during a 25-year period (1988–2013). The earliest article included is the seminal paper (Varadarajan and Menon 1988) where the first definition of C-RM is offered. TM techniques can reveal commonalities underlying a body of unstructured academic publications thus guiding and facilitating the organization of matters under review. In the present article, for instance, TM is used to identify topics discussed in the C-RM literature, ranking them by prominence and linking them with keywords and articles. In this way, TM not only facilitates the review process but is also capable of exposing the literature's trends and fashions. Examples of the use of TM in the reviewing of academic journals are Blei and Lafferty (2007, 2009), Delen and Crossland (2008), Liu et al. (2009), and Paul and Girju (2009).

The paper makes use of the full text of published articles, not just titles, abstracts, and keywords. An advanced, mixed membership clustering technique called Correlated Topic Modeling (CTM, Blei and Lafferty 2009) is employed here to achieve an efficient summarization and ranking of C-RM research via the introduction of contextual meaning in the analysis. The paper successfully tests the use of a recent but established method of knowledge extraction, showing its adequacy to the task of supporting the review of academic articles.

The paper is organized as follows: "Overview of Text Mining Approach" section offers a brief introduction to TM and its applications. In the "Methods and Results" section, publication selection criteria and the methods used are presented, and the results are also discussed. Section "Topic Analysis" contains the review of prominent literature in each topic. Finally, the final comments are presented in the "Conclusion" section.

Overview of Text Mining Approach

The full meaning of sentences as found in written texts, online forums, twitter messages, and other texts is hard to represent in a structured format allowing automatic processing (Mostafa 2013). Mining of unstructured texts is defined as the automated or partially automated processing of text aiming at obtaining a structured format (Miller 2004). TM has moved from initial attempts using paper-based texts to the processing of large online text collections "to discover new facts and trends about the world itself" (Hearst 1999, p. 8). Applications of TM include automated term extraction (Zhang et al. 2009), natural language processing (Jurafsky and James 2000; Manning and Raghavan 2008), biomedical research (Smalheiser and Swanson 1994; Srinivasan 2004; Swanson and Smalheiser 1997), textual stylometry (Holmes and Kardos 2003), and other areas.

The first step in TM consists of transforming the source text so as to obtain raw text with no formatting. The second step consists of removing all *stopwords*, that is, auxiliary verbs, common terms of limited importance (Delen and Crossland 2008), words like "the", "as", "that", specific words from the domain of study that are not discriminative (Delen and Crossland 2008) such as "cause-related marketing" in the present case. A third step ensures that similar words are not identified as being different: the *stemming* algorithm prunes all prefixes and suffixes so that words such as "sponsorship" or "sponsoring" are reduced to just "sponsor", the *radical* (Porter 1980). Conversion to lower case, whitespace, punctuation, and number removal should precede *stopword* removal and *stemming*. A document thus stripped is known as the *corpus* (Feinerer et al. 2008). The same procedure is then applied to all the documents to be analyzed together.

The number of similar terms in each document is then counted, such frequencies being stored in a *term-by-document* classification matrix (Feinerer et al. 2008). The term-by-document matrix is a *bag-of-words* representation of *corpora* (plural of *corpus*). When documents from distinct subject areas are analyzed together, the term-by-document matrix may be highly sparse. In such cases, transformations and penalty functions are used so as to reduce the influence of outlier frequencies and to decrease the weight of terms that occur in all documents (Blei and Lafferty 2009; Feinerer et al. 2008; Delen and Crossland 2008). As a result, truly discriminating terms have a higher frequency than irrelevant albeit frequent terms (Delen and Crossland 2008).

The final task in TM consists of using the term-by-document matrix to find out how the different terms may cluster together. Such clusters are supposed to stand for the underlying *topics* or building blocks of a subject area. For instance, a cluster containing terms such as "law" and "court" is probably related to the "Legal" topic, whereas a cluster containing terms such as "green", "sustainability" probably relates to the "Environment" topic. The task of ascribing a topic to a collection of terms found to cluster together is called *profiling*.

Until recently, traditional clustering algorithms were used to serve the purposes of TM. This is the case of Lu et al. (2012) and others. Lu et al. (2012) used Path Analysis and single membership clustering (K-Median and Euclidean distances) to uncover relevant topics from Ethics on nanotechnology that are latent in titles, abstracts, and keywords of published research.

Nowadays, algorithms are available that can include in the cluster search the latent semantic information present in texts. In a document, the same terms can be used in relation to multiple topics at the same time whereas different topics may also belong to a mixed membership set of clusters (Grün and Hornik 2011). Contextual meaning may be derived from observed proportions indicating how much each term belongs to each topic and how much each topic belongs to each document. Topics are modeled as hidden entities that can be inferred from observable term frequencies via posterior inference. Using hidden entities instead of simple bag-of-words, new, potentially useful information on context is added to the search.

Topic Models are probabilistic models able to uncover the underlying semantic structure of a document collection based on a hierarchical Bayesian analysis of texts (Blei and Lafferty 2007). They have been used to produce lists of topics in scientific abstracts (Blei et al. 2003; Griffiths and Steyvers 2004), for geographic information retrieval (Li et al. 2008), and for ad hoc information extraction (Wei and Croft 2006). Figure 1 shows an example of topic finding in the abstract of an article published by Strahilevitz and Myers (1998) empirically testing the influence of product type on C-RM efficiency. At least three topics can be observed by reading the highlighted terms. One topic is about C-RM terms, another topic is about products, and a third topic is about methods.

Topic Models are mixed membership models as each word can belong simultaneously to multiple topics (Grün and Hornik 2011). Each topic is modeled as a distribution over words in the document, where each word has a different probability of belonging to that topic. One of the most commonly used topic model cluster algorithms is the Correlated Topic Model (CTM), (Blei and Lafferty 2007). The algorithm is based on latent Dirichlet allocation (LDA)

where topics are assumed to be independent (Blei and Lafferty 2009). Since in a real-word document topics are usually correlated (terms like "social marketing" and "cause-related marketing" have a higher probability of occurring together in the same document than other terms), a logistic normal distribution (Atchison and Shen 1980), capable of incorporating covariance amongst topics, is used in CTM instead of the simple Dirichlet distribution used in LDA.

CTM has clear benefits over bag-of-word topic finders such as LDA. Indeed, a simple bag-of-words is not a realistic way of analyzing sentences (Wallach 2006). For example, the two sentences "the patient was referred to a psychologist with several emotional problems" and "the patient with several emotional problems was referred to a psychologist" have the same bag-of-words thus, for LDA, they are similar. In the case of CTM, however, since, in the second phrase, the correlation between "patient" and "emotional problems" is stronger than in the first phrase, it follows that "patient" would be correctly assigned to different topics in the two different phrases above. CTM would create a new topic for psychologists with emotional problems. Perplexity is a commonly used metric of how well the model predicts the remaining words in a document from a specific topic, after observing a small part of it. The authors of CTM have compared both LDA and CTM, finding that CTM reduces perplexity over LDA by at least 10 % (Blei and Lafferty 2007).

Method and Results

In order to extract common topics from C-RM literature, a search was conducted on the ABI/Inform and ISI Web of Knowledge databases, on articles published until the end of 2013. Keywords "cause-related marketing" and "cause marketing" were inserted as search criteria in the online publication system. Broad terms such as "social marketing" or "corporate social responsibility" were avoided as these would have returned multiple articles not directly related to C-RM research. The first search results returned 3509 articles from ABI/Inform and 125 from ISI Web of

Fig. 1 Abstract of Strahilevitz and Myers (1998)

This article focuses on the bundling of products with promised contributions to charity. Two lab experiments and one field study are conducted that compare the effectiveness of promised donations to charity in promoting "practical necessities" (e.g., a box of laundry detergent) to their effectiveness in promoting "frivolous luxuries" (e.g., a hot fudge sundae). The results suggest that charity incentives are more effective in promoting frivolous products than in promoting practical products. This research extends prior work on the effects of bundling complementary positive outcomes into the domain of affect-based complementarity with product-charity bundles.

Knowledge for the keyword "cause-related marketing" and of 3388 articles from ABI/Inform and 30 articles from ISI Web of Knowledge for the keyword "cause marketing". From these, only English-written articles published in peer reviewed journals with a 5-year ISI Impact Factor higher than 1 are selected as the inclusion of journals with a lower impact factor would raise quality issues. The inclusion of a broader spectrum of topics such as "social marketing" or "corporate social responsibility" would render the algorithm inefficient. As the current study asserts, text mining the literature review is a starting point for helping researchers understand the core topics discussed over the years. Therefore, if the search area is too broad, the algorithms would lose their sensitivity and the study would fail given the dispersion of terms (fuzziness) and the abundance of residual, unfocused subjects. After removal of duplicate articles and articles not related to C-RM, the final dataset consists of 246 articles from 40 journals. Appendix 1 shows the number of articles per publication.

Selected articles were downloaded and transformed into text. Whitespaces, numbers and punctuation were stripped from the *corpus*. *Stopwords* were also removed. Words directly related to "cause-related marketing" such as "ethics", "philanthropic", or "charities" and words related to academic publication such as "journal", "study", or "hypothesis", were removed. These terms, albeit frequent, do not add new knowledge to the search for determinants of C-RM key constructs and may jeopardize the cohesion of topics due to its high frequency. Finally, words were stemmed using Porter (1980) algorithm and a term-by-document matrix was generated.

Descriptive analysis reveals a highly sparse matrix (97 % empty) with a total of 29.928 terms by 246 documents. This suggests that most of the terms in the matrix have little representation in *corpora*. Therefore, the term-by-document matrix is set to include only those terms that occur in 90 % of the articles or more. Also, term frequency–inverse document frequency (tf–idf) is used to remove terms that occur frequently in one document but not in the overall count: only terms with frequency greater than the median (Grün and Hornik 2011) are kept. After these adjustments, the term-by-document matrix contains 1.114 terms by the same 246 documents.

A first exploratory analysis is conducted to uncover the most frequent terms. There are 39 terms that occur at least 1.000 times in the *corpora* (4.1 times per article in average). Figure 2 shows a word map with the 39 terms, in which the font size is proportional to the term frequency.

Three terms (consumer, brand and stakeholder) emerge as the most frequent. This is expected given that C-RM is a strategic tool that provides consumers the opportunity to engage in a win–win relationship involving brands and charities (Varadarajan and Menon 1988). A second group

Fig. 2 Word cloud with term frequency for the 39 most frequent stemmed terms

of terms (donation, price, environment, fit, motivation, attitude, purchase, and employee) is also salient. The first three words are expected: donation is the act through which consumers engage in the altruistic relationship, environmental issues are common concerns in C-RM campaigns (Leonidou et al. 2013), and price is associated with price promotions, often contrasted in the literature with donation-based promotions (Winterich and Barone 2011). Price also determines C-RM effectiveness. The remaining terms refer to constructs that are often cited in C-RM research or in the more abstract discussion of CSR. For example, congruency between brand and cause (fit) influences the choice of cause-related products (Pracejus and Olsen 2004). Although, in the present study, the search was constrained to "cause-related marketing" articles, some of the included articles discuss broader topics such as employee volunteering (participation in the firm's social activities) and identification with the firm through CSR programs (Kim et al. 2010; Peloza and Hassay 2006). Such broader articles compare C-RM "win–win–win" relationship between the charity, the company, and the customer to the "win–win–win" relationship between the charity, the employers, and the employees.

Term frequency indicates how often researchers use a given term. But, as previously noted, bag-of-words analyses fail to take advantage of context. Therefore, after an appropriate cross-validation sampling, CTM is applied to each sample. Being a hierarchical cluster-finding algorithm, CTM does not provide the exact number of clusters that should be considered. Instead, the algorithm provides measurements of the model's explained variability such as the mean log-likelihood of the model and its *perplexity* (the strength of the model to predict new words after fitting a model), for each possible number of clusters. The number

of clusters (in this case text topics) that best fit the data is thus evaluated by examining how such metrics change when the number of clusters increases. The ideal number of clusters/topics is attained when the variability explained does not change significantly by adding more clusters.

Figure 3 shows mean log-likelihood and perplexity scores for the 60 most salient topics.

In the case of C-RM texts, both metrics agree in that the ideal number of latent topics is situated around 24. To include topics fewer than 22–24 would sharply reduce explained variability while the inclusion of more than 24–26 topics would add little to explained variability while overfitting the data. Table 1 shows the 24 topics after profiling, together with the five most frequent terms within each topic.

The most frequently used topic (topic #1) discusses brand–cause fit. All term frequencies in this topic have increased since 2004 but terms *attitude* and *intention* are not as correlated with *fit* in 2012 as they were before. This is partially due to research on the influence of brand–cause fit on *consumer perceptions* and not on *attitudes* and *intentions* (Bigné et al. 2012).

The second most frequently used topic (#2) discusses ethics and law. This topic has been in active discussion since 2002. In 2012, however, discussion is mostly focused on the banking industry with articles addressing how CSR influences corporate identity (Pérez and del Bosque 2012) and how it is used to legitimate behaviors (Bravo et al. 2012). Results also suggest that this discussion should continue in near future.

The third most prominent topic is corporate and social identification (topic #3). After a first discussion on the differences between extrinsic (self-interested) and intrinsic

(altruistic) motivation of companies to support cause-related marketing campaigns (Ellen et al. 2000), this topic has experienced a revival on 2005 and has since remained an active topic.

Figure 4 graphically depicts the yearly evolution of the most frequent terms belonging to the three topics discussed above. Figure 4 suggests that consistent with the CTM approach, terms are correlated within each topic. Although correlated terms are sometimes absent in some years (for example, the most frequent use of terms for "brand-cause fit" topic appeared in 2004, 2007, 2010 and 2012 but the same terms disappeared in 2006, 2008 and 2011), the three most prominent topics show a positive trend along the years. Absence of correlated terms in some years may be due to the following reasons: (1) the innovative character of a subject may make it sparsely published and (2) too many topics (clusters) have been accepted thus fostering sparseness. A smaller number of topics, however, would have reduced sensitivity as in the case of the "sectors raising social taboos and moral debates", the most recent topic to emerge as a popular topic inside C-RM. This topic would not have surfaced if a smaller number of topics were specified.

Table 2 shows the four most recent topics (highest median frequency by publication year). Topic #22 (sectors raising social taboos and moral debates) emerges as a popular topic.

Topic #22 is about the use of social responsibility campaigns on controversial industry sectors. After an initial article addressing the use of CSR and C-RM by the tobacco industry (Palazzo and Richter, 2005), the topic has recently experienced a renewed interest centered on gambling and sport sectors.
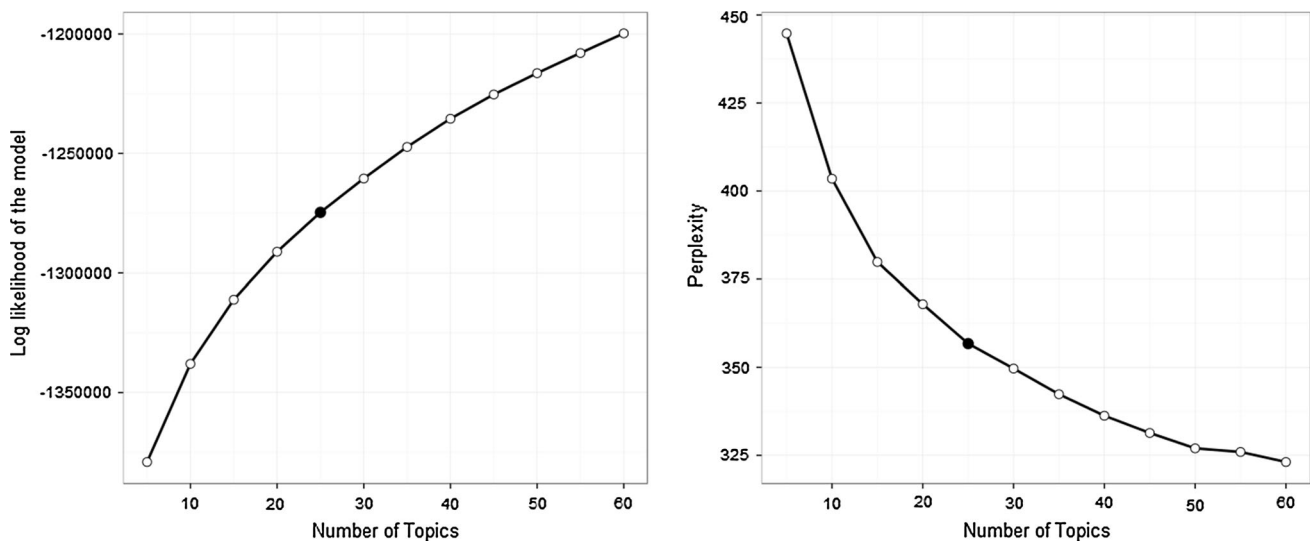

Fig. 3 Log-Likelihood and perplexity scores of the CTM model by number of topics

Table 1 The 24 topics found in the C-RM literature and their 5 most frequently used terms

1: Brand-cause fit (22 papers)	2: Law and ethics (20 papers)	3: Corporate and social identification (19 papers)	4: Skepticism (16 papers)
Fit	Bank	Consumer	Campaign
Attitudes	Legal	Identification	Advertise
Consumer	Law	Attribution	Consumer
Brand	Profit	Self	Claim
Intention	Stakeholder	Image	Skeptic
5: Stakeholder involvement (12 papers)	**6: Firm size (12 papers)**	**7: Trade (fair and ethical) (12 papers)**	**8: Corporate support for employee volunteerism (11 papers)**
Stakeholder	Industry	Consumer	Employee
Leadership	Reputation	Trade	Volunteerism
Network	Strategy	Fair	Program
Employee	Size	Countries	Event
Institutes	Profit	Purchase	Strategy
9: Brand equity and brand image (11 papers)	**10: Local versus global (10 papers)**	**11: Cause-based partnership dynamics (10 papers)**	**12: Morality (10 papers)**
Brand	Global	Partnership	Moral
Image	Non-governmental orgs	Partner	Identity
Categories	Politics	Sector	Self
Equity	Consumption	Cultural	Right
Event	Government	Gift	Prime
13: Environment and sustainability (10 papers)	**14: Campaign characteristics (9 papers)**	**15: Corporate social responsibility-corporate ability (9 papers)**	**16: Product price on donation-based promotions (9 papers)**
Environment	Donation	Intention	Price
Sustainability	Amount	Attribution	Consumer
Green	Price	Team	Choice
Program	Purchase	Purchase	Supplier
Institutes	Profit	Domain	Utility
17: Attitude-behavior gap (8 papers)	**18: Sponsoring events (7 papers)**	**19: Multi-sponsor partnerships (7 papers)**	**20: Profit/non-profit competition (6 papers)**
Consumer	Event	Card	Nonprofit
Enterprise	Sport	Red	Alliance
Purchase	Drug	Familiar	Profit
Affinity	Motivation	Credit	Innovation
Attitude	Attachment	Gap	Dominant
21: Corporate orientation behavior (5 papers)	**22: Sectors raising social taboos and moral debates (5 papers)**	**23: Corporate philanthropic motivations (4 papers)**	**24: Institutionalized versus promotional CSR programs (2 papers)**
Orientation	Sport	Motivation	Consumer
Code	Tobacco	Give	Program
Citizenship	Gambling	Charities	Local
Employee	Self	Size	Dimension
Society	Industry	Donor	Brand

Topic #1 – Brand-Cause Fit

Topic #2 – Law and Ethics

Topic #3 – Coporate and Social Identification

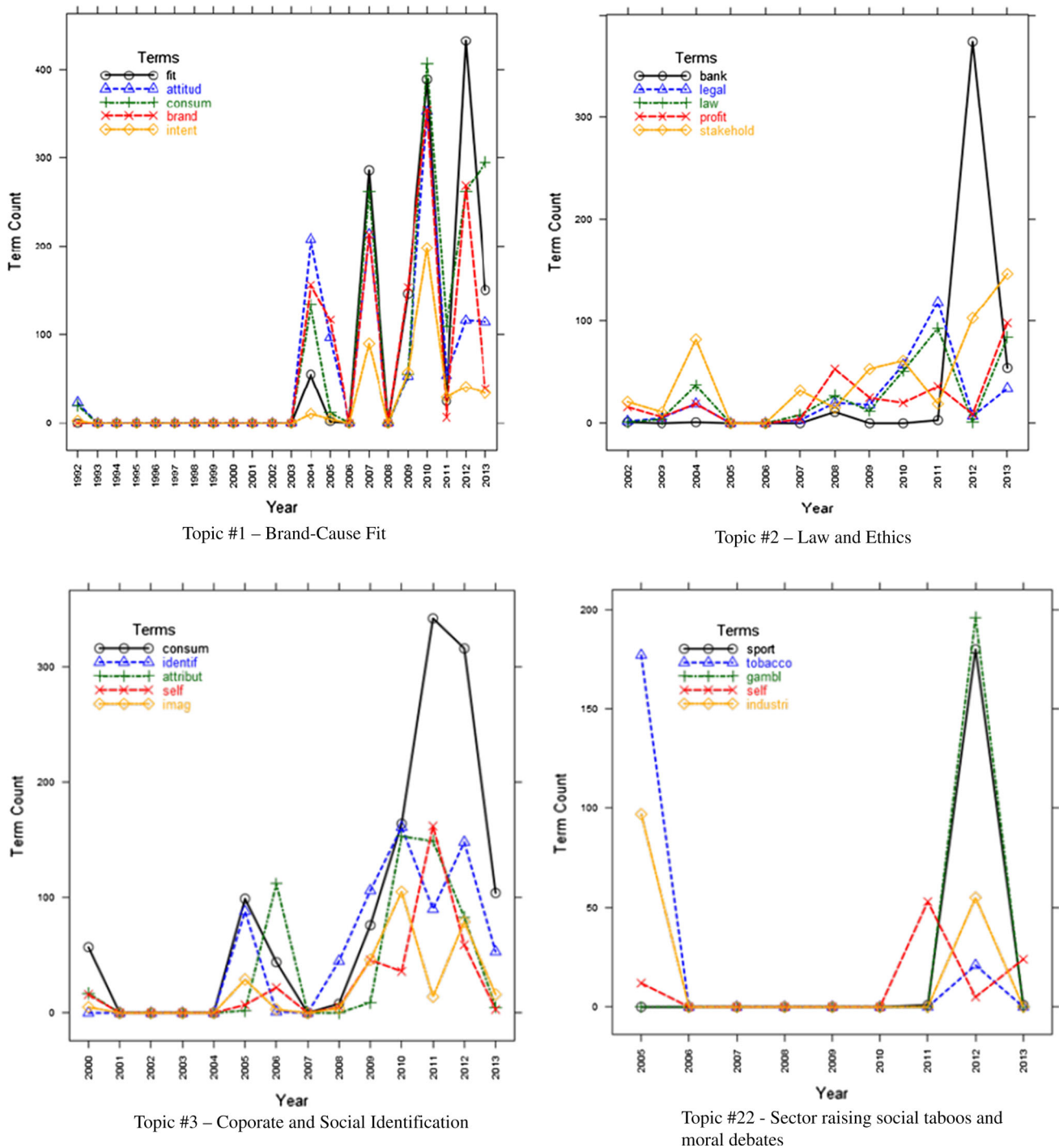Topic #22 - Sector raising social taboos and moral debates

Fig. 4 Frequency of use of terms (Y-axis) belonging to Topics #1, 2, 3, and 22 along the years (X-axis)

Table 2 Top 4 popular topics ranked by the year of their highest popularity: the median year (Mdn year) and median absolute deviation (MAD) within topics

Topic number	Topic name	Mdn year	MAD
#22	Sectors raising social taboos and moral debates	2012.0	1.48
#18	Sponsoring events	2011.0	2.97
#21	Corporate orientation behavior	2011.0	0.00
#13	Environment and sustainability	2011.0	2.97

Topic Analysis

This section presents results from the mining of published research on C-RM. The objective of text mining is to highlight the most frequent topics discussed in a body of literature, not to make a comprehensive review of such literature. However, TM provides three key tools to help in the task of reviewing a vast body of research texts such as C-RM. First, objective topics or building blocks underlying such body are isolated and ranked by prominence (frequency of publication); second, a series of terms or keywords is added to each topic, also ranked by prominence. Finally, journals and articles associated with topics or their keywords are also listed. Articles are assigned to topics based on the magnitude of posterior probabilities of pertaining to a topic given their most frequent terms. In order for an article to be associated to a specific topic, it is not required that the main subject of that article be coincident with the topic under question. What is required is that topic's associated terms are frequently mentioned in that article. Given the above, TM is indeed a helpful tool to guide the reviewing process. Table 1 shows the ranking of topics by prominence. Appendix 2 shows articles ranked by the posterior probability of association with topics.

Topic #1—Brand–Cause Fit discusses how congruence between sponsor and charity may influence C-RM efficiency. The five correlated terms emerging from the current topic are *fit, attitudes, consumer, brand,* and *intention.* The most relevant papers explaining how these terms are correlated show that *consumer attitudes* toward cause-related products are influenced not only by *fit* but by interaction of *fit* with familiarity with the charity. One of the articles decidedly correlated with this topic shows that the higher the familiarity with the cause, the lower the impact of fit on the attitude toward the charity but the attitude toward the *brand* increases (Zdravkovic et al. 2010). When consumers are familiar with a cause, they do not care much if the cause is partnered with a congruent sponsor or not. Lafferty (2007) also questions the evidence that high-fit alliances *per se* should elicit more positive feelings toward *intention* to purchase the products. Reasons that could explain why fit does not always play a key role in such case are emotional identification with the charity and influence of corporate credibility on purchase intentions.

Topic #2—Law and Ethics discusses how the search for profit may override the committed desire to help the social community. The words *legal, law,* and *profit* are highly correlated within topic 2. The article of Aßländer (2013), which is highly correlated with this topic, discusses a Ciceronian perspective under which corporate reputation may be lost if financial interests (*profit*) overcome an honorable behavior of the company. Articles in this group

explore such imbalance using Carroll (1979, 1991) components of CSR namely philanthropic, economic, and *legal.* One of the most prominent debates in this topic is the role of governments in setting mandatory CSR programs (*laws*) to institutionalize philanthropic donations or, by contrast, establish an effective regulatory framework for voluntary social responsibility campaigns (Waagstein 2011; Weyzig 2009).

Topic #3—Corporate and Social Identification topic groups words such as *consumer, identification, attribution, and self.* *Consumers* increase *identification* with a company that has a solid, committed partnership with a social cause. This is especially true for small companies in which CSR acts as a means to gain competitive advantage in the market (Arendt and Brettel 2010). As CSR associations (*attributions*) increase so does consumer *self*-satisfaction, identification with the company, and customer loyalty (Pérez et al. 2013). Research in this topic also extends to the company's workforce. Results show that selling performance is influenced by the salesperson's beliefs about the consumers' attitudes toward cause-related campaigns, which is mediated by selling confidence (Larson et al. 2008).

Topic #4—Skepticism The literature in this group includes highly correlated words such as *campaign, advertise, consumer, claim,* and *skeptic.* The literature discusses Mohr et al. (1998) four-item scale to measure consumer *skepticism* toward environmental *claims,* in which skeptic consumers are described as those who question what others say but can be convinced by evidence. Skeptic consumers are also distinguished from cynic consumers who not only doubt what is said, but the motives for saying it. *Consumers* are often skeptical about C-RM claims, questioning who benefits most from the ethical *campaigns*: the charity or the sponsor brand (La Ferle et al. 2013; Singh et al. 2009). Environmental certifications and other seals of approval are some examples of such claims that may often induce skepticism. One of the articles correlated with this topic addresses the need to regulate the use of seals of approval as fundraising devices (*advertising*) which should benefit both the companies and the charities (Bennett and McCrohan 1993). Although seals of approval bring competitive advantage for brands, there is no evidence that those health or environmental claims are transparent enough to benefit consumer decisions.

Topic #5—Stakeholder Involvement The words *stakeholder, leadership, network, employee,* and *institutes* are highly correlated in this topic. The literature builds on *stakeholder* theory to show that stakeholders use corporate reputation to determine their resource allocation to the company (Neville et al. 2005). This relationship occurs also on nonprofit organizations. As nonprofit brand values increase, so does stakeholder awareness and affinity with

the brand. This may improve both efficiency and effectiveness of nonprofit organizations (King 1991; Knox and Gruar 2007). Research in this topic also uncovers the important role of *leaders* as drivers of ethical practices. Companies with a stakeholder-oriented leadership often cultivate *networks* of relationships with both primary stakeholders (customers, employees, and investors) and secondary stakeholders (community and natural environment) (Freeman et al. 2007). Companies with different leadership styles have different organizational outcomes. While transformational leaders are more likely to engage in C-RM initiatives than transactional leaders, a transactional leader who "motivates *employees*, primarily through contingency-reward exchanges" enhances the relationship between ethical, responsible practices in the organization and business outcomes. On the other hand, transformational leaders, who led by example and by intellectual stimulus, decrease such positive relationship (Du et al. 2013).

Topic #6—Firm Size topic groups correlated words such as *industry, reputation, strategy, size,* and *profit.* According to Maas and Liket (2011), firm *size* and philanthropic expenditure, region and *industry* are some of the variables that should be evaluated in order to fully grasp the impact of philanthropic activities on the company *strategic* objectives such as its business impact (*profit*), the impact on society, reputation, and stakeholder satisfaction. Small companies use C-RM as a way to enrich the local community, thus increasing its competitive advantage (Amato and Amato, 2012), while large companies spend on C-RM in order to increase their legitimacy (*reputation*) in controversial business sectors (Du and Vieira, 2012) and mitigate future public relations problems that often arise from their high visibility (Amato and Amato 2007).

Topic #7—Trade (Fair and Ethical) Fair, trade, consumer, countries, and *purchase* are highly correlated words in the current topic. Low and Davenport (2005) report on differences that *fair trade* messages have undergone in the past, from companies focused on a trade reform to companies for which *consumers* perceive they were "shopping for a better world". This shift has occurred mainly given the skepticism that consumers display on some fair trade campaigns that are focused on the company's own individual benefit ("clean-wash"). The appropriation of the fair trade movement as a marketing tactic has lead companies to engage in new innovative ways to avoid being labeled as "clean-wash" companies by the consumers. Results also discuss how unethical practices by a company's country can lead to consumer boycotts on trade (Ettenson and Klein 2005). An example is the boycott from Australian consumers to French goods after the nuclear tests in South Pacific. Results showed that such unethical practices led to a decrease in the

willingness to *purchase* French products with longstanding damages in trade performance between both *countries*.

Topic #8—Corporate Support for Employee Volunteerism is a way to increase employee morale and enhance the company's value chain. Although the current topic is not directly associated with cause-related marketing, it emerges from the papers collected using cause-related marketing search criteria. Papers correlated with this topic highlight one particular side of volunteerism namely how it drives companies to engage in cause-related marketing programs while ensuring a healthy workforce environment. Words such as *employee, volunteerism, program,* and *strategy* are highly correlated within topic 8. Results show that corporate support for employee volunteerism is mostly conducted as response to employee's efforts to help rather than as *strategic* company policy (Basil et al. 2009). Intra-organizational *volunteerism* is driven by self-interests, such as the opportunity to engage in social networks in the workplace, but also by a desire to help the philanthropic efforts on the employer (Peloza and Hassay 2006). However, if social responsibility *programs* are co-designed and co-implemented by employees, companies can increase the employer identification with the firm leading to better job satisfaction, employee retention, and productivity (Bhattacharya et al. 2008).

Topic #9—Brand Equity and Brand Image: one of the articles with higher posterior likelihood of belonging to this topic starts by establishing a set of propositions for research to explore the effects of C-RM on *brand equity* and brand *image* (Hoeffler and Keller 2002). Indeed, these three words are highly correlated in the current topic along with *event* and *categories*. Empirical findings show that fit is one of the important drivers of brand image. Particularly, if partners have low fit in the beginning of the cause-related marketing campaign and congruence arises during the sponsorship *event*, brand image increases over time (Woisetschläger and Michaelis 2012). Results also show that brand image works as a carryover effect to other cause-unrelated categories. When a successful donation-based promotion is set on a "flagship" *category*, other categories from the same brand may benefit from such positive brand image even without being associated with a cause (Henderson and Arora 2010).

Topic #10—Local versus Global topic discusses local versus global C-RM initiatives and the use of local versus global norms in C-RM communication reports. The topic groups correlated words such as *global, non-governmental organizations, politics, consumption,* and *government.* The article with higher posterior probability of belonging to this topic discusses the impact of C-RM on ethical *consumption* within international development-focused organizations

(Hawkins 2012). Teegen et al. 2004 show how *non-governmental organizations* built from international social movements play a vital role in value creation and global governance (Teegen et al. 2004). Another line of research tests how companies use C-RM norms and laws (*politics* and *government* laws) in countries nevertheless reckoned to have local CSR practice. As companies engage in *global* C-RM practices that increase transparency and social awareness of the company, they become more globally competitive (Meyskens and Paul 2010).

Topic #11—Cause-based Partnership Dynamics literature proposes a framework to understand how companies and charities engage in a dynamic culture of (1) integration, (2) reculturation, and (3) separation (Parker and Selsky 2004). Separation *partnerships* often start because a small portion of top managers is emotionally engaged with a given cause even if the company *culture* is not. A more transactional partnership (integration) is a good way to start engaging in a cause-related alliance. There is a well-defined set of benefits that both charity and company want to achieve and both work to follow the objectives. Both the company and the charity use formal and informal mechanisms to diplomatically manage their differences (Simpson et al. 2011). The reculturation interface is more complex, given that the charity and company imprint one another's culture. The company eventually incorporates the social values of the charity into its own social responsibility standards (Parker and Selsky 2004).

Topic #12—Morality discusses moral identity and correlated words such as *prime* and *self*. The literature on this topic includes the classification of moral expressions into three categories, namely the benign, disputed, and problematic (Bowie and Dunfee 2002). Most people agree with the benign moral expressions that seek to establish a more sustainable and healthier environment. Disputed concerns are those that are of moral debate and do not have a moral consensus in society, such as abortion and use of animals in scientific experiments. The final problematic category consists of topics that dispute well-established social norms and are unarguably inconsistent with universal principles such as racial discrimination. According to Aquino et al. (2009), some situational factors such as moral *primes* positively trigger the individual characteristics of *moral identity* that each person possesses thus promoting prosocial intentions, while others like "financial incentives for task performance" have the inverse effect of decreasing altruistic behavior driven by the perceived *selfishness* of others.

Topic #13—Environment and Sustainability topic gathers articles that discuss *environment* and *sustainability programs*. The article with the second highest posterior probability of pertaining to this topic is a review on *sustainability* literature that proposes an integrated sustainability-specific framework for future research (Chabowski et al. 2011). Specifically, the authors suggest that future research should integrate a three-perspective approach based on focus (internal versus external), emphasis (social versus *environmental*), and intent (discretionary versus ethical versus legal) of sustainability efforts. Research also shows that the surplus between operational resources and financial resources (slack resources) have a positive impact on the use of *green* marketing strategies and that the interests of the multiple stakeholders of the organization (managers, customers, shareholders) can converge when the company uses green marketing strategies (*programs*) which is a positive way to align the corporation stakeholders in a common objective (Leonidou et al. 2013).

Topic #14—Campaign Characteristics In the current topic, words such as *donation, amount, price, purchase,* and *profit* are highly correlated. Pracejus et al. (2003) found that *donation amount* strongly affects choice; the higher the amount, the higher the likelihood of selecting the cause-related product. However, donation amount also has its limits. If the size of the contribution increases with an increase in product *price*, the likelihood of consumers to select the cause-related product (*purchase*) decreases (Chang 2008; Subrahmanyan 2004). Similar to donation amount, donation frame can also have an impact on choice. If marketers frame charity incentives in absolute terms rather than as a percentage of the sale price, C-RM effectiveness increases. The use of donation amount as a percentage of *profit*, however, confuses the consumers while they try to decide which cause-related product to choose (Olsen et al. 2003). Results, however, do not generalize to other type of donation-based campaigns, such as charity auctions where prices are set by increases driven by bidders. In such cases, as the price rises so does the donation amount, which leads to an additional philanthropic utility (Leszczyc and Rothkopf 2010).

Topic #15—Corporate Social Responsibility–Corporate Ability topic shows that *intention, attribution, team, purchase,* and *domain* are highly correlated words. According to the Brown and Dacin (1997) model, attitudes toward new products are influenced by the relationship between CSR reputation and corporate ability. Social inability is compensated by the corporate performance ability to deliver the products or services (Berens et al. 2007). Further, a successful social responsibility program with good reputation may be able to offset a weak business performance unless corporate ability has personal implications for consumers (Berens et al. 2007). Extending on the work of Brown and Dacin (1997), Sen and Bhattacharya (2001) suggest that in some *domains*, such as when CSR aims at

increasing employee conditions and when CSR initiatives are aligned with the consumer beliefs, CSR actions may increase *purchase intention* directly and not only through corporate evaluations and product *attribute* perceptions.

Topic #16—Product Price on Donation-Based Promotions: The literature shows a relationship between price and product purchases, when selecting donation-based promotions. *Price, consumer, choice, supply,* and *utility* are highly correlated words. Although research clearly suggests that C-RM can influence *consumer choice*, managers should be careful when setting the *price* tradeoff. When brands do not differ highly on price (*economic utility*), brand choice is influenced by its advantage to support social causes (*social utility*) regardless of how motivated the company is to support the charity. However, when brands have heterogeneous prices, the likelihood to choose the cause-related product increases along with the motivation of the company to support social causes (Barone et al. 2000). One way to achieve a positive response may be to set a transparent pricing strategy to expose social concerns along the company's *supply* chain (Carter and Curry 2010). Results from Krishna and Rajan (2009) also show that if a company pairs one of its disadvantaged products with a cause, it can raise prices on other products of its portfolio leading to an increased profit.

Topic #17—Attitude–Behavior Gap groups words such as *consumer, enterprise, purchase,* and *attitude*. In a qualitative study, Öberseder et al. (2011) found that the core factors that explain the *attitude*–behavior gap are focused on information and personal concern. Information about CSR programs determine whether consumers donate to C-RM campaigns. If *consumers* lack information on the campaign or have a negative perception of its successful implementation, they will use the limited information they have as a decision criteria. *Purchase* intention (behavior) is also dependent on the personal concerns of consumers. Deng (2012) classified consumers according to their purchase intention into three groups. The first group, "negative response group", includes consumers that often engage in boycotts toward companies' (*enterprises*) ethical activities. The second "zero response group" includes consumers that are indifferent to C-RM campaigns. Finally, the "positive response group" includes consumers that support CSR initiatives.

Topic #18—Sponsoring Events that support social causes is a topic that groups correlated words such as *event*, *sport*, *motivation*, and *attachment*. The literature shows that charity *event attachment* (for example when a *sport* event is supporting a charity) increases if individuals are *motivated* to participate by reciprocity, self-esteem, and the desire to improve the charity motives (Filo et al. 2011).

Although not exclusively focused on charitable events, Kropp et al. (2005) research suggests that group membership events may attract more participants if advertised to individuals susceptible to interpersonal influence. Also, when designing social campaigns targeted at sponsoring events, brands should be aware that although a well-designed campaign may benefit brand image, it also can foster shareholders to invest in the firm (Mazodier and Rezaee 2013). Investors evaluate CSR more positively than commercial sponsorships.

Topic #19—Multi-Sponsor Partnerships, one example being the RED campaign. The current topic groups correlated words such as *red, gap, card,* and *credit*. (PRODUCT)^RED has joined companies like Nike, Apple, *Gap,* and SAP, in an endeavor to help eradicate HIV/AIDS, Tuberculosis, and Malaria in Africa (Red 2013). Each brand has a cause-related product tailored to the *RED* campaign. Multi-sponsor campaigns such as RED bring a new and challenging way to address social issues, given that it joins competing firms into a common altruistic goal. Another example that the literature on this topic explores is the use of affinity *cards* using co-brand partners. Results show that in order to increase intention to use the affinity card, financial (*credit)* institutions must partner with charities or institutions that can elicit pride and prestige among its customers (Fock et al. 2005). This partnership can enhance the perceived quality of the affinity card as well as increase the altruistic motivation to support the sponsored institution (Woo et al. 2006).

Topic #20—Profit/Non-Profit Competition uncovers a marginal effect of unfair competition between profit and non-profit companies. Words such as *non-profit, profit, alliance, dominant,* and *innovative* are highly correlated in the current topic. While *non-profit* companies are usually in a disadvantageous position when establishing partnerships with *profit* companies (*dominant*) and support the risks of the *alliance* (Martinez 2003), they also benefit from policy and regulatory advantages. Results show that such benefits are not sufficient to damage profit companies (Liu and Weinberg 2004) when they compete for the same customers, one possible reason being that non-profit organizations are less *innovative* and less proficient in adopting advanced technologies for improving their efficiency. A suggested approach to better manage the relationship between the partners is by using the stakeholder theory (Savage et al. 1991). Abzug and Webb (1999) suggest a model in which the non-profit charities that gravitate around the company are viewed as stakeholder of the profit organization. However, they may assume multiple stakeholder roles, such as the competitor, the non-profit service provider, or even a non-profit customer consortium.

Topic #21—Corporate Orientation Behavior The current topic groups highly correlated words such as *orientation, code, citizenship, employee,* and *society*. Although previous research supports the assumption that firms improve business performance when they have a market *orientation* behavior, the article that correlates better with this topic shows that this relationship is moderated by CSR (Brik et al. 2011). Authors show that these are synergistic strategies rather than competing approaches. The topic also explores the use of corporate *codes* of conduct and its effect on building a socially responsible organization culture (toward a better *society*) (Erwin 2011). Findings report that corporate codes of conduct are correlated with better ranked ethical companies, which suggests that better quality in codes of conduct of the organization is an attribute that consumers use to classify companies with higher degrees of ethical performance. Also, the drivers of corporate *citizenship* and its effects on business performance are discussed (Maignan et al. 1999). Proactive corporate citizenship can be used to promote *employee* commitment (e.g., lower levels of absenteeism and higher identification with the company), customer loyalty (e.g., positive word-of-mouth), and business performance (e.g., sales growth and profit growth).

Topic #22—Sectors raising social taboos and moral debates gather discussions on C-RM in *industries* such as *tobacco* companies, *gambling* and lottery sites, social networks and *sport* events. There is an apparent contradiction when companies have a core business based on harmful products such as the tobacco industry and the promotion of C-RM initiatives (Palazzo and Richter 2005). These sectors are often *self-regulated* when it comes to CSR initiatives which often lead to lack of transparency and business opportunism. However, not all studies point to a failure in CSR strategies in sectors based on social taboos and moral debates. When consumers perceive that the regulated and legal operation of these sectors (such as casinos or abortion clinics) is a way to decrease the proliferation of illegal services in the non-regulated market, corporate social marketing initiatives adhere to the Porter and Kramer (2006) CSR model in which companies are able to solve a problem in society while reinforcing their corporate strategic objectives such as profit maximization (Lindorff et al. 2012). An article highly correlated with this topic presents a scale to measure the level of CSR efforts in sports lottery (Li et al. 2012).

Topic #23—Corporate Philanthropic Motivations gathers correlated words such as *motivation, give, charities, size,* and *donor*. Campbell et al. (1999) found that altruistic behavior (the act of *giving*) is strongly related to the decision-maker social consciousness. If CEOs have an individual social awareness, they drive the company to engage in CSR programs (they are *motivated* to donate). Particularly in small-*sized* companies, social marketing increases with the decision-maker satisfaction degree on the results of their corporate responsibility program (File and Prince 1998). However, decision-makers that do not share these social motives usually use more egoistical than altruistic motives to justify the company's lack of *charitable* support focused on business benefits and rewards (Campbell et al. 1999).

Topic #24—Institutionalized versus Promotional CSR Programs The topic discusses differences between institutional and promotional CSR programs and the corresponding effects on corporate identity (Pirsch et al. 2007). The topic groups correlated words such as *consumer, program, local, dimension,* and *brand*. Companies which institutionalize their commitment to social responsibility have usually a global CSR *dimension* (versus *local*). Such companies use CSR as a strategic tool and regularly audit its social efforts. Promotional *programs*, by contrast, are specifically designed with a limited scope, such as associating a cause with a new product (*brand*) in order to foster sales. Institutionalized social responsibility programs such as the example discussed in (Atakan and Eker 2007) help companies to increase *customer* loyalty. Promotional programs have a more narrow effect only on purchase intention and lead to a higher degree of consumer skepticism than when the company incorporates social responsibility in its DNA (Pirsch et al. 2007).

Conclusion

This study reveals the most discussed topics on C-RM since Varadarajan and Menon (1988) first defined the term in their seminal article. The objective here is to uncover topics, not to make a comprehensive review of the literature on C-RM. A Bayesian contextual analysis algorithm known as Correlated Topic Model (CTM) is used to find topics. The ensuing summarization and ranking of C-RM studies helps uncovering, not just the most relevant topics but also the less relevant ones. For example, in the present study, CTM results suggest that "corporate support for volunteerism" is a topic on its own, uncorrelated to other C-RM topics. Volunteerism is relevant to the current analysis insofar as it fosters company's cause-related marketing initiatives.

The analysis can also facilitate the process of peer-reviewing papers. Indeed, the current study has implications for authors, reviewers, and editors. The study reveals that "brand—cause fit", "law and ethics", and "corporate and social identification" are the most discussed topics in

C-RM. These topics show a positive growing trend along the years which reveals that they remain active. Such findings help both authors and reviewers to acquire a birds' eye view of C-RM literature thus avoiding ignoring significant constructs. Another useful finding is that although "sectors raising social taboos and moral debates" has few published articles so far, it is a popular topic, an emerging but understudied subject inside C-RM to be expanded in the future. Editors may further benefit from current findings by perceiving how C-RM literature is scattered amongst multiple scientific areas such as Ethics, Marketing, Psychology, and Law.

The paper makes use of the full text of published articles. Although titles, abstracts, and keywords could have been used instead, the use of the whole text is recommended as it reinforces the strength of the relationship between correlated terms. For example, terms "*attitude*" and "*intention*" are in the topic "brand-cause fit" because they are highly correlated with terms "*fit*", "*consumer*", and "*brand*". The use of a small part of the paper would lead to the missing of correlations present in full documents. Thus the contextual meaning of document *corpus* would be lost.

This paper has shown that TM is a valid and useful method to structure vast amount of previously unstructured data in tasks such as literature reviewing, namely TM can help reviewing academic articles without subjectively having to select which building blocks (topics) should be used as foundations of such review. Still mining text cannot replace subjective decisions that must be taken as part of a literature review or circumvent other methodologies such as meta-analysis. TM should be a way to help researchers explore correlations between the multiple terms and group them into topics, before engaging in a deeper statistical analysis on conflicts and agreements among published articles.

Appendix 1

See Table 3.

Appendix 2

See Table 4.

Table 3 Number of papers by journal

Journal name	Number of papers
Journal of Business Ethics	107
Journal of Advertising	19
Journal of the Academy of Marketing Science	18
European Journal of Marketing	17
Journal of Marketing	8
Journal of Business Research	7
Psychology and Marketing	7
International Marketing Review	7
Journal of Public Policy & Marketing	6
Management Decision	4
Nonprofit and Voluntary Sector Quarterly	4
MIT Sloan Management Review	4
The Journal of Consumer Affairs	4
Journal of Retailing	3
Journal of Marketing Research	2
Management Science	2
Journal of Cultural Economics	2
Quality and Quantity	2
Third World Quarterly	2
Journal of Personality and Social Psychology	1
Journal of International Business Studies	1
American Journal of Public Health	1
Journal of Consumer Research	1
Journal of Service Research	1
Journal of Marketing Research	1
GEOFORUM	1
Marketing Science	1
California Management Review	1
International Journal of Research in Marketing	1
Journal of Small Business Management	1
Journal of Gambling Studies	1
Journal of Service Management	1
Marketing Letters	1
Journal of Leisure Research	1
Management Communication Quarterly: McQ	1
The Journal of Business and Industrial Marketing	1
Gender Place and Culture	1
American Review of Public Administration	1
The Service Industries Journal	1
George Washington Law Review	1
Total	246

Table 4 List of articles ranked by posterior probability of pertaining to a topic given the frequency of correlated terms

Topic#	First author's last name	Year	Journal	Posterior probability
1	Lafferty	2007	Journal of Business Research	0.86
	Zdravkovic	2010	International Journal of Research in Marketing	0.79
	Kim	2012	Journal of Business Ethics	0.74
	Barone	2007	Journal of Retailing	0.68
	Bigné	2012	European Journal of Marketing	0.66
2	Waagstein	2011	Journal of Business Ethics	0.83
	Weyzig	2009	Journal of Business Ethics	0.81
	Aßländer	2013	Journal of Business Ethics	0.76
	Shum	2011	Journal of Business Ethics	0.75
	Bravo	2012	Journal of Business Ethics	0.75
3	Lin	2011	Journal of Business Ethics	0.84
	Pérez	2013	European Journal of Marketing	0.77
	Larson	2008	Journal of the Academy of Marketing Science	0.74
	Walker	2010	Journal of Business Ethics	0.71
	Currás-Pérez	2009	Journal of Business Ethics	0.64
4	Bennet	1993	Journal of Consumer Affairs	0.75
	Mohr	1998	Journal of Consumer Affairs	0.70
	Horne	2013	George Washington Law Review	0.68
	Drumwright	1996	Journal of Marketing	0.68
	Singh	2009	International Marketing Review	0.58
5	Du	2013	Journal of Business Ethics	0.90
	Knox	2007	Journal of Business Ethics	0.71
	Vaaland	2008	European Journal of Marketing	0.71
6	Mass	2011	Journal of Business Ethics	0.86
	Du	2012	Journal of Business Ethics	0.67
	Schreck	2011	Journal of Business Ethics	0.52
7	Ettenson	2005	International Marketing Review	0.92
	Low	2005	International Marketing Review	0.84
	Maignan	2001	Journal of Business Ethics	0.69
8	Peloza	2006	Journal of Business Ethics	0.91
	Basil	2009	Journal of Business Ethics	0.81
	O'Hagan	2000	Journal of Cultural Economics	0.77
9	Henderson	2010	Journal of Marketing	0.86
	Woisetschläger	2012	European Journal of Marketing	0.84
	Hoeffler	2002	Journal of Public Policy & Marketing	0.67
10	Hawkins	2012	Geoforum	0.86
	Teegen	2004	Journal of International Business Studies	0.85
	Meyskens	2010	Journal of Business Ethics	0.76
11	Parker	2004	Nonprofit and Voluntary Sector Quarterly	0.89
	Faldetta	2011	Journal of Business Ethics	0.79
	Lee	2013	Journal of Business Ethics	0.75
12	Aquino	2009	Journal of Personality and Social Psychology	0.96
	Segal	2013	Journal of Business Ethics	0.72
	Bowie	2002	Journal of Business Ethics	0.56
13	Leonidou	2013	Journal of the Academy of Marketing Science	0.85
	Chabowski	2011	Journal of the Academy of Marketing Science	0.72
	Dhanda	2013	Journal of Business Ethics	0.70

Table 4 continued

Topic#	First author's last name	Year	Journal	Posterior probability
14	Pracejus	2003	Journal of Advertising	0.90
	Olsen	2003	Journal of Public Policy & Marketing	0.88
	Leszczyc	2010	Management Science	0.88
15	Sen	2001	Journal of Marketing Research	0.90
	Brown	1997	The Journal of Marketing	0.64
	Berens	2007	Journal of Business Ethics	0.63
16	Carter	2010	Journal of the Academy of Marketing Science	0.93
	Anderson	2010	MIT Sloan Management Review	0.85
	Krishna	2009	Management Science	0.81
17	Deng	2012	Journal of Business Ethics	0.93
	Roehm	2007	Marketing Letters	0.72
18	Kropp	2005	International Marketing Review	0.87
	Filo	2011	Journal of Leisure Research	0.76
19	Fock	2005	European Journal of Marketing	0.91
	Woo	2006	Journal of Advertising	0.80
20	Camarero	2011	Journal of Cultural Economics	0.89
	Liu	2004	Journal of Public Policy and Marketing	0.76
21	Brik	2011	Journal of Business Ethics	0.96
	Erwin	2011	Journal of Business Ethics	0.91
22	Li	2012	Journal of Gambling Studies	0.91
	Pallazo	2005	Journal of Business Ethics	0.65
23	Mathur	1996	Psychology & Marketing	0.95
	Bendapudi	1996	Journal of Marketing	0.92
24	Pirsch	2007	Journal of Business Ethics	0.38
	Atakan	2007	Journal of Business Ethics	0.35

The number of articles included in the table is roughly in proportion to the total number of articles in each topic

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