

Funding Marketing Resources and Capabilities During a Recession: An Empirical Examination of Top Corporate Advertisers

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Funding marketing resources and capabilities during a recession: An empirical examination of top corporate advertisers

Purpose: We ask whether the funding behaviour of companies is different during a recession. Specifically, we study whether firms fund marketing resources and capabilities with internal or external financing during a recession, and under which conditions of strategic financial flexibility debt might be used to fund marketing resources and capabilities in recessions.

Design/methodology/approach: This study estimates empirical models using a newly merged data set covering 17 years, from 2000 to 2016. We merge firms' marketing and financial information from *Advertising Age*, the American Customer Satisfaction Index, Compustat, and the Center for Research in Security Prices. The sample includes a panel of 653 firm-years of 67 top corporate advertisers.

Findings: The results indicate that (1) firms take recessions as opportunities to be proactive and invest in short- and long-term marketing capabilities, (2) companies with higher strategic financial flexibility relative to their industry peers tend to rely more on debt to fund short- and long-term marketing capabilities during recessions, (3) firms use internal financing to fund their marketing budgets and short-term marketing capabilities in recessionary and non-recessionary periods, and (4) firms use internal financing and signals from past stock returns as mechanisms to fund long-term marketing capabilities.

Originality: This study provides a more complete picture of the financial antecedents of marketing resources and capabilities in general and during a recession. We provide light on the moderating role of strategic financial flexibility during recessions. Our study also clarifies the potential signalling of past performance for funding marketing resources and capabilities.

Research implications: Our findings contribute to the body of knowledge on the antecedents of marketing resources and capabilities. Our results extend the Pecking Order theory to include recessions and provide nuances of the financing drivers of resources and capabilities.

Practical implications: Companies should be proactive during recessions and invest in short- and long-term marketing capabilities. When negotiating marketing budgets with chief financial officers, marketing practitioners could suggest the sources to finance specific marketing resources and capabilities. Based on our results of top corporate advertisers, we recommend companies to fund marketing capabilities with internal resources (e.g., cash flows, retained earnings), and if cash is not available, companies need to rely on their superior strategic financial flexibility to access long-term debt and fund investments in marketing capabilities. We also recommend companies to fund long-term marketing capabilities by re-allocating investments. As well, signals from past performance are an important source to gain access to capital and fund investments in long-term marketing capabilities.

Keywords: marketing capabilities, marketing budget, internal financing, external financing, network DEA, RBV, Pecking Order theory, recession, strategic financial flexibility

Introduction

This study explores the financing drivers of marketing resources and capabilities. The extant literature recognizes that investing in marketing resources and capabilities (i.e., the financing of marketing) is important for the survival and growth of firms (Katsikeas *et al.*, 2016; Morgan, 2012; Srivastava *et al.*, 2001). However, the literature still needs to explain the mechanisms by which firms invest financial resources in their marketing budgets and in building marketing capabilities. We ask whether the funding behaviour of companies is different during a recession (a significant decline in economic activity spread across the economy, lasting more than a few months, visible in real GDP, real income, employment, production and wholesale–retail sales) (Currim *et al.*, 2016).

To date, research has shown that firms that invest proactively and consistently in marketing during recessions achieve higher profits (Srinivasan *et al.*, 2011), higher stock returns (Currim *et al.*, 2016; Srinivasan *et al.*, 2011) and higher subjective performance (Srinivasan *et al.*, 2005). However, we do not yet know (1) whether firms fund marketing resources and capabilities with internal or external financing during a recession and (2) under which conditions -of strategic financial flexibility- debt might be used to fund marketing resources and capabilities in a recessionary period. We combined the Resource-Based View (RBV) and Pecking Order theories to offer a more comprehensive theoretical picture of the way and the conditions under which companies fund marketing resources and capabilities during recessions.

By answering these questions, marketing practitioners will have a more nuanced understanding of the ways top advertisers¹ fund marketing resources and capabilities in

¹ We use top advertisers and top corporate advertisers interchangeably. These terms encompass companies that spend in all forms of advertisements and promotions (e.g., corporate ads, brand advertising). We use the term ‘top’ because these companies have the largest investments in advertising and promotions according to *Advertising Age*.

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3 recessionary periods. This study is also timely given the current pandemic and recessionary
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5 period we are facing; marketing practitioners will have a better understanding of the ways top
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7 corporate advertisers proceed with funding marketing resources and capabilities during a
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9 recession.
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12 This research contributes to the body of knowledge on the antecedents of marketing
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14 resources and capabilities. When we refer to “marketing resources,” we refer to expenditures in
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16 the marketing budget (e.g., promotions and advertising; Fischer et al., 2011; Piercy, 1987; West
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18 and Prendergast, 2009; West et al., 2014). By “marketing capabilities,” we refer to the processes
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20 of combining marketing resources to satisfy customers and attain brand equity (Angulo-Ruiz et
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22 al., 2014; Day, 1994; Keller and Lehmann, 2003; Rust et al., 2004; Srivastava et al., 2001). At a
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24 conceptual level, these processes may include understanding and forecasting customer needs
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26 better than competitors do, effectively linking offerings to customers, developing effective
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28 advertising and promotions programmes, developing and applying new market knowledge,
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30 developing new marketing processes not used before, brand management, and customer
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32 relationship management, among others (Day, 1994; Dutta et al., 1999; Krasnikov and
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34 Jayachandran, 2008; Vorhies and Morgan, 2005; Vorhies et al., 2011)².
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40 First, this study provides a more complete picture of the financial antecedents of marketing
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42 resources and capabilities in general and during a recession. Compared to the current literature
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44 (included in Table I), we integrate sparse research on the sources top advertisers employ to fund
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46 marketing resources and capabilities. Specifically, we integrate the simultaneous influence of
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48 internal, external and other sources of financing on marketing resources and capabilities. Our
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50 results indicate that (a) firms take recessions as opportunities to be proactive and invest in short-
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55 ² Throughout the text, we use “marketing resources and capabilities” together, but we disentangle resources from
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57 capabilities conceptually and empirically.
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3 and long-term marketing capabilities and (b) firms use internal financing to fund their marketing
4 budgets and short-term marketing capabilities in recessionary and non-recessionary periods.
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8 Second, we provide light on the sources employed to fund marketing resources and
9 capabilities during recessions and the moderating role of strategic financial flexibility. Current
10 studies in Table I focus on the general impact of internal or external sources of financing on
11 marketing resources or capabilities. Our study clarifies companies' financing behaviour in
12 recessionary periods and provides a more nuanced understanding of the role of external
13 financing to fund marketing resources and capabilities in recessions. Specifically, our findings
14 reveal that companies with higher strategic financial flexibility relative to their industry peers
15 tend to rely more on debt to fund short- and long-term marketing capabilities during recessions.
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26 Third, our study also clarifies the potential signalling of past performance for funding
27 marketing resources and capabilities. The current literature in Table I has shown that past
28 performance affects the funding of the advertising budget (e.g., Markovitch and Golder 2008).
29 Our study adds to the current literature that past performance (manifested in past stock returns)
30 signals the quality of the firm in the market, which in turn helps companies raise funds for
31 investing in long-term marketing capabilities. In effect, our findings show that firms use internal
32 financing and signals from past stock returns as mechanisms to fund long-term marketing
33 capabilities.
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44 The results of this study enable important managerial implications. Companies should be
45 proactive during recessions and invest in short- and long-term marketing capabilities. When
46 negotiating marketing budgets with chief financial officers, marketing practitioners should
47 suggest the sources to finance specific marketing resources and capabilities. Based on our results
48 of top advertisers, we recommend companies to fund short-term marketing capabilities with
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3 internal financing (e.g., cash flows, retained earnings), and if cash is not available, companies
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5 need to rely on their superior strategic financial flexibility to access long-term debt and fund
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7 investments in short-term marketing capabilities. We also recommend companies to fund long-
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9 term marketing capabilities by re-allocating investments (sell other assets and use this cash to
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11 fund long-term marketing capabilities). As well, signals from past performance are an important
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13 source to gain access to capital and fund investments in long-term marketing capabilities.
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17 In the next section, we briefly present the research on the antecedents of marketing resources
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19 and capabilities. Then, we develop a conceptual framework and research hypotheses on the ways
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21 and the conditions under which companies fund marketing resources and capabilities during
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23 recessions. Next, we elaborate models to measure our constructs and to capture the relationships
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25 among them. We perform several robustness checks. Finally, we discuss implications for theory,
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27 researchers and managers.
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33 **Literature review: Antecedents of marketing resources and capabilities**

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35 In general, research assesses the impact of marketing resources and capabilities on financial
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37 performance (e.g., Kachouie *et al.*, 2018; Krasnikov and Jayachandran, 2008; Liang and Gao,
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39 2020; Yim *et al.*, 2019). When research examines the antecedents of marketing resources and
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41 capabilities, studies focus on financial (e.g., Grullon *et al.*, 2006; Joseph and Richardson, 2002;
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43 Malshe and Agarwal, 2015; Mishra and Ewing, 2020) and non-financial antecedents (e.g., Feng
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45 *et al.*, 2015; Luxton *et al.*, 2017; West and Prendergast, 2009; West, Ford and Farris, 2014).
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49 Table I summarizes key extant research on the antecedents of marketing resources and
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51 capabilities.
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54 [Insert Table I about here]
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Literature on the financing drivers of marketing resources and capabilities indicates that higher levels of debt (external financing) limit advertising investments, customer satisfaction, and diversification (Grullon *et al.*, 2006; Malshe and Agarwal, 2015; Mishra and Ewing, 2020; O'Brien *et al.*, 2014). The current literature also indicates that internal sources of financing (i.e., retained earnings) play a key role to fund the marketing budget (Joseph and Richardson, 2002). However, extant literature has not yet provided answers on the financing behaviour of companies during recessions. In this sense, our research is different from the current literature (in Table I) because it integrates the simultaneous influence of internal, external and other sources of financing in one study. But most importantly, our study investigates whether firms fund marketing resources and capabilities with internal or external financing during a recession and under which conditions -of strategic financial flexibility- external financing (e.g., debt) might be used to fund marketing resources and capabilities in a recessionary period.

Conceptual framework and hypotheses: The influence of financing sources on marketing resources and capabilities

In this section, we begin by defining marketing resources and capabilities. Then, we explain the logic of the main effects and moderating hypotheses. We summarize the hypotheses of this study in Figure I.

Definition of marketing resources and capabilities

In this article, marketing resources are defined as the marketing actions taken by the firm, such as advertising campaigns, promotional efforts, or other specific initiatives designed to have a marketing impact (Rust *et al.*, 2004). We also refer to marketing resources as the expenditures

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3 included in the marketing budget (e.g., Fischer *et al.*, 2011; Joseph and Richardson, 2002;
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5 Piercy, 1987; West and Prendergast, 2009; West *et al.*, 2014).
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8 Amit and Shoemaker (1993), Helfat and Peteraf (2003), and Zollo and Winter (2002) assert
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10 that capabilities reflect the organization's ability to perform a coordinated set of tasks (with its
11
12 organizational resources) to achieve a particular result. In marketing, researchers have defined
13
14 marketing capabilities as a way to sense markets and relate to customers (Day, 1994), exhibit
15
16 "superiority in identifying customers' needs and in understanding the factors that influence
17
18 consumer choice behaviour" (Dutta *et al.*, 1999, p. 550), understand and forecast customer needs
19
20 better than competitors and to link offerings to customers effectively (Krasnikov and
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22 Jayachandran, 2008), and "transform resources into valuable outputs based on the classic
23
24 marketing mix" (Vorhies and Morgan, 2005, p. 82).
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29 In general, we define marketing capabilities as the process of combining marketing resources
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31 (e.g., promotions and advertising) by leveraging relational and intellectual assets to satisfy
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33 customers and attain brand equity (Angulo-Ruiz *et al.*, 2014; Day, 1994; Keller and Lehmann,
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35 2003; Rust *et al.*, 2004; Srivastava *et al.*, 2001). Specifically, we focus on short-term and long-
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37 term marketing capabilities (Feng *et al.*, 2015; Kachouie *et al.*, 2018).
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41 Short-term marketing capabilities maximize sales and refer to the process of translating
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43 marketing resources and marketing intangibles (customer satisfaction and brand equity) into
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45 sales revenues (Dutta *et al.*, 1999; Feng *et al.*, 2015; Narasimhan *et al.*, 2006). Conceptually,
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47 short-term capabilities may include understanding and forecasting customer needs better than
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49 competitors do and effectively linking offerings to customers and developing effective
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51 advertising and promotions programmes (Dutta *et al.*, 1999, Krasnikov and Jayachandran, 2008).
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3 Long-term marketing capabilities maximize and leverage marketing intangibles. That is,
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5 long-term marketing capabilities involve the processes that transform marketing resources, past
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7 marketing intangibles, and sales into new marketing intangibles (Angulo-Ruiz *et al.*, 2014; Feng
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9 *et al.*, 2015; Vorhies and Morgan, 2005). Conceptually, these processes may include developing
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11 and applying new market knowledge, developing new marketing processes not used before,
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13 brand management, and customer relationship management, among others (Day, 1994; Vorhies
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15 and Morgan, 2005; Vorhies *et al.*, 2011).
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22 ***The influence of internal and external financing on marketing resources and short-term*** 23 ***marketing capabilities*** 24 25

26 We develop our rationale using the Pecking Order theory. This theory suggests that firms prefer
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28 internal financing (e.g., cash flows), and if external financing is required, then firms issue the
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30 safest security first; for example, they start with debt, then convertible bonds, and then issue
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32 stocks as a last resort (e.g., Myers, 1984, p. 581)³. Applying the Pecking Order theory to
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34 marketing, we posit that firms with available internal funds (e.g., retained earnings) are able to
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36 finance the marketing budget internally (e.g., advertising and promotions expenses) and invest in
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38 short-term marketing capabilities for a number of reasons.
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42 First, both the marketing budget and short-term marketing capabilities represent a temporal
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44 priority for firms because they provide immediate results to firms (Feng *et al.*, 2015). Second,
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46 funding the marketing budget and short-term marketing capabilities with internal sources reduces
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48 the chance of disclosing internal information about investment in internal processes (Krasnikov
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53 ³ Pecking order theory (defined by Myers and Majluf (1984)) is underpinned by the assumption that asymmetric
54 information has an effect on cost of financing, so there is a hierarchy of financial sources, starting with internal
55 resources, then debt and, finally, issuing of new shares. According to this theory, the source of financial resources
56 acts as a signal of the need for external finance.
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3 and Jayachandran, 2008). This in turn makes these processes less likely to be imitated by
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5 competitors and ensures a source of sustainable competitive advantage.
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8 Third, if companies fund the marketing budget and short-term marketing capabilities with
9
10 external financing, they risk external monitoring. Investments in specific internal processes (i.e.,
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12 marketing budget and short-term marketing capabilities) will be disclosed to the public and
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14 therefore competitors may be able to build on or around these decisions (e.g., Krasnikov and
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16 Jayachandran, 2008). In turn, these internal processes may be more likely to be imitated and the
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18 company may lose competitive advantage. In effect, previous studies have shown that firms'
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20 higher financial leverage negatively affects expenses in advertising (Grullon *et al.*, 2006; Malshe
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22 and Agarwal, 2015). Other studies show that financial constraints negatively affect investment in
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24 marketing intangibles (Mishra and Ewing, 2020).
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29 Therefore, when internal funds are available, firms may use these sources to fund investment
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31 priorities such as those included in the marketing budget or in short-term marketing capabilities.
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33 With higher retained earnings, firms may fund planned expenses in advertising campaigns or in
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35 promotional programmes. Firms may also fund the components of short-term marketing
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37 capabilities, such as understanding and forecasting customer needs better than competitors do,
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39 effectively linking offerings to customers, developing effective advertising and promotions
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41 programmes, or developing sales activities. Therefore, we hypothesize the following:
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44 **H₁**: Internal financing will be positively related to the marketing budget.

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46 **H₂**: Internal financing will be positively related to short-term marketing capabilities.

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48 **H₃**: External financing will be negatively related to the marketing budget.

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50 **H₄**: External financing will be negatively related to short-term marketing capabilities.
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The influence of external financing on long-term marketing capabilities

Firms with higher long-term debt and stockholders' equity invest less in long-term marketing capabilities for several reasons. First, long-term marketing capabilities are investments in intangible assets (Srivastava *et al.*, 2001; Srivastava *et al.*, 1998; Vorhies *et al.*, 2011) and the returns on these investments are difficult to estimate, which leads to uncertainty about how much cash flow they will generate in the short term (Malshe and Agarwal, 2015). Thus, firms with higher debt (long-term debt or issuing stocks) have fewer financial resources to invest in difficult-to-predict long-term marketing capabilities and instead may use available financial resources to pay debt.

Second, in contrast to tangible investments – which typically represent fixed expenses – investments in intangible assets are susceptible to minimizations or removal in the case of firms with high debt (Mishra and Ewing, 2020). This argument suggests a negative relationship between debt and long-term marketing capabilities. Finally, firms with higher debt behave less aggressively, whereas the aggressive competitors are the firms that have lower leverage (Grullon *et al.*, 2006). With higher debt the firm may invest less in processes and abilities such as developing and applying new market knowledge, developing new marketing processes not used before, brand management, customer relationship management, and customer satisfaction processes. Thus, we hypothesize:

H₅: External financing will be negatively related to long-term marketing capabilities.

The influence of stock returns on long-term marketing capabilities

We focus on stock returns (Fama and French, 1992, 1993) as a potential mechanism to raise funding (Chakravarti and Grewal, 2011; Markovitch *et al.*, 2005; Markovitch and Golder, 2008;

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3 Spence, 1973). Stock returns possess two critical characteristics: (1) They are public information
4 and therefore are observable in the market, and (2) they indicate firm quality, where quality
5 indicates the unobservable ability of a firm to raise funding in the future (Connelly et al., 2011).
6
7 We expect that firms with higher stock returns invest in long-term marketing capabilities for
8 three main reasons. First, Eklund (2010, p. 796) theorizes that “firms that have a high Tobin’s Q⁴
9 ... find it less difficult to access external capital and thus depend less on retentions.” That is,
10 firms find it is simpler to signal relatively good investment opportunities to investors in the
11 capital market and, therefore, find it is easier to raise external funding.
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15 Second, Gugler *et al.* (2004, p. 519) contend that although “the [managerial discretion]
16 hypothesis claims that managers favour internal cash flows as a source of funds, it does not
17 preclude their resorting to the external capital market. Their willingness to do so is likely to be
18 positively related to [a firm’s market value].” In this sense, firms with higher market value (i.e.,
19 higher stock returns) signal quality to the market community. Quality signals sent to the market
20 community may provide opportunities to raise funds for investing in long-term marketing
21 capabilities.
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25 Third, previous research in marketing has found that past stock performance leads positively
26 to sales growth, marketing investments, and the marketing budget (Chakravarti and Grewal,
27 2011; Markovitch *et al.*, 2005; Markovitch and Golder 2008). Building on such previous
28 research, this study suggests that firms might use the potential cash raised to fund long-term
29 marketing capabilities. The raised funds should in particular help finance new marketing
30 processes (i.e., branding and customer satisfaction) to maximize the generation of new marketing
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54 ⁴ This study follows Mizik and Jacobson (2009, p. 323), who suggest, “It would be more expedient for analyses to
55 be based on stock return rather than Tobin’s q, which is subject to several unresolved issues associated with, for
56 example, measurement error.”
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3 intangibles critical to long-term marketing capabilities. In sum, this research expects that higher
4 stock returns may be a signal to raise funds to finance long-term marketing capabilities
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8 (Markovitch *et al.*, 2005; Markovitch and Golder, 2008). Thus, we hypothesize:
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10 **H₆**: Stock returns will be positively related to long-term marketing capabilities.
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12 [Insert Figure I about here]
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17 ***How do firms finance marketing resources and capabilities during a recession?*** 18

19 Recessions typically create a decline in demand that in turn affects firm spending and investment
20 decisions, at least in the short term. For instance, research has found that, in recessions, some
21 firms cut spending in marketing activities (Currim *et al.*, 2016). Latham and Braun (2011) argue
22 that firms reduce spending during recessions because managers view recessions as threats to
23 meeting performance benchmarks (Currim *et al.*, 2016). Given that recessions reduce demand,
24 firms' revenues and cash are also expected to reduce. In recessions, consumers face a reduction
25 of their income level, which has effects on their consumption levels (Mehra, 2001). According to
26 Currim *et al.* (2016), managers may decide that reducing marketing spending in the short term is
27 legitimate because demand and cash flow will have declined, competitors may also do the same,
28 and expenses need to be managed so that the firm remains profitable.
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42 While some firms may reduce marketing spending in a period of recession, other firms may
43 view recessions as opportunities to do proactive marketing. Proactive marketing in a recession
44 has been defined as a firm's interpretation of the recession as an opportunity and the
45 development and execution of an offensive marketing response to capitalize on the perceived
46 opportunity created by recession (Srinivasan *et al.*, 2005, p. 111). Proactive marketers during
47 recessions invest in marketing capabilities such as developing and applying new market
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3 knowledge, developing new marketing processes not used before, brand management, customer
4 relationship management, and customer satisfaction processes. These proactive firms invest in
5 marketing capabilities to strengthen their businesses and establish their advantage over their
6 weaker competitors (Srinivasan *et al.*, 2005). Thus, we expect the following:
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12 **H₇**: Recessions will be negatively related to the marketing budget.
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15 **H_{8a}**: Recessions will be positively related to short-term marketing capabilities.
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18 **H_{8b}**: Recessions will be positively related to long-term marketing capabilities.
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22 In earlier hypotheses (H₁ and H₂), we predicted that if internal financing sources are
23 available, then firms will fund the marketing budget and marketing capabilities with cash flows.
24 In a similar fashion, we expect that firms will fund the marketing budget and invest in short-term
25 marketing capabilities in recessionary and non-recessionary times if there are internal financial
26 resources available. However, we expect that the use of external financing to fund the marketing
27 budget and marketing capabilities will be different in recessionary versus non-recessionary
28 times. In particular, in recessionary times, we argue that firms with a higher strategic financial
29 flexibility will be much better able to use debt to fund the marketing budget and short- and long-
30 term marketing capabilities.
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42 As Kurt and Hulland (2013) indicate, strategic financial flexibility has been defined as
43 having the organizational capability and resources that enable a firm to respond quickly and
44 effectively to changing competitive conditions. Following Kurt and Hulland (2013), we focus on
45 the strategic financial flexibility relative to competitors in an industry. A critical advantage of
46 strategic financial flexibility is the capacity to raise additional financial resources (e.g., debt) that
47 allow firms to be more proactive in times of constraints (e.g., in recessions). Strategic financial
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flexibility provides the financial slack that makes firms more likely to respond aggressively to shifting environmental demands (Cheng and Kesner, 1997; Srinivasan *et al.*, 2005), stay in business (Tan and Peng, 2003), and innovate (Nohria and Gulati, 1996). While recessions reduce demand, and subsequently, firms' revenues and cash (Currim *et al.*, 2016; Latham and Braun, 2011), firms with strategic financial flexibility can obtain access to debt, which in turn may be used to fund the marketing budget as well as short- and long-term marketing capabilities.

Therefore, we hypothesize the following:

H₉: During a recession, strategic financial flexibility will positively moderate the relationship between debt and the marketing budget.

H_{10a}: During a recession, strategic financial flexibility will positively moderate the relationship between debt and short-term marketing capabilities.

H_{10b}: During a recession, strategic financial flexibility will positively moderate the relationship between debt and long-term marketing capabilities.

Data, operationalization of variables and estimation procedures

Sample

In this research, the unit of analysis is the firm. The marketing, financial, and control data variables cover 17 consecutive years, from 2000 to 2016, so that we can cover two recessions. To provide a broader picture of marketing expenses, we relied on the "100 Leading National Advertisers" reports by *Advertising Age*, which provide detailed data on advertising and promotion expenses⁵. Advertising expenses include advertising in magazines, newspapers,

⁵ While it was our intention to include all marketing expenses in the analysis, finding a breakdown of marketing expenses was difficult. We had the option to focus on the advertising expenses or the selling, general and administrative expenses provided by Compustat. The latter variable may overestimate marketing spending, while

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3 outdoor, television, radio, and the internet. Promotion expenses include data on total
4 expenditures in direct marketing, sales promotion, co-op spending, coupons, catalogues, product
5 placement, and special events. In total, we obtained 1,700 observations from *Advertising Age* for
6 the whole period of analysis.
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12 Another source of marketing data – customer satisfaction – is the ACSI. We gathered 3,992
13 firms' customer satisfaction observations from 2000 to 2016. We began building our data set
14 with information from *Advertising Age* and ACSI. When we merged *Advertising Age* and
15 available ACSI observations, 732 observations were available from the marketing data for all
16 years under analysis.
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24 We then collected financial data of companies using Compustat and CRSP and followed the
25 process by Malshe and Agarwal (2015) and others to compile the final data set. After merging
26 archival data from *Advertising Age*, ACSI, Compustat and CRSP, we gathered 653 observations
27 for the entire period of analysis. This represents 67 companies along the years of analysis.
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33 Table II shows the distribution of the sample by industry and includes the companies studied.
34 The sample consists of firms from the following two-digit Standard Industrial Classifications
35 (SIC): food and kindred products, chemicals and allied products, industrial machinery and
36 equipment, communications, building materials, general merchandise stores, food stores,
37 furniture and home furnishings stores, and eating and drinking places, among others. The
38 industry composition is similar to prior research (e.g., Anderson *et al.*, 2004; Tuli and
39 Bharadwaj, 2009).
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55 advertising underestimates it (Currim *et al.*, 2016). In this sense, and to have a more balanced approach, we focus on
56 advertising and promotion expenses available from *Advertising Age*.
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Operationalization of variables

Details of the operationalization of dependent, independent and control variables are presented in Table III.

[Insert Table III about here]

Model and estimation procedure

We include the marketing budget, the estimated marketing capabilities based on network DEA scores, and independent variables in differences (Δ). Working with differences allows us to avoid problems of spurious regression and to control for unmodelled, firm-specific information (Currim *et al.*, 2016). In addition, because this study focuses on firms' allocation of funds for the next year, we include the marketing budget and marketing capabilities in $t + 1$. We follow Joseph and Richardson (2002), Gugler *et al.* (2004) and Eklund (2010) to specify relevant independent variables in the model, in particular the effects of cash flows, retained earnings, long-term debt, stockholders' equity, stock returns, strategic financial flexibility and control variables from period t . To test the effect of recession on the marketing budget and marketing capabilities, both variables are measured in $t + 1$, as Currim *et al.* (2016) recommend. We apply logarithm to dependent and independent variables to normalize the data (Hair *et al.*, 2010).

We perform generalized least squares regressions, which as per Stata 15.0, fit panel-data linear models and allow estimations in the presence of autocorrelation within panels as well as cross-sectional correlation and heteroscedasticity across panels. One of the assumptions of ordinary least square (OLS) regressions is that there is a constant variance of the error term (Hair *et al.*, 2010). To accommodate this assumption, we use generalized least squares regressions with a heteroscedastic error structure [panels (heteroskedastic)]. Another assumption of OLS is the

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3 independence of error terms (Hair *et al.*, 2010). To correct for correlations between error terms
4 and time (given that we are using panel data), we also specify panel-specific autocorrelation
5 [corr(psar1)]. Because we have unbalanced panel data, we also specify the “force” option in
6 Stata. This option is critical “when the time variable is not equally spaced and with the force
7 option the model will be fit, and it will be assumed that the lags based on the data ordered by the
8 time variable are appropriate” (Stata 15 help information).
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19 **Empirical findings**

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21 Table IV presents descriptive statistics and the correlation matrix of the variables. In levels and
22 across all years of analysis, the marketing budget represents on average 4% of total assets. From
23 the output-oriented network DEA, we obtained two scores for short-term (α_1 and α_2) and long-
24 term marketing capabilities (β_1 and β_2), that correspond to the simultaneous (Model 1) and non-
25 simultaneous (Model 2) approaches presented in Appendix 1 (in supplementary files). On
26 average, the scores of short-term marketing capabilities (α_1 and α_2) are 15.82 for α_1 and 4.38 for
27 α_2 ⁶. These scores indicate that sales on average should be approximately 16 and 4.5 times their
28 original values, respectively, to maximize the second stage of the network DEA, meaning the
29 generation of intangibles. We need to point out that our sample contains firms that are highly
30 efficient and highly inefficient, so the variance of the distribution of the short-term marketing
31 capabilities is prominent.
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53 ⁶ After applying logarithms to original values, these values were normalized. The average of α_1 for the sample of
54 analysis becomes .538 with a 1.532 standard deviation, while the average of α_2 becomes .711 with a 1.771 standard
55 deviation. In robustness checks, we also re-ran models presented in Tables V and VI using 5% and 10% trimmed
56 values of short-term marketing capabilities to check for the potential effect of outliers.
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3 On average, the scores of long-term marketing capabilities (β_1 and β_2) are 1.044 for β_1 and
4
5 1.028 for β_2 . These scores indicate that firms should increase the generation of long-term
6
7 marketing intangibles by 4.4% and 2.8% on average to be fully efficient. To compute differences
8
9 (Δ) of marketing capabilities (to be used as dependent variables), we first apply logarithm and
10
11 then calculate $(\alpha_1 - \alpha_2)$ for Δ short-term marketing capabilities, and $(\beta_1 - \beta_2)$ for Δ long-term
12
13 marketing capabilities. Doing this, we make sure that the results in regressions can be interpreted
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15 as follows: Positive signs mean an improvement in efficiency and marketing capabilities; in
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17 other words, the non-simultaneous model (in Appendix 1, Figure A.1.b) appears to be more
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19 efficient than the simultaneous approach (in Appendix 1, Figure A.1.a) is, whereas negative
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21 values indicate a drop in efficiency (reduction of marketing capabilities).
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27 Cash flows from financing activities, investing activities and operating activities represent on
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29 average -5.1%, -6.7% and 12.3% of total assets, respectively. Retained earnings represent on
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31 average 34.1% of total assets. The average of continuously compounded stock returns is -2.4%.
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33 Long-term debt and stockholders' equity represent on average 23.5% and 33.3% of total assets,
34
35 respectively. Approximately 15% of observations come from a recessionary period and the
36
37 average strategic financial flexibility of firms is 0.021⁷.
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41 Bivariate correlations show that the marketing budget is significantly associated with cash
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43 flows from operating activities. We also observe in Table IV that long-term marketing
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45 capabilities are significantly correlated with cash flows from investing and operating activities as
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47 well as with strategic financial flexibility and long-term marketing capabilities are higher during
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49 a recessionary period.
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55 ⁷ The average of the difference between the mean financial leverage of rivals and the financial leverage of the focal
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57 firm is 0.26%, which indicates a positive unstandardized firms' strategic financial flexibility.
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[Insert Table IV about here]

Testing H₁ and H₂: The effect of internal financing on the marketing budget and short-term marketing capabilities

Table V provides the main effects of internal financing on the marketing budget and short-term marketing capabilities. The results show that $\Delta\text{Cashflow}_{\text{financing}_t}$ (.317, $p < .001$), $\Delta\text{Cashflow}_{\text{investing}_t}$ (.318, $p < .001$), and $\Delta\text{Cashflow}_{\text{operations}_t}$ (.649, $p < .01$) have significant effects on $\Delta\text{Marketingbudget}_{t+1}$. Therefore, we find support for H₁ that firms with higher cash flows in the current fiscal year fund the marketing budget of the next fiscal year.

In addition, the results reveal that ΔRE_t has a significant effect on $\Delta\text{Short-termMC}_{t+1}$ (1.246, $p < .01$). This result provides support for H₂ that firms with higher retained earnings in the current fiscal year invest in short-term marketing capabilities of the next fiscal year. Cash flow and retained earnings results confirm that firms fund the marketing budget and short-term marketing capabilities with internal financing.

Testing H₃ and H₄: The effect of external financing on the marketing budget and short-term marketing capabilities

The results show that $\Delta\text{Longtermdebt}_t$ (-.551, $p < .01$) and $\Delta\text{Stockholdersequity}_t$ (-.732, $p < .001$) have negative significant effects on $\Delta\text{Marketingbudget}_{t+1}$ and have no significant effect on short-term marketing capabilities. These results confirm findings from previous literature (Grullon *et al.*, 2006; Malshe and Agarwal, 2015; Mishra and Ewin, 2020) that higher debt is negatively related to the marketing budget. These results support only H₃ and not H₄.

[Insert Table V about here]

Testing H₅ and H₆: The effects of external financing and stock returns on long-term marketing capabilities

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3 The results in Table V reveal that $\Delta\text{Longtermdebt}_t$ ($-.047, p > .10$) has no significant effect on
4 $\Delta\text{Long-termMC}_{t+1}$. The results also show that $\Delta\text{Stockholdersequity}_t$ ($.064, p > .10$) has no
5
6 significant effect on $\Delta\text{Long-termMC}_{t+1}$. These findings provide no support for H₅ that firms with
7
8 higher external financing invest less in long-term marketing capabilities.
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12 Moreover, the results show that ΔCCAR_t ($.034, p < .01$) has a significant effect on $\Delta\text{Long-}$
13 termMC_{t+1} . This finding provides support for H₆ that firms with higher past stock returns invest
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15 in long-term marketing capabilities. In other words, companies with higher past stock returns
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17 provide positive signals to raise funds and invest in long-term marketing capabilities.
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21 Additional results indicate that $\Delta\text{Cashflowinvesting}_t$ ($.121, p < .01$) has a significant effect on
22 $\Delta\text{Long-termMC}_{t+1}$. Although not hypothesized, this finding indicates that cash flows from
23
24 investing activities are used to fund long-term marketing capabilities and point to the role of
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26 internal financing to fund capabilities.
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31 ***Testing H₇ to H₁₀: The effects of recession and strategic financial flexibility on the marketing***
32 ***budget and marketing capabilities***
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35 Table V reveals that $\Delta\text{Recession}_{t+1}$ ($-.062, p < .05$) has a significant effect on
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37 $\Delta\text{Marketingbudget}_{t+1}$. This finding supports H₇ that during a recession, managers tend to reduce
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39 their marketing budget in response to reductions in customer demand. Results also show that
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41 $\Delta\text{Recession}_{t+1}$ has a significant effect on $\Delta\text{Short-termMC}_{t+1}$ ($.34, p < .05$) and $\Delta\text{Long-termMC}_{t+1}$
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43 ($.035, p < .01$). These results provide support to H_{8a} and H_{8b} that during a recession, firms tend
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45 to invest more in short- and long-term marketing capabilities.
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49 To test H₉ and H₁₀, we split the sample into no recession (recession = 0) and recessionary
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51 periods (recession = 1) and present results in Table VI. Results show that the interaction term
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53 $\Delta\text{Longtermdebt}_t \times \Delta\text{Strategicfinancialflexibility}_t$ is significantly related to the marketing budget
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3 in recessionary periods ($-.284, p < .01$). Figure IIA visualizes the moderating effect of strategic
4 financial flexibility⁸ on the relationship between long-term debt and the marketing budget in a
5 recessionary period. Results indicate that in recessions, firms use long-term debt (in addition to
6 internal financing) to fund their marketing budgets. However, results also show that the
7 relationship between long-term debt and marketing budget is not stronger in conditions of high
8 strategic financial flexibility than it is in conditions of low strategic financial flexibility. Thus, H₉
9 is not supported.
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19 Table VI reveals that the interaction term $\Delta\text{Longtermdebt}_t \times \Delta\text{Strategicfinancialflexibility}_t$ is
20 significantly related to both short-term marketing capabilities ($2.243, p < .001$) and long-term
21 marketing capabilities ($.187, p < .05$) in recessionary periods. Figures IIB and IIC show the
22 moderating effect of strategic financial flexibility on the relationship between long-term debt and
23 marketing capabilities in recessionary periods. Figure IIB indicates that firms fund short-term
24 marketing capabilities with long-term debt when they have higher strategic financial flexibility;
25 and when firms have lower strategic financial flexibility, they do not seem to use long-term debt
26 to fund short-term marketing capabilities. Figure IIC shows that the relationship between long-
27 term debt and long-term marketing capabilities is less negative in circumstances of high strategic
28 financial flexibility than it is in circumstances of low strategic financial flexibility. These results
29 support H_{10a} and H_{10b} that in a recessionary period, strategic financial flexibility positively
30 moderates the relationship between debt and marketing capabilities.
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47 Table VI also offers results on the relationship among internal financing, stock returns, the
48 marketing budget and marketing capabilities in recessionary and non-recessionary periods. Firms
49 fund their marketing budgets with internal financing in periods of recession or in periods of no
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55 ⁸ Strategic financial flexibility indicates that firms with greater capacity to borrow are better able to build long-term
56 marketing capabilities using long-term debt. We thank an anonymous reviewer for providing this idea.
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3 recession. Firms seem to fund short-term marketing capabilities with cash flows from operations
4 and retained earnings in periods of recession. Firms also seem to fund long-term marketing
5 capabilities with cash flows from investing activities in both periods of recession and no
6 recession. Additionally, past stock returns show positive effects on long-term marketing
7 capabilities in both periods of recession and no recession.
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14 All models in Tables V and VI have good fit based on Wald chi-square.

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17 [Insert Table VI about here]

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19 [Insert Figure II about here]

20 21 **Robustness checks**

22 We assess the robustness of the findings using several tests, including different measures of
23 retained earnings and stock returns, trimmed sample, different computation of recession, and
24 validation of marketing capabilities measurement.
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30 First, following DeAngelo *et al.* (2006), we used the ratio of retained earnings to
31 shareholders' equity as follows: $[NI - DIV] / [(\{AT-LT\}_t + \{AT-LT\}_{t-1}) / 2]$. The results show that
32 ΔRE_t (.346, $p < .10$) has a significant effect on $\Delta \text{Short-term}MC_{t+1}$. The effects of cash flows,
33 stock returns, long-term debt, and stockholders' equity stay the same as they were in our central
34 analysis. The results of this additional test are in line with our main findings.
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42 Second, we employed another measure of retained earnings following Eklund (2010): $[NI +$
43 $DP - DIV] / [AT_t]$. Although the effect of retained earnings is not significant, the effects of cash
44 flows, stock returns, long-term debt, and stockholders' equity are similar to those in our main
45 analysis. In general, these results corroborate the original findings.
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Third, research suggests the need to use additional measures of stock returns to validate findings (Mizik and Jacobson, 2009). Thus, we used annual cumulative stock returns (CARs) as follows:

$$(1) CAR_{it} = \sum_{m-12}^m AR_{im},$$

where CAR_{it} is the annual CAR of stock i in year t . For the operationalization of AR, check Appendix 3 (in supplementary files). The results indicate that our main findings are robust; that is, ΔCAR_t (.023, $p < .01$) has a significant effect on $\Delta Long-termMC_{t+1}$.

Fourth, we also check for short-term marketing capabilities outliers' effect. We trimmed the sample using 5% and 10% cut-off points of α_2 . We re-ran short-term marketing capabilities models in Table V and Table VI. When trimming 5% of the sample, we found that the effect of retained earnings (1.447, $p < .01$), recession (.392, $p < .05$) and $\Delta Longtermdebt_t \times \Delta Strategicfinancialflexibility_t$ (1.785, $p < .05$; 2.243, $p < .001$) are positive and significant. When trimming 10% of the sample, we also found that the effect of retained earnings (1.302, $p < .05$), recession (.347, $p < .05$) and $\Delta Longtermdebt_t \times \Delta Strategicfinancialflexibility_t$ (1.914, $p \leq .01$; 1.614, $p < .01$) are positive and significant. These results substantiate our original findings.

Fifth, we include recession differences in the empirical models in an alternative way. Given that we follow Currim *et al.* (2016), differencing recession year 2009 (recession = 1) minus recession year 2008 (recession = 1) results in 0. To make sure this potential problem does not affect our estimations, we re-ran our empirical models presented in Table V by not including these zeros. After re-running models, we found that $\Delta Recession_{t+1}$ has a significant effect on $\Delta Marketingbudget_{t+1}$ (-0.033, $p < .10$, one-tailed test). Robustness results also show that $\Delta Recession_{t+1}$ has a significant effect on $\Delta Short-termMC_{t+1}$ (.395, $p < .05$) and $\Delta Long-termMC_{t+1}$ (.045, $p < .001$). These results corroborate our original findings in Table V.

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3 Finally, to validate the construction of marketing capabilities, we use stochastic frontier
4 estimation (Battese and Coelli, 1988). In particular, we use the natural logarithm of sales
5 (LnSales) as the output variable and the natural logarithm of advertising (LnAdvertising) and
6 promotional spending (LnPromotion) from period (t) and customer satisfaction (LnCS) and
7 brand equity (LnBE) from period ($t - 1$) as the input variables. We employ panel-data stochastic
8 frontier models following Battese and Coelli (1988). We obtain expected positive signs for all
9 right-hand-side variables included in the stochastic frontier estimation as follows: LnAdvertising _{t}
10 (.236, $p < .001$), LnPromotion _{t} (.093, $p < .001$), LnCS _{$t-1$} (1.243, $p < .001$), and LnBE _{$t-1$} (.137, $p <$
11 .01). These results lend robustness to the input and output variables used in the network DEA.
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26 Discussion

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28 The main results obtained in this research imply that firms take recessions as opportunities to be
29 proactive and invest in marketing capabilities. Likewise, financial flexibility drives to rely more
30 on debt to fund marketing capabilities during recessions. Regarding financing, firms use internal
31 financing (e.g., cash flows) to fund their marketing budgets and short-term marketing capabilities
32 in recessionary and non-recessionary periods, and also use internal financing (e.g., cash flows
33 from investing activities) and signals from past stock returns as mechanisms to fund long-term
34 marketing capabilities. As follows, we discuss the theoretical and managerial implications of our
35 findings.
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49 *Theoretical implications*

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51 Our study contributes to the body of knowledge on the antecedents of marketing resources and
52 capabilities. First, this study demonstrates the significant role of recessions when funding
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3 marketing resources and capabilities. One of our key results indicates that, during a recession,
4 firms redirect their marketing spending and invest in short- and long-term marketing capabilities.
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6 Firms view recessions as opportunities to be proactive and invest in marketing capabilities to
7 remain competitive and weed out weaker competitors. Firms also recognize that –during
8 recessions- customers’ requirements change and act reactively, even if this is quickly⁹.
9
10 Srinivasan et al. (2005) explain that firms are proactive during a recession because they have a
11 strategic emphasis on marketing and an entrepreneurial culture.
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19 Second, our results substantiate the premise of the pecking order theory (Myers, 1984; Myers
20 and Majluf, 1984) in marketing and indicate a direct positive relationship between internal
21 financing and the marketing budget, short-term marketing capabilities, and long-term marketing
22 capabilities in recessionary and non-recessionary periods. In this way, our results contribute to
23 the body of knowledge of the antecedents of marketing resources and capabilities by adding that
24 internal financing is key to fund marketing expenses during recessionary and non-recessionary
25 periods.
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35 Third, our study reveals that external financing plays a key role during recessions. During a
36 recession, firms fund short- and long-term marketing capabilities with debt. This is particularly
37 the case when firms have higher strategic financial flexibility relative to their industry peers.
38 While internal financing always plays a role in funding marketing resources and capabilities,
39 external financing becomes relevant only when firms have higher strategic financial flexibility
40 during recessions. These findings provide an understanding of the role of external financing to
41 fund marketing resources and capabilities during recessions. Future studies should include
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56 ⁹ We thank an anonymous reviewer for providing this idea.
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3 strategic financial flexibility, especially during recessions, when studying the way firms fund
4 marketing resources and capabilities.
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8 Fourth, in this study, we posit that past high stock returns provide positive signals to the
9 financial community, which firms can use to raise funds for investing in marketing capabilities.
10 Our results indicate that past stock returns have a positive and direct impact on long-term
11 marketing capabilities in recessionary and non-recessionary periods. This finding complements
12 the results of Chakravarti and Grewal (2011), Markovitch, Steckel and Yeung (2005), and
13 Markovitch and Golder (2008), who show that stock returns impact future sales growth, new
14 product development, and the advertising budget. Our finding implies that past stock returns
15 signal the quality of the firm in the market, which in turn helps companies raise funds for
16 investing in long-term marketing capabilities.
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31 ***Managerial implications***

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33 We offer the following recommendations to marketing practitioners:
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35 1) Consider the following reference point to determine competitive-based marketing
36 budgets: the marketing budget (expenses in advertising and promotions) of top advertisers in our
37 sample represents approximately 4% of total assets. This competitive reference point could serve
38 marketing practitioners to set up marketing budgets in conjunction with more sophisticated
39 algorithmic budgeting methods, as the literature recommends (West, Ford and Farris, 2014).
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49 [Insert Table VII about here]
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3 2) When negotiating marketing budgets with chief financial officers, marketing practitioners
4 should suggest the sources to finance specific marketing resources and capabilities. Table VII
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6 presents a lay summary of our empirical findings. For instance, in normal conditions, marketing
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8 practitioners could suggest chief financial officers to fund the marketing budget with cash flows,
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10 to funds short-term marketing capabilities with retained earnings and to fund long-term
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12 marketing capabilities with cash flow from investing activities. In an interview with a finance
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14 director at a FTSE top 100, West and Prendergast (2009) quote “(t)he problem is most marketing
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16 departments are narrowly focused. They have no interest in finance, ops or anything except
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18 marketing. They see marketing as the only thing. The potential for error is huge. It’s arrogance. I
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20 would fall and make love to any marketing director that would see a wider perspective” (p.
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22 1470). We therefore recommend marketing practitioners to embrace wider business topics than
23
24 just marketing. In the case of our paper, marketing practitioners will benefit from bringing to the
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26 table ideas on the ways to fund the marketing budget and marketing capabilities in addition to
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28 asking for funding.
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35 3) During a recession, marketing practitioners could suggest chief financial officers to fund
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37 their marketing budget with debt, especially if the firm has higher strategic financial flexibility
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39 relative to their industry peers. We specifically advise that marketing practitioners emphasize
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41 their budgetary ask on funding short- and long-term marketing capabilities. During recessions,
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43 our sample of top advertisers invest in short-term and long-term marketing capabilities. Past
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45 research has demonstrated that investing in marketing capabilities pays off.
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49 4) Marketing practitioners could also suggest to chief financial officers that the signalling of
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51 past stock returns is a key mechanism to fund long-term marketing capabilities. Higher past
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3 stock returns signal the quality of the firm to the financial community, which provides access to
4 financial resources that, in turn, help fund long-term marketing capabilities.
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7 ***Limitations***

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10 This study is not without limitations. In this paper, we operationalize marketing capabilities
11 using advertising, promotion, and stocks of marketing intangibles as inputs of the marketing
12 process. However, marketing capabilities may also include other inputs. Future studies could
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14 process. However, marketing capabilities may also include other inputs. Future studies could
15 collect primary or secondary data on other inputs of marketing capabilities, such as pricing
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17 decisions, channel and distribution strategy, product strategy, positioning and targeting activities,
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19 and power structure of the marketing department (e.g., Feng et al., 2015; Vorhies and Morgan,
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21 2005). Accounting for all of these inputs would provide a more complete picture of the
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23 marketing capabilities, enabling researchers to further analyse the impact of internal and external
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25 financing on these marketing capabilities.
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31 Future studies are also encouraged to do a more complex analysis of the contingent role of
32 recessions (Currim et al., 2016; Srinivasan et al., 2005, 2011). For instance, future research can
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34 examine the effects of pre-, during, and post-recession. Future studies with access to more data
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36 points will be able to enlighten us on the longitudinal role of recessionary periods on financing
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38 marketing resources and capabilities.
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43 This research focuses on a panel of top corporate advertisers (West et al., 2014; West and
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45 Prendergast, 2009). Future research can study the financing drivers of marketing resources and
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47 capabilities in the context of small- and medium-sized enterprises and businesses from different
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49 countries. With cross-country longitudinal data of businesses of different size and age, future
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51 research can develop the ideal study of the financing drivers of marketing resources and
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53 capabilities.
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Table I
Antecedents of marketing resources and capabilities in extant research

Authors (by year)	Underlying Theory	Financial Antecedents			Non-Financial Antecedents	Contingencies		Dependent Variables		Sample Size
		Internal Equity	External Equity	Other Sources		Mediators	Moderators	Marketing Resources	Marketing Capabilities	
Moorman (1995)	Culture, market information processes	-	-	-	Yes	Information acquisition, transmission, and utilization	-	Yes	-	92 US firms
Vorhies (1998)	Organizational capabilities	-	-	-	Yes	-	-	-	Yes	85 US firms
Joseph & Richardson (2002)	Agency theory	Yes	-	-	-	-	Managerial ownership	Yes	-	2763 U.S. firm-year observations
Markovitch et al. (2005)	Principal agent, prospect theory	-	-	Yes	-	-	-	Yes	-	117-203 U.S. observations
Grullon et al. (2006)	Capital structure	-	Yes	-	-	-	Intangibility	Yes	-	577 U.S. firms
Markovitch & Golder (2008)	Efficient markets	-	-	Yes	-	-	-	-	-	71 U.S. firms
Nasution & Mavondo (2008)	RBV	-	-	-	Yes	-	-	-	Yes	231 hotels 385 guests
Fang & Zou (2009)	Dynamic capabilities	-	-	-	Yes	-	Departmentalization, formalization, goal congruency, learning culture	-	Yes	129 IJVs in China
West & Prendergast (2009)	Agency, prospect, risk compensation	-	-	-	Yes	-	-	Yes	-	77 surveys, 9 interviews in UK
Chakravarty & Grewal (2011)	Myopic management	-	-	Yes	-	-	Firm size, industry concentration	Yes	-	8915 U.S. firm-year observations
Merrilees et al. (2011)	RBV	-	-	-	Yes	-	-	-	Yes	367 B2Bs in Australia
O'Cass & Ngo (2011)	Services marketing	-	-	-	Yes	Branding and customer empowerment capabilities	-	-	Yes	266 services in Australia
Murray et al. (2011)	RBV	-	-	-	Yes	-	Coordination, cost-leadership, market turbulence, competitive intensity	-	Yes	491 export ventures in China
Vorhies et al. (2011)	The RBV and dynamic capabilities	-	-	-	Yes	Marketing exploration, marketing exploitation	-	-	Yes	169 U.S. firms
Currim et al. (2012)	Compensation, myopic management	-	-	-	Yes	-	-	Yes	-	3382 firm-year observations
Theodosiou et al. (2012)	Organizational capability	-	-	-	Yes	Customer, competitor, cost, innovation orientations	-	-	Yes	316 banks in Greece
Yang (2012)	RBV	-	-	-	Yes	CRM technology use	-	-	Yes	209 firms in Korean
Kemper et al. (2013)	Organizational capabilities	-	-	-	Yes	-	Technological turbulence, competitive intensity	-	Yes	280 firms in Germany

Authors	Underlying Theory	Financial Antecedents			Non-Financial Antecedents	Contingencies		Dependent Variables		Sample Size
		Internal Equity	External Equity	Other Sources		Mediators	Moderators	Marketing Resources	Marketing Capabilities	
Kurt & Hulland (2013)	Equity offerings, strategic flexibility	-	Yes	-	-	-	Strategic flexibility	Yes	-	1581 U.S. IPOs, 1729 SEOs
Natividad (2013)	Organizational slack	Yes	-	-	-	-	-	Yes	-	1518 U.S. observations
West et al. (2014)	Cognitive appraisal theory	-	-	-	Yes	-	-	Yes	-	125 surveys in the US
Feng et al. (2015)	Power and capabilities	-	-	-	Yes	-	-	-	Yes	612 U.S. firms, 16 years
Malshe & Agarwal (2015)	Financing	-	Yes	-	-	-	Service firms, competition, sales growth	Yes	Yes	1346 firm year observations
Wies & Moorman (2015)	Equity offerings, innovation	-	Yes	-	-	-	Sales growth, demand instability, strategic emphasis, industry concentration	Yes	-	3954 U.S. firm-year observations
Currim et al. (2016)	Economic cycle, signaling	-	-	-	Yes	-	-	Yes	-	45843 firm-year observations
Luxton et al. (2017)	RBV	-	-	-	Yes	Market orientation, brand orientation	-	-	Yes	187 firms in Australia
Mishra & Ewing (2020)	RBV	-	Yes	-	-	-	-	Yes	-	55,439 U.S. firm year observations
Current Study	The RBV and pecking order	Yes	Yes	Yes	Yes	-	Recession, strategic financial flexibility	Yes	Yes	653 U.S. firm-year observations

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Table II
Sample distribution by industry

2-digit SIC	SIC major groups (2-digit)	Sampled companies	% of observations
20	Food and kindred products	Anheuser Busch; Cadbury Schweppes; Campbell Soup; Coca-Cola; ConAgra Foods; Dr Pepper Snapple; General Mills; Kraft Heinz; Kellogg; Molson Coors; Nestlé; Pepsico; SABMiller; Sara Lee	21.25
28	Chemicals and allied products	Clorox; Colgate-Palmolive; Procter & Gamble; Unilever	6.35
30	Rubber and miscellaneous plastic products	Nike	1.19
35	Industrial machinery and equipment	Dell; Hewlett-Packard	3.96
36	Electronic, electrical equipment, & components, except computer equipment	Apple	1.39
37	Transportation equipment	Daimler Chrysler; Ford Motor; General Motors; Honda Motor; Hyundai Motor; Nissan Motor; Toyota Motor; Volkswagen AG	11.90
47	Transportation services	Expedia	0.40
48	Communications	AT&T; BellSouth; Comcast; DirectTV; Dish Network; Qwest Communications; Sprint Nextel; Time Warner Cable; Verizon Communications	10.31
52	Building materials	Home Depot; Lowe's	5.16
53	General merchandise stores	J.C. Penney; Kohl's; Macy's; Sears Holdings; Target; Wal-mart	14.48
54	Food stores	Albertson's; Kroger; Safeway	4.96
56	Apparel and accessory stores	Gap	1.19
57	Furniture and home furnishings stores	Best Buy; Circuit Stores	2.78
58	Eating and drinking places	Burger King Holdings; McDonald's; Wendy's International; Yum! Brands	6.55
59	Miscellaneous retail	Amazon; CVS Health; Walgreens,	1.98
63	Insurance carriers	Allstate; Progressive	2.38
73	Business services	eBay; Microsoft	2.38
99	Nonclassifiable establishments	Berkshire Hathaway, General Electric	1.39
-	Total	67 companies, 653 firm-year observations	100%

Table III
Variables and sources of data

Variable	Operationalization	Sources of information	Literature source
Marketing budget	Total sum of expenses on advertising and promotion used as a proxy for the marketing budget.	“100 Leading National Advertisers” by <i>Advertising Age</i>	Luo and Donthu (2005), Piercy (1987); West and Prendergast (2009); West et al. (2014)
Short-term marketing capability	The result of the output-oriented network DEA with a reference frontier. The model is based on the ratio of intermediary outputs (sales) to multiple inputs (advertising, promotion, past customer satisfaction, and past brand equity). We apply log.	Self-estimated, see Appendix 1	Angulo-Ruiz et al. (2014), Dutta et al. (1999), Feng et al. (2015)
Long-term marketing capability	The result of the output-oriented network DEA with a reference frontier. The model is based on the ratio of multiple outputs (customer satisfaction and brand equity) to multiple inputs (optimal sales from short-term marketing capability model, advertising, promotion, past customer satisfaction, and past brand equity).	Self-estimated, see Appendix 1	Angulo-Ruiz et al. (2014), Dutta et al. (1999), Feng et al. (2015)
Advertising	Sum of advertising expenditures in television, radio, print, outdoor, and Internet	“100 Leading National Advertisers” by <i>Advertising Age</i>	Luo and Donthu (2005, 2006)
Promotion	Sum of expenditures in direct marketing, sales promotion, co-op spending, coupons, catalogs, product placement, and special events	“100 Leading National Advertisers” by <i>Advertising Age</i>	Luo and Donthu (2005, 2006)
Sales	Total annual sales [Compustat code: SALE]	Compustat	Dutta et al. (1999)
Customer satisfaction	Firm’s ACSI	National Quality Research Centre at the University of Michigan	Anderson et al. (2004)
Brand equity	The residual of sales	(see Appendix 2), Self-estimated	Luo and Donthu (2006), Slotegraaf and Pauwels (2008)
Internal Financing:			
Retained earnings	The ratio of retained earnings to average total assets. We apply log. Also mean-centered. [Compustat codes: [RE]/[(AT _t + AT _{t-1})/2]]	Compustat	DeAngelo et al. (2006)
Cash flow from operating activities	The ratio of operating activities net cash flow to total assets. We apply log. Also mean-centered. [Compustat codes: OANCF/AT]	Compustat	Gruca and Rego (2005)

Variable	Operationalization	Sources of information	Literature source
Cash flow from investing activities	The ratio of investing activities net cash flow to total assets. We apply log. Also mean-centered. [Compustat codes: IVNCF/AT]	Compustat	Gruca and Rego (2005)
Cash flow from financing activities	The ratio of financing activities net cash flow to total assets. We apply log. Also mean-centered. [Compustat codes: FINCF/AT]	Compustat	Gruca and Rego (2005)
External Financing:			
Long-term debt	The ratio of long-term debt to total assets. We apply log. Also mean-centered. [Compustat codes: DLTT/AT]	Compustat	Myers (1984)
Stockholders' equity	The ratio of stockholders' equity to total assets. We apply log. Also mean-centered. [Compustat codes: SEQ/AT]	Compustat	Myers (1984)
Stock Returns:			
CCAR	Logarithm of CCARs resulting from Appendix 3. We mean-centered the variable.	Self-estimated	Fama and French (1992, 1993)
Conditions:			
Recession	Following the National Bureau of Economic Research and Currim et al. (2016), we specify 2001, 2008 and 2009 as recession years. In this sense, recession is a binary variable, where 1 indicates a recession year and 0 a non-recession year.	National Bureau of Economic Research	Currim et al. (2016)
Strategic financial flexibility	Relative strategic financial flexibility of firms with respect to rivals. [Compustat codes: {average of 2-SIC rivals' (DLTT + DLC)/AT – firm's (DLTT + DLC)/AT} / standard deviation of all in 2-SIC]. Positive values of relative strategic financial flexibility indicate that firms have greater strategic financial flexibility than rivals have.	Compustat	Campello (2006), Kurt and Hullah (2013)
Control Variables:			
Year	Dummy variables for each year under analysis to prevent omitted effects and cross-individual correlation.	-	Aaker and Jacobson (1994)
Industry	2-SIC industry		Boulding (1990); Currim et al. (2016); Jacobson (1990)

Table IV
Descriptive statistics and correlation matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Δ MarketingBudget _{it+1}	1											
2. Δ Short-termMC _{it+1}	-.091 (.04)	1										
3. Δ Long-termMC _{it+1}	-.178 (.000)	.053 (.235)	1									
4. Δ Cashflowfinancing _{it}	.008 (.862)	-.063 (.157)	.063 (.156)	1								
5. Δ Cashflowinvesting _{it}	-.023 (.60)	.05 (.26)	.128 (.004)	-.505 (.000)	1							
6. Δ Cashflowoperations _{it}	.089 (.045)	.038 (.395)	-.146 (.001)	-.343 (.000)	-.294 (.000)	1						
7. Δ RE _{it}	.001 (.982)	.049 (.27)	-.033 (.455)	.077 (.084)	-.059 (.189)	-.027 (.551)	1					
8. Δ CCAR _{it}	-.044 (.322)	-.031 (.494)	.012 (.785)	-.002 (.97)	-.082 (.067)	.149 (.001)	.183 (.000)	1				
9. Δ Longtermdebt _{it}	-.025 (.572)	.025 (.582)	.012 (.795)	.089 (.047)	-.125 (.005)	.012 (.789)	-.061 (.175)	-.114 (.01)	1			
10. Δ Stockholders'equity _{it}	-.05 (.26)	.014 (.748)	-.037 (.408)	-.065 (.143)	.022 (.621)	.112 (.012)	.228 (.000)	.122 (.006)	-.603 (.000)	1		
11. Δ Recession _{t+1}	-.029 (.519)	.022 (.628)	.193 (.000)	.023 (.608)	-.021 (.646)	-.124 (.006)	-.142 (.001)	-.027 (.549)	.048 (.285)	-.144 (.001)	1	
12. Δ Strategic financial flexibility _{it}	-.011 (.799)	.029 (.523)	-.102 (.023)	-.115 (.01)	.067 (.136)	-.043 (.338)	.07 (.118)	.09 (.043)	-.473 (.000)	.306 (.000)	-.006 (.887)	1
Mean (Δ)	-.027	-1.136	.024	-.003	.005	-.001	.001	-.002	.005	-.004	-.012	-.02
Standard deviation (Δ)	.202	1.453	.125	.083	.08	.046	.075	.224	.041	.045	.389	.862
Minimum (Δ)	-1.325	-9.188	-.247	-.377	-.377	-.313	-.733	-.952	-.189	-.504	-1	-3.305
Maximum (Δ)	.992	7.809	1.238	.353	.353	.56	.168	1.212	.345	.151	1	2.888
Mean (levels)	.04	15.82 ^a ; 4.38 ^a	1.044; 1.028	-.051	-.067	.123	.341	-.024	.235	.333	.146	.021
Standard deviation (levels)	.044	158.23; 15.321	.054; .11	.072	.063	.063	.32	.235	.131	.156	.354	1.162

Notes: For correlations, observations in variations (Δ) were used. For descriptive statistics, observations in variations (Δ) and levels reported. P-values are between parentheses. ^aTrimmed means at 10% (5% in each tail)

Table V
Main effects of sources of financing, recession and strategic flexibility on marketing resources and capabilities

	Δ MarketingBudget _{it+1}	Δ Short-termMC _{it+1}	Δ Long-termMC _{it+1}
	Estimates δ (Standard Error)	Estimates δ (Standard Error)	Estimates δ (Standard Error)
Δ Cashflowfinancing _{it}	.317*** (.083)	-.442 (.616)	.046 (.046)
Δ Cashflowinvesting _{it}	.318*** (.081)	.293 (.54)	.121** (.045)
Δ Cashflowoperations _{it}	.649** (.208)	1.201 (1.291)	-.205* (.095)
Δ RE _{it}	.075 (.07)	1.246** (.477)	-.022 (.027)
Δ CCAR _{it}	.016 (.028)	-.15 (.16)	.034** (.011)
Δ Longtermdebt _{it}	-.551** (.208)	1.237 (1.109)	-.047 (.068)
Δ Stockholders' equity _{it}	-.732*** (.201)	1.071 (1.13)	.064 (.072)
Δ Recession _{t+1}	-.062* (.025)	.34* (.174)	.035** (.012)
Δ Strategic financial flexibility _{it}	-.011 (.007)	.027 (.034)	-.007† (.004)
Constant	-.049* (.02)	-.011 (.132)	.022* (.01)
Industry effects	18 industries	18 industries	18 industries
Year effects	14 years	14 years included	14 years included
n (in Δ changes)	516	567	567
Wald χ^2	214.06***	423.41***	455.15***

Notes: Year effects refer to the range from 2002 to 2016. We performed panel data feasible generalized least squares regressions.

† $p \leq .10$ * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.

Table VI
Contingency analysis of recession

	$\Delta Marketing Budget_{it+1}$		$\Delta Short-term MC_{it+1}$		$\Delta Long-term MC_{it+1}$	
	Under No Recession	Under Recession	Under No Recession	Under Recession	Under No Recession	Under Recession
	Estimates δ (Standard Error)	Estimates δ (Standard Error)	Estimates δ (Standard Error)	Estimates δ (Standard Error)	Estimates δ (Standard Error)	Estimates δ (Standard Error)
$\Delta Cashflow_{financing}_{it}$	.325*** (.086)	.18* (.078)	-.649 (.657)	-1.428*** (.053)	.108* (.047)	-.05 (.044)
$\Delta Cashflow_{investing}_{it}$	.347*** (.078)	-.111 (.102)	.396 (.555)	-.436*** (.112)	.151*** (.04)	.368*** (.057)
$\Delta Cashflow_{operations}_{it}$	.56** (.206)	2.422*** (.143)	1.472 (1.362)	3.795*** (.142)	.032 (.091)	-2.459*** (.063)
ΔRE_{it}	-.148 (.097)	.332*** (.024)	.93 [†] (.602)	2.564*** (.062)	-.036 (.038)	-.065** (.024)
$\Delta CCAR_{it}$	-.058* (.029)	.01 (.013)	-.025 (.168)	-.935*** (.024)	.05*** (.012)	.073*** (.009)
$\Delta Longtermdebt_{it}$	-.656*** (.196)	1.042*** (.285)	1.89 [†] (1.117)	.541*** (.106)	-.045 (.072)	-.805*** (.069)
$\Delta Stockholders' equity_{it}$	-.437* (.192)	.726** (.238)	.334 (1.245)	-2.387*** (.112)	-.039 (.081)	-.626*** (.037)
$\Delta Longtermdebt_{it} \times \Delta Strategic financial flexibility_{it}$	-.425** (.118)	-.284** (.091)	1.048 ^{a†} (.68)	2.243*** (.223)	.101* (.052)	.187* (.075)
$\Delta Strategic financial flexibility_{it}$	.003 (.008)	.02*** (.002)	.017 (.037)	-.131*** (.007)	-.013** (.004)	.008* (.004)
Constant	-.022 [†] (.013)	.025*** (.002)	.089 (.122)	.303 (.009)	.024** (.009)	.088*** (.001)
Year effects	Included	Included	Included	Included	Included	Included
n (in Δ changes)	444	68	493	68	493	68
Wald χ^2	113.35***	12447.85***	219.30***	15641.49***	400.33***	29487.45***

Notes: Year effects refer to the range from 2002 to 2016. We performed panel data feasible generalized least squares regressions.

[†] $p \leq .10$ * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$. ^aone-tailed test.

Table VII. Summary of managerial implications

	Conditions	
	In general conditions and in non-recessionary periods	In recessionary periods
Which sources to employ for financing marketing budgets (advertising, promotion)	Cash flow from operations	Cash flow from operations, cash flow from financing, retained earnings, long-term debt, stockholders' equity
Which sources to employ for financing short-term marketing capabilities	Retained earnings	Cash flow from operations, retained earnings, long -term debt when strategic financial flexibility is higher than industry peers
Which sources to employ for financing long-term marketing capabilities	Cash flow from investing activities, signalling from past stock returns	Cash flow from investing activities, long -term debt when strategic financial flexibility is higher than industry peers, signalling from past stock returns

Figure I
How do companies finance marketing resources and capabilities?

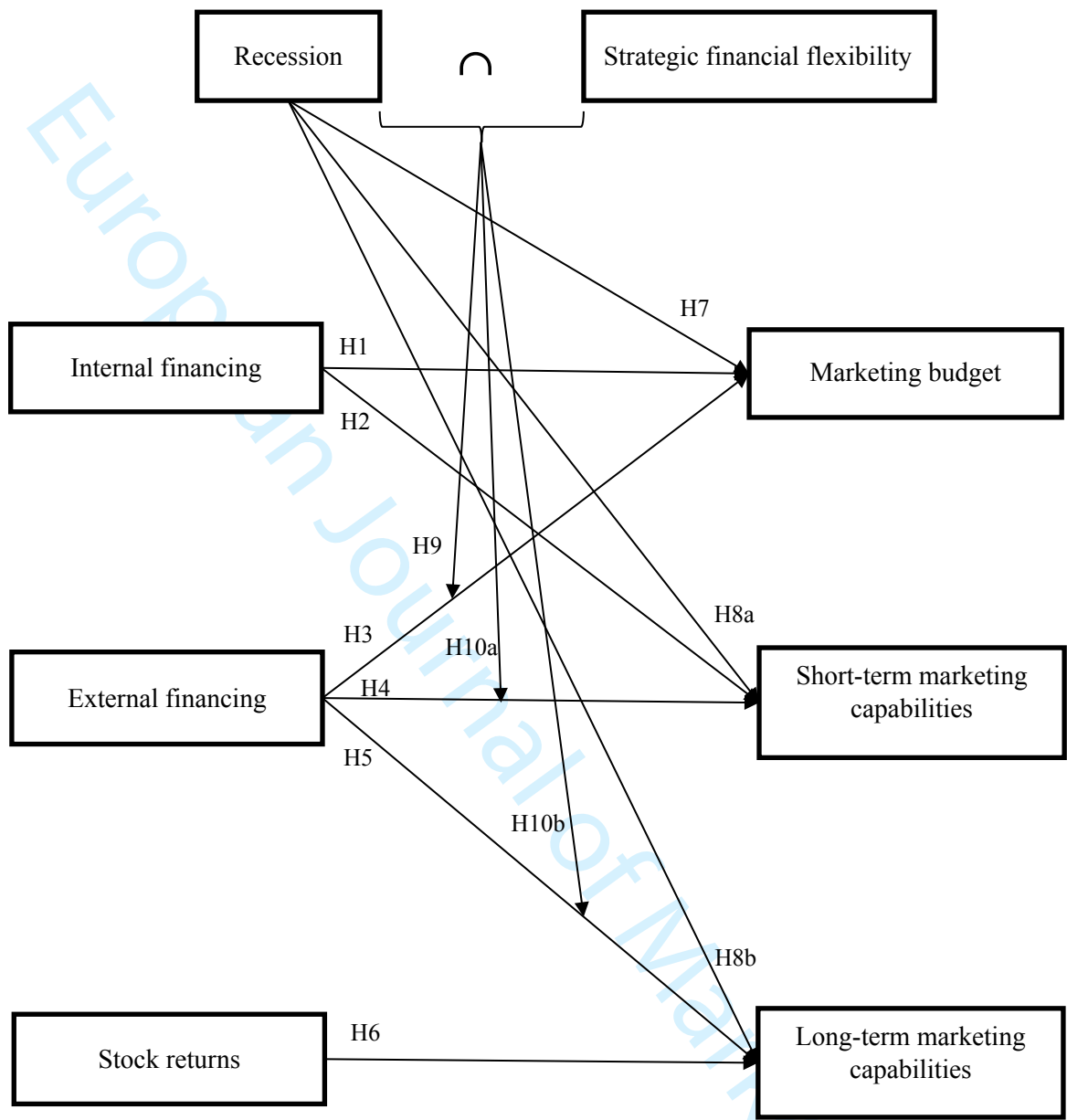
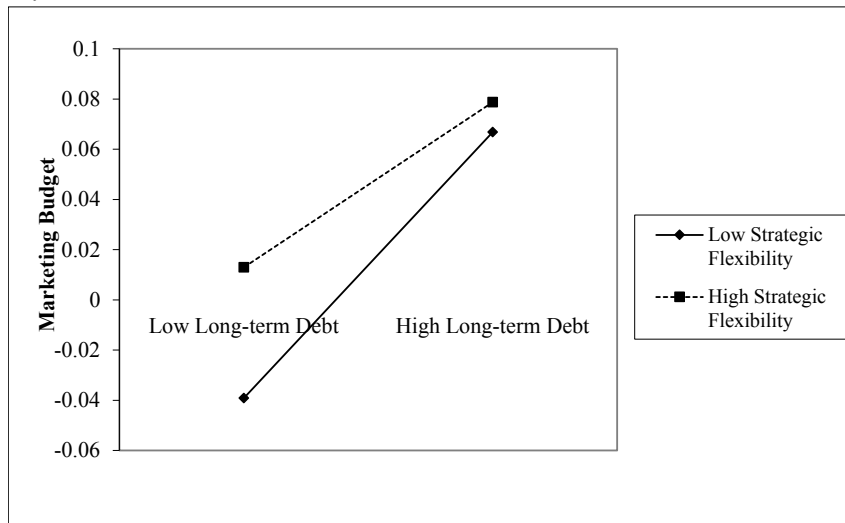
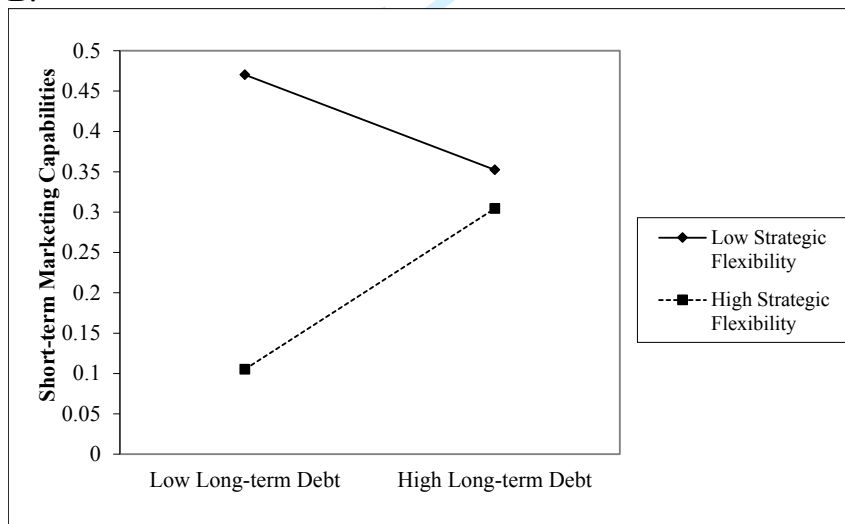


Figure II
Moderating effects of strategic financial flexibility in a recessionary period

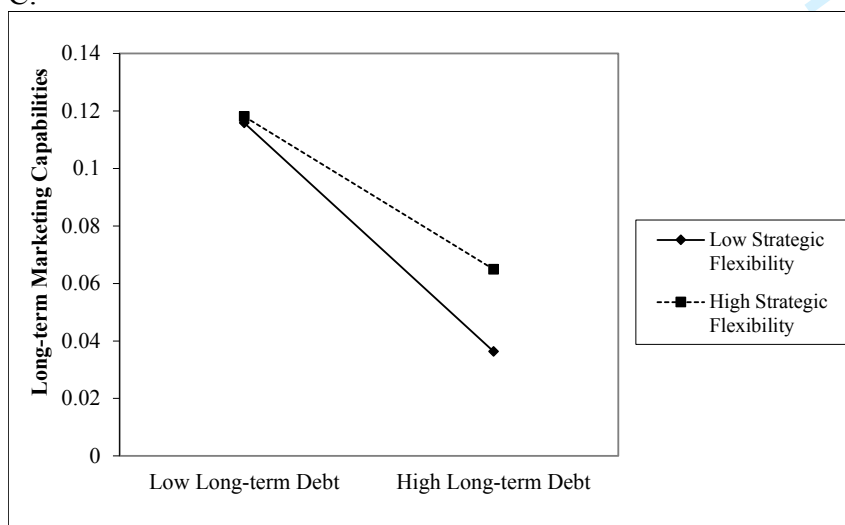
A.



B.



C.



SUPPLEMENTARY FILES

Appendix 1

Estimation of network DEA with a reference frontier with simultaneous and non-simultaneous approach

Existing research employs survey-based as well as parametric and nonparametric frontiers to model and estimate marketing capability (in other words, extant research uses production functions or optimization tools to establish the frontier corresponding to the best performer). In our case, a nonparametric method such as data envelopment analysis (DEA) fits with the process of converting resources (inputs) into results (outputs) and therefore serves to model and estimate marketing capability. In essence, DEA captures how efficiently firms deploy inputs to achieve desired outputs; consequently, firms that are more efficient have greater capability than less efficient firms have (Angulo-Ruiz et al., 2014).

More precisely, we employ a network DEA composed of two stages (see Figure A.1): (1) generation of sales and (2) generation of marketing intangibles. Considering the time variable, we define two different technologies: The first considers that the process of generating sales and marketing intangibles is simultaneous to the consumption of the marketing resources. The alternative model is less automatic as it assumes a one-year delay between the consumption of the marketing resources and the generation of sales and marketing intangibles. During Stage 1 (generation of sales), the existing marketing intangibles (coming from period t), in addition to the marketing resources (expended in $t + 1$), are oriented towards the fulfilment of sales optimization (in $t + 1$). Consistently, short-term marketing capabilities are the result of Stage 1.

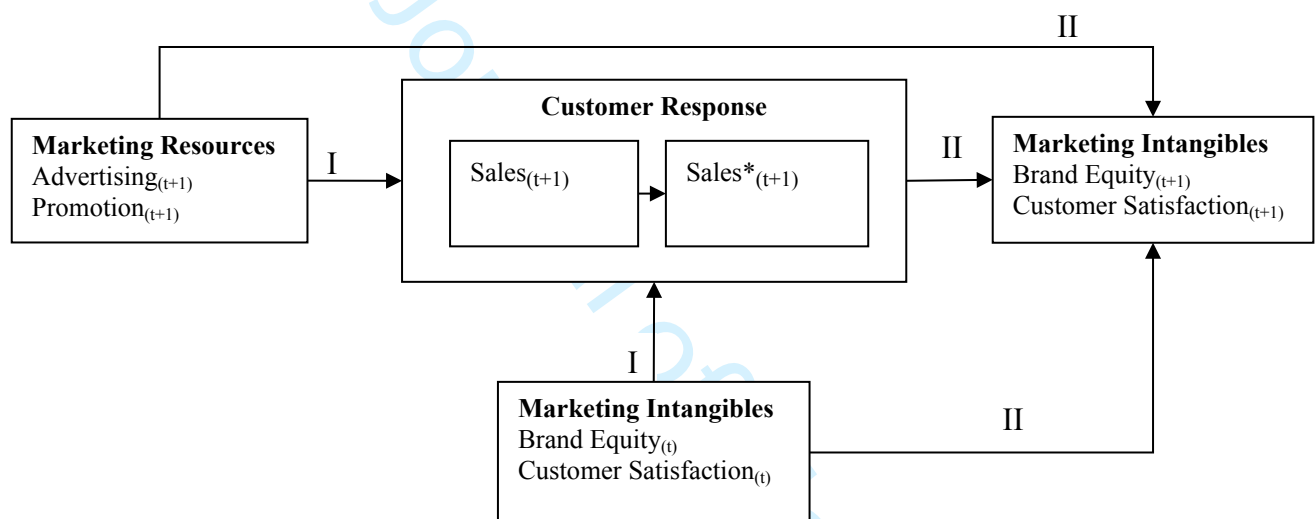
In Stage 2, the optimal level of sales is added to the previous resources (marketing resources, expended in $t + 1$, and marketing intangibles, existing in t) to maximize the level of marketing intangibles generation (in $t + 1$). A firm oriented towards maximizing

intangibles generation should efficiently manage both steps to guarantee the achievement of the final goal. Any problem in one of the steps will make it impossible to achieve the maximum level of intangibles generation. Long-term marketing capabilities are the result of Stage 2. Below we provide the mathematical development to estimate the efficiency coefficients under the two approaches (simultaneous and non-simultaneous models) depending on the cadence of the facts under scrutiny. This cadence is also described in Figures A.1.a and A.1.b.

Figure A.1

Marketing capabilities and network DEA

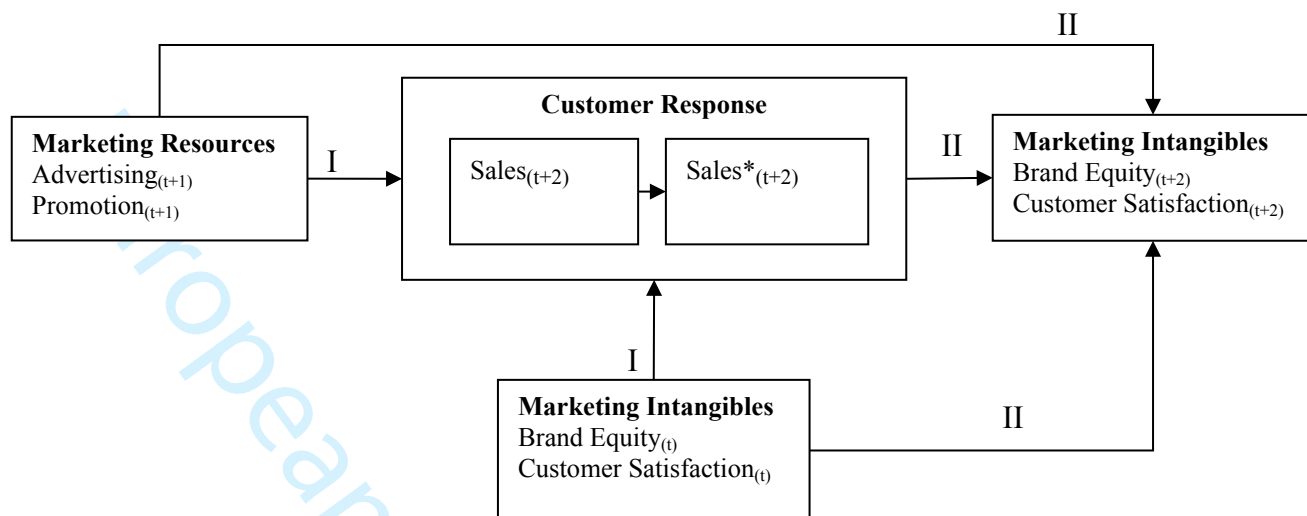
Figure A.1.a: Simultaneous model where marketing resources and outputs occur at the same time (α_1 and β_1)



I: Short-term marketing capabilities (α_1)

II: Long-term marketing capabilities (β_1)

Figure A.1.b: Non-simultaneous model where marketing resources and outputs occur at different times (α_2 and β_2)



I: Short-term marketing capabilities (α_2)

II: Long-term marketing capabilities (β_2)

We estimate the simultaneous network output-oriented DEA model with variable returns to scale by defining a technology synthesized in Figure 2.a as follows:

$$\begin{aligned}
 & \max. \beta_1, \\
 & \text{s.t.:} \\
 & \sum_{k=1}^K \lambda_k \cdot x_{jkt+1} \leq x_{jt+1}^o, \quad j = 1, \dots, J, \\
 & \sum_{k=1}^K \lambda_k \cdot y_{fkt} \leq y_{ft}^o, \quad f = 1, \dots, F, \\
 & \sum_{k=1}^K \lambda_k \cdot y_{ikt+1} \geq \alpha_1 \cdot y_{it+1}^o, \quad i = 1, \dots, I, \\
 & \sum_{k=1}^K \lambda_k = 1, \\
 & \sum_{k=1}^K \mu_k \cdot x_{jkt+1} \leq x_{jt+1}^o, \quad j = 1, \dots, J, \\
 & \sum_{k=1}^K \mu_k \cdot y_{fkt} \leq y_{ft}^o, \quad f = 1, \dots, F, \\
 & \sum_{k=1}^K \mu_k \cdot y_{ikt+1} \leq \alpha_1 \cdot y_{it+1}^o, \quad i = 1, \dots, I,
 \end{aligned}$$

$$\begin{aligned} \sum_{k=1}^K \mu_k \cdot y_{fkt+1} &\geq \beta_1 \cdot y_{ft+1}^o, & f = 1, \dots, F, \\ \sum_{k=1}^K \mu_k &= 1, \\ \lambda_k &\geq 0; \mu_k \geq 0. \end{aligned}$$

where β_1 is the network efficiency coefficient for the unit under analysis in period $t+1$. For the purposes of this study, β_1 represents the firm's level of long-term marketing capabilities. When $\beta_1 = 1$ it the DMU (Decision-Making Unit) under analysis is efficient, and $\beta_1 > 1$ indicates that DMU is inefficient (the bigger the β_1 , the more inefficient the DMU is in generating intangible resources). The term x_{jt+1}^0 represents the observed inputs vector of the DMU under analysis in period $t+1$ (in our case, the marketing resources spent in the current period), y_{ft}^o refers to the marketing intangibles coming from the previous period, y_{it+1}^o is the intermediate output vector of the DMU under analysis in period $t+1$ (in our case, there is only one intermediate output: sales), y_{ft+1}^o expresses the value of the marketing intangibles at the end of $t+1$. Finally, x_{jkt+1} , y_{fkt} , y_{ikt+1} refer to inputs, final and intermediate outputs of the k ($k = 1, \dots, K$) DMUs forming the total sample, and λ and μ indicate the activity vector; these vectors serve to identify those units that create the shape of the efficient frontier.

The non-simultaneous approach (described in Figure 2.b) introduces a delay in the generation of the intermediate and final outputs, the program that offer the estimation of the efficiency coefficients under this technology is as follows:

$$\begin{aligned} \max. & \beta_2, \\ \text{s.t.:} & \\ & \sum_{k=1}^K \lambda_k \cdot x_{jkt+1} \leq x_{jt+1}^o, & j = 1, \dots, J, \\ & \sum_{k=1}^K \lambda_k \cdot y_{fkt} \leq y_{ft}^o, & f = 1, \dots, F, \end{aligned}$$

$$\begin{aligned}
& \sum_{k=1}^K \lambda_k \cdot y_{ikt+2} \geq \alpha_2 \cdot y_{it+2}^o, \quad i = 1, \dots, I, \\
& \sum_{k=1}^K \lambda_k = 1, \\
& \sum_{k=1}^K \mu_k \cdot x_{jkt+1} \leq x_{jt+1}^o, \quad j = 1, \dots, J, \\
& \sum_{k=1}^K \mu_k \cdot y_{fkt} \leq y_{ft}^o, \quad f = 1, \dots, F, \\
& \sum_{k=1}^K \mu_k \cdot y_{ikt+2} \leq \alpha_2 \cdot y_{it+2}^o, \quad i = 1, \dots, I, \\
& \sum_{k=1}^K \mu_k \cdot y_{fkt+2} \geq \beta_2 \cdot y_{ft+2}^o, \quad f = 1, \dots, F, \\
& \sum_{k=1}^K \mu_k = 1, \\
& \lambda_k \geq 0; \mu_k \geq 0.
\end{aligned}$$

Here we observe that there is a delay of one year between the consumption of inputs ($t+1$) and the generation of the outputs ($t+2$).

As Figures 2.a and 2.b illustrate, this program has two steps, which are solved altogether. Step 1 coincides with the restrictions formed with the λ vector, and Step 2 includes the remaining restrictions, built with the μ vector as an activity vector.

Previous works in the field of network DEA include Färe and Grosskopf (1996, 2000), Sexton and Lewis (2003), Lewis and Sexton (2004), Prieto and Zofio (2007), and Tone and Tsutsui (2009). Our proposal extends these proposals by (1) accounting for original inputs not only for the optimization of the intermediate but also for the final output and (2) producing the optimization of Steps 1 and 2 simultaneously to maximize the final output, as the isolated optimization of Step 1 does not guarantee the achievement of the maximal output in Step 2.

Appendix 2

Operationalization of brand equity

Equation 1 is used to measure brand equity. After accounting for past sales level, delayed marketing effects, firm effects (size and firm dummies), industry effects (four-digit SIC), and economywide factors (year dummies), we can obtain the residual of sales, which can be considered an approximate measure of brand equity (BE_{it}) (Angulo-Ruiz *et al.*, 2014).

$$(1) BE_{it} = Sales_{it} - Predicted_Sales_{it},$$

where $Sales_{it} = \beta_0 + \beta_1 Sales_{i(t-1)} + \beta_2 AD_{i(t-1)} + \beta_3 PROMO_{i(t-1)} + \beta_4 \Delta Assets_{it} + \beta_5 SIC_{ij} + \eta_i + \lambda_t + v_{it}$,

where

BE_{it} = the approximate annual brand equity of firm i at the end of year t .

$Sales_{it}$ = the log of the annual sales level of firm i at the end of year t .

$Predicted_Sales_{it}$ = fitted annual sales level of firm i at the end of year t , from the Sales equation.

$AD_{i(t-1)}$ and $PROMO_{i(t-1)}$ = the one-year lags of the annual advertising and promotion expenditures of firm i , respectively. We use lag variables to control for the carryover effects of marketing resources.

$\Delta Assets_{it}$ = the annual growth of assets of firm i at the end of year t .

SIC_{ij} = the effect of four-digit SIC j in which firm i competes.

λ_t = the time effect common to all firms; it prevents cross-individual correlation (for which we include year-dummy effects).

η_i = a permanent but unobservable firm-specific effect to control for unmodeled firm-specific information.

v_{it} = the random-error term.

Appendix 3

Operationalization of stock returns

We specify the four-factor FF model as follows:

$$(2) \mathbf{R}_{im} - \mathbf{R}_{rf, m} = \alpha_{im} + \beta_{mki} (\mathbf{R}_{mkm} - \mathbf{R}_{rf, m}) + \beta_{si} (\mathbf{SMB}_m) + \beta_{hi} (\mathbf{HML}_m) + \beta_{mi} (\mathbf{MOM}_m) + \varepsilon_{im},$$

where¹

\mathbf{R}_{im} ² = monthly return of stock i in month m ,

$\mathbf{R}_{rf, m}$ = monthly risk-free return in month m ,

\mathbf{R}_{mkm} = monthly market return on month m ,

\mathbf{SMB}_m = monthly return of a value-weighted portfolio of small stocks less the return of a value-weighted portfolio of big stocks on month m , and

\mathbf{HML}_m = monthly return of a value-weighted portfolio of high book-to-market stocks less the return of a value-weighted portfolio of low book-to-market stocks on month m .

\mathbf{MOM}_m = momentum factor on month m .

We obtain abnormal returns for each firm i and each period m (\mathbf{AR}_{im}) as the residual of Equation 2, as follows:

$$(3) \mathbf{AR}_{im} = (\mathbf{R}_{im} - \mathbf{R}_{rf, m}) - (\hat{\mathbf{R}}_{im} - \hat{\mathbf{R}}_{rf, m}).$$

¹ We obtain monthly data of *risk-free return* (\mathbf{R}_{rf}), *market return* (\mathbf{R}_{mk}), *SMB*, *HML*, and *MOM* from Kenneth French's website (see

http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

² We compute monthly stock returns (\mathbf{R}_{im}) as $\mathbf{R}_{im} = [(P_{im} + D_{im}) - P_{i(m-1)}] / P_{i(m-1)}$, where P_{im} is the split-adjusted price of stock i on the last day of trade of month m , D_{im} is dividends from stock i at month m , and $P_{i(m-1)}$ is the split-adjusted price of stock i on the last day of trade of month $m - 1$. We use CRSP monthly data.

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3 Because we examine the relationship between marketing capability and stock
4 returns on a yearly basis, we compute annual continuously compounded abnormal stock
5 returns (CCARs) (see Fama and French, 1993) as follows:
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$$(4) \quad CCAR_{it} = \prod_{m-12}^m (1 + AR_{im}),$$

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15 where $CCAR_{it}$ are annual CCARs of stock i in year t . When modeling annual abnormal
16 stock returns, research in finance and accounting uses measures at one-quarter ahead of
17 fiscal-year end. This way ensures that capital market participants incorporate new
18 information into their expectations. Therefore, $CCAR_{it}$ is specified as a one-quarter-
19 ahead measure of fiscal-year end. Thus, if fiscal-year end of firm i is in December of
20 year t , CCAR is computed for firm i from the end of March of year t to the end of
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March of year $t + 1$.