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Financing strategically: The moderation effect of marketing activities on the bifurcated relationship between debt level and firm valuation of small and medium enterprises

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ABSTRACT

This study argues that debt can be strategically issued by governing its interpretations from investors. In particular, we pay attention to the signaling aspects of debt financing, and conjecture that firms purposefully determine the level of debt issuance, which can affect firm valuation. Also, we argue that the bifurcated or diverged roles of debt are moderated by marketing activities, as a way to treat the stakeholders' evaluation of the firm. This idea is empirically examined in a population of SMEs (Small- and Medium-sized Enterprises) in the U.S. stock market. Using a sample of 2174 U.S. public firms ranging from 1982 to 2010, we find resource-independent debt (called idiosyncratic debt) has diverged impacts on firm valuation and the marketing moderation of such relationship is also bifurcated.

1. Introduction

Can debt financing be considered a strategic choice? If so, how can firms strategize their debt levels for performance enhancement? Given that financial resource can be a critical source for the competitive advantage of the firm (George, 2005; Bower, 1970; Gilbert, 2005), it is important to investigate how firms strategically construct their capital structures for their competitive advantage. This suggests that debt financing may be strategically employed: i.e. firms will determine a particular level of debt where the advantages of the debt can be strengthened, and the disadvantages of the debt can be mitigated. In this sense, finance scholars have been interested in investigating the optimal debt capacity (Myers, 1984; Frank & Goyal, 2005, chap. 7; Leary & Roberts, 2010). Then, when and how would firms employ the debt financing as a strategic firm decision?

Acknowledging that those different meanings of debt result from asymmetric information (Ross, 1977), we postulate that different levels of debt can yield different firm valuations from investors. In fact, this information-asymmetry thesis on debt is related to how investors figure out the financial status of the focal firm (Ross, 1977). In other words, the firm value can be significantly governed by investors' interpretation (Hennessy, Livdan, & Miranda, 2010; Ross, 1977). This suggests that the information-asymmetry thesis can be elaborated in terms of the strategic use of debt financing if we can disentangle the debt-signaling mechanism in firm valuation. With the debt-signaling mechanism, we can understand that a firm's debt financing can be strategically made as a signal for firm valuation. In this study, we pay attention to the firm's action to gauge the debt signaling effects, which will help further the debt-signaling mechanism.

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In this sense, we focus on marketing activities as a means to calibrate the debt signaling mechanism. From the marketing literature, it has been understood that through marketing activities, firms can persuade stakeholders (including investors, debtors, shareholders, suppliers, and customers) about their advantageous prospects by facilitating communication with them and framing any issues around the firm (e.g. Keller & Lehmann, 2006; Joshi & Hanssens, 2010). Furthermore, as Srivastava, Shervani, and Fahey (1998) found, marketing activities can generate market-based assets (e.g., strong brands or loyalty of customers and channel members) that, in turn, can lead to superior financial outlook. As such, marketing activities can facilitate the positive interpretation of debt on firm valuation. However, we need to beware that these marketing activities may impair firm valuation as they further seek for short-term-oriented performances (Levinthal & March, 1993; Mizik, 2010). And such myopic perspective of marketing activities, accordingly, may blur a positive effect of debt on firm valuation, such as a growth driver (Titman & Trueman, 1986, Hyytinen & Pajarinen, 2005; Hennessy et al., 2010). This suggests that the debt-signaling mechanism can be bounded by marketing activities.

Taken together, we are inspired to examine the differentiated moderation roles of marketing activities by illuminating the diverged signaling impact of debt on firm valuation. To examine these ideas, we consider a population of small- and medium-sized enterprises (SMEs) in the U.S. SMEs are a relevant setting to investigate the multiple interpretations of debt, which can affect firm valuation, because debt financing has been understood as heavily dependent on firm size (e.g. Degryse, de Goeij, & Kappert, 2012; Sogorb-Mira, 2005; Lemmon & Zender, 2010; Hyytinen & Pajarinen, 2005). Large firms are generally more diversified and thus able to hedge risks of stock returns (Fama & French, 2002; Lemmon & Zender, 2010). As such, bankruptcy risks by debt can be less severely interpreted by investors (Degryse et al., 2012). In contrast, since SMEs tend to rely on internal resources in their capital structure (Carpenter & Petersen, 2002), the issuance of debt (as an external financing source) can convey a significant signal and thus their valuation will significantly rely on the level of debt (e.g. Degryse et al., 2012). Accordingly, in SMEs (comparing to large firms), the 'polysemous' character of debt can be clearly identified.

By using COMPUSTAT data between 1982 and 2010, we examine that SMEs' debt has a relationship with financial performance, which is captured by Buy-and-Hold Abnormal Returns (BHARs) as well as alternative measures such as Tobin's Q and Cumulative Abnormal Return (CAR), and this relationship is influenced by marketing activities. Furthermore, we discern the maturity of debt (i.e. long-term and short-term debt) and also investigate if the different maturity of debt has also the bifurcated relationship with firm valuation and if marketing activities can moderate the non-monotonic relationship.

The contribution of this paper is threefold. First, this study attempts to integrate financial theories into strategy literature. Acknowledging that debt financing is a firm's decision made to construct a firm's capital structure and thus significantly influences other strategic decisions, this study can provide a guideline regarding how debt financing can be strategically used to enhance competitive advantages. Second, this study specifies that marketing activities can be a moderator to strategize debt financing. Under the bifurcated or diverged relationship between debt and firm valuation, we contend that the moderating role of marketing activities is also diverged. Lastly, our paper can be beneficial for SMEs in coping with their constrained resources and in seeking for firm growth. By considering debt financing and marketing activities, SMEs can enhance firm valuation.

The rest of the paper is structured as follows: First, we develop hypotheses based on prior literature on debt signaling effects and marketing activities. The hypotheses will be examined with the financial data of the U.S. public SMEs by developing valid measures of debt, marketing activities and firm valuation. Lastly, we report empirical results and further discussions from the findings follow.

2. Theory and hypotheses

2.1. Systematic vs. idiosyncratic debt-financing

According to prior literature, debt, as a component of capital structure, has highlighted positive meanings as well as negative meanings (e.g., Modigliani & Miller, 1958; Myers, 1984; Kraus & Litzenberger, 1973). For example, debt improves the firm's cash flow and can shield earnings from corporate income taxes (Miller, 1977; Myers & Majluf, 1984) while it still entails bankruptcy risks (Kraus & Litzenberger, 1973; Hennessy et al., 2010). Also, debt has been understood as a constraint of firm capabilities while the benefits of its control mechanisms in corporate governance have been acknowledged (O'Brien, David, Yoshikawa, & Delios, 2014; David, O'Brien, & Yoshikawa, 2008; Simerly & Li, 2000; Tan & Peng, 2003).

These multiple meanings imply that firms have particular expectations with the use of debt. For example, they will anticipate the debt issuance will bring them more benefits in terms of firm performance (e.g. Denis & McKeon, 2012). That is, debt issuance is not necessarily a random walk. The expectations, which are drawn from the meanings of debt, lead managers to make decisions on the debt issuance. Analogously, Jones (1991) contended that firms can make discretionary decisions on their earning management in response to their institutional environment (such as tariff increases and quota reductions). Related to this, Kothari, Leone, and Wasley (2005) proposed that accruals can be discretionarily used. These studies indicate that firms can make their own decisions on attaining and managing financial resources.

Given that the construction of the capital structure is driven by debt financing and the level of debt issuance is determined by the firm's fundamentals in the prior time period (Frank & Goyal, 2005, chap. 7), we can discern systematic ways of debt financing. By systematic, it is meant to the extent which a firm's debt level is driven from its prior fundamentals. Accordingly, the (normal) level of debt can be identified depending on what the firm is facing. If the firm is facing a financial deficit to operate their businesses, they will consider debt financing (Shyam-Sunder & Myers, 1999; Frank & Goyal, 2005, chap. 7). In this sense, Denis and McKeon (2012) found that firms employ the debt financing method to produces a financial surplus. This implies that there is an optimal level of debt a firm can use and thus debt financing will be resorted to until the debt level is under their debt capacity (Denis & McKeon, 2012; Marchica & Mura, 2010). Through this type of debt financing, the level of debt is systematically calculated; and thus it is non-discretionary.

Meanwhile, firm-specific expectations related to debt financing are modeled to control for the effects of economic conditions on the debt levels (e.g. DeAngelo & Roll, 2015; Kothari et al., 2005; Marchica & Mura, 2010). Firms thus make decisions on debt financing to cope with the uncertain and complex environment (e.g. DeAngelo & Roll, 2015; Hackbarth & Mauer, 2011). That is, the level of debt is not substantiated depending on the firm's fundamentals, but also it is determined as a strategic choice to deal with its environment. The latter is firm-specific or idiosyncratic, and thus it is discretionary. As such, through idiosyncratic debt financing, firms might issue debt even at an excessive level (whether excessively low or excessively high) as the decision on debt issuance is influenced by economic conditions outside of the firm as well as the firm's fundamentals (DeAngelo & Roll, 2015; Kothari et al., 2005; Marchica & Mura, 2010).

Taken together, the distinction between systematic debt-financing and idiosyncratic debt-financing suggests that there is a normal level of debt-financing, which is driven by the firm's fundamentals and other factors to influence debt issuance (Harford, Masa, & Walcott, 2009); and comparing to the normal level of debt-financing, firms can purposefully more or less issue debt (Denis & McKeon, 2012). For example, Denis and McKeon (2012), considering the long-run target debt levels, found that firms tend to issue more debt to cover their financial deficits even though the leverage ratio is well above estimated target levels. Such excessive issuance of debt compared to their target levels reveals a type of idiosyncratic debt-financing.

Idiosyncratic debt-financing counts on how firms (particularly decision makers) interpret the meanings of debt. Since debt has multiple meanings, which thus have equivocal performance implications (e.g. Modigliani & Miller, 1958; Myers & Majluf, 1984; Sogorb-Mira, 2005; Weill, 2008; López -Gracia & Sogorb-Mira, 2008; Wahba, 2013), debt financing *per se* will not always bring optimal payoffs. That is, according to what the decision makers pay attention to a certain meaning of debt, idiosyncratic debt financing is differentiated among firms (Marchica & Mura, 2010; DeAngelo & Roll, 2015; Hackbarth & Mauer, 2011; Denis & McKeon, 2012).

2.2. Strategic use of debt in SMEs

Given that the decisions on debt financing are behaviorally made, expectations from debt financing is necessary to be further explored. As expectations for debt financing are based on the perceptions of managers as well as investors on the use of debt, we need to figure out how decision makers or external investors understand the meanings of debt. In fact, many scholars on capital structure pointed out that the studies investigating the roles of debt in the construction of a firm's capital structure should consider information asymmetry (Myers, 1984; Ross, 1977). According to Ross (1977), in terms of governing information asymmetry, debt is one of the important financial indicators for investors. Since the utilization/interpretation of its information is differentiated between senders and receivers (Spence, 1973; Connelly, Certo, Ireland, & Reutzel, 2011), debt, as asymmetrically treated information, can be used to "signal" a firm's strength rather than to reveal it (Ross, 1977). This implies that firms can enhance their valuation from stakeholders by strategically managing debt level. (Leland & Pyle, 1977; Stulz, 1990).

From prior literature, we can understand two different signals debt can convey. First, debt can involve a negative relation with firm valuation. Since debt indicates financial liabilities, it can entail bankruptcy costs (Myers, 1984; Frank & Goyal, 2005, chap. 7; Hennessy et al., 2010). Also, debt is seen as inherently costly because it impairs access to credit from debt-holders and non-financial stakeholders (i.e., customers, suppliers, and employees) (Opler & Titman, 1994; Degryse et al., 2012). Accordingly, the more debt, the more apparent the "distress" signal, which will lead to the decreased market value of the firm. That is, debt can increase the perceived risk associated with businesses, making the firms unattractive to investors (Smith & Watts, 1992). In fact, firms with a low debt level have a better ability to respond to competitor's aggressive strategy, whereas firms with a high debt level lack the resources needed to compete with (Bolton & Scharfstein, 1990; Chevalier, 1995). Thus, the limited liquidation status of a firm elicits a distress signal.

Hence, the distress signal can be disregarded to the stock market by issuing less debt purposefully. Given that the optimal level of debt can be implicitly determined by firm characteristics (such as prior performance, financial deficits, or other financial status) (e.g. Myers, 1984), firms can intend to issue less debts than the level of debts investors perceive as moderate. This suggests that the distress signal can be alleviated by letting investors perceive the debt of the firm is under-issued.

For SMEs, the distress signal can appear more clearly compared to large firms which have much leeway to control the volatility of firm valuation. In particular, given that SMEs tend to prefer internal capital to external capital (Sogorb-Mira, 2005), debt, as an external financing mean, can signify that the firm is vulnerable to the influence from stakeholders, which can affect trade credit of the firm (e.g. Degryse et al., 2012). Furthermore, when there are sound financing alternatives, especially internal financing (Gilbert, 2005), debt financing can indicate that the firm's capital structure is not solid, conveying a signal of "distress". For SMEs, vulnerable to their environment with limited resources, debt financing will be likely to take the firms to a risk of bankruptcy. SMEs, accordingly, have incentives to reduce debt levels.

Further, to signal the soundness of the firm, an SME may intend to issue debt less than the normal level of debt. As a type of idiosyncratic debt-financing, such under-issued debt-financing makes the firm retain its debt level below the level of systematic debt-financing (i.e. normally-issued debt). As the level of the under-issued debt is away from the level of normally-issued debt, the distress signals can be alleviated. That is, the less the borrowings than expected, the less likely are the bankruptcy risks to be perceived from the market. As a result, the firm with the higher level of debt issued below the normal level of debt will be more likely to have positive valuation from the market. Therefore, we hypothesize as follows:

H1. The higher level of (purposefully) under-issued debt in an SME's financial capital, the greater firm valuation from the market.

On the other hand, debt can convey a signal indicating a positive aspect in firm valuation: "driver" (Titman & Trueman, 1986, Hyytinen & Pajarinen, 2005; Hennessy et al., 2010). The "driver" signal can increase the favorable evaluation of the firm because

investors will perceive that the firm is likely to grow in the future with the increase of debt (Jensen, 1986; Hennessy et al., 2010). According to Myers (1984), debt financing itself implies that the firm's stocks are undervalued, so investors will be likely to perceive the firm is performing well. In addition to this, as debt can control agency problems, the "driver" signal can be reinforced by issuing debt more than the normal level of debt issuance. For example, Jensen (1986) found that debt can govern appropriating free cash flow or moral hazard. Furthermore, the higher level of debt enables firms to change their governance structure by mitigating information asymmetry (Ross, 1977; Wahba, 2013). As such, the higher level of debt can positively influence firm valuation. This suggests that by purposefully issuing more debt, firms can reinforce the driver signal, enhancing firm valuation. In other words, the driver signal can be gone off when the perceived level of debt from investors is apparently high.

The aforementioned driver signal can be more effectively intensified for SMEs under higher resource constraints. For SMEs, financing through equity will be especially costly through higher flotation costs and negative signaling impact coming from investors' concern for asymmetric information more prevalent in smaller firms. Therefore, the SMEs with true growth potential will choose to issue debt to assist the potential growth. Moreover, SMEs with unclear growth prospect would not be able to issue debt to either disguise its status or send a positive signal to the market since the additional debt financing will likely put the firm under amplified financial distress.

Given that, in a strategic sense, SMEs can be likely to be incentivized to consider debt financing for its firm valuation. Such incentivized behaviors on debt financing can be identified by specifying debt levels which are above the normal level of debt. As a type of idiosyncratic debt-financing, such over-issued debt indicates the extent to which a firm's debt level is above the level of systematic debt-financing (i.e. normally-issued debt). As the level of the over-issued debt intensified, the driver signals can be highlighted. That is, the more the borrowings than expected, the more likely are the growth opportunities to be interpreted from the market. As a result, the firm with the higher level of debt issued above the normal level of debt will be more likely to have positive valuation from the market. In this sense, the positive relationship between the purposefully over-issued debt and firm valuation is hypothesized as shown below:

H2. The higher level of (purposefully) over-issued debt in an SME's financial capital, the greater firm valuation from the market.

2.3. The role of marketing activities for debt signaling

Given that debt conveys multiple signals regarding the firm valuation in terms of its level, we explore how the signals can be strategized. In this study, we postulate that marketing activities, which generally deal with the perception of stakeholders (Joshi & Hanssens, 2010; Srivastava, Shervani, & Fahey, 1999; McAlister, Srinavasan, & Kim, 2007; Gruca & Rego, 2005), can affect firm valuation from investors. For example, Joshi and Hanssens (2010) found that firm advertising and communication spending can "promote product differentiation, distributor loyalty, repurchase intention, and price insensitivities that directly affect firm sales and profits" (p. 9). In the stock market, investors also can benefit from marketing activities (Rao * Bharadwaj, 2008). By using marketing data, investors can expect more accurately about the risk of future cash flows (Srivastava et al., 1999; Joshi & Hanssens, 2010). According to Mizik and Jacobson (2007), marketing expenditure, which is a discretionary spending, can be used as an indicator for firm's financial status telling whether the firm is a good-quality or a bad-quality firm. Erikson and Jacobson (1992) found out that increased advertising spending is positively associated with stock returns because investors interpret the increase in advertising spending as a signal of higher future profitability. Also, as McAlister et al. (2007) argued, marketing spending helps build brand equity that can serve as a high-quality information channel that leads to higher liquidity and increased breadth of investor ownership.

In fact, while marketing activities have positive impact on firm financial outcome (e.g., enhanced financial outlook, acceleration, and stabilization of firm's cash flow, reduced vulnerability to the cash flow variability) (e.g. Gruca & Rego, 2005; Rao & Bharadwaj, 2008), marketing activities also can convey a contradictory signal to what debt signals. In general, it has been understood that marketing management often falls into myopia (Levinthal & March, 1993; Deleersnyder, Steenkamp, Dekimpse, & Leeflang, 2009, Graham, Harvey, & Rajgopal, 2005; Lamey, Deleersnyder, Dekimpe, & Steenkamp, 2007). Even with this increased financial accountability of marketing actions, managers often get caught in the trap of myopic management such as underinvesting in R&D, advertising, and employee training (Levinthal & March, 1993; Lehmann, 2004; Markovitch, Steckel, & Young, 2005; Mizik & Jacobson, 2007; Mizik, 2010). Thus, if marketing activities become apparently are trapped in myopia, the roles of managing the signals of debt for firm valuation cannot be properly played.

The myopic connotation of marketing activities is particularly contradictory to the driver signal of debt. If the myopic meaning from marketing activities is combined with the driver signal from debt, investors may not clearly understand what such a convoluted meaning implies. And such a misunderstanding of a firm from the market makes the firm's valuation discounted. That is, if the driver signal from debt financing is not aligned with the myopic connotation of marketing activities, firm valuation may be impaired. That is, the consideration of marketing activities may make the driver signal of debt inconsistent, resulting in lowering firm valuation.

Consider the situation where a firm intends to send a signal of alleviated distress with the under-issued debt. In this situation, the alleviated signal doesn't indicate the firm is expected to have a growth opportunity. Still, marketing activities signify that the firm focuses on short-run performances (Levinthal & March, 1993). This combined signal reveals that the firm is short-sighted and seeks for stability and efficiency by making its capital structure sound. This makes the firm profitable in the short run, not in the long run. As such, investors who expect to enhance the firm's future values may no longer invest in the firm. And the firm's valuation from the market, accordingly, will be marked down. If the firm has a higher level of under-issued debt, the misaligned signal can be amplified. This will make the firm's market valuation driven by the alleviated distress discounted. Likewise, the purposefully over-issued debt financing also gets through the misaligned meanings of marketing activities. The overissued debt-financing itself, as discussed,

signifies firm growth opportunities (i.e. long-term expectations), but it is contradictory to the myopic connotation of marketing activities (i.e. short-term outcomes) (Mizik, 2010). Hence, in this situation, focusing on marketing activities with debt financing can convey an equivocal signal. Investors will not clearly understand the meaning of debt financing.

Such suspicious interpretation from the market, drawn from the meaning combination of debt financing and marketing activities, is salient in SMEs. In general, firms with high information asymmetry tend to show more opportunistic behavior (e.g., moral hazard) than others with less information asymmetry (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000; Healy & Palepu, 2001). As SMEs usually limitedly disclose their information to the market (Sogorb-Mira, 2005; Hamilton & Fox, 1998; Holmes & Kent, 1991), investors only have access to restrictive information on their financial status. In this situation, the misaligned meanings between debt and marketing activities will affect firm valuation. Based on this, we specify the hypotheses indicating the moderation roles of marketing activities in firm valuation in terms of the in terms of two types of idiosyncratic debt-financing (i.e. under-issued and over-issued debt) as follows:

H3. In SMEs, as the level of under-issued debt intensifies, firm valuation will decrease with the increase in marketing activities.

H4. In SMEs, as the level of over-issued debt intensifies, firm valuation will decrease with the increase in marketing activities.

3. Methods

3.1. Sample and data

Our empirical focus is on small- and medium-sized firms (SMEs) which are appropriate to explicitly identify the multiple signals of debt. When the organizational structure is complex, the interpretations from investors can be also idiosyncratic. This means that debt signaling can be influenced by organizational structure. The more segments a firm has, the more complex the interpretation of the debt level. To reduce this measurement bias in identifying the multiple debt signals, we need a setting which could be less confounded with structural factors. SMEs have fewer organizational and managerial resources than relatively large, established firms (Gilmore & Carson, 1999; Man, Lau, & Chan, 2002). That is, they are more likely to suffer from resource constraints, whereas large, established firms are able to address their resource constraints by expanding their financing sources (e.g. Degryse et al., 2012). Because of the resource constraints, they are vulnerable to environmental contingency and their performance tends to be volatile (e.g. Stinchcombe, 1965). Accordingly, SMEs tend to be dependent on internal resources and thus debt financing can be interpreted as a salient action for the firms (Wahba, 2013; Barclay & Smith, 1995). From this standpoint, we considered SMEs.

In defining SMEs, we followed the most widely used definition, which is offered by American Small Business Administration (SBA): Stand-alone enterprises with < 500 employees (e.g. Lubakin, Simsek, Ling, & Veiga, 2006). Other than this, SMEs can be also identified as enterprises which own $25 to $500 million asset values (Beamish, Craig, & McLellan, 1993). Following these criteria, we defined a sample of SMEs as publicly traded U.S. firms that have < 500 employees with less than $500 million asset values.

The detailed procedure for sampling was as follows: at first, we identified all public firms in the COMPUSTAT database. Then, we used the year of IPO as a starting point of our sampling because publicly traded firms provide validated financial data, making our analysis reliable. To consider the criteria for SMEs (i.e. employees and asset values) as dispositional characters of SMEs, we excluded

Table 1
Industry classification of sample firms. The empirical focus is on small- and medium-sized firms (SMEs), defined as publicly traded U.S. firms that have < 500 employees with less than $500 million asset values. Among all public firms appearing in the COMPUSTAT database, 2174 SMEs between 1982 and 2010 (i.e. 13,894 firms-years) are identified according to the definition of SMEs, constituting a sample for this study.

SIC Code	Description	Frequency*	SIC Code	Description	Frequency*
10	Metal Mining	9 (0.41%)	38	Instruments and Related Products	303 (13.94%)
13	Oil and Gas Extraction	62 (2.85%)	39	Misc. Manufacturing Industries	22 (1.01%)
15	General Building Contractors	4 (0.18%)	47	Transportation by Air	2 (0.09%)
17	Special Trade Contractions	5 (0.23%)	48	Communication	32 (1.47%)
20	Food and Kindred Products	22 (1.01%)	49	Electric, Gas, and Sanitary Services	15 (0.69%)
22	Textile Mill Products	3 (0.14%)	50	Wholesale Trade – Durable Goods	61 (2.81%)
24	Lumber and Wood Products	4 (0.18%)	51	Wholesale Trade – Nondurable Goods	20 (0.92%)
25	Furniture and Fixtures	2 (0.09%)	55	Automotive Dealers & Service Stations	4 (0.18%)
26	Paper and Allied Products	11 (0.51%)	57	Furniture and Home-Furnishings Stores	6 (0.28%)
27	Printing and Allied Products	6 (0.28%)	58	Eating and Drinking Places	11 (0.51%)
28	Chemicals and Allied Products	421 (19.37%)	59	Misc. Retail	25 (1.15%)
30	Rubber and Misc. Plastics Products	26 (1.20%)	70	Hotels and Other Lodging Places	8 (0.37%)
32	Stone, Clay, and Glass Products	4 (0.18%)	73	Business Services	423 (19.46%)
33	Primary Metal Industries	7 (0.32%)	78	Motion Pictures	5 (0.23%)
34	Fabricated Metal Products	18 (0.83%)	79	Amusement & Recreation Services	7 (0.32%)
35	Industrial Machinery and Equipment	242 (11.13%)	80	Health Services	22 (1.01%)
36	Electronic & Other Electric Equipment	281 (12.93%)	87	Engineering & Management Services	49 (2.25%)
37	Transportation Equipment	14 (0.64%)	99	Non-Classifiable Establishments	18 (0.83%)

* Percentage of the firms in parentheses, N = 2174.

firms which have ever had > 500 employees or exceed the averaged asset values of $500 million until 2010. As a result, we sampled 13,894 firms-years of 2174 SMEs between 1982 and 2010. The specific samples by industry classification are shown in Table 1.

The sample used to analyze our hypotheses employed COMPUSTAT and CRSP database. The COMPUSTAT database was used to calculate our main hypothesized variables (total debt, long-term debt, long-term debt, and marketing activities), as well as control variables that represent firm and industry characteristics. CRSP (Center for Research in Security Prices) monthly database provides information pertaining to the stock value on a monthly basis, i.e. stock price, returns, and outstanding shares, etc. We used monthly stock returns in CRSP to calculate firm valuation.

3.2. Measures

3.2.1. Dependent variable

Our primary dependent variable, firm valuation, is based on abnormal returns (e.g. Prabhala, 1997; Barber & Lyon, 1997; Chemmanur, Ertugrul & Krishnan, 2018, Jiang, Stohs, & Xie, 2015). In particular, if the abnormal returns are understood as the firm performance after accounting for market's general performance, these stock returns can indicate how investors evaluate the given firm (Prabhala, 1997; Barber & Lyon, 1997). Specifically, the abnormal returns implicitly assume investors take high turnover strategy. If investors hold a firm's stocks in some time intervals, this behavior indicates that the investors have a positive attitude on the firm. Accordingly, the relationship between debt and the abnormal returns can be used to represent how the use of debt by the firm and its signals can be interpreted by investors. In this sense, we focused on buy-and-hold abnormal returns (BHARs), which refer to the compounding excess returns relative to the returns from the market where the market return is the value-weighted return of all U.S. firms listed on the NYSE, AMEX, and NASDAQ. Based on the long-term performance measure of Barber and Lyon (1997), it is defined as the following:

$$BHAR_{it} \prod_{t=s}^{s+12} (1 + ret_{it}) - \prod_{t=s}^{s+12} (1 + market\_ret_t) \tag{1}$$

where we adjust the 12-month cumulative stock returns of the firm (denoted by ret_{it}), by the corresponding cumulative returns of market portfolio (denoted by $market\_ret_t$). This provides the firm's abnormal stock returns during next year, controlling for the effect of market performance.

3.2.2. Independent variables

To discern the multiple signaling effects of debt on firm valuation, we have to acknowledge that debt financing is inherently dependent on resources around the firm (Myers & Majluf, 1984). Under resource-infertile conditions, such as economic recession periods or under-performing situations, the use of debt can be constrained as it can entail financial distress. Under resource-fertile conditions, such as environmental munificence, growth opportunities, retained earnings, etc., the use of debt can be facilitated as it can bring various financial advantages.

However, since financing (or attaining resources) is a precursor of the construction of firm competence in competitive environments (Barney, 1991; Gilbert, 2005), the level of debt financing is not fully endogenously-determined. Firms have a clear intent on the resource-attainment decisions, including debt financing. They can intend to avoid debt financing and to issue fewer debts than what their competitors do. They can internally provide the resources they need or can attract investors from the public (Frank & Goyal, 2005, chap. 7; Gilbert, 2005). Also, they intend to issue more debts than their competitors do even under the same conditions where they are situated in terms of resource attainment.

This suggests that the dollar amount of debt in a firm can be decomposed into *systematic debt* which is drawn from the resource-related conditions and *idiosyncratic debt* which is strategically made in each firm. As resource-dependent, *systematic debt* is predicted under resource-related conditions (Denis & McKeon, 2012; Harford et al., 2009). As firm-specific, *idiosyncratic debt* has unobserved variability from the estimation of debt with respect to the resource-related conditions (Denis & McKeon, 2012; Harford et al., 2009). This decomposition of debt enables to delineate the exogenous variation (or strategic use) of debt financing from the endogenously-made (or resource-dependent) debt financing.

To discriminate between the two types of debt, we use a regression model to estimate the dollar amount of debt with respect to resource-related conditions. The resource-related conditions refer to any conditions under which the firms' capital structure can be influenced. Specifically, internal firm-resources (such as retained earnings) will affect debt financing (Myers, 1984); environmental munificence also can be a resource-related condition (Castrogiovanni, 1991); and national economic situation (such as recession) can affect firm activities (Stinchcombe, 1965). In this sense, we consider three factors to affect the level of debt: decrease in firm revenues, underperforming returns (i.e. discrepancy between firm performance and industry-averaged performance), and the economic recession period. Since the regression model presents how the level of debt is explained by resource-related conditions, the idiosyncratic debt (i.e. resource-independent debt) can be understood as the residuals of the model. We thus calculate the residuals of the regression model and use the measure as the independent variable.

Technically, idiosyncratic debt is measured from the equation below:

$$ID_{it} = D_{it} - \dot{D}_{it} \quad s.t. \quad \dot{D}_{it} = f(R^F_{jt}, R^I_{it} R^E_t) \tag{2}$$

where ID_{it} denotes idiosyncratic debt of firm i at time t; D_{it} indicates the dollar amount of total debt, the sum of long-term debt and short-term debt, of firm i at time t; $\dot{D}_{it}$ represents systematic debt or total debt predicted from the three factors (i.e. decrease in firm

revenues (R_{it}^{F}), difference between ROE and industry-averaged ROE (R_{it}^{I}), and year dummies indicating economic recession (2007–2010) (R_{t}^{E})). Then, to normalize the level of debt, the calculated idiosyncratic debt is divided by financial capital which is the sum of total debt and market value of outstanding shares (see Leary & Roberts, 2010; David et al., 2008; O'Brien et al., 2014)[1]. Based on the equation, the measure of idiosyncratic debt shows exogenous variation and is independent of resource-related conditions. That is, the level of idiosyncratic debt can be strategically made in each firm regardless of resource availability (based on performance), environmental conditions or other resource-based attributes. Accordingly, we can understand that idiosyncratic debt is a firm-specific and self-select characteristic.

Given that, as the equation represents, the idiosyncratic debt is understood as the distance between actual debt and resource-induced debt, the conception of distance brings two cases in further understanding the idiosyncratic debt: under-issued vs. over-issued debt. Under-issued debt refers to the debt-financing case where the level of debt is less than the resource-induced debt (i.e. systematic debt). This indicates that firms intend to reject debt financing comparing to the level of debt the industry can predict. In other words, firms strategically take the low-level debt financing. On the other hand, over-issued debt shows the case where the level of debt is greater than that of the resource-induced debt (i.e. systematic debt). This means that firms strategically issue more debt than what we predict based on resource-related conditions.

Such bifurcated cases can be captured empirically by using a spline method (e.g. Greve, 1998). The variables of under-issued and over-issued debt are computed as shown below:

$$ID_{it}^{U} = \begin{cases} D_{it} - \dot{D}_{it} & \text{if } D_{it} - \dot{D}_{it} < 0 \\ 0 & \text{else} \end{cases} \tag{3}$$

$$ID_{it}^{O} = \begin{cases} D_{it} - \dot{D}_{it} & \text{if } D_{it} - \dot{D}_{it} > 0 \\ 0 & \text{else} \end{cases} \tag{4}$$

where ID_{it}^{U} and ID_{it}^{O} in Eqs. (3) and (4) denote under-issued debt and over-issued debt respectively.

3.2.3. Moderating variable

Marketing activities are considered as a moderator of the relationship between debt and firm valuation. Our argument on the moderation role of marketing activities is based on the premise that firms can influence investors' interpretations. In addition to marketing activities, advertising also can alternatively influence any signals firms convey (e,g, Barone, Taylor, & Urbany, 2005; Xie & Kronrod, 2012). Accordingly, we construct the variable of marketing activities as the sum of marketing expenditures (i.e. SG&A expenditures) and advertising expenditures, divided by total assets, which represent the carrying capacity of the firm. The equation for marketing activities is shown below:

$$MKT_{it} = \frac{SGA_{it} + AD}{AT_{it}} \tag{5}$$

where MKT_{it} denotes marketing intensity of firm i at time t; SGA_{it} and AD_{it} respectively indicate the dollar amount of SG&A expenditures and advertising expenditures of firm i at time t; AT_{it} refers to the dollar amount of total assets of firm i at time t.

3.2.4. Control variables

Our set of control variables includes prior performance, industry performance, industry asset intensity, market share, market-to-book ratio, firm size, firm age, current ratio, and free cash flow. Prior performance, the lagged ROA, was included in the estimation model to control for a contingent condition under where firms are likely to conceive debt financing (e.g. Bromiley, 1991). Undervalued firms are likely to issue the less underpriced short-term debt and overvalued firms tend to consider issuing the more overpriced long-term debt (Flannery, 1986; Kale & NOE, 1990). To control for industry effects, we also used industry performance and industry asset intensity as our control variables. Industry performance is operationally defined as the aggregation of ROA for firms with a given 3-digit SIC code. Industry asset intensity has been viewed as a barrier to exit in studying diversification strategies (e.g., Robins & Wiersema, 1995), but it also influences a firm's performance when firms perceive the industry-level assets as sunk investment. We measured this by averaging the total assets for firms with a given 3-digit SIC code.

Market share is calculated as the proportion of individual firm's sales to the total sales in the industry, indicates that the higher the share, the greater the impact of innovations for the firm value (Tsai, 2006). Market-to-Book ratios are measured by the year-end market value of equity divided by book value of equity. The Market-to-Book ratios are known to capture value risk factor (Fama & French, 1993) and studies have documented that value stocks tend to outperform the market. Firm size is defined as the number of employees in the given firm. Studies have shown that larger firms are less subject to financial distress due to higher diversification (Titman & Wessels, 1988) while smaller firms have higher external financing cost with a greater level of constraints than larger firms (Whited, 1992; Fazzari & Petersen, 1993).

Firm age is also controlled for because the longer years of existence in the market can reflect the solid market shares of the firm's product as well as the value of the firm through built-up reputation and stability of the business. Furthermore, firm age represents the firm's operating experience (Stinchcombe, 1965; Jovanovic, 1982) and thus is expected to influence the decision on debt financing. For example, younger firms are likely to be more flexible than older firms in debt financing. In our analysis, we measured firm age as

[1] The market value of equity is computed as the multiplication of common shares outstanding and share price of the end of fiscal year.

Table 2
Variable operationalization.

Measure	Operationalization[1)]	Data Source
BHAR	$BHAR_{it} = \prod_{t=s}^{s+12}(1+ret_{it}) - \prod_{t=s}^{s+12}(1+market\_ret_{t})$ ret_{it}: 12-month cumulative stock returns of firm i at time t $market\_ret_{it}$: 12-month cumulative returns of market portfolio at time t	CRSP
ROA	Net income / Total Asset	Compustat
Industry Performance	The sum of ROA in each 3-digit SIC at t	Compustat
Industry asset intensity	Log(The sum of book values of total assets in each 3-digit SIC)	Compustat
Market Share	Sales of firm i / aggregated sales in each 3-digit SIC	Compustat
Market-to-Book Ratio	(share price * number of common stock outstanding) / Total assets	CRSP and Compustat
Firm size	Number of employees (in thousands)	Compustat
ln Firm Age	Logarithm of the years after IPO	Compustat
Slack	Current asset / current liability	Compustat
Free Cash Flow	Net income + depreciation and amortization – Δworking capital – capital expenditures	Compustat
Under-issued Total Debt	$D^{U}_{it} = D_{it-1} - \dot{D}_{ijt-1}$ if $D_{it-1} - \dot{D}_{ijt-1} < 0$ 0 else $\dot{D}_{ijt-1} = f(R^{I}_{jt-1}, R^{F}_{it-1}, R^{E}{}_{t-1})$ * D^{U}_{it} : Under-issued Total Debt (=Long-term debt + Short-term debt) of firm i at time $t-1$ D_{it-1}: Actual Total Debt of Firm i at time $t-1$ $\dot{D}_{ijt-1}$: Estimated Total Debt of Firm i at time $t-1$ $R^{I}_{jt-1} = ROE_{it-1} - IROE_{it-1}$ s.t. R_{it-1}: ROE of firm i at time $t-1$ IR_{it-1}: Industry-averaged ROE of industry j (2-digit SIC codes) at time $t-1$ $R^{F}_{it-1} = g(GR_{it-1}) \cdot R_{it-1}$ s.t. $g(GR_{it-1})$: Indicator of decreasing growth rate of sales of firm i at time $t-1$ R_{it-1}: Revenue of firm i at time $t-1$ $R^{E}{}_{t-1}$: *Periods of Economic recession (i.e. 1: focal year>2007, 0: else)*	Compustat
Over-issued Total Debt	$D^{O}_{it} = D_{it-1} - \dot{D}_{ijt-1}$ if $D_{it-1} - \dot{D}_{ijt-1} > 0$ 0 else * D^{O}_{it} : Over-issued Total Debt of firm i at time $t-1$	Compustat
Marketing Activities	(Selling, general, and administrative expenditure + advertising expenditure) / Total assets	Compustat

[1)] The dollar-value-based variables (e.g. total assets etc.) are deflated by the 1982-based Consumer Price Index (CPI).

the logarithm of the years after the IPO. Current ratios have been understood as a measure to indicate slack resources. Since slack resources emphasize the firm's flexibility to re-allocate its resources (George, 2005), they can influence the way to determine the level of debt. Current ratios are computed as a ratio of current assets to current liability (George, 2005; Bromiley, 1991). Lastly, as another dimension for slack resources, free cash flow is computed as "net income plus depreciation and amortization minus changes in working capital minus capital expenditures" (Novy-Marx, 2013: p. 3).

Table 2 summarizes the variables, their measures, and data sources, and Table 3 provides a descriptive statistic for all variables used in the models

Table 3

Descriptive statistics and correlation matrix .The empirical focus is on small- and medium-sized firms (SMEs), defined as publicly traded U.S. firms that have < 500 employees with less than $500 million asset values. Among all public firms appearing in the COMPUSTAT database, 2174 SMEs between 1982 and 2010 (i.e. 13,894 firms-years) are identified according to the definition of SMEs. BHAR (Buy-and-Hold Abnormal Return) which refer to the compounding excess returns relative to the returns from the market where the market return is the value-weighted return of all U.S. firms listed on the NYSE, AMEX, and NASDAQ. The types of under-issued and over-issued debt (i.e. total debt, long-term debt, and short-term debt) are computed with residuals of a regression model estimating the debt level of the firm with respect to three factors (decrease in firm revenues, difference between ROE and industry-averaged ROE, and year dummies indicating economic recession between 2007 and 2010). Marketing activities are measured as the sum of marketing expenditures (i.e. SG&A expenditures) and advertising expenditures, divided by total assets.

Variables (N = 13,894)	Mean	SD	Min	Max	1	2	3	4	5	6
1. BHAR	0.19	1.31	−1.00	34.5						
2. ROA	0.86	0.77	0	18.47	0.01					
3. Industry performance	0.04	0.06	−0.55	0.88	−0.11***	−0.07				
4. Industry Asset Intensity	0.50	0.75	0.01	12.44	0.02†	−0.01***	0.01			
5. Market Share	0.00	0.03	0	1.00	0.00	0.04***	0.01	−0.04***		
6. Market-to-Book Ratio	2.73	4.43	0	137.38	−0.03***	−0.18***	0.09***	0.00	−0.01	
7. # Employees	0.13	0.10	0	0.5	−0.03**	0.20***	−0.06***	0.04***	0.06***	−0.18***
8. Firm Age	2.17	0.59	1.10	3.91	−0.02*	0.13***	0.03***	0.11***	0.00	−0.10***
9. Slack	5.18	17.34	0	1719.25	0.00	−0.11***	0.02**	−0.01	−0.01	0.03**
10. Free Cash Flow	−0.03	0.10	−3.74	1.36	−0.02*	0.25***	0.03***	−0.03***	0.06***	−0.03***
11. Under-issued Total Debt	−0.03	0.09	−4.80	0	−0.02*	−0.06**	−0.02**	−0.15***	0.00	−0.13***
12. Over-issued Total Debt	0.00	0.02	0	1.16	0.02**	0.01***	−0.04***	0.02*	−0.01	0.00
13. Under-issued Long-term Debt	−0.02	0.08	−4.04	0	−0.02†	−0.05	−0.01	−0.14***	−0.01	−0.11***
14. Over-issued Long-term Debt	0.00	0.01	0	0.92	0.02*	0.01***	−0.04***	0.01	−0.01	0.00
15. Under-issued Short-term Debt	−0.01	0.02	−0.75	0	−0.01	−0.05***	−0.06***	−0.16***	0.00	−0.18***
16. Over-issued Short-term Debt	0.00	0.02	0	1.88	0.00	−0.01	0.00	0.00	0.00	0.02†
17. Marketing Activities	0.43	0.45	−0.13	17.09	0.04***	0.29***	−0.08***	−0.01	−0.01	0.16***

Variables (N = 13,894)	7	8	9	10	11	12	13	14	15	16
1. BHAR										
2. ROA										
3. Industry performance										
4. Industry Asset Intensity										
5. Market Share										
6. Market-to-Book Ratio										
7. # Employees										
8. Firm Age	0.09***									
9. Slack	−0.06***	−0.03**								
10. Free Cash Flow	−0.08***	0.11***	−0.01							
11. Under-issued Total Debt	0.21***	0.06***	0.00	−0.06***						
12. Over-issued Total Debt	−0.02**	−0.01	−0.02†	0.00	0.03***					
13. Under-issued Long-term Debt	0.19***	0.04***	0.01	−0.06***	0.97***	−0.02*				
14. Over-issued Long-term Debt	−0.02*	−0.02*	−0.02†	−0.01	0.03***	0.97***	0.03***			
15. Under-issued Short-term Debt	0.25***	0.10***	−0.01	−0.07***	0.88***	0.04***	0.80***	0.03**		
16. Over-issued Short-term Debt	−0.02*	0.02**	−0.01	0.00	0.01	0.35***	−0.22***	0.14***	0.01	
17. Marketing Activities	−0.02*	−0.08***	−0.08***	0.02*	−0.19***	0.06***	−0.17***	0.07***	−0.21***	0.00

† $p < 0.1$ *$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.

Table 4
The moderation effect of marketing activities on the relationship between debt and Buy-And-Hold Abnormal Return (BHAR). With a sample of 2,174 SMEs between 1982 and 2010 (i.e. 13,894 firms-years), the hypotheses are examined by running a fixed-effects regression model. BHAR (Buy-and-Hold Abnormal Return) refers to the compounding excess returns relative to the returns from the market where the market return. Under-issued and over-issued debt are computed with residuals of a regression model estimating the debt level of the firm with respect to three factors (decrease in firm revenues, difference between ROE and industry-averaged ROE, and year dummies indicating economic recession between 2007 and 2010). Marketing activities are measured as the sum of marketing expenditures (i.e. SG&A expenditures) and advertising expenditures, divided by total assets.

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−0.543	−0.588	−0.687	−0.576	−0.671
	(0.750)	(0.750)	(0.745)	(0.745)	(0.742)
Prior ROA	−0.309***	−0.312***	−0.315***	−0.316***	−0.316***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Industry Performance	−1.344***	−1.358***	−1.341***	−1.345***	−1.349***
	(0.257)	(0.257)	(0.257)	(0.257)	(0.257)
Industry Asset Intensity	0.064	0.076	0.073	0.074	0.074
	(0.056)	(0.056)	(0.056)	(0.056)	(0.056)
Market Share (%)	−0.099	−0.102	−0.081	−0.082	−0.076
	(0.893)	(0.892)	(0.891)	(0.891)	(0.891)
Market-to-Book Ratio	−0.031***	−0.034***	−0.036***	−0.036***	−0.036***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Firm Size (# Employees)	−1.623***	−1.503***	−1.473***	−1.435***	−1.473***
	(0.210)	(0.210)	(0.210)	(0.211)	(0.210)
Firm Age	−0.184*	−0.166*	−0.184*	−0.184*	−0.183*
	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)
Slack	−0.000	−0.000	−0.000	−0.000	−0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Free Cash Flow	−0.200	−0.208	−0.148	−0.137	−0.142
	(0.154)	(0.154)	(0.154)	(0.154)	(0.154)
Under-issued Debt		−1.106***	−0.867***	−1.164***	−0.853***
		(0.196)	(0.202)	(0.237)	(0.202)
Over-issued Debt		2.450*	2.180*	2.090†	3.135**
		(1.064)	(1.065)	(1.066)	(1.190)
Marketing Activities			0.189***	0.240***	0.203***
			(0.037)	(0.042)	(0.037)
Under-issued Debt* × *Marketing Activities				0.152*	
				(0.064)	
Over-issued Debt* × *Marketing Activities					−1.130†
					(0.630)
Year Dummies	Included	Included	Included	Included	Included
Firm Dummies	Included	Included	Included	Included	Included
AR(1)-DW	0.155	0.154	0.155	0.155	0.156
Log Likelihood	−21110.27	−21089.04	−21074.41	−21071.13	−21073.18
AIC	42296.54	42258.08	42230.82	42226.27	42230.35
χ^2	–	42.46***	71.72***	78.28***	74.18***

The number of firm-year: 13,894, The number of firms: 2,174, Standard errors in parentheses
† $p < 0.1$ *$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.

3.3. Estimation methods

In the empirical setting, to examine the hypotheses, the maximum likelihood estimation of firm valuation is employed. Through the Breusch-Pagan Lagrange multiplier (LM) test, we find that the random effects model is superior to the OLS model ($\chi^2 = 25.72$; $p < 0.000$). Between the random effects model and fixed effects model, Hausman test suggests that the fixed effects model is more appropriate for our data than the random effects model ($\chi^2 = 1377.16$; $p < 0.000$)[2]. Also, in case that the fixed effect models may have composite errors that are serially correlated, we conducted Durbin-Watson tests and found that serial correlation could exist in the error terms in the model at the 0.05 significance level (DW = 358.75; $p < 0.001$).

The estimation of the valuation of SMEs is done with the equations below:

$$y_{it} = X_{it}\beta + Z_{it}\delta + D + u_i\varepsilon_{it} \quad (6)$$

where y_{it} is the dependent variable, BHAR, of firm i at time t; X_{it} is a matrix of the independent variables (i.e. under-issued debt and over-issued debt); Z_{it} is a matrix of the control variables; D indicates year dummies; and β and δ are vectors of parameters for independent variables and control variables respectively; u_i refers to individual-level effects and ε_{it} is the error term.

[2] The Hausman test is typically used to compare fixed and random effects models in econometrics (Hausman, 1978). If the statistic for the test has lower p-values than the 0.05 significance level, the random effects model shows inconsistent results.

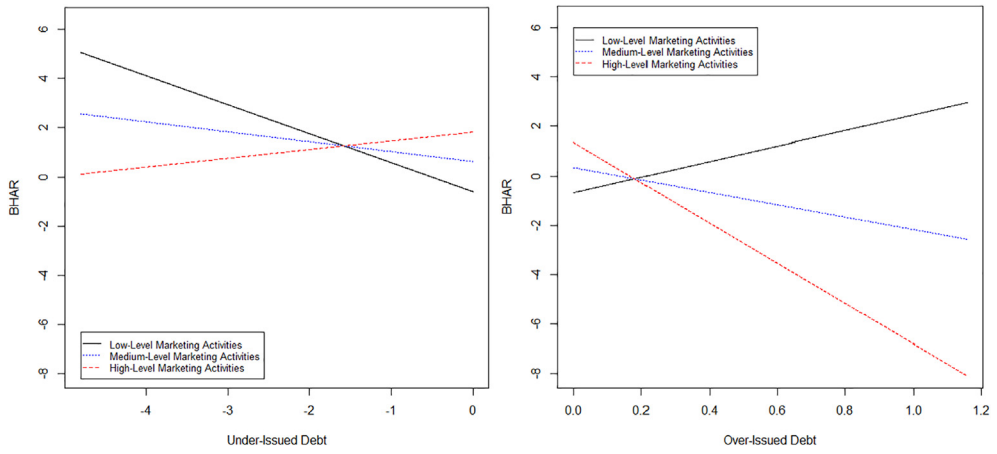

Fig. 1. Interaction effects of debt and marketing activities on BHAR. The interaction effects of under- and over-issued debt and marketing activities are graphed respectively. On the left-hand side, the relationship between under-issued debt and BHAR is specified with three levels of marketing activities (low, medium, and high). Likewise, on the right-hand side, the relationship between over-issued debt and BHAR is specified with three levels of marketing activities (low, medium, and high). On both figures, the black solid line indicates the moderation of low level marketing activities on the relationship between debt and BHAR; the blue dotted line presents the moderation of medium level marketing activities; and the red broken line shows the moderation of high level marketing activities.

4. Results

4.1. Hypothesis tests

Table 4 presents the estimation of BHAR with respect to the debt level and marketing activities. Model 1 presents the effect of control variables on BHAR. Model 2 tests the bifurcated effect of total debt on BHAR. Models 3 through 5 show the moderation effects of marketing activities on the relationship between the level of debt and firm valuation.

In Model 2, we find a negative effect of under-issued debt on BHAR ($\beta = -1.106$; $p < 0.000$) and a positive effect of over-issued debt on BHAR ($\beta = 2.450$; $p < 0.01$). These results support Hypotheses 1 and 2. Models 3 through 5 test Hypotheses 3 and 4. Overall, comparing to Model 2, Models 3 through 5 improve the prediction as the log likelihood tests suggest (i.e. $\chi^2 = 29.26$; $p < 0.000$ for the marketing main effect, $\chi^2 = 35.82$; $p < 0.000$ for the marketing interaction effects with under-issued debt, and $\chi^2 = 31.72$; $p < 0.000$ for the marketing interaction effects with over-issued debt). This indicates that the relationship between debt and firm valuation is significantly moderated by marketing activities. Specifically, in Model 4, we find that the interaction effect between marketing activities and under-issued debt is positive ($\beta = 0.152$; $p < 0.01$) and the interaction effect between marketing activities and over-issued debt is negative ($\beta = -1.130$; $p < 0.1$) in Model 5. Given that the under-issued debt has a negative relation with BHAR, the positive moderation of marketing activities indicates that the relationship between under-issued debt and BHAR can become positive as marketing activities increase. Meanwhile, for the over-issued debt, its relationship with BHAR can be negative as marketing activities increase. Fig. 1 presents the interaction effects of debt signaling and marketing activities on firm valuation.

4.2. Additional analyses

4.2.1. Debt maturity

The bifurcated effects of debt on firm valuation can appear even when the maturity of debt is differentiated. When the total debt is decomposed into long-term and short-term debt, the bifurcated effects of debt on firm valuation remains consistent. Table 5 presents the estimation of BHAR with respect to debt maturity and marketing moderation. Models 1 through 4 test the relationship between long-term debt (decomposed into under-issued long-term debt and over-issued long-term debt) and firm valuation and the moderation impact of marketing activities. In Model 2, we find the main effects of long-term debt on firm valuation consistent. That is, there is a negative impact of under-issued long-term debt ($\beta = -1.123$; $p < 0.000$) and a positive impact of over-issued long-term debt ($\beta = 2.904$; $p < 0.01$). In terms of marketing moderation, the results reveal that marketing activities weaken the positive impact of over-issued debt ($\beta = -1.498$; $p < 0.01$).

Meanwhile, in Models 5 through 8, we test how short-term debt affect firm valuation and how marketing activities moderate its relation. As Model 5 shows, there is a negative impact of under-issued debt on firm valuation ($\beta = -6.015$; $p < 0.000$) while over-issued debt has insignificant effect ($\beta = 0.146$; $p = 0.798$). Marketing activities play a significantly positive role in enhancing firm valuation with under-issued debt ($\beta = 0.927$; $p < 0.000$).

Table 5
Fixed effect estimation of BHAR with respect to debt maturity and marketing activities. With a sample of 2174 SMEs between 1982 and 2010 (i.e. 13,894 firms-years), the hypotheses are examined by running a fixed-effects regression model. BHAR (Buy-and-Hold Abnormal Return) refers to the compounding excess returns relative to the returns from the market where the market return. The under- and over-issued long-term debt as well as short-term debt are identified from the variables of DLTT (Long-Term Debt – Total) and DLC (Debt in Current Liabilities – Total) in COMPUSTAT. Then, we computed under-issued and over-issued debt based on the residuals of a regression model estimating the debt level of the firm with respect to three factors (decrease in firm revenues, difference between ROE and industry-averaged ROE, and year dummies indicating economic recession between 2007 and 2010). Marketing activities are measured as the sum of marketing expenditures (i.e. SG&A expenditures) and advertising expenditures, divided by total assets.

	Long-Term debt				Short-Term Debt			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Intercept	−0.525	−0.649	−0.547	−0.652	−0.507	−0.613	−0.580	−0.623
	(0.750)	(0.744)	(0.746)	(0.741)	(0.752)	(0.747)	(0.749)	(0.748)
Prior Performance	−00.311***	−0.315***	−0.315***	−0.315***	−0.312***	−0.315***	−0.316***	−0.315***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Industry Performance	−1.354***	−1.337***	−1.340***	−1.347***	−1.364***	−1.346***	−1.351***	−1.345***
	(0.257)	(0.257)	(0.257)	(0.257)	(0.257)	(0.257)	(0.257)	(0.257)
Industry Asset Intensity	0.075	0.072	0.073	0.073	0.078	0.074	0.075	0.074
	(0.056)	(0.056)	(0.056)	(0.056)	(0.056)	(0.056)	(0.056)	(0.056)
Market Share (%)	−0.104	−0.082	−0.082	−0.076	−0.078	−0.062	−0.055	−0.063
	(0.892)	(0.891)	(0.891)	(0.891)	(0.892)	(0.891)	(0.891)	(0.891)
Market-to-Book Ratio	−0.033***	−0.035***	−0.035***	−0.036***	−0.035***	−0.037***	−0.036***	−0.037***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Firm Size (# Employees)	−1.522***	−1.488***	−1.465***	−1.486***	−1.497***	−1.472***	−1.411***	−1.471***
	(0.210)	(0.210)	(0.211)	(0.210)	(0.210)	(0.210)	(0.211)	(0.210)
Firm Age	−0.170*	−0.188*	−0.187*	−0.188*	−0.154†	−0.174*	−0.176*	−0.174*
	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)
Slack	−0.000	−0.000	−0.000	−0.000	−0.000	−0.000	−0.000	−0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Free Cash Flow	−0.206	−0.144	−0.137	−0.138*	−0.207	−0.150	−0.132	−0.151
	(0.154)	(0.154)	(0.154)	(0.154)	(0.154)	(0.154)	(0.154)	(0.154)
Under-issued Debt,Long-Term	−1.123***	−0.881***	−1.095***	−0.870***				
	(0.226)	(0.230)	(0.270)	(0.230)				
Over-issued Debt,Long-Term	2.904*	2.418†	2.309†	3.981*				
	(1.356)	(1.358)	(1.360)	(1.549)				
Under-issued Debt,Short-Term					−6.015***	−4.743***	−6.552***	−4.775***
					(0.958)	(0.992)	(1.093)	(0.995)
Over-issued Debt,Short-Term					0.146	0.224	0.255	0.185
					(0.569)	(0.569)	(0.568)	(0.576)
Marketing Activities		0.198***	0.228***	0.212***		0.182***	0.259***	0.178***
		(0.036)	(0.041)	(0.037)		(0.037)	(0.042)	(0.038)
Under-issued Long-Term Debt × Marketing Activities			0.115					
			(0.076)					
Over-issued Long-Term Debt × Marketing Activities				−1.498*				
				(0.715)				
Under-issued Short-Term Debt × Marketing Activities							0.927***	
							(0.236)	
Over-issued Short-Term Debt × Marketing Activities								1.281
								(3.057)
Year Dummies	Included	Included	Included	Included	Included	Included	Included	Included
Firm Dummies	Included	Included	Included	Included	Included	Included	Included	Included
AR(1)-DW	0.154	0.155	0.155	0.156	0.154	0.155	0.155	1.55
Log Likelihood	−21093.63	−21077.34	−21076.01	−21075.51	−21086.67	−21073.32	−21063.63	−21073.26
AIC	42267.26	42236.68	42236.03	42235.03	42253.34	42228.65	42211.27	42230.51
χ^2	33.28***	65.86***	68.52***	69.52***	47.2***	73.9***	93.28***	74.02***

The number of firm-year: 13,894, The number of firms: 2174, Standard errors in parentheses.
† $p < 0.1$ *$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.

4.2.2. Split-sample test

To further understand the moderation impact of marketing activities, we split the sample into two competing groups in terms of marketing activities. We define a group of low marketing activities as the group whose marketing activities are below its median and a group of high marketing activities as the group whose marketing activities are above its median. Under the different samples, we figure out how the impact of debt level can be differentiated. Table 6 presents the split-sample test. In the group of low marketing activities, as shown in Model 1 through 4, we can find the strong negative impact of under-issued debt regardless of debt maturity while over-issued debt has no significant effect on firm valuation. The group of high marketing activities, as shown in Model 5 through 8, show consistent results: significant and negative impact of under-issued debt, but insignificant effect of over-issued debt.

Table 6
Marketing moderation effect (split-sample) tests With split samples based on marketing activities, the hypotheses are examined by running a fixed-effects regression model. The sample is re-grouped with the median value of marketing activities. The re-grouped samples are 1286 SMEs (6351 firm-years) for Low Marketing Activities and 1364 SMEs (6516 firm-years) for High Marketing Activities. BHAR (Buy-and-Hold Abnormal Return) refers to the compounding excess returns relative to the returns from the market where the market return. Under-issued and over-issued debt are computed with residuals of a regression model estimating the debt level of the firm with respect to three factors (decrease in firm revenues, difference between ROE and industry-averaged ROE, and year dummies indicating economic recession between 2007 and 2010). Marketing activities are measured as the sum of marketing expenditures (i.e. SG&A expenditures) and advertising expenditures, divided by total assets.

	Low Marketing Activities				High Marketing Activities			
	Model 1 Base	Model 2 Total Debt	Model 3 Long-Term	Model 4 Short-Term	Model 5 Base	Model 6 Total Debt	Model 7 Long-Term	Model 8 Short-term
Intercept	−0.379	0.462†	0.467†	0.484†	0.357	0.228	0.229	0.235
	(0.260)	(0.261)	(0.262)	(0.264)	(0.221)	(0.219)	(0.219)	(0.219)
Prior Performance	−0.340***	−0.344***	−0.343***	−0.344***	−0.419***	−0.427***	−0.427***	−0.427***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.012)	(0.012)	(0.012)	(0.012)
Industry Performance	−0.029	−0.106	−0.070	−0.129	−1.109**	−1.068**	−1.069**	−1.067**
	(0.427)	(0.427)	(0.427)	(0.426)	(0.359)	(0.358)	(0.358)	(0.358)
Industry Asset Intensity	−0.067	−0.048	−0.054	−0.052	0.098	0.094	0.093	0.098
	(0.086)	(0.086)	(0.086)	(0.085)	(0.094)	(0.094)	(0.094)	(0.094)
Market Share (%)	−0.648	−0.829	−0.791	−0.644	0.653	0.734	0.735	0.736
	(1.708)	(1.706)	(1.707)	(1.703)	(1.276)	(1.272)	(1.272)	(1.272)
Market-to-Book Ratio	−0.028***	−0.031***	−0.030***	−0.032***	−0.039***	−0.046***	−0.046***	−0.047***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Firm Size (# Employees)	−1.561***	−1.469***	−1.514***	−1.418***	−1.716***	−1.463***	−1.471***	−1.456***
	(0.305)	(0.307)	(0.307)	(0.306)	(0.359)	(0.359)	(0.359)	(0.359)
Firm Age	−0.318**	−0.283*	−0.301*	−0.258*	−0.190	−0.195	−0.197	−0.194
	(0.122)	(0.122)	(0.122)	(0.122)	(0.163)	(0.163)	(0.163)	(0.164)
Slack	−0.000	−0.000	−0.000	.000	−0.012	−0.001	−0.001	−0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.008)	(0.008)	(0.008)	(0.008)
Free Cash Flow	−0.020	.003	.005	.008	−0.634*	−0.515†	−0.512†	−0.516†
	(0.208)	(0.208)	(0.208)	(0.208)	(0.303)	(0.304)	(0.304)	(0.304)
Under-issued Debt		−1.599***	−1.165**	−10.126***		−0.521*	−0.617†	−2.246
		(0.379)	(0.407)	(1.828)		(0.264)	(0.317)	(1.364)
Over-issued Debt		0.274	2.457	−0.634		1.246	0.910	12.300†
		(2.701)	(3.967)	(0.716)		(1.583)	(1.894)	(7.412)
Marketing Activities		0.512†	0.511†	0.495†		0.259***	0.262***	0.261***
		(0.262)	(0.263)	(0.262)		(0.053)	(0.053)	(0.053)
Year Dummies	Included	Included	Included	Included	Included	Included	Included	Included
Firm Dummies	Included	Included	Included	Included	Included	Included	Included	Included
AR(1)-DW	0.226	0.226	0.227	0.224	0.291	0.294	0.294	0.295
Log Likelihood	−8771.62	−8758.82	−8765.04	−8748.42	−9754.22	−9733.90	−9734.13	−9733.83
AIC	17619.24	17599.64	17612.07	17578.84	19584.45	19549.8	19550.25	19549.65
χ^2	–	25.6***	13.16**	46.4***	–	40.64***	40.18***	40.78***
# Firm	1,286	1,286	1,286	1,286	1,364	1.364	1,364	1,364
# Firm-Year	6,351	6,351	6,351	6,351	6,516	6,516	6,516	6,516

$\dagger$ $p < 0.1$ $*p < 0.05$ $** p < 0.01$ $*** p < 0.001$.

Given the relationships between debt and firm valuation in the split samples, we compare the coefficients across the split-samples. All coefficients of under-issued debt in the group of high marketing activities are larger than those in the group of low marketing activities. This means that as marketing activities intensify, the negative relation between under-issued debt and firm valuation is mitigated. This facilitating role of marketing is shown regardless of debt maturity (See Models 3 and 7 for long-term debt; Model 4 and 8 for short-term debt).

4.2.3. Alternatives dependent variables

To validate our arguments regarding firm valuation, we consider alternative measures of our dependent variable (i.e. BHAR). First, as an alternative of BHAR, we consider CAR (Cumulative Abnormal Return) (Prabhala, 1997; Fama, 1998). CAR, as the time-aggregated abnormal returns, determines cumulative effects over time. In terms that CARs use arithmetic average rather than geometric average, the measures can represent firm valuation with a different approach to it from BHAR. Even though BHARs have been suggested to use over CARs in illustrating investors' experience (Barber & Lyon, 1997), those still can be useful to specify how the information of debt can influence firm valuation from investors (Prabhala, 1997; Fama, 1998). The correlation between BHAR and CAR in our sample is 0.13. Table 7 presents the fixed effects estimation of CAR with respect to debt level, debt maturity, and marketing moderation. Overall, we find that the negative impacts of under-issued debt on CAR regardless of debt maturity. And such

Table 7
Fixed effect estimation of Cumulative Abnormal Return (CAR) with respect to debt and marketing moderation With a sample of 2174 SMEs between 1982 and 2010 (i.e. 13,894 firms-years), the hypotheses are examined by running a fixed-effects regression model estimating Cumulative Abnormal Return (CAR). CAR (Cumulative Abnormal Return) refers to the cumulative excess returns relative to the returns from the market where the market return. Three types of under-issued and over-issued debt (Total debt, long-term debt, and short-term debt) are computed with residuals of a regression model estimating the debt level of the firm with respect to three factors (decrease in firm revenues, difference between ROE and industry-averaged ROE, and year dummies indicating economic recession between 2007 and 2010). Marketing activities are measured as the sum of marketing expenditures (i.e. SG&A expenditures) and advertising expenditures, divided by total assets.

	Model 1 Base	Total Debt		Long-Term Debt		Short-Term Debt	
		Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	−8.110***	−7.816***	−8.119***	−7.725***	−8.051***	−8.056***	−8.138***
	(0.761)	(0.736)	(0.742)	(0.737)	(0.742)	(0.747)	(0.746)
Prior Performance	−0.206***	−0.199***	−0.199***	−0.200***	−0.199***	−0.199***	−0.200***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Industry Performance	−0.062	−0.071	−0.061	−0.062	−0.055	−0.077	−0.065
	(0.178)	(0.177)	(0.177)	(0.177)	(0.177)	(0.177)	(0.177)
Industry Asset Intensity	0.000	0.010	0.008	0.009	0.007	0.012	0.010
	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)
Market Share (%)	0.524	0.540	0.540	0.540	0.540	0.567	0.557
	(0.612)	(0.609)	(0.609)	(0.609)	(0.610)	(0.608)	(0.609)
Market-to-Book Ratio	−0.021***	−0.026***	−0.026***	−0.026***	−0.026***	−0.027***	−0.028***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Firm Size (# Employees)	−2.480***	−2.250***	−2.313***	−2.286***	−2.329***	−2.229***	−2.295***
	(0.141)	(0.141)	(0.141)	(0.141)	(0.141)	(0.141)	(0.141)
Firm Age	0.199***	0.195***	0.195***	0.192***	0.191***	0.202***	0.205***
	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)
Slack	−0.001	−0.000	−0.000	−0.000	−0.000	−0.000	−0.000
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Free Cash Flow	0.235*	0.295**	0.278**	0.296**	0.284**	0.293**	0.270*
	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)
Under-issued Debt		−1.336***	−0.872***	−1.219***	−0.812***	−7.292***	−5.460***
		(0.161)	(0.138)	(0.184)	(0.158)	(0.742)	(0.678)
Over-issued Debt		1.654*	1.567†	2.378*	2.409*	−0.184	−0.344
		(0.724)	(0.816)	(0.924)	(1.061)	(0.387)	(0.392)
Marketing Activities		0.282***	0.199***	0.269***	0.210***	0.271***	0.174***
		(0.029)	(0.026)	(0.028)	(0.025)	(0.029)	(0.026)
Under-issued Debt × Marketing Activities		0.245***		0.224***		1.205***	
		(0.044)		(0.053)		(0.163)	
Over-issued Debt × Marketing Activities			0.268		0.169		4.468
			(0.437)		(0.496)		(2.101)
Year Dummies	Included	Included	Included	Included	Included	Included	Included
Firm Dummies	Included	Included	Included	Included	Included	Included	Included
AR(1)-DW	0.108	0.112	0.111	0.112	0.111	0.110	0.110
Log Likelihood	−15997.83	−15900.95	−15917.96	−15915.57	−15925.05	−15882.45	−15903.59
AIC	32071.67	31885.89	31919.92	31915.15	31934.11	31848.9	31891.18
χ^2	–	193.76***	159.74***	164.52***	145.56***	230.76***	188.48***

The number of firm-year: 13,894, The number of firms: 2174, Standard errors in parentheses.
† $p < 0.1$ *$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.

relationship is positively moderated by marketing activities. In the case of over-issued debt, short-term debt has no significant impact on CAR whereas total debt and long-term debt have significant, positive effects. And marketing moderation for the over-issued debt turns out insignificant.

Another alternative measure of firm valuation is Tobin's q. Tobin's q explains the variability of book values as well as that of market values (e.g. Lubakin & Shrieves, 1986; Allen, 1993). Operationally, Tobin's *q* is calculated by dividing the market value of the firm by the book value of assets (Brown & Caylor, 2006; Bebchuk & Cohen, 2005; Gompers, Ishii, & Metrick, 2003). The correlation between BHAR and Tobin's q in our sample is -0.06. Table VIII presents the fixed effect estimation of Tobin's q. As seen in Table 8, there are negative effects of under-issued debt on Tobin's q and positive moderating effects of marketing activities regardless of debt maturity. Those results are consistent to the results using other dependent variables (such as BHAR and CAR). For over-issued debt, we cannot find any significant results.

Overall, we conclude that the level of debt (especially under-issued debt) has a significant impact on firm valuation (i.e. BHAR, CAR, and Tobin's q). Those consistent estimation results in the terms of debt level and moderation effects of marketing activities enable us to conclude that our results are robust to an alternative measure of firm valuation.

Table 8
Fixed effect estimation of Tobin's q with respect to debt and marketing moderation With a sample of 2174 SMEs between 1982 and 2010 (i.e. 13,894 firms-years), the hypotheses are examined by running a fixed-effects regression model estimating Tobin's q. Tobin's q is calculated by dividing the market value of the asset by the book value of assets. Three types of under-issued and over-issued debt (Total debt, long-term debt, and short-term debt) are computed with residuals of a regression model estimating the debt level of the firm with respect to three factors (decrease in firm revenues, difference between ROE and industry-averaged ROE, and year dummies indicating economic recession between 2007 and 2010). Marketing activities are measured as the sum of marketing expenditures (i.e. SG&A expenditures) and advertising expenditures, divided by total assets.

	Model 1 Base	Total Debt		Long-Term Debt		Short-Term Debt	
		Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	−4.468***	−4.175***	−4.456***	−4.083***	−4.432***	−4.374***	−4.432***
	(0.356)	(0.359)	(0.358)	(0.358)	(0.357)	(0.364)	(0.360)
Prior Performance	−0.009	−0.013	−0.006	−0.013	−0.008	−0.006	−0.001
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Industry Performance	0.276	0.251	0.270	0.260	0.275	0.239	0.252
	(0.417)	(0.416)	(0.417)	(0.416)	(0.417)	(0.416)	(0.416)
Industry Asset Intensity	−0.090	−0.084	−0.088	−0.081	−0.087	−0.079	−0.080
	(0.114)	(0.114)	(0.114)	(0.114)	(0.114)	(0.113)	(0.114)
Market Share (%)	1.152	1.135	1.129	1.141	1.138	1.158	1.131
	(1.566)	(1.561)	(1.565)	(1.563)	(1.566)	(1.557)	(1.562)
Market-to-Book Ratio	−0.110***	−0.105***	−0.111***	−0.106***	−0.110***	−0.111***	−0.118***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Firm Size (# Employees)	−2.669***	−2.378***	−2.621***	−2.460***	−2.648***	−2.274***	−2.509***
	(0.403)	(0.404)	(0.405)	(0.405)	(0.405)	(0.403)	(0.404)
Firm Age	−0.462†	−0.325	−0.417	−0.359	−0.441†	−0.259	−0.317
	(0.263)	(0.260)	(0.261)	(0.261)	(0.262)	(0.255)	(0.260)
Slack	−0.001	−0.001	−0.002	−0.001	−0.001	−0.001	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Free Cash Flow	0.154	0.188	0.113	0.182	0.123	0.152	0.082
	(0.252)	(0.252)	(0.253)	(0.253)	(0.253)	(0.252)	(0.253)
Under-issued Debt		−2.661***	−0.933**	−2.194***	−0.504	−18.647***	−11.870***
		(0.404)	(0.341)	(0.468)	(0.392)	(1.879)	(1.707)
Over-issued Debt		0.626	0.609	1.775	2.139	−0.993	−1.263
		(1.919)	(2.041)	(2.440)	(2.641)	(1.054)	(1.088)
Marketing Activities		0.197**	−0.110	0.152*	−0.082	0.096	−0.198**
		(0.073)	(0.064)	(0.071)	(0.063)	(0.071)	(0.064)
Under-issued Debt* × *Marketing Activities		0.823***		0.836***		3.064***	
		(0.104)		(0.127)		(0.366)	
Over-issued Debt* × *Marketing Activities			0.825		0.596		4.270
			(0.997)		(1.138)		(4.995)
Year Dummies	Included	Included	Included	Included	Included	Included	Included
Firm Dummies	Included	Included	Included	Included	Included	Included	Included
AR(1)-DW	0.467	0.463	0.465	0.465	0.466	0.458	0.464
Log Likelihood	−28443.73	−28396.93	−28436.06	−28413.68	−28439.99	−28361.62	−28410.11
AIC	56963.47	56877.86	56956.13	56911.35	56963.98	56807.25	56904.22
χ^2	–	193.76***	159.74***	164.52***	145.56***	230.76***	188.48***

The number of firm-year: 13,894, The number of firms: 2174, Standard errors in parentheses.
† $p < 0.1$ *$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.

4.2.4. Robustness check for sample selection

To consider sample selection bias which may arise when the cases of under-issued or over-issued debt are not compared with equivalent cases, we conduct a propensity score matching method to re-group our sample. With respect to total assets, revenues, and the number of employees, we estimated the indicators of under-issued debt and over-issued debt respectively. Based on the estimations, we computed propensity scores[3]. And then we distinguished the treatment group which indicates the cases with under-issued debt and the control group which is matched to the treatment group in terms of the propensity scores. That is, the control group includes the firms with non-under-issued debt, which have equivalent firm fundamentals. (i.e. total assets, revenues, and the number of employees) to the treatment group. Likewise, we re-grouped our sample in terms of over-issued debt. Then, we compile the two sets of the re-grouped samples. As a result, the re-grouped and complied sample amounts to 1239 firms and 5084 firm-years. With the new sample, we re-ran our estimation models and found the estimation results consistent with our main results. This indicates that the cases of under-issued or over-issued debt are randomly sampled and the comparisons between the groups turn out to be sound.

[3] For the propensity score matching, we used the module of *MatchIt* in R (ver. 3.5.1)

5. Discussion

5.1. Marketing as a strategic means to control debt signaling

In this study, we demonstrate that the level of debt has bifurcated effects on firm valuation, captured by Buy-and-Hold Abnormal Returns (BHARs) and the effects are reinforced by marketing intensity. In particular, we find that long-term debt and short-term debt have different roles in firm valuation. The implication of debt signaling is that firms can strategically determine the level of debt to control how investors or other stakeholders evaluate a firm's status. This implies that some firms may retain even higher levels of debt to enhance their valuation than others. The curvilinear relationship thus indicates that firms can time and make the strategic retention of debt effective. By investigating the threshold where the "driver" signal is turned to the "distress" signal, firms can make a decision as to whether they will issue more debt for the next period. We found in this study that the threshold tends to rely on the maturity of the debt.

Ross (1977) argued that one firm could issue more debt than the other. That means that increasing debt can be costly (or beneficial) for certain firms. Our findings suggest that when the strategic use of debt can be reinforced when firms acknowledge that the effect of debt can be interpretative. That is, the marketing activities which can make the perception of stakeholders on the firm favorable will facilitate the strategic use of debt signaling. We find that firm valuation in the lower levels of debt can be enhanced when marketing activities are engaged. However, the moderating role of marketing activities for the debt signaling is not linear. In the higher level of debt, the marketing activities cannot boost up a firm's value. Rather, the simultaneous increases in debt and marketing intensity may lead to detrimental firm valuation. In other words, marketing activities under the significant growth opportunities harm the firm valuation instead of alleviating the distress.

This finding suggests that the stock market, i.e. firm valuation from investors, is not isolated from the consumer market. Investors have their own roles in a firm, but they can be critical customers of the firm. Firms should consider these multiplex relations between investors and firms in constructing their resource structure. These activities driven by marketing activities can be further investigated in terms of the enhancement of firm valuation in the stock market.

5.2. Debt maturity and firm valuation

In general, debt is useful for cash generation, but it entails a peril that a firm's investment incentives can be reduced (Williamson, 1988; Singh & Faircloth, 2005). To mitigate such underinvestment problems, called *debt overhang*, finance scholars have focused on the maturity of debt (Myers, 1977; Diamond & He, 2012; Wahba, 2013). Myers (1977) argued that shortening debt maturity can resolve the debt overhang problems. Since the short-term debt involves earlier repayments and thus the bankruptcy costs can be lessened compared to the long-term debt (Diamond, 1991; Johnson, 2003). As such, short-term debt provides leeway to adjust its capital structure to avoid debt overhang (Diamond & He, 2012). However, when short-term debt is overwhelmed in a firm's capital structure, it creates a risk of suboptimal liquidation (Johnson, 2003; Titman & Tsyplakov, 2007). Since short-term debt maturity increases the control rights of debtors (Benmelech, 2006), it makes firm liquidation volatile (Diamond & He, 2012).

On the other hand, the long-term debt may mitigate liquidation volatility as it can reduce refinancing costs which are generated by the short-term maturity of debt (e.g. Wahba, 2013). The longer maturity can also facilitate managerial discretion (Johnson, 2003; Stulz, 1990) and alleviate adverse selection issues (Webb, 1991). However, as discussed, long-term debt is not free from the debt overhang problem and also it increases information costs (Flannery, 1986) and adverse selection costs (Barclay & Smith, 1995). When a firm's capital structure is dominated by long-term debt, investors can interpret that the firm may be vulnerable to debt overhang and its related issues. Based on the understandings of the long- and short-term debt, we can understand that the roles of debt can be differentiated depending on the level of each type of debt.

In our analysis, we find that debt maturity has a different signaling impact on firm valuation. For both the under-issued debt, both long-term and short-term debt have negative impacts on firm valuation. Yet, for the over-issued debt, long-term debt has a marginal positive impact while short-term debt has no significant impact on firm valuation. Marketing moderation is also differentiated depending on debt maturity. In terms of long-term debt, there is only negative moderation with over-issued long-term debt. Since long-term debt inherently bears liquidation risks, marketing activities will accelerate the negative signaling. On the other hand, marketing activities can exacerbate the alleviated distress signal of under-issued short-term debt.

5.3. Smes vs. large firms

In this study, we focus only on SMEs, because, we acknowledge, large firms have some convoluted factors for firm valuation, such as diversified segments, corporate governance, complex tax schemes, or other means to hedge risks of share prices. To check the difference between SMEs and large firms in terms of debt signaling, we re-run the main models with a sample of large-sized firms[4] and found that there is no significant relationship between debt and BHAR in large firms. Specifically, we perform the Chow test to examine the coefficients of debt level in SMEs and large firms are different. The test shows that the role of debt level (i.e. under-issued and over-issued debt) and marketing moderation for firm valuation are differentiated between SMEs and large firms (F = 30.10;

[4] To sample large firms, from the Compustat database, we first identified all available firms which belong to the same industries of the SMEs, and then extracted all the cases where the number of employees exceeds 500.

$p < 0.000$, for main effects of debt level; $F = 28.11$; $p < 0.000$, for marketing moderation effects). This indicates that SMEs, compared to large firms, have a distinctive relationship between debt and firm valuation. Furthermore, since large firms have several tools to enhance firm valuation, the underlying mechanisms to relate debt to firm valuation would be situated in multiple conditions. This means that for large firms, we may need to examine additional perspectives to disentangle the signaling effect of debt on firm valuation. For example, the financing priority in capital structure (i.e. pecking order theory) can be a more important aspect in understanding the signaling effect in large firms (e.g. Myers, 1984). This suggests that future studies will unpack the underlying mechanisms of debt-signaling for large firms.

6. Conclusion

In this study, we argue that the signals of debt (i.e., driver vs. distress) can be bifurcated in SMEs, correspondingly affecting firm valuation. As the issuance of debt signifies that firms utilize the external financing source extensively, active use of external financial resources can make investors positively perceive the firm's value (Myers, 1984; Jensen, 1986). Meanwhile, investors also can understand issuing of debt as a state of financial distress. This suggests that in a certain range of its use, debt is interpreted as a driver for growth, but in the other range of debt financing, negative signals of the debt are dominated (Hennessy et al., 2010).

Recognizing that the debt signaling processes are inherently interpretative, this study demonstrates that marketing activities moderates the bifurcated relationship between debt and firm valuation. This study finds that firms with less amount of debt issued (under-issued) will experience the negative effect of debt on firm valuation as the firm increases use of debt while firms with a high amount of debt issued (over-issued) will add value as additional debts are implemented. Marketing activities have two distinctive impacts in response to the use of additional debt depending on the current debt situation. If a firm is currently under-issued, marketing activities positively moderate the existing negative relationship between debt and firm valuation. On the other hand, marketing negatively moderates the positive relationship between debt and firm valuation for firms that currently hold a significant amount of debt. This finding on the relationship between debt and firm valuation and the impact of marketing activities on this relationship persists when we examine the effect of long-term and short-term debt separately. Also, subsample analysis of marketing activities suggests a negative impact of debt on the firm value by firms with under-issued debt regardless of the level of marketing intensity while the magnitude of the negative impact is alleviated for the sample of firms with high marketing intensity.

This study has three implications. First, this study provides a perspective that debt is polysemous so that the effect of debt on a firm's outcome should be treated as an interpretative process. In particular, marketing activities, which mainly enable firms to communicate with stakeholders (including investors), can be critically involved in the interpretative process of debt. That is, the strategic use of marketing activities will enhance firm valuation. The second implication presents that the interplay between the stock market and the product market can affect firm valuation. Although the marketing function is mainly engaged in the product market, its implementation can be reflected to the stock market. In this sense, investors can be a link to connect the two markets. In other words, investors, who are influenced by a firm's activities at the product market and its capital structure, will rate the firm for their future investment decisions. Lastly, debt maturity is also an important aspect of investigating debt signaling effect on firm valuation. The different roles of long-term vs. short-term debt can enable firms to strategically construct their capital structure, which can convey a significant signal to investors.

Although this study has meaningful implications in the areas of strategy, finance, and marketing, it has some limitations which can be considered for the future studies. First, the marketing intensity was measured in terms of the marketing expenditures. According to the resource allocation theory (Gilbert, 2005), decision-makers' resource commitment is reflected by capital investment. That is, marketing expenditures can indicate how intensive the decision makers pay attention to marketing activities. Yet, the measure is still indirect to capture the means to govern the stakeholders' interpretations. If the marketing activities to directly relate to investors (such as industrial relations) could be specified, the role of marketing for debt signaling could be more precisely identified. Accordingly, future studies will specify the measure of marketing intensity to further understand the moderation role of marketing activities in the debt signaling in the stock market. Second, future studies will specify how firms strategically use debt financing. We theorized that according to the level of debt, its signals can be differentiated for firm valuation. Yet, debt is still a main cost of capital and signifies a financial constraint (Jensen & Meckling, 1976). Given this, we need to specify how firms can create such "costly signals" of debt for firm valuation. Third, we acknowledge that stakeholders have various kinds of vested interests; marketing activities may play a partial role in moderating the debt signals. Accordingly, future studies will consider various strategies to govern the stakeholders' interpretations of the firm. This will elaborate the conditions under which a firm can strategically use debt to enhance its valuation.

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