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Capital structure, free cash flow, diversification and firm performance: A holistic analysis

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ABSTRACT

This study jointly investigated the inter-relationships among capital structure, free cash flow, diversification and firm performance. Prior research has separately examined each individual relationship, but all four of these components are closely related and have complicated endogenous relationships. Thus, a joint examination is needed in order to better understand the inter-relationships among them. The results of this study showed that unrelated diversification discount is not caused by free cash flow but instead by diversification performance itself. Free cash flow increases both related and unrelated diversification entropies, which contradicts the hypothesis that diversification discount is caused by an over-investment of free cash flows. This study also found that debt leverage is an efficient way to reduce free cash flows and enhance firm performance. In particular, for firms with unrelated diversification, debt leverage directly alleviates the negative effects of unrelated diversification on firm performance. It also indirectly counterbalances the level of unrelated diversification via free cash flows. Further discussion and industry implications are also presented in the paper.

1. Introduction

Since Modigliani and Miller's (1958) seminal paper, the choice between debt and equity has been extensively investigated in the finance literature. As Weston and Brigham (1981) mentioned, however, there is wide disagreement over what determines the choice of capital structure and how this choice affects firm performance. Conversely, Barton and Gordon (1987) argued that a corporate strategy perspective on managerial choice would yield a more detailed understanding of capital structures and their effects. Along the same lines, Andrews (1971) claimed that capital structure decisions are made based on managerial perspectives on the value of the firm in terms of internal and external business factors. This is referred to as the "Strategy–Capital structure" relationship. This concept implies that corporate capital structures and strategic behavior are more accurately understood through a holistic approach that brings together corporate strategic perspectives and extant financial research. Following the "Strategy–Capital structure" argument, the current study jointly examined the inter-relationships among capital structure, free cash flow, diversification and firm performance.

To date, these factors have been analyzed separately in prior finance and strategic management research. Although the previous literature carefully examined the relationships among them, it does not provide consistent results due to a failure to examine critical corporate strategy and finance factors. Thus, a holistic approach including "Strategy–Capital structure" could make it possible to estimate the complicated associations among these four critical factors. Consequently, a holistic analysis may also provide more sophisticated results as compared to the separate examinations in prior studies.

Further, most prior empirical studies on the determinants of capital structure, diversification and firm performance analyzed large manufacturing firms. However, these relationships could differ within service industries. For example, in service industries investments in machinery and equipment are relatively small. If service firms lease their facilities, the total capital invested is working capital (Gill et al., 2008). Moreover, the benefits of diversification derived from scale economies could also differ between manufacturing and service industries due to differences in investments. This suggests that the association between capital structure and strategic choice might produce different outcomes within service industries. Thus, the current study analyzed the service industry in order to fill in the gaps between industries. Due to the lack of firm level diversification data, this study specifically investigated the restaurant industry as a representative sample of service industries. In many case studies and textbook examples restaurant companies, such as McDonalds or Starbucks, have been used but

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little effort has been made to investigate the holistic mechanism of service companies' diversification strategies. Thus, the results of this study can provide a good cornerstone for understanding diversification mechanisms in the service industry.

Thus, the purpose of this study is to jointly examine the relationships among capital structure, free cash flow, diversification and firm performance in the restaurant industry. In the following section, we review the prior finance and strategic literature. First, we review previous studies on the relationship between capital structure and firm performance. Second, the free cash flow hypothesis is examined from the perspective of agency theory. Third, the diversification discount literature on over-investment of free cash flows is reviewed. Fourth, we investigate the relationship between diversification and capital structure. Finally, we introduce our holistic approach in terms of the above four issues. We analyze the proposed conceptual model using 2SLS (two-stage least square) and 3SLS (three-stage least square) regression, present the results of the model, and conclude with theoretical and practical implications.

2. Literature review

2.1. Capital structure and firm performance

The choice between debt and equity has been a major topic in the finance literature since Modigliani and Miller (1958) argued that capital structure is not related to firm value. However, they eventually reversed this claim, stating that corporate value is maximized when it is financed entirely with debt (Modigliani and Miller, 1963; Jang et al., 2008). In order to understand the rationale behind the relationship between capital structure and firm performance, this section reviews three theories: trade-off theory, pecking-order theory, and agency theory.

The trade-off theory posits that there is an optimal level of capital structure in which firm value is maximized. At the optimal point, the marginal benefits of debt equal the marginal costs of debt and firm performance is maximized (Tang and Jang, 2007; Jang et al., 2008). Compared with equity financing, debt is cheaper because it is tax deductible. However, an excessive use of debt is risky due to the higher likelihood of bankruptcy. Thus, the trade-off theory argues that firms set an optimal target debt ratio determined by the trade-off between the benefits (tax deductions) and costs of debt (bankruptcy costs). A number of empirical studies have attempted to find the determinants of capital structure using the trade-off framework, including those by Ferri and Jones (1979), Castanias (1983), and Tang and Jang (2007). Bradley et al. (1984) reviewed the theory and evidence of the trade-off hypothesis. Under the trade-off framework, Kester (1986), Titman and Wessels (1988), and Rajan and Zingales (1995) found strong support for a negative relationship between leverage and performance.

On the other hand, Myers and Majluf (1984) argued that there is an asymmetric information problem between managers and investors. Investors would like to discount a firm's new securities when they are issued. Thus, managers can anticipate price discounts in advance. As a consequence, in order to avoid distorting investment decisions managers prefer internal financial resources, such as retained earnings, to external financial sources such as debt and equity. Myers (1984) suggested that the costs of issuing risky debt or equity overwhelm the forces that determine optimal leverage in the trade-off model. This is referred to as the pecking-order theory. Pecking-order refers to the idea that in order to minimize asymmetric information and other financing costs, firms should first finance investments with retained earnings, then with safe debt, then with risky debt, and finally with equity. In this argument, Myers (1984) defined "safe debt" as newly issued debt that is default-risk free. According to simple pecking order theory, debt typically grows when investments exceed retained earnings and falls when investments are less than retained earnings. Thus, if profitability and investment outlays are persistent, the simple version of the model predicts that leverage is lower for more profitable firms when investment is fixed (Jang, 2011; Jang and Park, 2011). Given profitability, leverage is higher for firms with more investments. Yet in a more complex view offered by Myers (1984), firms are concerned with future as well as current financing costs. Balancing current and future costs, it is possible for firms with large potential investments to maintain a low-risk debt capacity in order to avoid either foregoing future investments or financing them with risky new securities. Thus, controlling for other effects, firms with larger potential investments have less current leverage. Based on the asymmetric information theory Ross (1977) proposed the signaling effect. According to Ross (1977), market participants interpret high levels of debt as a signal of high quality and future cash flows for the firm. This implies that low quality firms cannot handle larger debt levels due to the higher likelihood of bankruptcy (Barclay et al., 1995). Consequently, the signaling effect restricts firms' access to equity markets because issuing new equity is perceived as a negative signal to market participants.

Finally, in the agency models of Jensen and Meckling (1976) and Jensen (1986), there is a conflict between managers and stockholders. The interests of managers are not aligned with those of investors. Managers tend to waste free cash flow on perquisites. As Jensen (1986) argued, the greater the discretionary amount available to a manager, the greater the likelihood that the manager will use it for perquisites. This means that managers have a propensity to expand the scale of their firms, even if that behavior means undertaking poor projects or reducing firm value. This is referred to as an over-investment problem. To mitigate over-investment problems, a manager's ability to promote their interests is constrained by the availability of free cash flows. This constraint can be tightened even further through debt financing. Consequently, agency problems might be optimally solved through a capital structure decision, such as increasing debt leverage. This model assumes a positive relationship between leverage and firm performance. A more detailed discussion is provided in the following sections.

Prior studies have also argued that the relationship between capital structure and firm performance is endogenous (De Jong, 2002). For example, Smith and Watts (1992) claimed that leverage is endogenous, while Tobin's q is assumed to be exogenous. However, McConnell and Servaes (1995) documented that Tobin's q is endogenous while leverage is exogenous. Recently, Rajan and Zingales (1995), Demsetz and Villalonga (2001) and Harvey et al. (2004) treated both leverage and Tobin's q as endogenous variables, which means that there is a bi-directional causal relationship. Consequently, capital structure decisions affect firm performance and firm performance also influences capital structure. Thus, this study incorporated the endogenous relationship between capital structure and firm performance when estimating the relationship between leverage and Tobin's q.

2.2. Free cash flow hypothesis

As indicated earlier, the free cash flow hypothesis (Jensen, 1986, 1989, 1993; Jensen and Meckling, 1976) states that excessive free cash flows allow managers to pursue personal goals, regardless of stockholder value. Richardson (2006) defined free cash flow as cash flow beyond what is necessary to maintain assets and finance expected new investments. Under agency theory (Jensen, 1986; Jensen and Meckling, 1976), if a firm has excessive free cash flows managers tend to invest the extra cash in new projects, even if a negative net present value (NPV) is anticipated. Such an

over-investment of free cash flows would deteriorate firm value. Titman et al. (2004) and Fairfield et al. (2003) found empirical evidence that firms with excessive investments experience inferior future stock returns. Dechow et al. (2008) also showed that firms retaining excessive cash flows had lower future performances. Moreover, Brush et al. (2000) found that even though cash flow itself has a positive effect on firm growth, free cash flow has a negative influence on firm growth. Consequently, excessive cash flow (free cash flow) lowers firm value. Accordingly, reducing managerial discretion (free cash flow) reduces agency costs and, in turn, increases firm value. Thus, debt financing can further restrain over-investment behaviors. This implies that the agency problem might be mitigated through a capital structure decision by increasing debt because incremental debt forces managers to pay off interest and reduces the flow of free cash. Lang et al. (1996) found that the negative relationship between debt leverage and investment holds strongly only for firms with a low Tobin's *q*. This confirms that leverage effectively reduces free cash flows.

Methodologically, the finance and strategic management literature mentions a few ways to estimate free cash flow. One frequently used method measures the operating cash flow normalized by total assets such as free cash flow (Lehn and Poulsen, 1989). The rationale behind this measure is that normalized operating cash flows capture free cash flows, because free cash flows are simply an excess level of cash flow. However, this method is a simplified proxy measure that does not account for investment opportunities. The second method (Brush et al., 2000) estimates free cash flow as the normalized operating cash flow only if Tobin's *q* is less than one. Brush et al. (2000) argued that free cash flows exist when firms have poor growth opportunities. Thus, the operating cash flow could be perceived as a free cash flow only if the firm runs short of potential investment opportunities. Though Brush et al.'s (2000) method considers investment opportunities, it fails to incorporate investments in current assets. This means that a firm with poor investment opportunities should invest in their present assets in order to maintain their business. To directly capture the investments of a firm, Arslan and Karan (2007) estimated free cash flow as the difference between operating cash flow and capital expenditure divided by total assets. This method, however, ignores that capital expenditures include investment in present assets and new opportunities. Thus, Arslan and Karan's (2007) method could under-estimate free cash flow. Zhao et al. (2009) modified Arslan and Karan's (2007) method and measured free cash flow as the difference between operating cash flow and average capital expenditures for the last 3 years divided by total assets. To capture optimal investment, Zhao et al. (2009) used the average value of capital expenditure over the last 3 years, but this is also another proxy.

Finally, to overcome the limitations of these prior measures, Richardson (2006) used information from cash flow statements as opposed to noisy combinations of income statements and balance sheets. To capture the source of free cash flow, Richardson (2006) defined total investment expenditures as investments toward maintaining existing assets and new investments. Investments to maintain existing assets refer to maintenance capital expenditures as a portion of the total investment expenditures necessary to maintain the assets already in place. Next, Richardson (2006) measured the source of free cash flow as the difference between free cash flow from existing assets already in place and free cash flow from growth opportunities. To estimate cash flows from growth opportunities, Richardson (2006) used the expected investment on new projects and a firm level investment decision model (Hubbard, 1998). This is a complicated method, but it is more logical and considers all components of free cash flow at the firm level. Thus, the current study incorporated and modified Richardson's (2006) method in our analysis.

2.3. Diversification discount and free cash flow

Since Rumelt (1974, 1982) found that related diversification produces superior performance as compared to unrelated diversification, a number of studies have investigated the effects of diversification strategies on firm performance. The rationale behind Rumelt's (1974, 1982) argument is rooted in economies of scale and the synergy hypothesis. From this perspective, unrelated diversification requires certain substantial costs derived from new and unfamiliar business environments, which could adversely deteriorate firm value. However, the internal market efficiency hypothesis argues that unrelated diversification perform better. The internal market efficiency hypothesis (Higgins and Schall, 1975; Lewellen, 1971; Scherer and Ross, 1970) implies that diversified firms can allocate their capital resources more efficiently than undiversified firms due to the variety of investment options. As a result, performance is enhanced through the reduced costs of capital and optimal investment.

Lang and Stulz (1994) and Berger and Ofek (1995) provided evidence of a "diversification discount" by comparing business segments in diversified firms with specialized firms. Diversification discount refers to a performance diminution (discount) in a firm after it diversifies its business. The cause of diversification discount has been rigorously debated. One contributing factor is inefficient resource allocation by corporate management, which destroys firm value (Shin and Stulz, 1998; Scharfstein and Stein, 2000; Rajan et al., 2000). However, this concept has recently been criticized. Some researchers have argued that the diversification discount derives from the endogenous nature of the diversification choice (Villalonga, 2004a) or is an artifact of poor data (Villalonga, 2004b). Others have pointed toward either a discount gained from the target firm (Graham et al., 2002) or the firm's discount before diversifying (Chevalier, 2004).

However, most scholars argue that managerial agency problems could contribute to the diversification discount (Berger and Ofek, 1995; Comment and Jarrell, 1995; Lang and Stulz, 1994; Stulz, 1990; Tang and Jang, 2010). For example, Berger and Ofek (1995) found that unrelated segments of diversified firms overinvesting in low-*q* industries resulted in a higher diversification discount. Several empirical studies (Lang and Stulz, 1994; Berger and Ofek, 1995; Comment and Jarrell, 1995) also found consistent results with the free cash flow hypothesis (Jensen, 1986, 1989, 1993) in accounting for the diversification discount. Thus, agency theory provides a theoretical rationale for why a diversification strategy might benefit managers but result in the erosion of firm value. There is also a high correlation between diversification and increased firm size and between firm size and management compensation (Finkelstein and Hambrick, 1996). This means that managers tend to pursue diversification as a way to increase their compensation and protect their position (Denis et al., 1997; Rose and Shepard, 1997) even when diversification damages firm value.

Ultimately, there are conflicts between the theoretical explanations and the empirical results on the effects of diversification strategies on firm performance. For example, Doukas and Kan (2004) confirmed a direct association between the diversification discount and free cash flow in both related and unrelated diversification. Yet, Villalonga (2004a) found evidence that there is a discount (negative effect) associated with unrelated diversification, but a premium (positive effect) associated with related diversification. Villalonga's (2004a) argument has generally been accepted in the strategic and finance literature. This notion is based on the idea that unrelated diversification is the result of over-investment behaviors, which is supported by the free cash flow hypothesis. However, a logical discrepancy exists because this is an *ex post* interpretation of the empirical findings. If there were free cash flows within a firm and the manager diversified by investing in

a negative NPV project, the manager would consider both related and unrelated diversification. Even though unrelated diversification is more beneficial for managers, related diversification is still attractive due to the relative ease and familiarity of the business compared to unrelated diversification. Thus, managers could spend the free cash flows on either related or unrelated diversification. Accordingly, if the diversification discount is derived from an over-investment of free cash flows both types of diversification should produce the diversification discount. Consequently, if free cash flows are the source of the diversification discount, there would be little reason for any corporation to diversify because either type of diversification could damage firm performance. Under this negative condition of diversification, managers would not diversify because investors would prevent any diversification in order to protect firm value. In sum, the inconsistent results of diversification performance studies may be due to examining the diversification discount separately.

Following prior studies (i.e., Lang and Stulz, 1994; Hyland and Diltz, 2002; Campa and Kedia, 2002; Graham et al., 2002), the current study also incorporated the endogenous relationship between diversification strategy and firm performance. For example, Campa and Kedia (2002) found the endogeneity of diversification via a simultaneous estimation model. However, as Hall (1995) indicated, few theoretical arguments attempt to explain the effects of firm performance and diversification. Rijamampianina et al. (2003) explained a firm's motivations to diversify in terms of: (1) stock value enhancement, (2) firm (or sales) growth, (3) internal market efficiency, (4) stability of income stream, and (5) profitability enhancement. The motivations described by Rijamampianina et al. (2003) stem from a firm's performance level. These motivations for diversification imply that a firm's low performance (low profitability and/or high volatility of profits) could influence diversification decisions, as well as the level of diversification. Consequently, based on prior studies and the above theoretical understanding of diversification motivations, this study considered the relationship between diversification and firm performance as endogenous.

2.4. The relationship between leverage and diversification

Several prior studies have attempted to verify which theory (i.e., trade-off theory or pecking-order theory) better explains financing behavior. Others investigated capital structure decisions at the level of corporate strategic position. However, few studies examined the role of diversification strategy in the choice of capital structure (Taylor and Lowe, 1995; Markides and Williamson, 1996; Kochhar and Hitt, 1998; Chkir and Cosset, 2001; Alonso, 2003). As La Rocca et al. (2009) claimed, examining the relationship between capital structure and diversification could expand our understanding of financing behavior.

Traditionally, three theories account for the relationship between diversification and capital structure: coinsurance effect, transaction cost hypothesis and agency theory. Coinsurance effect (Bergh, 1997; Berger and Ofek, 1995; Miller and Bromiley, 1990; Comment and Jarrell, 1995; Kim and McConnell, 1977; Lewellen, 1971) argues that cash flows from diversified segments are weakly correlated and, thus, reduce cash flow volatility. Lewellen (1971) explained that reducing the variance in cash flows increases a diversified firm's debt capacity. Further, because the income streams from unrelated diversification are more weakly correlated than those from related diversification, the increase in debt leverage via the coinsurance effect is larger with unrelated diversification (Kim and McConnell, 1977). On the other hand, Majd and Myers (1987) argued that the increased debt capacity via diversification might contribute to performance enhancement due to increased interest tax shields. Thus, diversified firms have higher debt leverage and lower tax payments than undiversified competitors. Majd and Myers (1987) also found that when diversified firms experience operational losses they pay less in taxes than their segment competitors.

The transaction cost hypothesis argues that a firm's financial decision between debt and equity is highly related to its asset characteristics (Markides and Williamson, 1996). Thus, the transaction cost hypothesis considers debt a rule-based governance structure and equity a discretionary governance device. In turn, it supports the use of debt to finance non-specific assets and the use of equity to finance specific ones. For example, firms with larger intangible assets, which tend to be specialized and inflexible, should transfer assets to related businesses (Chatterjee and Wernerfelt, 1991). However, unrelated diversification cannot be achieved with highly specific resources due to their inflexibility (Montgomery and Wernerfelt, 1988). Consequently, highly specific assets, which are associated with related diversification, should be financed by equity because they are limited in terms of liquidation in the event of a bankruptcy. General assets, which are associated with unrelated diversification, should be financed by debt because they are easily liquidated in case of bankruptcy and are valuable as collateral. Thus, in this case related diversification would decrease debt leverage while unrelated diversification would increase debt leverage.

Finally, agency theory (Jensen and Meckling, 1976) also contributes to the theoretical stream supporting the relationship between leverage and diversification (Kochhar, 1996; Kochhar and Hitt, 1998). As mentioned earlier, Jensen (1986) argued that debt could constrain managerial behavior by reducing the free-cash flow under managerial discretion. This supports the positive role of debt in reducing management diversification strategies, especially unrelated diversification. Consequently, shareholders promote the use of debt as a way to limit managers' unrelated diversification decisions. Along the same lines, Li and Li (1996) mentioned that low leverage under a diversification strategy could lead to over-investment. Thus, diversified firms need to maintain higher levels of debt leverage than non-diversified firms to avoid over-investment (Riahi-Belkaoui and Bannister, 1994). The underlying rationale is consistent with the diversification discount, in that unrelated diversification is due to the over-investment of free cash flows. Following agency theory's perspective on diversification, an increase in debt leverage would decrease unrelated diversification. However, the effect of leverage on related diversification is not clear. In the presence of unrelated diversification, agency theory posits that shareholders increase debt leverage to decrease the level of unrelated diversification. This implies that unrelated diversification could increase debt leverage. Thus, even though agency theory (Jensen and Meckling, 1976) is referenced separately in the literature on capital structure, the diversification discount and the relationship between diversification and capital structure share the same underlying theoretical rationale. Consequently, agency theory proposes that debt leverage might decrease the level of unrelated diversification.

2.5. A holistic framework for leverage, free cash flow, diversification and firm performance

The main purpose of the current study is to jointly examine the relationships among capital structure, free cash flow, diversification and firm performance in the restaurant industry. Very few studies (Amit and Livnat, 1988; Ruland and Zhou, 2005) have attempted a joint examination of these factors and those that have only presented a partial examination. Amit and Livnat (1988) tested the inter-relationship among diversification, capital structure and systematic risk using path analysis. Amit and Livnat (1988) found that firms reduce risk via diversification but increase debt leverage for tax benefits. Ruland and Zhou (2005) claimed that

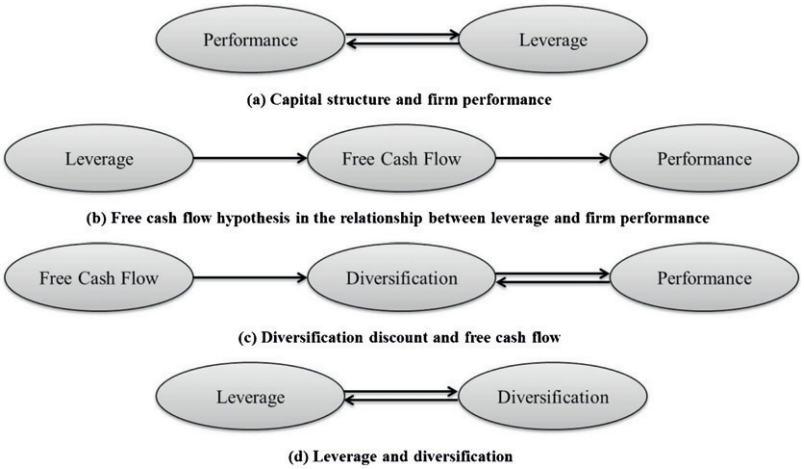

Fig. 1. Summary of separate research related to capital structure, free cash flow, diversification and firm performance.

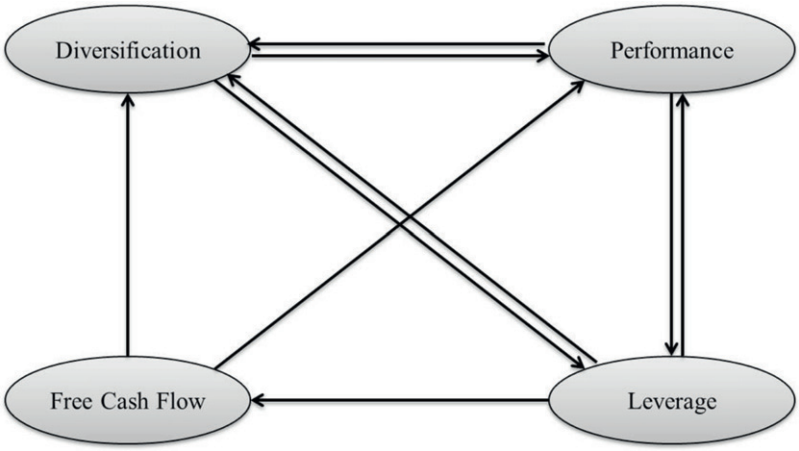

Fig. 2. Holistic framework for leverage, free cash flow, diversification and firm performance.

diversification itself destroyed firm value but financial leverage increases firm value only when firms are diversified. Following agency theory, debt leverage is an effective solution to the diversification discount. Nevertheless, the above two studies considered total diversification (Amit and Livnat, 1988) or a multi-segmentation dummy (Ruland and Zhou, 2005) in their analysis. Thus, prior studies have not provided detailed information about the inter-relationships of each diversification strategy.

The major contribution of this study lies in correcting the misspecification error in prior studies. A misspecification error is the omission of one or more important variables in the hypothesis testing model. Misspecification errors generally occur from a univariate analysis of a multivariate phenomenon, the application of data-driven techniques such as stepwise multiple regression procedures, or the omission of important variables. Thus, separate estimation and a partial examination of the relationships among leverage, free cash flow, diversification and firm performance could lead to inaccurate results due to the multivariate nature of the relationships, endogeneity and the omission of variables. Specifically, many prior studies incorporated the free cash flow hypothesis and interpreted the results based on agency theory. Yet most of these studies excluded free cash flow in their models. Because the free cash flow hypothesis is related to the associations between capital structure-performance and diversification-performance, the inclusion of free cash flow in the model and joint estimation are very important. Fig. 1 shows the four types of prior research, which are capital structure and firm performance, free cash flow hypothesis, diversification discount, and leverage and diversification. These four separate research streams could be merged, as shown in Fig. 2. The conceptual framework in Fig. 2 shows that capital structure, diversification strategy and firm performance are closely inter-correlated and free cash flow mediates the effects of capital structure on diversification and firm performance. Thus, the current study tested the holistic conceptual model presented in Fig. 2.

3. Methodology

3.1. Data

The data used in the analysis was collected from the Compustat database for the restaurant industry (SIC 5812). The final sample spanned from 1995 to 2008 and included 308 companies with a total of 2829 firm-year observations. We included non-diversified firms in our dataset to compare diversification performance in accordance with the type of diversification strategy. Of the 308 restaurant firms, 77 firms were diversified. The Compustat Segment Database provided the annual sales of each business segment based on a four-digit SIC (Standard Industrial Classification). Other variables, such as debt leverage, Tobin's q and free cash flow, were collected from the Compustat Fundamental Annual Database. To identify restaurant firms, any observations were eliminated if sales generated from the primary segment (SICs 5812) were less than 50%.

3.2. Dependent variables

The major dependent variables included in this study were firm performance (Tobin's q), capital structure (debt leverage), diversification (related/unrelated diversification entropy), and free cash flow. The dependent variables were treated as endogenous in the model. First, Tobin's q was calculated following Himmelberg et al. (1999) method. Tobin's q is the ratio of the market value of the firm divided by the replacement value of assets. Firm value was calculated as the market value of common equity plus the market value of preferred stock plus the book value of total liabilities. Replacement value of assets was the book value of total assets. Second, debt leverage was calculated as the ratio of total debt to the book value of total assets. Third, Tobin's q and debt leverage were logarithmically transformed due to the size of some of the restaurant firms.

This study used the diversification entropy measure introduced by Jacquemin and Berry (1979) to measure the level of diversification. The entropy measure has been widely used in prior strategic management literature because it is objective, continuous, and decomposable in comparison with the traditional Wrigley/Rumelt measure. However, before calculating entropy measures it is important to categorize each diversified business as either a related or unrelated business. Most prior studies followed Rumelt's classification, which identified the relatedness of businesses based on whether the first two-digit SIC codes are the same or not. If they match the two businesses are categorized as related businesses. Otherwise, they are categorized as unrelated businesses. However, the SIC classification system is not meant to represent whether businesses are related. Further, when the traditional method is applied to restaurant firms there are technically no businesses related to the primary business in this industry. Thus, this study modified the classification method based on the basic characteristics of each diversifying target industry. Following Porter (1987) and Teece (1982), related diversification means that the corporate center of a firm operating in two strategic businesses can exploit any synergies between the two to achieve a cost or differentiation advantage over an undiversified rival. Thus, two related businesses should share core assets and competencies. Because restaurant firms provide food-related products and services, we categorized food-related businesses, such as food retail, food production or restaurant franchises, as related diversification. Related and unrelated entropy were calculated as follows:

$$DR = \sum_{j=1}^{M} DR_j \times P_j$$

where DR_j is the diversification within industry groups; M is the number of industry groups ($n \geq M$); and P_j is the ratio of the firm's total sales within the jth industry group.

DR represents related diversification entropy; DR_j is related diversification arising from operating in several businesses within industry group j; and P_j is the share of the segment jth group's sales out of the total sales of the firm. Thus, a larger DR means that a firm is highly diversified into related businesses.

$$DU = \sum_{j=1}^{M} P_j \times \ln\left(\frac{1}{P_j}\right)$$

where M is the number of industry groups; P_j is the ratio of the firm's total sales within the jth industry group.

DU represents unrelated diversification entropy; P_j is the share of the jth industry group's sales out of the total sales of the firm; and M is the number of industry groups (Palepu, 1985). Likewise, a larger DU means that a firm is highly diversified into unrelated businesses. For example, let's assume that a restaurant firm generates \$50 million dollars from its core business. One business related to the core business makes \$25 million dollars, while another business that is unrelated to the core business produces another \$25 million dollars. The related diversification entropy (DR) is calculated as follows: $\{(50–75) \times ln(1–(50–75)) + (25–75) \times ln(1–(25–75))\} \times 0.75 + \{(25–25) \times ln(1–(25–25))\} \times 0.25 \approx 0.4774 + 0 \approx 0.4774$. The unrelated diversification entropy (DU) is calculated as follows: $(75–100) \times ln(1–(75–100)) + (25–100) \times ln(1–(25–100)) \approx 0.5623$.

Finally, free cash flow was measured following a modified version of Richardson's (2006) method. As indicated earlier, Richardson's (2006) measure of free cash flow is complicated. Richardson (2006) defined total investment expenditure as composed of investments to maintain existing assets that are in place as well as new investments. The difficulty derives from the fact that new investments include both sound investments in firm growth opportunities and fallacious over-investment driven by free cash flows. To identify these two types of new investments, Richardson (2006) used a regression method on new investments using a firm level investment decision model (Hubbard, 1998). The results show that the value of a new investment is perceived as free cash flows from growth opportunities. Finally, Richardson (2006) measured the source of free cash flow as the difference between free cash flows from existing assets and free cash flows from growth opportunities. Free cash flows from existing assets were calculated as net cash flow from operating activities minus maintenance investment expenditures plus R&D (Research & Development) expenditures. However, like other service industries restaurants are more concerned with advertising expenditures than R&D expenditures since they are not high-tech businesses. In other industries, R&D expenditures are an important investment in intangible assets that generate future cash flows and a competitive market position. In service industries, this role is generally played by advertising expenditures, which also contribute to a better market position and generate cash flows. Thus, we replaced R&D expenditures with advertising expenditures. This is a complicated method, but it is logical and considers all components of free cash flow at the firm level. A detailed description of the measurements is provided in the Appendix.

3.3. Proposed models and analytical method

To jointly estimate the inter-relationships of capital structure, diversification, free cash flow and firm performance, this study used 2SLS (Two-Stage Least Square) and 3SLS (Three-Stage Least square) regressions. The testing equations were formulated as follows (Table 1):

$$\begin{aligned}\ln(\text{Tobin}'s\, q)_{i,t} &= \alpha + \beta_1 \times FCF_{i,t} + \beta_2 \times R\_\text{entropy}_{i,t} \\ &+ \beta_3 \times U\_\text{entropy}_{i,t} + \beta_4 \times \ln(TDL)_{i,t} + \beta_5 \times Cashflow_{i,t} \\ &+ \beta_6 \times Sales\_GR_{i,t} + \beta_7 \times \ln(\text{sales})_{i,t} + \sum DY_t + \varepsilon_{i,t} \end{aligned} \quad (1)$$

$$\begin{aligned}\text{FCF}_{i,t} &= \alpha + \beta_1 \times \ln(TDL)_{i,t} + \beta_2 \times \text{equity\_repurchase}_{i,t} \\ &+ \beta_3 \times \text{dummy\_}Dividend_{i,t} + \beta_4 \times \ln(\text{sales})_{i,t} \\ &+ \sum DYt + \varepsilon_{i,t} \end{aligned} \quad (2)$$

$$\begin{aligned}\text{R\_entropy}_{i,t} &= \alpha + \beta_1 \times \text{FCF}_{i,t} + \beta_2 \times \ln(\text{Tobin}'s\, q)_{i,t} \\ &+ \beta_3 \times \ln(\text{TDL})_{i,t} + \beta_4 \times \text{RER}_{i,t} + \beta_5 \times \text{PPNE}_{i,t} \\ &+ \beta_6 \times \ln(\text{Ad\_Ex})_{i,t} + \beta_7 \times \ln(\text{Sales})_{i,t} + \sum DY_t + \varepsilon_{i,t} \end{aligned} \quad (3)$$

Table 1
Variable description.

Variable	Description
$ln(\text{Tobin's } q)_{i,t}$	Logarithmic transformed Tobin's q, which was calculated as the ratio of the market value of the firm divided by the replacement value of the assets. Market value of the firm is the sum of the market value of the common equity, market value of the preferred stock and the book value of total liabilities. Replacement value of assets was the book value of total assets
$FCF_{i,t}$	Free cash flow for firm i at time t, which is a modification of Richardson's (2006) calculation. A detailed method is presented in Appendix.
$R\_entropy_{i,t}$	Related entropy for firm i at time t.
$U\_entropy_{i,t}$	Unrelated entropy for firm i at time t.
$ln(TDL)_{i,t}$	Logarithmic transformed total debt leverage, which is the ratio of the total debt to the book value of total assets.
$Cashflow_{i,t}$	Cash flow of firm i at time t, which was calculated as followings: [(operating income before depreciation – total income taxes – Change in deferred taxes from the previous year to the current year – gross interest expense – preferred dividend requirements on cumulative preferred stocks and dividends paid on non-cumulative preferred stock – total dollar amount of dividends declared on common stocks)/total assets]
$Sales\_GR_{i,t}$	Net sales growth [(Net $sales_{i,t}$ – net $sales_{i,t-1}$)/net $sales_{i,t-1}$]
$ln(Sales)_{i,t}$	Logarithmic transformed net sales for firm i at time t.
$Equity\_Repurchase_{i,t}$	Equity repurchase for firm i at time t, which was calculated as the ratio of purchase of common and preferred stock to total assets.
$Dummy\_Dividend_{i,t}$	One if firm i paid out dividends at time t. Zero if firm i did not pay out dividends at time t.
$RER_{i,t}$	Ratio of retained earnings divided by total assets for firm i at time t.
$PPNE_{i,t}$	Logarithmic transformed fixed asset ratio [Ln(PP&E/total assets)]
$ln(Ad\_Ex)_{i,t}$	Logarithmic transformed advertising expenditure for firm i at time t.
$QR_{i,t}$	Quick ratio for firm i at time t [(cash and short-term investment + total receivable)/total current liability].
$Wcap_{i,t}$	Working capital for firm i at time t, which was calculated as the difference of current assets and current liabilities divided by total assets.
$ln(Capx)_{i,t}$	Logarithmic transformed capital expenditures on property, plant and equipment for firm i at time t.
$DEP_{i,t}$	Depreciation divided by total assets for firm i at time t.
$\sum DY_t$	Year dummies.

$$\text{U\_entropy}_{i,t} = \alpha + \beta_1 \times \text{FCF}_{i,t} + \beta_2 \times \ln(\text{Tobin's } q)_{i,t} + \beta_3 \times \ln(\text{TDL})_{i,t} + \beta_4 \times \text{RER}_{i,t} + \beta_5 \times \text{PPNE}_{i,t} + \beta_6 \times \ln(\text{sales})_{i,t} + \sum DY_t + \varepsilon_{i,t} \quad (4)$$

$$\ln(\text{TDL})_{i,t} = \alpha + \beta_1 \times \text{R\_entropy}_{i,t} + \beta_2 \times \text{U\_entropy}_{i,t} + \beta_3 \times \ln(\text{Tobin's } q)_{i,t} + \beta_4 \times \text{QR}_{i,t} + \beta_5 \times \text{Wcap}_{i,t} + \beta_6 \times \ln(\text{Capx})_{i,t} + \beta_7 \times \ln(\text{sales})_{i,t} + \sum DY_t + \varepsilon_{i,t} \quad (5)$$

All five dependent variables (i.e., $ln(\text{Tobin's } q)_{i,t}$, $FCF_{i,t}$, $R\_entropy_{i,t}$, $U\_entropy_{i,t}$, $ln(TDL)_{i,t}$) were assumed to be endogenous and estimated by 2SLS (Two-Stage Least Square) and 3SLS (Three-Stage Least square) regressions. Statistically, there are two methods to estimate simultaneous equation models (Greene and Zhang, 2003): (1) single-equation methods or limited information methods, such as 2SLS, and (2) system methods or full information methods, such as 3SLS. In the limited information method, each equation of the simultaneous equations is estimated independently without considering the restrictions on the other equations in the system. Conversely, the full information method estimates all the equations simultaneously by taking all restrictions into account. Greene and Zhang (2003) pointed out that full information methods are preferred to single equation methods. Belsley (1988) found that coefficients of 3SLS are asymptotically more efficient than 2SLS in cases with a small sample dataset. On the other hand, Wooldridge (2001) suggested that 2SLS is more robust and consistent if the research interest lies in a particular equation of a system. Gujarati (2003) also suggested 2SLS if there are no lagged endogenous variables and the sample is large. However, if the purpose of the study is to estimate all equations in a system, 3SLS is preferable. Thus, the choice between 2SLS and 3SLS is critical to this study. To resolve this problem this study conducted the Hausman specification test (Hausman, 1978), which tests the specification of the system and can be done equation by equation. The test picks one equation in the system and compares 2SLS and 3SLS coefficients. The test statistic is the Wald statistic based on the difference of the two estimators. The statistic has p degrees of freedom, where p denotes the number of coefficients to be tested in the equation. If the null hypothesis cannot be rejected, then 3SLS is consistent and efficient and 2SLS is only consistent. If the null hypothesis is rejected, then 3SLS coefficients are inconsistent whereas 2SLS is consistent. Consequently, the current study estimated the five proposed equations using 2SLS and 3SLS and conducted Hausman specification tests in order to decide between the two estimation results.

4. Results

Table 2 shows the results of the performance equation (Eq. (1)) estimated by OLS, 2SLS and 3SLS. This study provided the OLS (ordinary least square) regression results to compare with the other two estimations. The result of the Hausman specification test was significant and rejected the null hypothesis, which implies that 2SLS was justified for the performance equation. As seen in Table 2, debt leverage was positive in all three estimations. In 2SLS, debt leverage was positive and significant on firm performance. Thus, the signaling effect (Ross, 1977) was accepted based on these results. This means that market participants understand that highly leveraged firms are quality companies in the restaurant industry. In other words, higher debt is perceived as a positive signal to the market and those restaurant firms are considered capable of bearing a high level of debt. Nonetheless, regardless of this result managers should be careful with debt leverage due to the higher possibility of bankruptcy with an excessive level of debt. However, free cash flow was negative and significant in all estimations, which bolsters the free cash flow hypothesis (Jensen, 1986, 1989, 1993; Jensen and Meckling, 1976). Thus, firms with larger free cash flows have a propensity to invest in negative projects, which results in overinvestment and damages firm performance. In all estimations of the association between diversification and firm performance, related diversification was positive but unrelated diversification was negative. In 2SLS, however, the coefficient of related diversification was marginally significant. Thus, although it is not always evident, related diversification tends to enhance firm performance. On the other hand, in 2SLS unrelated diversification was negative and significant, which implies that there is a substantial diversification discount for unrelated businesses. The results are consistent with the traditional argument by Rumelt (1974, 1982) and also seem to support Villalonga's (2004a) argument that there is a diversification premium associated with related diversification and a diversification discount associated with unrelated diversification. However, as indicated earlier, if the unrelated diversification discount is caused by free cash flows, free cash flow should significantly affect

Table 2
Regression results of firm performance equation (Eq. (1)).

D.V.: ln(Tobin's q)$_{i,t}$	OLS	2SLS	3SLS
FCF$_{i,t}$	−0.9608*** (0.1967)	−7.3456*** (1.7846)	−11.2478*** (1.3308)
R_entropy$_{i,t}$	0.4624*** (0.0946)	1.3028* (0.7443)	1.9942*** (0.5387)
U_entropy$_{i,t}$	−0.7940*** (0.2883)	−7.9094*** (2.5418)	−12.6414*** (1.9052)
ln(TDL)$_{i,t}$	0.0457 (0.0432)	0.5869*** (0.1818)	0.4145*** (0.1551)
Cashflow$_{i,t}$	0.7906*** (0.2058)	5.0085*** (1.1382)	4.2730*** (0.8734)
Sales_GR$_{i,t}$	0.0029 (0.0203)	−0.0926* (0.0529)	−0.0966*** (0.0293)
ln(Sales)$_{i,t}$	0.1211*** (0.0134)	0.1263*** (0.0378)	0.2071*** (0.0325)
Observation number	511	511	511
RMSE	0.5162	1.1656	1.7512
F-value	12.59***	3.11***	
χ^2			262.17***
Hausman specification test between 2SLS and 3SLS		$\chi^2_{(df=18)} = 103.72$***	

(c.f.) Coefficients of year dummies were not reported. Numbers in parenthesis were the standard errors.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Table 3
Regression results of free cash flow equation (Eq. (2)).

D.V.: FCF$_{i,t}$	OLS	2SLS	3SLS
ln(TDL)$_{i,t}$	−0.0252** (0.0116)	−0.0834*** (0.0185)	−0.0847*** (0.0181)
Equity_Repurchase$_{i,t}$	0.1222 (0.0952)	0.1200 (0.0975)	−0.0381 (0.0666)
Dummy_Dividend$_{i,t}$	−0.0307** (0.0148)	−0.0370** (0.0153)	−0.0104 (0.0101)
ln(Sales)$_{i,t}$	0.0199*** (0.0039)	0.0229*** (0.0041)	0.0227*** (0.0038)
Observation number	511	511	511
RMSE	0.1446	0.1483	0.1466
F-value	4.74***	5.56***	
χ^2			83.14***
Hausman specification test between 2SLS and 3SLS		$\chi^2_{(df=15)} = 10.35$	

(c.f.) Coefficients of year dummies were not reported. Numbers in parenthesis were the standard errors.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Table 4
Regression results of related diversification entropy equation (Eq. (3)).

D.V.: R_entropy$_{i,t}$	OLS	2SLS	3SLS
FCF$_{i,t}$	0.1246 (0.0798)	0.2951 (0.2094)	0.4712** (0.1958)
ln(Tobin's q)$_{i,t}$	0.1032*** (0.0201)	−0.0305 (0.0466)	0.0128 (0.0440)
ln(TDL)$_{i,t}$	0.0188 (0.0216)	−0.1363*** (0.0498)	−0.1301*** (0.0478)
RER$_{i,t}$	0.0016 (0.0129)	−0.0547** (0.0231)	−0.0545** (0.0216)
PPNE$_{i,t}$	−0.1710*** (0.0303)	−0.1630*** (0.0342)	−0.1716*** (0.0325)
ln(Ad_Ex)$_{i,t}$	0.0311*** (0.0111)	0.0517*** (0.0130)	0.0316*** (0.0118)
ln(Sales)$_{i,t}$	0.0067 (0.0076)	0.0395*** (0.0010)	0.0345** (0.0105)
Observation number	511	511	511
RMSE	0.2335	0.2550	0.2476
F-value	28.47***	23.09***	
χ^2			62.17***
Hausman specification test between 2SLS and 3SLS		$\chi^2_{(df=18)} = 23.07$	

(c.f.) Coefficients of year dummies were not reported. Numbers in parenthesis were the standard errors.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

unrelated diversification, but not related diversification. Thus, we examined this issue in Eqs. (3) and (4).

Table 3 shows the results of the free cash flow equation (Eq. (2)). The Hausman specification test was not significant and the null hypothesis was accepted. Thus, the Hausman specification test supported using 3SLS. In 3SLS, debt leverage was negative and significant, which is consistent with Titman et al. (2004), Fairfield et al. (2003) and Dechow et al. (2008). This implies that increasing debt leverage is an efficient tool for reducing free cash flows, which, in turn, could enhance firm performance. Thus, over-investment due to managerial discretion could be mitigated by increasing debt leverage.

Tables 4 and 5 show the results of the diversification entropy equations (Eqs. (3) and (4)). The Hausman specification test of the related diversification entropy equation (Eq. (3)) justified 3SLS, while 2SLS was justified for the unrelated diversification entropy equation (Eq. (4)). The most important thing to note in Tables 4 and 5 is that both related and unrelated diversifications were positively influenced by free cash flow. This means that restaurant firms with free cash flows have a propensity to diversify via either type of strategy. Thus, the argument that the unrelated diversification discount is a result of free cash flows is not relevant based on the empirical results. Besides, the magnitude of free cash flow coefficient was larger for related diversification than unrelated diversification. This implies that restaurant firms with free cash flows have a tendency to be more engaged in related businesses. Thus, if the diversification discount is caused by free cash flows both types of diversification should have a negative

Table 5
Regression results of unrelated diversification entropy equation (Eq. (4)).

D.V.: U_entropy$_{i,t}$	OLS	2SLS	3SLS
FCF$_{i,t}$	0.0600** (0.0269)	0.1908*** (0.0665)	0.2063*** (0.0535)
ln(Tobin's *q*)$_{i,t}$	−0.0178*** (0.0067)	−0.0239* (0.0141)	−0.0367*** (0.0129)
ln(TDL)$_{i,t}$	−0.0090 (0.0072)	−0.0127 (0.0152)	0.0032 (0.0138)
RER$_{i,t}$	−0.0161*** (0.0044)	−0.0251*** (0.0072)	−0.0235*** (0.0061)
PPNE$_{i,t}$	−0.0252** (0.0098)	−0.0298*** (0.0106)	−0.0164* (0.0091)
ln(Sales)$_{i,t}$	0.0085*** (0.0025)	0.0098*** (0.0035)	0.0098*** (0.0031)
Observation number	511	511	511
RMSE	0.0789	0.0809	0.0812
F-value	2.99***	1.58*	
χ^2			37.03***
Hausman specification test between 2SLS and 3SLS		$\chi^2_{(df=17)} = 28.51$**	

(c.f.) Coefficients of year dummies were not reported. Numbers in parenthesis were the standard errors.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Table 6
Regression results of debt leverage equation (Eq. (5)).

D.V.: *ln*(TDL)$_{i,t}$	OLS	2SLS	3SLS
R_entropy$_{i,t}$	0.2194** (0.0896)	−0.5720 (0.5812)	−0.9382*** (0.3645)
U_entropy$_{i,t}$	0.1333 (0.2626)	6.7291*** (2.5935)	11.3726*** (1.8868)
ln(Tobin's *q*)$_{i,t}$	−0.0422 (0.0441)	0.2463 (0.3187)	0.2047 (0.2296)
QR$_{i,t}$	−0.0245 (0.0531)	0.1513 (0.2094)	0.2125 (0.1422)
Wcap$_{i,t}$	−1.8746*** (0.2172)	−2.2938*** (0.8669)	−2.2495*** (0.5957)
ln(Capx)$_{i,t}$	−0.0545** (0.0235)	−0.0911 (0.0856)	−0.0060 (0.0544)
ln(Sales)$_{i,t}$	0.0281** (0.0137)	0.0219 (0.0472)	0.0222 (0.0354)
Observation number	511	511	511
RMSE	0.4606	0.7198	1.0157
F-value	81.12***	34.03***	
χ^2			709.79***
Hausman specification test between 2SLS and 3SLS		$\chi^2_{(df=19)} = 42.36$***	

(c.f.) Coefficients of year dummies were not reported. Numbers in parenthesis were the standard errors.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

impact on firm performance. However, as Table 2 shows, only unrelated diversification had a negative and significant impact on firm performance. Consequently, the unrelated diversification discount is a result of the under-performing unrelated business itself.

As seen in Tables 4 and 5, firm performance was not significant for related diversification entropy, but it was negatively significant for unrelated diversification, although only marginally significant. Consistent with Hall (1995) and Rijamampianina et al. (2003), low performing restaurant firms have a propensity to diversify into unrelated businesses. This implies that low performing restaurant firms are moving to other industries to overcome unfavorable circumstances in the restaurant industry. Finally, debt leverage had a negative but significant impact on diversification entropy, as seen in Table 4. But it is not significant in Table 5. Agency theory hypothesizes that debt leverage might reduce the level of unrelated diversification, which decreases agency costs. However, the results in Table 5 show that increasing debt is not an efficient solution for reducing the level of unrelated diversification. This means that even though debt is a significant tool for reducing free cash flows, it has no direct effect on unrelated diversification. On the other hand, Table 4 shows that low leveraged restaurant firms are more likely to engage in related diversification. This is understandable considering that franchises are a typical diversifying target business of restaurant firms and franchising in particular provides additional funds for restaurant firms.

Finally, Table 6 shows the results of the debt leverage equation (Eq. (5)). The Hausman specification test was significant, which means that 2SLS was justified. Firm performance had a positive but not significant impact on debt leverage. It is believed that firms with a high Tobin's *q* are more likely to finance using the equity market because they are fairly evaluated in the stock market. A high Tobin's *q* means that the firm's equity is more fairly or highly valued in the equity market than its book value. Thus, the financing costs of equity are cheaper than debt for such firms. On the other hand, the coinsurance effect (Bergh, 1997; Berger and Ofek, 1995; Comment and Jarrell, 1995; Kim and McConnell, 1977; Lewellen, 1971) argues that both types of diversification strategies could increase the level of debt due to a reduction of cash flow volatility. However, the transaction cost hypothesis (Markides and Williamson, 1996; Chatterjee and Wernerfelt, 1991; Montgomery and Wernerfelt, 1988) argues that related diversification decreases debt leverage, but unrelated diversification increases debt leverage. As shown in Table 6, the 2SLS results found that related diversification was negative but not significant and unrelated diversification was positive and significant. However, 3SLS found that both related and unrelated diversifications were significant. Thus, the transaction cost hypothesis is supported by the results. Even though 2SLS was justified for the debt leverage equation, the overall patterns of the relationship between diversification and leverage followed the transaction cost hypothesis. Thus, related diversified restaurant firms are more likely to be engaged in the equity market, while unrelated diversified restaurant firms are more likely to rely on debt borrowing. The negative but not significant coefficient of related diversification could be due to the fact that the composition of related diversification in the restaurant industry includes various but heterogeneous industries such as food production, food retailing and franchising. For example, the franchising segment, the major related business for restaurant firms, provides additional financing to franchisor restaurant firms. However, food production requires relatively larger capital investments for the construction of factories and equipment. However, if we consider the negative and significant effect of unrelated diversification on firm performance

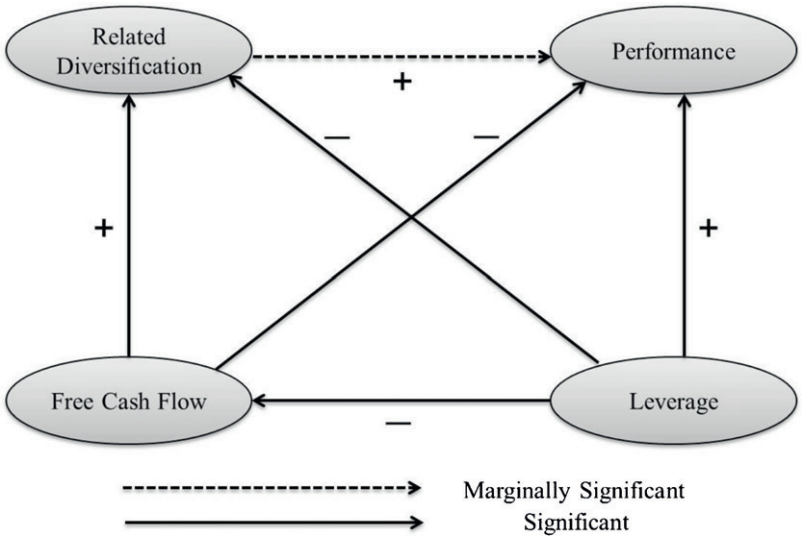

Fig. 3. Inter-relationship among leverage, free cash flow, related diversification and firm performance.

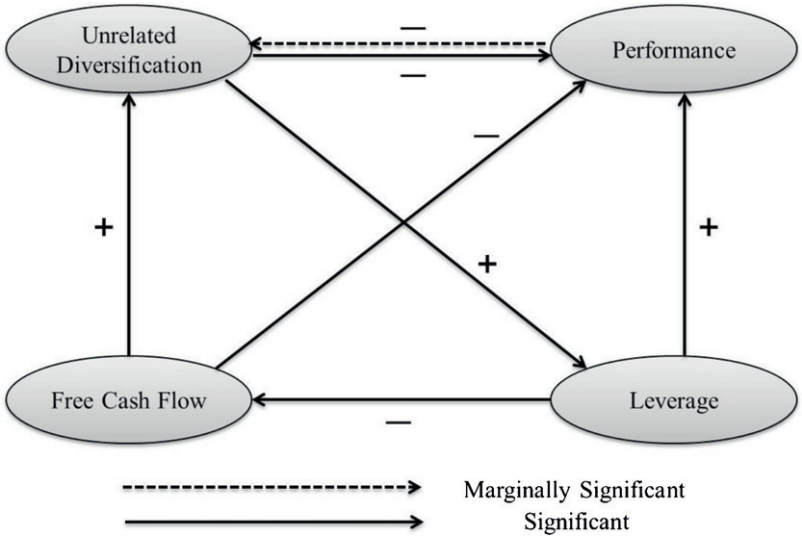

Fig. 4. Inter-relationship among leverage, free cash flow, unrelated diversification and firm performance.

in Table 2, increased debt leverage via unrelated diversification could mitigate the negative influence of unrelated diversification on firm performance because higher debt enhances firm performance. To help the reader understand the findings, we summarize the results of the inter-relationships among leverage, free cash flow, diversification and firm performance for related and unrelated diversification separately in Figs. 3 and 4.

5. Conclusion

This study jointly examined the inter-relationship among capital structure, free cash flow, diversification and firm performance. Through reviewing prior research, this study revisited various theories of capital structure, free cash flow, diversification and firm performance. These four factors are closely inter-related, but there has been little effort to jointly investigate them using a holistic approach. The current study attempted to test the inter-relationships and expand the understanding of "Strategy–Capital structure" perspectives. Beyond this, examining restaurant firms contributes to understanding the specific features of inter-relationships among these factors in the service industry.

This study found that debt leverage had a positive influence on firm performance, which supported the signaling effect (Ross, 1977), while firm performance had no significant direct impact on debt leverage. However, performance can indirectly affect leverage via unrelated diversification. Low performing firms have a propensity to diversify into unrelated businesses, which in turn increases debt leverage (Fig. 4). This study tested the free cash flow hypothesis for diversification strategy and firm performance. Free cash flow directly deteriorates firm performance, which means an over-investment problem exists in the restaurant industry. However, performance declines could be alleviated by increasing debt, since debt leverage decreases free cash flows. From the perspective of free cash flow, the most important finding of this study is that free cash flows amplified both types of diversification. Thus, if the diversification discount in unrelated diversification is derived from free cash flows, the positive effect of free cash flow on diversification

should be significant only for unrelated diversification. However, this study found that both related and unrelated diversification entropies were increased by free cash flows. Consequently, the diversification discount is not caused by free cash flows, but instead the varied performance is produced by the diversification itself.

In the relationship between diversification and firm performance, related diversification had a positive effect on firm performance and unrelated diversification had a negative and significant effect. Firm performance was not significant in terms of related diversification, but low performing firms tended to engage in unrelated diversification more often. Finally, in the relationship between diversification and debt leverage, this study found that the transaction cost hypothesis was supported in the restaurant industry. There could be a restaurant industry specific effect derived from diversifying target businesses. In the restaurant industry the major related diversifying business is franchising, which does not require a considerable amount of financing. Other businesses require a relatively large amount of financing compared to franchising. Thus, the mixture of different diversifying target businesses might produce insignificant results in 2SLS. As the transaction cost hypothesis argues, however, unrelated diversification increases debt leverage. Further, the negative impact of unrelated diversification is alleviated via debt leverage because unrelated diversification increases debt leverage, which in turn increases firm performance. Increased debt leverage through unrelated diversification also decreases free cash flows, which in turn decreases unrelated diversification. Thus, the negative effects of unrelated diversification could be mitigated via two paths: unrelated diversification-leverage-performance or unrelated diversification-leverage-free cash flow-unrelated diversification. Consequently, the unfavorable effects of unrelated diversification are allayed by the direct positive effects of debt leverage on firm performance and the level of unrelated diversification is affected by the feedback loop via the path of unrelated diversification-leverage-free cash flow-unrelated diversification. This means that leverage and free cash flow play an important role in maintaining a stable level of unrelated diversification. Thus, unrelated diversification cannot excessively increase due to these two components: leverage and free cash flow.

Practical implications can be inferred from the results of this study. Restaurant firms with large free cash flows need to diversify into related businesses to enhance firm performance. In order to avoid over-investment problems, restaurant owners need to decrease free cash flows using debt leverage. In particular, unrelated diversified restaurants should maintain higher debt leverage to alleviate the negative impact of unrelated diversification on firm performance. In unrelated diversified restaurant firms, the positive feedback via debt leverage is efficient due to the direct and indirect influence of debt leverage via the two paths.

This study introduced the detailed inter-relationships among capital structure, free cash flow, diversification and firm performance. It also expanded our understanding of the inter-relationships among them. Based on the results of this study, further studies need to incorporate the characteristics of diversifying target industries into this framework. As mentioned earlier, although related diversification has a positive influence on firm performance, the effect could differ according to the characteristics of the diversifying target business. For example, franchises and food production are different in terms of financing requirements. Also, further studies need to examine the holistic relationship among the four variables used in this study in other industries such as manufacturing and high technology industries. Finally, little effort has been made to investigate the effects of within-industry diversification or vertical integration in this framework.

Acknowledgement

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Appendix 1.

See Tables A1 and A2.

Table A1
Descriptive statistics.

Variables	Full sample	Diversified firms	Undiversified firms
Tobin' *q*	1.48	1.53	1.37
Related entropy	0.18	0.29	–
Unrelated entropy	0.02	0.03	–
Total debt leverage	0.60	0.59	0.64
Free cash flow	−0.03	−0.01	−0.05
Sales growth rate	19.3%	16.5%	24.6%
Net sales	793.15	1036.22	346.73

(c.f.) The shows mean value of variables. Unit of net sales is US million dollars.

Table A2
List of diversified restaurants.

Company name	Company name	Company name
Applebees Intl. Inc.	Friendly Ice Cream Corp.	Rare Hospitality Intl Inc.
Back Yard Burgers Inc.	Frisch's Restaurants Inc.	Red Robin Gourmet Burgers
Benihana Inc.	Good Times Restaurants Inc.	Roadhouse Grill Inc.
Blimpie Intl. Inc.	Grill Concepts Inc.	Rubio's Restaurants Inc.
Bob Evans Farms	Host Marriott Services Corp.	Ruby Tuesday Inc.
Briazz Inc.	Jack In The Box Inc.	Ruths Hospitality Group Inc.
Brinker Intl. Inc.	Krystal Co.	Ryan's Restaurant Group Inc.
Buffalo Wild Wings Inc.	Landrys Restaurants Inc.	Santa Barbara Restaurant Group
Burger King Holdings Inc.	Logans Roadhouse Inc.	Shoney's Inc.
California Pizza Kitchen Inc.	Max & Ermas Restaurants	Skyline Chili Inc.
Champs Entmt Inc.	McDonald's Corp.	Sonic Corp.
Checkers Drive-In Restaurant	Mexican Restaurants Inc.	Star Buffet Inc.
Cheesecake Factory Inc.	Miami Subs Corp.	Steakhouse Partners Inc.
Chipotle Mexican Grill Inc.	N U Pizza Holding Corp.	Taco Cabana
CKE Restaurants Inc.	Nathan's Famous Inc.	Texas Roadhouse Inc.
Cosi Inc.	New York Bagel Entrprs Inc.	Tim Hortons Inc.
Creative Host Services Inc.	Noble Romans Inc.	Tumbleweed Inc.
Cucos Inc.	O'charley's Inc.	Ultimate Franchise Systems
Dennys Corp.	Panera Bread Co.	Uno Restaurant Corp.
Eateries Inc.	Papa Johns International Inc.	Vicorp Restaurants Inc.
Einstein Noah Restaurant Group	Paradise Holdings Inc.	Wall Street Deli Inc.
Elephant & Castle Group Inc.	Planet Hollywood Intl Inc.	Wendy's International Inc.
Elmer's Restaurants Inc.	Pollo Tropical Inc.	Western Sizzlin Corp.
Elxsi Corp.	Quiznos Corp.	Worldwide Restaurant Concept
Famous Daves of America Inc.	Rainforest Cafe Inc.	Yum Brands Inc.
Fine Host Corp.	Rallys Hamburgers Inc.	

Appendix 2.

Panel A. Definition of investment expenditures.

	Variable	Compustat Item
Total investment expenditure	I^{Total}	
+ Capital expenditure	*CAPEX*	capx
+ Advertising expenditure	*AD*	xad
+ Acquisition	*ACQ*	aqc
− Sale of property, plant and equipment	*SalePPE*	sppe
Investment to maintain existing assets in place		
+ Amortization and depreciation	$I^{Maintenance}$	dpc

(c.f.) All variables were normalized by prior year's total assets.

Panel B. Decomposition of investment expenditure.

Total investment expenditure ($I^{Total}{}_{,i,t}$)	=	Investment to Maintain Existing Assets in Place ($I^{Maintenance}{}_{,i,t}$)	+	New Investments ($I^{New}{}_{,i,t}$)
New Investments ($I^{New}{}_{,i,t}$)	=	Expected Investment on New Projects ($I^{New^*}{}_{,i,t}$)	+	Abnormal investment in New Projects ($I^{New\ \varepsilon}{}_{,i,t}$)

Panel C. Firm level investment decision model.

$$I^{New}_{,i,t} = \alpha + \beta_1 \times I^{i,t-1}_{New} + \beta_2 \times \ln(Tobin's\,q)_{i,t-1} + \beta_3 \times \ln(Total\ debt\ leverage)_{i,t-1} + \beta_4 \times \ln(Cash)_{i,t-1} + \beta_5 \times \ln(Total\ assets)_{i,t-1} + \sum \text{Year\_dummies} + \varepsilon_{i,t}$$

$I^{New^*}{}_{,i,t}$ = predicted value of firm level investment decision model from above regression; $I^{New\varepsilon}{}_{,i,t}$ = error term of firm level investment decision model from above regression.

(c.f.) All variables were normalized by prior year's total assets.

Panel D. Source of free cash flow.

	Variable	Compustat Item
Free cash flow from existing assets in place	CF^{AIP}	
+ Net cash flow from operating activities	*CFO*	oancf
− Maintenance investment Expenditure	$I^{Maintenanec}$	dpc
+ Advertising expenditure	*AD*	xad
Free cash flow from growth opportunities		
+ Expected Investment on New Projects	I^{New^*}	

(c.f.) All variables were normalized by prior year's total assets.

Net source of free cash flow (FCF) = $CF^{AIP} - I^{New^*}$.

References

Alonso, E., 2003. Does diversification strategy matter in explaining capital structure? Some evidence from Spain. Applied Financial Economics 13, 427–430.

Amit, R., Livnat, J., 1988. Diversification, capital structure, and systematic risk: an empirical investigation. Journal of Accounting, Auditing, and Finance 3, 19–43.

Andrews, K., 1971. The Concept of Corporate Strategy. Irwin, Homewood, IL.

Arslan, O., Karan, M., 2007. Does free cash flow anomaly exist in an emerging market? Evidence from the Istanbul Stock Exchange. International Research Journal of Finance and Economics 11, 163–171.

Barclay, M.J., Smith, C.W., Watts, R.L., 1995. The determinants of corporate leverage and dividend policies. Journal of Applied Corporate Finance 7, 4–19.

Barton, S., Gordon, P., 1987. Corporate strategy: useful perspective for the study of capital structure? Academy of Management Review 12, 67–75.

Belsley, D., 1988. Two-or three-stage least squares? Computational Economics 1, 21–30.

Berger, P., Ofek, E., 1995. Diversification's effect on firm value. Journal of Financial Economics 37, 39–65.

Bergh, D., 1997. Predicting divestiture of unrelated acquisitions: an integrative model of ex ante conditions. Strategic Management Journal 18, 715–731.

Bradley, M., Jarrell, G., Kim, E., 1984. On the existence of an optimal capital structure: theory and evidence. Journal of Finance 39, 857–878.

Brush, T., Bromiley, P., Hendrickx, M., 2000. The free cash flow hypothesis for sales growth and firm performance. Strategic Management Journal 21, 455–472.

Campa, J., Kedia, S., 2002. Explaining the diversification discount. The Journal of Finance 57, 1731–1762.

Castanias, R., 1983. Bankruptcy risk and optimal capital structure. Journal of Finance, 1617–1635.

Chatterjee, S., Wernerfelt, B., 1991. The link between resources and type of diversification: theory and evidence. Strategic Management Journal 12, 33–48.

Chevalier, J., 2004. What Do We Know About Cross-subsidization? Evidence from Merging Firms. The BE Journal of Economic Analysis & Policy 4, 3.

Chkir, I., Cosset, J., 2001. Diversification strategy and capital structure of multinational corporations. Journal of Multinational Financial Management 11, 17–37.

Comment, R., Jarrell, G., 1995. Corporate focus and stock returns. Journal of Financial Economics 37, 67–87.

De Jong, A., 2002. The disciplining role of leverage in Dutch firms. Review of Finance 6, 31.

Dechow, P., Richardson, S., Sloan, R., 2008. The persistence and pricing of the cash component of earnings. Journal of Accounting Research 46, 537–566.

Demsetz, H., Villalonga, B., 2001. Ownership structure and corporate performance. Journal of Corporate Finance 7, 209–233.

Denis, D., Denis, D., Sarin, A., 1997. Agency problems, equity ownership, and corporate diversification. Journal of Finance 52, 135–160.

Doukas, J., Kan, O., 2004. Excess cash flows and diversification discount. Financial Management 33, 71–88.

Fairfield, P., Whisenant, J., Yohn, T., 2003. Accrued earnings and growth: implications for future profitability and market mispricing. Accounting Review 78, 353–371.

Ferri, M., Jones, W., 1979. Determinants of financial structure: a new methodological approach. Journal of Finance, 631–644.

Finkelstein, S., Hambrick, D., 1996. Strategic Leadership: Top Executives and Their Effects on Organizations. West Publishing Company, St. Paul, MN.

Gill, A., Biger, N., Bhutani, S., 2008. Corporate performance and the chief executive officer's compensation in the service industry. Open Business Journal 1, 53–57.

Graham, J., Lemmon, M., Wolf, J., 2002. Does corporate diversification destroy value? The Journal of Finance 57, 695–720.

Greene, W., Zhang, C., 2003. Econometric Analysis. Prentice Hall Upper, Saddle River, NJ.

Gujarati, D., 2003. Basic Econometrics, 4th ed. McGraw Hill, New York, NY.

Hall, E., 1995. Corporate diversification and performance: an investigation of causality. Australian Journal of Management 20, 25.

Harvey, C., Lins, K., Roper, A., 2004. The effect of capital structure when expected agency costs are extreme. Journal of Financial Economics 74, 3–30.

Hausman, J., 1978. Specification tests in econometrics. Econometrica: Journal of the Econometric Society 46, 1251–1271.

Higgins, R., Schall, L., 1975. Corporate bankruptcy and conglomerate merger. Journal of Finance 30, 93–113.

Himmelberg, C., Hubbard, R., Palia, D., 1999. Understanding the determinants of managerial ownership and the link between ownership and performance. Journal of Financial Economics 53, 353–384.

Hubbard, R., 1998. Capital-market imperfections and investment. Journal of Economic Literature 36, 193–225.

Hyland, D., Diltz, J., 2002. Why firms diversify: an empirical examination. Financial Management 31, 51–81.

Jacquemin, A., Berry, C., 1979. Entropy measure of diversification and corporate growth. The Journal of Industrial Economics 27, 359–369.

Jang, S., 2011. Growth-focused or profit-focused firms: transitions toward profitable growth. Tourism Management 32 (3), 667–674.

Jang, S., Park, K., 2011. Inter-relationship between firm growth and profitability. International Journal of Hospitality Management 30 (4), 1027–1035.

Jang, S., Tang, C., Chen, M., 2008. Financing behaviors of hotel companies. International Journal of Hospitality Management 27, 478–487.

Jensen, M., 1986. Agency costs of free cash flow, corporate finance, and takeovers. The American Economic Review 76, 323–329.

Jensen, M., 1989. Eclipse of the public corporation. Harvard Business Review 67, 61–75.

Jensen, M., 1993. The modern industrial revolution: exit and the failure of internal control systems. Journal of Finance 48, 831–880.

Jensen, M., Meckling, W., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. Journal of Financial Economics 3, 305–360.
Kester, W., 1986. Capital and ownership structure: a comparison of United States and Japanese manufacturing corporations. Financial Management 15, 5–16.
Kim, E., McConnell, J., 1977. Corporate mergers and the co-insurance of corporate debt. Journal of Finance 32, 349–365.
Kochhar, R., 1996. Explaining firm capital structure: the role of agency theory vs. transaction cost economics. Strategic Management Journal 17, 713–728.
Kochhar, R., Hitt, M., 1998. Linking corporate strategy to capital structure: diversification strategy, type and source of financing. Strategic Management Journal 19, 601–610.
La Rocca, M., La Rocca, T., Gerace, D., Smark, C., 2009. Effect of diversification on capital structure. Accounting & Finance 49, 799–826.
Lang, L., Ofek, E., Stulz, R., 1996. Leverage, investment, and firm growth. Journal of Financial Economics. 40, 3–29.
Lang, L., Stulz, R., 1994. Tobin's q, corporate diversification, and firm performance. Journal of Political Economy 102, 1248–1280.
Lehn, K., Poulsen, A., 1989. Free cash flow and stockholder gains in going private transactions. Journal of Finance 44, 771–787.
Lewellen, W., 1971. A pure financial rationale for the conglomerate merger. Journal of Finance 26, 521–537.
Li, D., Li, S., 1996. A theory of corporate scope and financial structure. Journal of Finance 51, 691–709.
Majd, S., Myers, S.C., 1987. Tax asymmetries and corporate tax reform. In: Feldstein, M. (Ed.), The effects of taxation on capital accumulation. University of Chicago Press, Chicago, IL, pp. 343–376.
Markides, C., Williamson, P., 1996. Corporate diversification and organizational structure: a resource-based view. Academy of Management Journal 39, 340–367.
McConnell, J., Servaes, H., 1995. Equity ownership and the two faces of debt. Journal of Financial Economics 39, 131–157.
Miller, K., Bromiley, P., 1990. Strategic risk and corporate performance: an analysis of alternative risk measures. Academy of Management Journal 33, 756–779.
Modigliani, F., Miller, M., 1958. The cost of capital, corporation finance and the theory of investment. The American Economic Review 48, 261–297.
Modigliani, F., Miller, M., 1963. Corporate income taxes and the cost of capital: a correction. The American Economic Review 53, 433–443.
Montgomery, C., Wernerfelt, B., 1988. Diversification, Ricardian rents, and Tobin's *q*. The RAND Journal of Economics 19, 623–632.
Myers, S., 1984. The capital structure puzzle. Journal of Finance 39, 575–592.
Myers, S., Majluf, N., 1984. Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics 13, 157–187.
Palepu, K., 1985. Diversification strategy, profit performance and the entropy measure. Strategic Management Journal 6, 239–255.
Porter, M.E., 1987. From competitive advantage to corporate strategy. Harvard Business Review 65 (3), 43–59.
Rajan, R., Servaes, H., Zingales, L., 2000. The cost of diversity: the diversification discount and inefficient investment. The Journal of Finance 55, 35–80.
Rajan, R., Zingales, L., 1995. What do we know about capital structure? Some evidence from international data. Journal of Finance 50, 1421–1460.
Riahi-Belkaoui, A., Bannister, J., 1994. Multidivisional structure and capital structure: the contingency of diversification strategy. Managerial and Decision Economics 15, 267–276.
Richardson, S., 2006. Over-investment of free cash flow. Review of Accounting Studies 11, 159–189.
Rijamampianina, R., Abratt, R., February, Y., 2003. A framework for concentric diversification through sustainable competitive advantage. Management Decision 41, 362–371.
Rose, N., Shepard, A., 1997. Firm diversification and CEO compensation: managerial ability or executive entrenchment? Rand Journal of Economics 28, 489–514.
Ross, S., 1977. The determination of financial structure: the incentive-signalling approach. The Bell Journal of Economics 8, 23–40.
Ruland, W., Zhou, P., 2005. Debt, diversification, and valuation. Review of Quantitative Finance and Accounting 25, 277–291.
Rumelt, R., 1974. Strategy, Structure, and Economic Performance. Harvard University Press, Cambridge, MA.
Rumelt, R., 1982. Diversification strategy and profitability. Strategic Management Journal 3, 359–369.
Scharfstein, D., Stein, J., 2000. The dark side of internal capital markets: divisional rent-seeking and inefficient investment. The Journal of Finance 55, 2537–2564.
Scherer, F., Ross, D., 1970. Industrial Market Structure and Market Performance. Rand McNally, Chicago.
Shin, H., Stulz, R., 1998. Are internal capital markets efficient? Quarterly Journal of Economics 113, 531–552.
Smith, C., Watts, R., 1992. The investment opportunity set and corporate financing, dividend, and financing policies. Journal of Financial Economics 32, 262–292.
Stulz, R., 1990. Managerial discretion and optimal financing policies. Journal of Financial Economics 26, 3–27.
Tang, C., Jang, S., 2007. Revisit to the determinants of capital structure: a comparison between lodging firms and software firms. International Journal of Hospitality Management 26 (1), 175–187.
Tang, C., Jang, S., 2010. Does international diversification discount exist in the hotel industry? Journal of Hospitality and Tourism Research 34 (2), 225–246.
Teece, D.J., 1982. Towards an economic theory of the multiproduct firm. Journal of Economic Behavior & Organization 3 (1), 39–63.
Taylor, P., Lowe, J., 1995. A note on corporate strategy and capital structure. Strategic Management Journal 16, 411–414.
Titman, S., Wei, K., Xie, F., 2004. Capital investments and stock returns. Journal of Financial and Quantitative Analysis 39, 677–700.
Titman, S., Wessels, R., 1988. The determinants of capital structure choice. Journal of Finance 43, 1–19.
Villalonga, B., 2004a. Diversification discount or premium? New evidence from the business information tracking series. The Journal of Finance 59, 479–506.
Villalonga, B., 2004b. Does diversification cause the"diversification discount"? Financial Management 33, 5–27.
Weston, J., Brigham, E., 1981. Managerial Finance, 7th ed. Dryden Press, Hinsdale, IL.
Wooldridge, J., 2001. Applications of generalized method of moments estimation. Journal of Economic Perspectives, 87–100.
Zhao, Y., Chen, K., Yao, L., 2009. Effects of takeover protection on earnings overstatements: evidence from restating firms. Review of Quantitative Finance and Accounting 33, 347–369.