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Article

Growth opportunities and the effect of corporate diversification on value

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ABSTRACT

This paper provides empirical evidence of how a firm's growth opportunities shape the diversification–value relationship on a sample of U.S. companies between 1998 and 2010. Our findings suggest that the negative relationship between diversification and a firm's value may reverse at high levels of diversification, and that such a U-form diversification–value relation is partly mediated by a firm's growth opportunities. Results are robust to various model specifications and after controlling for endogenous self-selection of the diversification decision.

1. Introduction

Corporate diversification and its effect on a firm's value is a long-standing controversy in the literature. The bulk of the research is not optimistic about the implications of this strategy for value creation while, at the same time, diversified firms maintain their relevance in modern economies. Evidence in prior literature ranges from the diversification discount (the major position, as documented by Lang and Stulz, 1994; Berger and Ofek, 1995; Servaes, 1996; Stowe and Xing, 2006; Hoechle et al., 2012) to the diversification premium (Campa and Kedia, 2002; Villalonga, 2004a), and also includes the lack of any significant relationship (Villalonga, 2004b; Elsas et al., 2010). The so-called *diversification puzzle* remains unresolved, in both the academic and business sphere.[1]

The origin of this conflicting evidence also remains unclear. One prominent strand of research suggests that endogeneity may obscure the true relationship between diversification and corporate value. In this regard, Campa and Kedia (2002), Miller (2004), and Villalonga (2004b), among others, argue that certain factors affecting a firm's decision to diversify may also drive value outcomes. Overlooking such endogeneity may misattribute valuation effects to this strategy rather than to a firm's circumstances prior to the diversification decision. Once this endogeneity is controlled, Campa and Kedia (2002) report a premium. Nevertheless, Hoechle et al. (2012) cast doubt on this argument since they still obtain a discount even when endogeneity is accounted for.

Much of the empirical literature addresses the 'average effect' of diversification in terms of discount/premium, yet insufficient attention is paid to the cross-sectional variation of diversification value outcomes (Stein, 2003). In this sense, recent research embraces a contingent approach and posits that the impact of diversification on a firm's value may differ across firms. This relationship may be influenced by certain factors such as the institutional framework (Lins and Servaes, 1999), the industry (Santaló and Becerra, 2008), or diversity of growth opportunities (Rajan et al., 2000), to name but a few.

Among those factors, the literature has compiled suggestive yet inconclusive evidence concerning firms' growth opportunities. Certain papers such as Bernardo and Chowdhry (2002) explain the diversification discount on the grounds that single-segment firms have more growth opportunities whereas multisegment firms may have exhausted part of these. Further supporting evidence, such

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[1] *"But is there an optimum degree of diversification? It is a question many of our clients ask us* (advisers at the Boston Consulting Group)" (Heuskel et al., 2006).

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as Ferris et al. (2002), reveals for a sample of international joint ventures, that diversification is value-destroying in firms with a weak cash flow position and low growth opportunities available. In contrast, other evidence (Stowe and Xing, 2006) shows that the discount remains after controlling for growth opportunities.

Based on this strand of literature, we empirically analyze whether the effect of diversification on a firm's value (discount/premium) may be contingent on growth opportunities. Firstly, we explore how diversification shapes the value of a firm's growth opportunities (more specifically, the proportion of growth opportunities value over a firm's total value, hereinafter, the growth opportunities ratio, or *GOR*). According to Myers (1977), growth opportunities are one component of a firm's market value (the other being the value of assets in place). Were diversification to have a significant effect on *GOR*, we would test whether a proportion of the total effect of diversification strategy on a firm's value is channeled via the value of growth opportunities. To address this potential mediating role of growth opportunities, we follow Baron and Kenny's (1986: 1176) causal step method. This approach is based on analyzing whether the direct effect between diversification and firm value (widely documented in prior literature) becomes weaker once the mediator *GOR* is accounted for in the model. If so, it will confirm that part of the impact of diversification is channeled through *GOR*.

Our empirical analysis is carried out on a dataset of U.S. firms from 1998 to 2010 (16,859 firm-year observations). Our empirical evidence is based on U.S. on a post-1997 sample, after coming into force the new SFAS no. 131 accounting standard. We account for the endogenous self-selection of the diversification decision using the Heckman two-step estimation. Given that this strategy is not random but is rather selected by companies, the Heckman procedure enables a firm's ex-ante underlying characteristics to be disentangled from ex-post diversification value outcomes.

Our study contributes to the existing literature by offering a deeper empirical insight into the trinomium corporate diversification, growth opportunities, and firm value, on which prior research has reached inconclusive results. Our findings show that the diversification–value relationship may take a U-form, this curvilinear effect being partly mediated by growth opportunities. Results are robust to alternative proxies and methodologies. Overall, our study provides an additional explanation to performance divergences across diversifiers.

The remainder of the paper is organized as follows. The following section describes the sample, variables, and models to be estimated. Section 3 presents our main empirical findings. The final section discusses results and conclusions.

2. Sample, variables, and estimation strategy

2.1. Data and sample selection

The initial sample consists of an unbalanced panel sample of U.S. public companies over the period 1998–2010. Data is extracted from Worldscope (annual data, both at the industry segment and company level[2]), Datastream (market data) and the U.S. Bureau of Economic Analysis[3] (macroeconomic data). To build a dataset consistent with prior literature, we select the sample following the Berger and Ofek (1995) criteria.[4] These criteria reduce the sample size to 28,206 firm-year observations for the period 1998–2010 (67% corresponding to pure-play firms and 33% to diversifiers).[5] Next, we exclude firm-year observations with negative common equity and outlier observations of the study variables.[6] Our final study sample comprises a maximum of 16,859 firm-year observations corresponding to 3190 firms.

2.2. Empirical models and variables

As a starting point, we analyze the relationship between diversification and growth opportunities by estimating Eq. (1):

$$GOR_{it} = \alpha + \beta_1 DIVER_{it} + \beta_2 DIVER_{it}^2 + \beta_3 LTA_{it} + \beta_4 DTA_{it} + \beta_5 \lambda_{it} + \beta_6 Industry\_dummies_{it} + \beta_7 Year\_dummies_{it} + v_{it} \quad (1)$$

where i identifies each firm, t indicates the year of observation (from 1 to 13), α and β_p are the coefficients to be estimated, and v_{it} is the random disturbance. The dependent variable (growth opportunities ratio (*GOR*)) is proxied by either the market to book assets ratio (Adam and Goyal, 2008), Tobin's *Q* (Cao et al., 2008), or the ratio of R&D expenses to total sales (Mehran, 1995). The degree of diversification (*DIVER*) is computed by alternative measures to test the robustness of our empirical findings: the number of businesses at the 4-digit SIC code level (*numsegments*), the Herfindahl index (*HERF*) (Hirschman, 1964), and the entropy measure (*TotalEntropy*) (Jacquemin and Berry, 1979). *HERF* is calculated as:

$$HERF = 1 - \sum_{s=1}^{n} P_s^2$$

where '*n*' is the number of a firm's segments (at the 4-digit SIC code level), and 'P_s' the proportion of the firm's sales from segment '*s*'. This index positively relates to the level of diversification, its values ranging between 0 (focused firms) and 1.

TotalEntropy is computed as follows:

$$TotalEntropy = \sum_{s=1}^{n} P_s * \ln\left(\frac{1}{P_s}\right)$$

where 'P_s' is the proportion of a firm's sales in segment '*s*' for a company with '*n*' different 4-digit SIC segments. The higher the total entropy, the greater the diversification, although this index has no upper boundary.

Following prior literature, we control for firm size (Andrés et al., 2005), leverage (Myers, 1977), industry effect, and time effect. Size (*LTA*) is estimated by the natural logarithm of the book value of total assets. Leverage (*DTA*) is calculated by the total ratio debt over total assets. We include dummy variables to control for the major groups of industries[7] and dummies to control for the year effect.

Once we have confirmed the relation between *GOR* and diversification, we apply Baron and Kenny's (1986) approach to test the mediation role of growth opportunities in the relation between diversification (independent variable) and excess value (dependent variable). According to Baron and Kenny (1986), *GOR* will act as a mediator if it meets three conditions: (i) variations in the independent variable (the 'diversification level') significantly account for variations in the presumed mediator (*GOR*); (ii) variations in the mediator (*GOR*) significantly account for variations in the dependent variable (excess value); and finally (iii) when the mediator

[2] Industry segment data at the 4-digit SIC code level.

[3] This body belongs to the U.S. Department of Commerce: http://www.bea.gov/national/index.htm .

[4] See Berger and Ofek (1995) for more details about sample selection.

[5] These proportions are similar to those reported by prior works such as Villalonga (2004b).

[6] We drop observations beyond three standard deviations from the sample mean for each variable.

[7] The U.S. Department of Labor major industries classification: http://www.osha.gov/pls/imis/sic_manual.html.