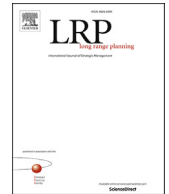




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## Diversification, relatedness and growth options value: Beyond a linear relationship

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### ABSTRACT

This paper investigates how corporate diversification affects a firm's growth options value. We adopt a real options approach from which diversification is seen as both a way to exploit current growth options (option exercise effect) and as a source of future options to expand (option creation effect). We focus on two dimensions of this strategy: degree of diversification and relatedness between segments. Using a panel sample of U.S. firms from 1998 to 2014, and accounting for the endogenous nature of the diversification decision, we find a U-form relationship between diversification degree and growth options value, suggesting that this strategy may primarily become a source of growth options after a certain point. Relatedness has an inverse U-relation with growth options value, suggesting that positive effects from synergies are limited to a certain level after which negative effects from duplicities prevail. Results also reveal that such an inverse U-linkage of relatedness is less pronounced in high diversifiers than in low ones. This study extends the applicability of the real options approach to strategy, and suggests the relevance of a multidimensional and contingent view in the diversification debate.

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### Introduction

Corporate diversification is an old research topic yet one which still demands attention. Despite being a widespread strategy among firms worldwide, scholars have not yet reached a consensus on the relationship between diversification and a firm's value. From a theoretical perspective, diversification has been identified as a driver of both value-creating forces, such as resource synergies across businesses (Markides and Williamson, 1994), and value-destroying ones, like agency costs (Jensen, 1986). However, the relative importance of each set remains imprecise. This again reflects the controversial findings in the empirical literature, which range from a “discount effect” (Berger and Ofek, 1995; Hoehle et al., 2012; Servaes, 1996), to a “premium effect” (Campa and Kedia, 2002; Villalonga, 2004) or even a curvilinear effect (Palich et al., 2000).<sup>1</sup>

Such a lack of consensus calls for a more fine-grained analysis of the potential channels through which this strategy can affect the value creation process. A crucial step in this direction was taken when it was noticed that market-based measures of performance may prove more relevant in diversification research than accounting-based measures, since the former

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<sup>1</sup> See Erdorf et al. (2013), Martin and Sayrak (2003), or Ahuja and Novelli (2016) for comprehensive reviews.

capture expectations of future returns whereas the latter simply reflect past outcomes (Palich et al., 2000). Even focusing on a firm's total market value might still prove insufficient. According to the real options approach, a firm's total market value is the sum of the value of current businesses (assets-in-place value) and the value of the options to expand in future businesses (growth options value).<sup>2</sup> Some of the theoretical advantages usually attributed to diversified firms, such as efficiency gains resulting from the transfer and joint use of resources across multiple existing businesses (Teece, 1980), basically affect the value of assets-in-place. However, another set of advantages granted to firms by diversification can be exploited not only in current units but also in prospective businesses. This is the case of funding efficiencies arising from internal markets (Hubbard and Palia, 1999), which might affect the performance of assets already in place, whilst at the same time affecting the conditions under which to enter new businesses (especially for unexplored ventures with limited available information), and thereby, the expected value of growth options. Moreover, simultaneous management of multiple businesses enhances top managers' ability to sense and seize opportunities in new business domains (Teece, 2000), which does only affect the growth options value component.

Despite such a twofold diversification effect on a firm's value components, the bulk of the existing literature has mainly dealt with whether corporate diversification influences the assets-in-place value component (by using accounting-based measures of performance) or the total market value, but makes no reference to the growth options value component. Given that growth options arise from intangible resources and specific capabilities which cannot be so easily duplicated by competitors as assets-in-place, (which are built mainly on tangible assets), identifying the effect of diversification on a firm's growth option value might prove critical to understanding both prior ambiguous empirical findings and to providing practical implications for managers.

Our paper aims to fill this gap, for which a few earlier works have provided some interesting albeit conflicting insights. For instance, Raynor (2002) considers that firms can follow either an assets-in-place diversification or a growth options diversification, depending on the type of target asset to be generated by diversifying. He argues that an options-based diversification dominates in terms of value creation as it provides the firm with strategic insurance which reduces firm-specific risk in a way shareholders could not replicate with a portfolio of unisegment companies. In a similar vein, Yang et al. (2014) suggest that high degrees of diversification offer firms the ability to create new paths of action in response to uncertainty. In contrast, Bernardo and Chowdhry (2002) contend that unisegment firms have more options to expand whereas multisegment firms may have already depleted part of them. Holder and Zhao (2015) posit that diversification by above average performers mainly involves exercising growth options, whereas in the case of below average performers it aims to seek out further opportunities. Altogether, this available empirical evidence does not help to disentangle whether the final effect of this strategy on a firm's growth options value is positive or negative.

We draw on the real options approach to rationalize and reconcile such conflicting ideas and evidence. One cornerstone of this approach is that investing in a new business creates value not only from cash flows but also from the new resources to emerge as a consequence of the follow-on day-to-day operations (Kogut, 1991). These resources have value insofar as they grant the possibility (the right but not the obligation) to make certain future choices (e.g. exploit future investment opportunities) which a firm could not otherwise make (Bowman and Hurry, 1993; McGrath and Nerkar, 2004). We present a theoretical basis where diversification simultaneously implies both exploiting current growth options and creating new ones, producing a U-form relationship between diversification and growth option values. Moreover, we contend that relatedness may carry a beneficial effect on the growth options value component as a result of synergies and complementarities between current and future assets, whilst at the same time possibly giving rise to duplication costs across options. We also extend our analysis to consider the effect of relatedness on growth options value both for high and low diversifiers.

We test our hypotheses on a panel of U.S. firms (5615 firm-year observations) during the 1998–2014 period and use two-step Generalized Methods of Moments (GMM) system estimations to control for unobserved heterogeneity and endogeneity. Our study confirms a U-form relation between the degree of diversification and a firm's growth options value. We also report an inverted U-form relationship between relatedness and a firm's growth options value, suggesting the beneficial effect of relatedness on this value component, but which is restricted by certain duplication costs. Finally, our results suggest that the impact of relatedness on growth options value differs between low and high diversifiers, causing the inverted U-form of relatedness to be unexpectedly flatter in the latter case.

Our study contributes to the literature in at least four different ways. Firstly, our paper joins a growing stream of literature extending the real options approach to strategic analysis (Andrés et al., 2017; Folta and O'Brien, 2004; Klingebiel and Adner, 2015; Tong et al., 2008). This theoretical framework suggests a non-linear link between diversification on the growth options value that allows us to reconcile prior competing findings. Secondly, we extend the literature on the relationship between corporate diversification and the value of growth options (Bernardo and Chowdhry, 2002; Raynor, 2002; Tong et al., 2008) by considering the direct association between both degree and relatedness of diversification with a firm's growth options and identifying their underlying value mechanisms.<sup>3</sup> Thirdly, we provide robust and fresh evidence on the value of diversification by using a panel of U.S. firms from 1998 up to 2014, which extends the time window considered by the most recent studies such as Andreou et al.

<sup>2</sup> In fact, growth options seem to account for around half of a firm's market value (and even more in more volatile industries) according to estimations such as those of Adam and Goyal (2008), Alessandri et al. (2007), Kester (1984) or Tong et al. (2008), among others.

<sup>3</sup> We follow the latest study by Haans et al.'s (2016) approach to theorize curvilinear relationships. We thank an anonymous reviewer for this suggestion.

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