Received: 13 March 2023 | Revised: 27 June 2024 | Accepted: 1 July 2024

DOI: 10.1002/smj.3645

RESEARCH ARTICLE

SMS | Strategic Management Journal

WILEY

Is knowledge really the most important strategic resource? A meta-analytic review

Donald D. Bergh[1] | **Laura D'Oria**[2] | **T. Russell Crook**[3] | **Ashley Roccapriore**[4]

[1]Daniels College of Business, The University of Denver, Boulder, Colorado, USA

[2]Ivey College of Business, Iowa State University, Ames, Iowa, USA

[3]Haslam College of Business, The University of Tennessee, Knoxville, Tennessee, USA

[4]Harbert College of Business, Auburn University, Auburn, Alabama, USA

Correspondence
Donald D. Bergh, Daniels College of Business, The University of Denver, Boulder, CO, USA.
Email: dbergh@du.edu

Abstract

Research Summary: The knowledge-based view (KBV) claims that knowledge is the most important strategic resource because it is the strongest determinant of firm competitive advantage and the glue that pulls resources together. We examine this assertion through a meta-analysis of the accumulated evidence on the relationships among strategic resources and firm performance (stock market, financial performance, and growth). Findings from 348 samples reporting 248,136 firm-level observations show that knowledge resources have the highest positive association with all three performance dimensions, with the highest positive relationship with growth, followed by market and then financial performance. Further, knowledge may serve as a foundational resource by augmenting other strategic resources and helping make firms different. These findings support the KBV's core prediction that knowledge resources offer superior strategic value.

Managerial Summary: Managers need to understand what resources yield the strongest and most consistent

returns. We examined the often-invoked claim that knowledge is the most important resource associated with firm success. Our study combines evidence from over 300 samples and finds that knowledge-based resources are consistently associated with the strongest profit, stock market, and growth returns relative to other types of resource investments. For managers, the message is clear—acquire, integrate, retain, and motivate knowledge-related resources because doing so pays off.

KEYWORDS

knowledge-based view, meta-analysis, resource-based view, strategic resources

1 | INTRODUCTION

Since its formal introduction more than 25 years ago, the knowledge-based view (KBV) of the firm has emerged as a prominent perspective to explain competitive advantage and firm performance (Grant, 2003; Grant & Phene, 2022; Miller, 2019). Indeed, citation counts of two foundational contributions provide some evidence of the KBV's acceptance in the strategic management community: Grant (1996a) has been cited more than 27,000 times, and Kogut and Zander (1992) over 21,000 times.[1] The KBV's distinct identity lies in its assertion that knowledge is "the most strategically important of the firm's resources" (Grant, 1996a, p. 110; Conner & Prahalad, 1996; Spender, 1996).[2] Knowledge is depicted as the strongest driver of competitive advantage and serves as a "glue" that pulls resources together to create firm resource heterogeneity, firm differences more generally, and, ultimately, high performance outcomes.[3]

This claim "that knowledge is the most important resource" has been widely accepted without a rigorous assessment of its validity. The omission of such a test raises important questions, namely, what if this assertion is not supported in the body of empirical research on the KBV? Does the KBV currently stand on strong empirical footing? We currently lack knowledge of whether the KBV's distinguishing contention is true. Thus, we ask, "Is knowledge really the most important strategic resource driving firm performance differentials?"

We test this question using a meta-analysis of study findings on the resource-performance relationship reported during the period spanning1990 through 2022. Data from 348 samples reporting 248,136 firm-level observations reveal that knowledge is indeed the most important strategic resource, as no other resource helps firms consistently realize competitive advantage and enjoy strong stock market, financial, and growth performance. In addition, knowledge is

[1]Accessed on Google Scholar on June 25, 2024.

[2]The term "strategic resource" developed in the resource-based view literature (Chi, 1994, p. 271). It refers to firm assets that are valuable, scarce, and not easily copied or substituted (Barney, 1991). Such resources can be the basis for competitive advantage and strong performance (Barney et al., 2011).

[3]The authors gratefully acknowledge an anonymous reviewer for this metaphor.

related to other strategic resources, indicating that it may be foundational to creating firm resource heterogeneity. The meta-analysis provides a new and more rigorous test of the KBV's core prediction, finds strong and broad empirical support for it, identifies the differential value of strategic resources relative to firm performance, and helps distinguish the KBV from other theories of strategy.

2 | THEORY AND HYPOTHESIS DEVELOPMENT

Much of the theorizing about the KBV focuses on how knowledge resources represent the most critical ingredient of competitive advantage and performance differentials. The KBV draws heavily from the resource-based view of the firm (RBV) to make its argument for the superiority of knowledge to other resource types (Grant, 1996a; Grant, 1996b). The primary unit of analysis in the RBV logic is the resource (Barney, 1991; Penrose, 1959; Wernerfelt, 1984), which refers to the "intangible and tangible assets firms use to conceive of and implement their strategies" (Barney & Arikan, 2001, p. 138). Knowledge is such a resource and can manifest in both intangible and tangible forms. In addition, the KBV leverages the RBV in two important ways to derive its argument that "knowledge is the most important resource."

First, using the RBV's predictive logic (i.e., resources imbued with certain attributes enable advantages), the KBV hones in on knowledge as the "resource that can be acquired, transferred, or integrated to achieve competitive advantage" (Eisenhardt & Santos, 2000, p. 140).[4] Specifically, researchers argue that knowledge is likely to be more valuable, rare, and hard to substitute or imitate than other strategic resources because of unique historical conditions surrounding its development and accumulation, making it a compelling source of competitive advantage (Grant, 1996b; Nonaka, 1991; Wiklund & Shepherd, 2003). These unique conditions are hard to copy because links between development and accumulation may be unclear (i.e., causally ambiguous) or difficult to articulate (i.e., socially complex). Nonaka and Takeuchi (1995) compile this reasoning into a framework that integrates individual and organizational knowledge to describe knowledge that outsiders find difficult to decode and replicate, producing resource heterogeneity among firms.

Second, applying the RBV's conception of resource bundling, knowledge resources can link with other strategic resources to create value that is even more unique and difficult to imitate or substitute than other resources (Zack, 1999).[5] The reasoning is that knowledge resources develop through learning curves as well as knowledge management and other systems, which have interrelationships with other organizational resources (cf. Eisenhardt & Santos, 2000). Indeed, knowledge resources, particularly the combination of tacit and explicit knowledge, contribute to other strategic resources such as a firm's culture, routines, and reputation (Amit & Schoemaker, 1993; Liebeskind, 1996; Winter, 2009), and can be "integrated externally through relational networks that span organizational boundaries [which] can provide efficient mechanisms for accessing and integrating new knowledge..." (Eisenhardt & Santos, 2000,

[4]Note that Grant (1996b) does not offer a specific definition of knowledge but instead focuses on characteristics and types of knowledge that exist. However, Liebeskind (1996, p. 94, italics in original) provides the following definition: "*information whose validity has been established through tests of proof.*" Spender (1996) identifies four types of organizational knowledge arising from the interactions of explicit and implicit. We make no distinctions here and focus instead on the general arguments linking knowledge to firm performance.

[5]See Foss (1996), Spender (1996), and Eisenhardt and Santos (2000) for critiques.

p. 144; Kogut & Zander, 1992; Mowery et al., 1996). Further, knowledge plays a more critical role in production activity than other types of strategic resources (Grant, 1996a). For example, Liebeskind notes that "superior knowledge allows a firm to build a better piece of machinery, train its workers more effectively, or devise a more productive system of work organization" (1996, p. 94). Collectively, knowledge is foundational to other resources in the firm, making it a multidimensional source of competitive advantage that other resources cannot offer (Grant, 1996a; Kogut & Zander, 1992; Spender & Grant, 1996).

Overall, more than any other resource type, knowledge resources can profoundly contribute to making firms different, giving firms the opportunity "to create value that no rival can match so that no rival can fully compete away that value, thereby leaving some portion of the value available for the advantaged firms to capture, regardless of how competitive the industry may be" (Makadok, 2010, p. 1318). Therefore, "knowledge may be the key source of rent...and may be the key inimitable resource managers need to appreciate... [and] competitive advantage derived through knowledge assets may go a long way to suggest how sustainability conditions arise and are maintained" (Schendel, 1996, p. 4).[6] Relative to other strategic resources, "*knowledge* has the greatest potential to serve as a source of competitive advantage" (Wang et al., 2009: 1265) and ultimately, contribute to strong performance (Bogner & Bansal, 2007). Thus, we predict:

> **Hypothesis H1.** Knowledge is related more positively to firm performance than other strategic resources.

3 | METHODS

3.1 | Sample and data collection

The sampling frame consisted of empirical evidence on the strategic resource–performance relationships from 1991 through 2022. To identify relevant studies, we followed a multi-step approach (see Online Supplement for more information) that, consistent with other meta-analyses, included keyword searches in the full text of articles in leading journals, in the abstract of articles and dissertations in the management, economics, and business fields, and an ancestry search of meta-analytic reviews on resources and capabilities.

This process identified 1041 studies for possible inclusion. We retained studies if they provided the information needed for a meta-analysis (e.g., correlations and sample size) and described measures consistent with our conventionally accepted construct definitions. This process yielded 348 samples from 341 studies involving 248,136 firm-level observations (see Online Supplement for the list of the primary studies). Three of the study's co-authors coded articles, attaining over 99% agreement, and then discussed differences until 100% agreement was reached.

[6]As noted in Crook et al. (2008, p. 1144), "The assumption is that if strategic resources and performance are related, then a competitive advantage must exist. Within many studies, the term competitive advantage is almost synonymous with performance in the sense that competitive advantage is "generally used to describe the relative performance of rivals in a given (product) market environment" (Peteraf & Barney, 2003, p. 313)." Our testing of the KBV's assertion around advantages—along with the studies we included in our empirical testing—also draws on this assumption.

3.2 | Variables

3.2.1 | Knowledge resources

Knowledge resources "refer to the knowledge and information held by an organization that all, part, or parts of the organization share" (Schulz, 2001, p. 662). Knowledge resources have two different forms, explicit and implicit (Polanyi, 1966).[7]

Explicit knowledge "is that which is written, easily communicated, and often contained in policies, procedures, or rules" (Kacmar et al., 2006, p. 135). It can be declared and conceptualized (Polanyi, 1966), formalized and transferred (Ambrosini & Bowman, 2001), and "is not specific or idiosyncratic" to the one holding it (Sobol & Lei, 1994, p. 170). These properties suggest two sets of measures. *Information systems* and *knowledge management systems* are designated as explicit knowledge because they are formalized systems designed for the acquisition, storage, distribution, and retrieval of organizational knowledge and information (Adams & Lamont, 2003). *Patents* are intellectual property rights and capture explicit knowledge because they have been formalized and codified.

Tacit knowledge "is not easily articulated and is acquired through practice" and experiences (Kacmar et al., 2006, p. 135). Polanyi (1966) described tacit knowledge as practical knowledge acquired from personal and subjective experiences. Such knowledge is unobservable, embedded in the possessor, context-specific, and difficult to formalize and transfer (Nonaka, 1991). Since tacit knowledge is unobservable, we focused on more observable conditions that represent different sources of tacit knowledge: individual and team characteristics and organizational experience. The *diversity* of a team reflects its degree of unique perspectives and distinct sources of tacit knowledge. Diversity encompasses knowledge gained from different personal and professional experiences held by team members. More diversity means more unique, difficult to formalize, and transfer tacit knowledge (Hadjimichael & Tsoukas, 2019; Leonard & Sensiper, 1998), and was captured using available diversity measures (e.g., gender, tenure, racial, and functional diversity). *Education* reflects socialization into tacit ways of thinking and doing (Collins, 2010) and was captured using measures such as education level (e.g., Chen & Nadkarni, 2017). *Experience* (industry or task) and *tenure* (number of years in a firm) captures tacit knowledge acquired through practice, exposure, and time in an organization (Kacmar et al., 2006). Finally, *organizational learning* produces tacit knowledge embodied in experience curves, routines, and procedures (e.g., Grant, 1996b; Nelson & Winter, 1982). Each captured measure reflects knowledge that is context-specific (Nonaka, 1991).

[7]As with all meta-analyses, the variety of the measures captured within each category could be cause for concern. Three factors mitigate this matter. First, our meta-analytic procedures include a correction for measurement error (Aguinis et al., 2011). Second, if any error remains after the correction, such variability makes it harder to find support for a hypothesis. Third, we use a construct validation test to evaluate the measurement model. Further, given that knowledge resources are one type of the larger class of intangible resources, we assess the validity of the latent construct and its indicants in the analysis.

3.2.2 | Other strategic resources

We synthesized multiple typologies (e.g., Barney, 1991; Barney & Arikan, 2001; Dyer & Singh, 1998; Grant, 1996b) and arrived at three resource categories beyond knowledge: tangible, intangible, and relational resources.[8]

Tangible resources refer to a firm's physical resources. In this category, we captured measures of property, plant, and equipment and capital expenditures (Barney, 1991). Barney and Arikan (2001, p. 139) further noted that physical and financial assets have similar attributes. Thus, we also include cash and marketable securities in this resource category.[9]

Other intangible resources reside in a firm's culture, structure, brand, internal coordination policies, capacity for change, and responsiveness (Carmeli & Tishler, 2004). To capture such resources, we include measures such as brand name capturing symbols, names, and images used in commerce (e.g., Barthélemy, 2008), organizational culture (e.g., Powell & Dent-Micallef, 1997), and characteristics of a firm's structure (e.g., interfunctional coordination—Hult et al., 2005; informal organizational structure—Fultz & Hmieleski, 2021).

Relational resources involve affiliations with other firms (Dyer & Singh, 1998). Examples include links with important external stakeholder groups (e.g., Stam & Elfring, 2008), the duration of a buyer–supplier relationship (e.g., Weigelt, 2013), characteristics of a firm's interfirm network (e.g., Andrevski & Ferrier, 2019;), board interlocks (e.g., Ruigrok et al., 2006), and entrepreneurs' social ties (e.g., Hmieleski et al., 2015).

3.2.3 | Firm performance

Competitive advantages are reflected in a firm's performance, which were captured on three dimensions: stock market, financial performance, and growth performance (Combs et al., 2005). We operationalized *stock market performance* as including stock market returns, Tobin's Q, and cumulative abnormal returns. *Financial performance* encompassed return on assets, investment, and sales. Finally, *growth performance* was captured using year-over-year changes in sales, total assets, and employees.

3.2.4 | Controls

We controlled for *firm age* based on observations by Barney (1991) that a firm's history shapes its ability to acquire and exploit resources. This included measures of the number of years since a firm's founding. We controlled for *firm size* because more recent RBV-based research revealed that smaller firms can use their resources to grow at faster rates than larger firms (Nason &

[8]Barney (1991) includes relational resources within the organizational (i.e., intangible) resource category. Following Penrose's (1959) suggestion to refine resources to identify the origin of their value, we separated relational resources. Considerable research depicts relational resources as an independent resource type (e.g., Dyer & Singh, 1998), thus leaving them within intangible resources could obscure their overall meaning of how they create value.

[9]Later, Barney (2007) explicitly recognized financial resources as a separate resource category. Thus, in a post hoc analysis, we examine if the effects differ between physical and financial resources. From a practical standpoint, we combined financial and physical resources as there were only 18 studies reporting an effect between purely physical resources and our outcomes. In some cases, there were only three effects among physical resources and other constructs. Schmidt and Hunter (2015) caution against using fewer than three studies when conducting meta-analysis.

Wiklund, 2018). Measures such as the average number of employees and total revenues were used to capture size. Because managerial discretion is constrained, in part, by a firm's amount of debt, we controlled for *financial leverage* using measures such as a firm's debt-to-equity ratio. The Online Supplement reports our coding, example studies, and measures.

3.3 | Data analysis and results

Due to the heterogeneity of measures (e.g., various strategic resource types), we coded all effect sizes following best practice recommendations in the methodological literature (Aguinis et al., 2011) and implemented in other domains, including strategic management (e.g., Bergh et al., 2016). We used a two-step theory testing approach described by Viswesvaran and Ones (1995). In the first step, we used a meta-analytic procedure following the analytical guidelines and formulae of Hunter and Schmidt (2004) and the meta-analytical best reporting practices recommended by Aytug et al. (2012). We conducted random effects meta-analyses for all pairwise combinations to produce meta-analytically derived correlations (i.e., $\bar{r}$) and we used a correction factor value of .80 to address measurement error (cf. Aguinis et al., 2011; Dalton & Dalton, 2005).[10]

Second, we tested the meta-analysis findings using structural equations modeling (MASEM). We did so because MASEM allows for testing the relative effects of different strategic resources in a simultaneous manner, for capturing variance shared among knowledge as a foundational resource with other strategic resources, and for construct validation tests of unobservable (latent) constructs (e.g., knowledge resources) and their corresponding measures. The interrelationships between knowledge and other strategic resources can be modeled within structural equations modeling (SEM) as covariances (e.g., joint variance).

Our procedure involves SEM rather than path analysis because it included measurement error-corrected latent scores based on multiple observable indicators similar to other MASEM procedures.[11] We followed Bergh et al.'s (2016) and Kepes et al. (2013) recommended best practices for implementing and reporting an MASEM study. We chose the harmonic mean (6859) because it gives less weight to substantially large individual study sample sizes and is therefore more conservative. The SEM procedure used the maximum likelihood estimation approach within Amos 28.

The bivariate meta-analysis findings are reported in Table 1. The effect sizes and the respective 95% confidence intervals are reported in the lower half of the diagonal in the table, and the number of samples and the summed sample sizes are reported in the upper half.[12]

For the measurement model, we followed Lambert and Newman's (2023) recommendation for assessing construct validity for our latent construct (i.e., knowledge resources comprised of indicators for tacit and explicit knowledge) The factor loadings for the tacit (.435) and explicit

[10]We also examined the strategic resource-outcome relationships in Comprehensive Meta Analysis software, which is based on the Hedges and Olkin (1985) approach. The estimates do not substantively change; out of the 15 resource-outcome relationships, 8 do not differ across analyses. For the 7 that do, differences are below the third decimal point.
[11]The SEM models permit testing both latent and observable variables in the same model. When models include only observable variables, they are analyzed as a path model rather than MASEM (see Bergh et al., 2016, p. 483).
[12]The counts of primary study samples having one or more of our study's variables include: 39 samples with at least one measure of explicit knowledge, 128 samples with at least one measure of tacit knowledge, 69 samples with at least one measure of tangible resources, 59 samples with at least one measure of other intangible resources, and 76 samples with at least one measure of relational resources.

TABLE 1 Meta-analytically derived correlation matrix for input into meta-analytic structural equation models.

		1	2	3	4	5	6	7	8	9	10	11
1	Financial performance	-	41/34,385	30/39,639	48/23,450	13/2055	37/25,506	23/6991	24/11,410	51/42,277	143/127,177	45/65,493
2	Stock market performance	.171 [.108, .234]	-	8/4475	25/15,374	7/2072	17/11,131	13/8543	14/10,349	23/10,643	65/47,000	30/37,373
3	Firm growth	.017 [−.016, .05]	.100 [.002, .196]	-	28/9189	5/866	12/4806	11/3320	14/3103	36/12,711	60/58,793	9/33,898
4	Tacit knowledge	.021 [.000, .041]	.016 [−.003, .034]	.053 [.021, .084]	-	11/4388	17/10,080	28/19,856	31/33,375	64/54,693	111/79,054	17/13,263
5	Explicit knowledge	.094 [.042, .145]	.029 [−.022, .081]	.177 [.060, .293]	.152 [.071, .232]	-	10/4341	8/1376	15/4629	20/5446	26/7821	5/2146
6	Tangible resources	.094 [.055, .132]	.011 [−.043, .065]	.021 [−.060, .101]	−.005 [−.035, .025]	.071 [.018, .123]	-	8/3156	14/9033	33/14,766	56/33,095	17/10,558
7	Intangible resources	.113 [.069, .156]	.068 [.033, .101]	.081 [.015, .146]	.038 [−.010, .086]	.181 [.016, .345]	.026 [−.005, .056]	-	12/12,442	25/13,426	49/27,686	9/6233
8	Relational resources	.010 [−.026, .046]	.004 [−.028, .036]	.032 [−.054, .118]	.032 [−.001, .065]	.117 [.06, 0174]	.044 [−.015, .104]	.085 [.033, .136]	-	45/36,656	61/46,708	13/10,247
9	Firm age	.013 [−.014, .040]	−.103 [−.150, −.056]	−.052 [−.090, −.014]	.035 [.008, .061]	.136 [.058, .214]	.027 [.000, .054]	.117 [.078, .155]	.116 [.087, .143]	-	147/97,612	16/14,863
10	Firm size	.117 [.083, .151]	−.097 [−.130, −.063]	.017 [−.007, .041]	.042 [.022, .062]	.188 [.122, .254]	.033 [−.018, .085]	.181 [.132, .228]	.174 [.138, .209]	.175 [.154, .195]	-	55/47,169
11	Financial leverage	−.222 [−.317, −.125]	−.050 [−.083, −.017]	−.012 [−.035, .012]	−.011 [−.038, .016]	−.062 [−.090, −.034]	.011 [−.050, .073]	−.008 [−.052, .035]	.024 [−.008, .056]	.070 [.030, .110]	.106 [.074, .138]	-

Note: Below the diagonal, we report correlations (*rc*) which are corrected for unreliability based on guidance from Aguinis et al. (2011) and confidence intervals based on $\overleftarrow{r}$; above the diagonal, we report k = number of independent effect sizes/N = total number of organizations from primary studies.

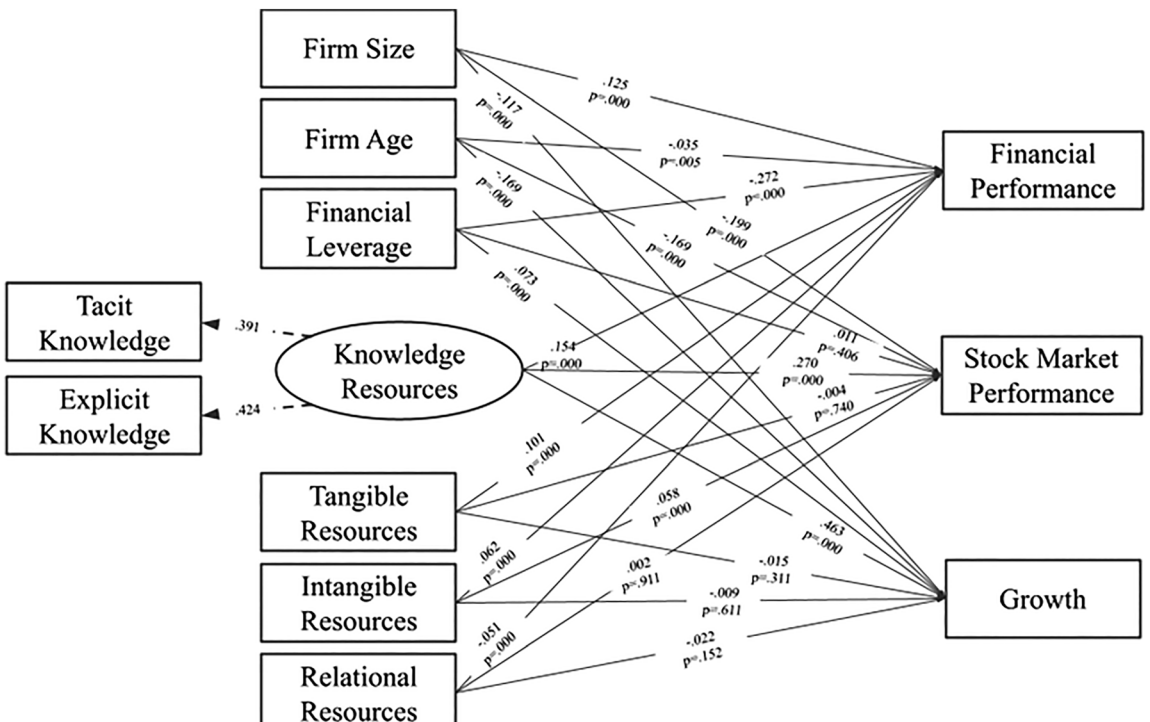

FIGURE 1 MASEM model.

TABLE 2 MASEM results.

	Model 1		
Relationship	***β***	***p***	**SE**
Size-Financial Performance	.125	.000	.014
Size-Stock Market Performance	−.199	.000	.015
Size-Growth	−.117	.000	.019
Age-Financial Performance	−.035	.005	.013
Age-Stock Market Performance	−.169	.000	.014
Age-Growth	−.169	.000	.016
Leverage-Financial Performance	−.272	.000	.012
Leverage-Stock Market Performance	.011	.406	.014
Leverage-Growth	.073	.000	.016
Tangible Resources-Financial Performance	.101	.000	.012
Tangible Resources-Stock Market Performance	−.004	.740	.013
Tangible Resources-Growth	−.015	.311	.014
Intangible Resources-Financial Performance	.062	.000	.013
Intangible Resources-Stock Market Performance	.058	.000	.015
Intangible Resources-Growth	−.009	.611	.018
Relational Resources-Financial Performance	−.051	.000	.012
Relational Resources-Stock Market Performance	.002	.911	.013
Relational Resources-Growth	−.022	.152	.015
Knowledge Resources-Financial Performance	.154	.000	.059
Knowledge Resources-Stock Market Performance	.270	.000	.069
Knowledge Resources-Growth	.463	.000	.099
Chi-square	936.67	.000	
Df	19		
GFI	.976		
CFI	.804		
NFI	.802		
RMR	.048		
AIC	1030.67		
BIC	1351.84		
R^2 (Financial Performance)	.151		
R^2 (Stock Market Performance)	.095		
R^2 (Growth)	.171		

Note: Harmonic mean = 6859. Standardized coefficients shown with standard errors in parentheses. AMOS reports p values except when below $p < .001$, which we report as .000.

Abbreviations: CFI, comparative fit index; GFI, goodness-of-fit index; MASEM, meta-analytic structural equation modeling; NFI, normative fit index; RMR, root square mean.

(.437) indicants exceed the 0.40 levels needed for convergent validity (Lambert & Newman, 2023) and were higher with knowledge resources than other constructs. These findings indicate that the model meets construct validity standards.

The structural model is depicted in Figure 1 and the results are presented in Table 2. Model 1 examines relationships among strategic resources and financial, market, and growth performance outcomes. We find that knowledge resources are positively related to all outcomes ($\beta = .154$, .270, and .463 for financial, market, and growth performance, respectively). We then test the differences between the resource coefficients with respect to the performance measures, finding that the knowledge coefficients are significantly higher than all other resource coefficients for each performance measure (z-score relative to tangible: 4.48, $p = .000$; intangible: 4.80, $p = .000$; relational: 6.82, $p = .000$ for financial performance; z-score relative to tangible: 9.22, $p = .000$; intangible: 7.85, $p = .000$; relational: 8.97, $p = .000$ for stock market performance; and z-score relative to tangible: 11.14, $p = .000$; intangible: 10.39, $p = .000$; relational: 10.99, $p = .000$ for growth performance). Taken together, these findings support Hypothesis 1. In addition, knowledge covaries with tangible (0.037, $p = .000$), intangible (0.134, $p = .000$), and relational resources (0.084, $p = .000$), supporting its bundling relationships with these other strategic resources. Including covariances also controls for shared variance between knowledge and the other resources, allowing each resource's unique relationship with performance to be identified.

3.4 | Post hoc analyses

We conducted several post hoc tests to verify the robustness of our findings (Kepes et al., 2013). First, to determine whether heterogeneity in effect sizes within the primary studies affected our results, we identified potential outliers by examining sample-adjusted meta-analytic deviancy (Huffcutt & Arthur, 1995). Next, we followed Geyskens et al. (2009) suggestion to eliminate such outliers and reexamine the results. We found no evidence that heterogeneity substantively affects our results. Second, to address the possibility of publication bias (i.e., file drawer problem—see Aguinis et al., 2011), we use Duval and Tweedie's (2000) Trim and Fill approach. Of the 55 pairwise relationships in our meta-analyses, 14 were re-estimated. We then used these estimates as input in our MASEM models; our results did not substantively change.

Third, we investigate whether physical and financial resources (i.e., our primary tangible resources) have differential effects on each outcome. Here, we created subgroups of those measures and estimated the effects (Schmidt & Hunter, 2015). We found no statistical differences. Finally, we examined whether results may be shaped by a potentially important source of endogeneity: study design type. We created subgroups of studies based upon whether an outcome measure was lagged relative to resource measures or if the two were observed at the same time point. Then, we reanalyzed all strategic resource–performance relationships and compared the effects between groups. Again, we found no statistical differences.

4 | DISCUSSION

We examine a distinguishing assertion of the KBV that provides its unique identity, namely, that knowledge is the most important strategic resource. Our meta-analysis reveals that knowledge matters more than other resources to all three performance dimensions and is also related

to other strategic resources, lending support to Grant's claim that "[k]nowledge is the overwhelmingly important productive resource" (2003, p. 201). In addition, when the findings are averaged across the performance outcomes, knowledge has 8 times more influence, and by far, the highest average positive effects ([.154 + .270 + .463]/3 = .296) relative to the next closest resource (i.e., other intangible resources [.062 + .058–.009]/3 = .037). No other resource helps firms consistently realize such strong performance. These findings support the KBV's key premise, identify the differential value of resources, and serve as a reference point for further development of the perspective itself.

To begin, our findings provide strong evidence that "knowledge is the most important resource" (Grant, 1996b, p. 110). This outcome offers both empirical support for the KBV as a core theory within the field of strategic management and provides an answer to the question of whether "certain strategic resources [are] superior to others" in shaping performance (Crook et al., 2008, p. 1152). While previous research documents that strategic resources are related to performance (e.g., Crook et al., 2008; D'Oria et al., 2021), knowledge is superior to other resource types because it is the strongest single driver of, and its links with other resources contribute most to making firms different. Knowledge resources appear to produce stronger and more difficult to imitate competitive advantages.

Our findings also help clarify boundaries between the KBV and the RBV. In part, the KBV is a "special case" or "outgrowth" of the RBV (e.g., Eisenhardt & Santos, 2000; Grant, 1996a) because it relies on the perspective's theoretical reasoning. However, the KBV differs from the RBV by adding theoretical explanations for which resources matter more in driving advantage and performance. The RBV does not differentiate the relative value of resources as drivers of firm performance differentials while the KBV does. Ironically, the KBV's unique identity as a theory of strategy arises through applying the RBV's theoretical mechanisms to explain why knowledge matters more for competitive advantage and performance. Collectively, the two views serve as complementary perspectives.

Further, the findings highlight areas for further research. First, of all the strategic resource types, knowledge has the only positive association with firm growth. To the extent that growth shapes firm boundaries, there is a need to better understand and clarify the KBV's boundaries within the set of theories that explain firm growth (e.g., Penrose's theory, transaction cost economics). Second, resources have both interrelationships with one another and direct associations with performance differentials. Knowledge, as a foundational resource, will be embedded in, but might also be influenced by other resources. We direct future attention to further examine how these interdependencies impact competitive advantage, meaningful firm differences, and firm performance within both the RBV and the KBV perspectives. Finally, we examine the KBV as a theory of strategy. However, the KBV also serves as a theory of the firm (e.g., why firms exist). Future research that examines the KBV from this other viewpoint would help contribute toward producing a more comprehensive understanding of the theory's role within the field of strategic management. We do not know whether knowledge is the most important resource for firm boundaries and the actions that impact them, such as those associated with growth and decline.

Our findings are subject to several limitations. One concern within the RBV literature is that some measures are distant proxies for the resources they are intended to represent (Ketchen et al., 2013). In response, we attempted to maximize the validity of our approach by applying the purification process developed by Crook et al. (2008), found by those authors to enhance measurement validity and reliability (cf. Dalton & Aguinis, 2013), and confirmed via construct validity tests (Lambert & Newman, 2023). In addition, our primary studies did not differentiate

knowledge creation from utilization. We therefore assumed that firms use their knowledge resources as fully as possible. Research into the relationships between knowledge creation and utilization could illuminate theoretical mechanisms for how this resource impacts competitive advantage and performance. Finally, the article search process could produce selection effects, as published articles may be biased toward those reporting significant findings. Although the Trim and Fill method was used to help remedy this concern, selection effects and publication bias are possible limitations to our findings.

5 | CONCLUSION

Since its origins, the field of strategic management has sought to understand the determinants of why some firms outperform others. The evidence that we offer supports the KBV's core prediction about the role of knowledge resources in such outcomes—and shows that such resources are at least *a*—if not *the*—key determinant. As the field of strategy continues to build a "wall" of understanding, knowledge resources appear to be both foundational bricks as well as the glue that binds other strategic resources together to help explain why firms have differences in their performances.

ACKNOWLEDGEMENTS

The authors express their sincere gratitude to Karin Hoisl, the editor, three anonymous reviewers, and David Ketchen, Jr., for insightful contributions to the development of this paper.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Donald D. Bergh https://orcid.org/0000-0002-0815-6654

REFERENCES

Adams, G. L., & Lamont, B. T. (2003). Knowledge management systems and developing sustainable competitive advantage. *Journal of Knowledge Management*, *7*(2), 142–154.

Aguinis, H., Dalton, D. R., Bosco, F. A., Pierce, C. A., & Dalton, C. M. (2011). Meta-analytic choices and judgment calls: Implications for theory building and testing, obtained effect sizes, and scholarly impact. *Journal of Management*, *37*(1), 5–38.

Ambrosini, V., & Bowman, C. (2001). Tacit knowledge: Some suggestions for operationalization. *Journal of Management Studies*, *38*(6), 811–829.

Amit, R., & Schoemaker, P. J. (1993). Strategic assets and organizational rent. *Strategic Management Journal*, *14*(1), 33–46.

Andrevski, G., & Ferrier, W. J. (2019). Does it pay to compete aggressively? Contingent roles of internal and external resources. *Journal of Management*, *45*(2), 620–644.

Aytug, Z. G., Rothstein, H. R., Zhou, W., & Kern, M. C. (2012). Revealed or concealed? Transparency of procedures, decisions, and judgment calls in meta-analyses. *Organizational Research Methods*, *15*(1), 103–133.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*(1), 99–120.

Barney, J. B. (2007). *Strategic management and competitive advantage*. Pearson Publishing.

Barney, J. B., & Arikan, A. M. (2001). The resource-based view: Origins and implications. In M. A. Hitt, R. E. Freeman, & J. S. Harrison (Eds.), *Handbook of strategic management*. Blackwell.

Barney, J. B., Ketchen, D. J., Jr., & Wright, M. (2011). The future of resource-based theory: Revitalization or decline? *Journal of Management*, *37*(5), 1299–1315.

Barthélemy, J. (2008). Opportunism, knowledge, and the performance of franchise chains. *Strategic Management Journal*, *29*(13), 1451–1463.

Bergh, D. D., Aguinis, H., Heavey, C., Ketchen, D. J., Boyd, B. K., Su, P., Lau, C. L., & Joo, H. (2016). Using meta-analytic structural equation modeling to advance strategic management research: Guidelines and an empirical illustration via the strategic leadership-performance relationship. *Strategic Management Journal*, *37*(3), 477–497.

Bogner, W. C., & Bansal, P. (2007). Knowledge management as the basis of sustained high performance. *Journal of Management Studies*, *44*(1), 165–188.

Carmeli, A., & Tishler, A. (2004). The relationships between intangible organizational elements and organizational performance. *Strategic Management Journal*, *25*, 1257–1278.

Chen, J., & Nadkarni, S. (2017). It's about time! CEOs' temporal dispositions, temporal leadership, and corporate entrepreneurship. *Administrative Science Quarterly*, *62*(1), 31–66.

Chi, T. (1994). Trading in strategic resources: Necessary conditions, transaction cost problems, and choice of exchange structure. *Strategic Management Journal*, *15*(4), 271–290.

Collins, H. (2010). *Tacit and explicit knowledge*. University of Chicago Press.

Combs, J. G., Crook, T. R., & Shook, C. L. (2005). The dimensionality of organizational performance and its implications for strategic management research. In *Research methodology in strategy and management* (pp. 259–286). Emerald Group Publishing Limited.

Conner, K. R., & Prahalad, C. K. (1996). A resource-based theory of the firm: Knowledge versus opportunism. *Organization Science*, *7*(5), 477–501.

Crook, T. R., Ketchen, D. J., Jr., Combs, J. G., & Todd, S. Y. (2008). Strategic resources and performance: A meta-analysis. *Strategic Management Journal*, *29*(11), 1141–1154.

Dalton, D. R., & Aguinis, H. (2013). Measurement malaise in strategic management studies: The case of corporate governance research. *Organizational Research Methods*, *16*(1), 88–99.

Dalton, D. R., & Dalton, C. M. (2005). Strategic management studies are a special case for meta-analysis. *Research Methodology in Strategy and Management*, *2*, 31–63.

D'Oria, L., Crook, T. R., Ketchen, D. J., Jr., Sirmon, D. G., & Wright, M. (2021). The evolution of resource-based inquiry: A review and meta-analytic integration of the strategic resources–actions–performance pathway. *Journal of Management*, *47*(6), 1383–1429.

Duval, S., & Tweedie, R. (2000). A nonparametric "trim and fill" method of accounting for publication bias in meta-analysis. *Journal of the American Statistical Association*, *95*, 89–98.

Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review*, *23*(4), 660–679.

Eisenhardt, K. M., & Santos, F. M. (2000). Knowledge-based view: A new theory of strategy? In A. Pettigrew, H. Thomas, & R. Whittington (Eds.), *Handbook of strategy and management* (pp. 139–164). Sage.

Foss, N. J. (1996). More critical comments on knowledge-based theories of the firm. *Organization Science*, *7*(5), 519–523.

Fultz, A. E., & Hmieleski, K. M. (2021). The art of discovering and exploiting unexpected opportunities: The roles of organizational improvisation and serendipity in new venture performance. *Journal of Business Venturing*, *36*(4), 106–121.

Geyskens, I., Krishnan, R., Steenkamp, J., & Cunha, P. V. (2009). A review and evaluation of meta-analysis practices in management research. *Journal of Management*, *35*(2), 393–419.

Grant, R., & Phene, A. (2022). The knowledge based view and global strategy: Past impact and future potential. *Global Strategy Journal*, *12*(1), 3–30.

Grant, R. M. (1996a). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, *17*(S2), 109–122.

Grant, R. M. (1996b). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization Science*, *7*(4), 375–387.

Grant, R. M. (2003). The knowledge-based view of the firm. In D. O. Faulkner & A. Campbell (Eds.), *The Oxford handbook of strategy: A strategy overview and competitive strategy* (Vol. 1, pp. 197–221). Oxford University Press.

Hadjimichael, D., & Tsoukas, H. (2019). Toward a better understanding of tacit knowledge in organizations: Taking stock and moving forward. *Academy of Management Annals*, *13*(2), 672–703.

Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Academic Press.

Hmieleski, K. M., Carr, J. C., & Baron, R. A. (2015). Integrating discovery and creation perspectives of entrepreneurial action: The relative roles of founding CEO human capital, social capital, and psychological capital in contexts of risk versus uncertainty. *Strategic Entrepreneurship Journal*, *9*(4), 289–312.

Huffcutt, A. I., & Arthur, W. (1995). Development of a new outlier statistic for meta-analytic data. *Journal of Applied Psychology*, *80*(2), 327–334.

Hult, G. T. M., Ketchen, D. J., Jr., & Slater, S. F. (2005). Market orientation and performance: An integration of disparate approaches. *Strategic Management Journal*, *26*(12), 1173–1181.

Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis: Correcting error and bias in research findings*. Sage.

Kacmar, M., Andrews, M. C., Van Rooy, D. L., Steilberg, C. R., & Cerrone, S. (2006). Sure everyone can be replaced... but at what cost? Turnover as a predictor of unit-level performance. *Academy of Management Journal*, *49*(1), 133–144.

Kepes, S., McDaniel, M. A., Brannick, M. T., & Banks, G. C. (2013). Meta-analytic reviews in the organizational sciences: Two meta-analytic schools on the way to MARS (the meta-analytic reporting standards). *Journal of Business and Psychology*, *28*, 123–143.

Ketchen, D. J., Ireland, R. D., & Baker, L. T. (2013). The use of archival proxies in strategic management studies: Castles made of sand? *Organizational Research Methods*, *16*, 32–42.

Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, *3*(3), 383–397.

Lambert, L. S., & Newman, D. A. (2023). Construct development and validation in three practical steps: Recommendations for reviewers, editors, and authors. *Organizational Research Methods*, *26*(4), 574–607.

Leonard, D., & Sensiper, S. (1998). The role of tacit knowledge in group innovation. *California Management Review*, *40*(3), 112–132.

Liebeskind, J. P. (1996). Knowledge, strategy, and the theory of the firm. *Strategic Management Journal*, *17*(S2), 93–107.

Makadok, R. (2010). The interaction effect of rivalry restraint and competitive advantage on profit: Why the whole is less than the sum of the parts. *Management Science*, *56*(2), 356–372.

Miller, D. (2019). The resource-based view of the firm. In *Oxford research encyclopedia of business and management*. https://doi.org/10.1093/acrefore/9780190224851.013.4

Mowery, D. C., Oxley, J. E., & Silverman, B. S. (1996). Strategic alliances and interfirm knowledge transfer. *Strategic Management Journal*, *17*(S2), 77–91.

Nason, R. S., & Wiklund, J. (2018). An assessment of resource-based theorizing on firm growth and suggestions for the future. *Journal of Management*, *44*(1), 32–60.

Nelson, R., & Winter, S. (1982). *An evolutionary theory of economic change*. Harvard.

Nonaka, I. (1991). The knowledge-creating company. *Harvard Business Review*, *9*(6), 96–104.

Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford University Press.

Penrose, E. T. (1959). *The theory of the growth of the firm*. Oxford University Press.

Peteraf, M. A., & Barney, J. B. (2003). Unraveling the resource-based tangle. *Managerial and Decision Economics*, *24*(4), 309–323.

Polanyi, M. (1966). The logic of tacit inference. *Philosophy*, *41*(155), 1–18.

Powell, T. C., & Dent-Micallef, A. (1997). Information technology as competitive advantage: The role of human, business, and technology resources. *Strategic Management Journal*, *18*, 375–405.

Ruigrok, W., Peck, S. I., & Keller, H. (2006). Board characteristics and involvement in strategic decision making: Evidence from Swiss companies. *Journal of Management Studies*, *43*(5), 1201–1226.

Schendel, D. (1996). Editor's introduction to the 1996 Winter special issue: Knowledge and the firm. *Strategic Management Journal*, *17*, 1–4.

Schmidt, F. L., & Hunter, J. E. (2015). *Methods of meta-analysis: Correcting error and bias in research findings* (3rd ed.). Sage.

Schulz, M. (2001). The uncertain relevance of newness: Organizational learning and knowledge flows. *Academy of Management Journal*, *44*(4), 661–681.

Sobol, M. G., & Lei, D. (1994). Environment, manufacturing technology, and embedded knowledge. *International Journal of Human Factors in Manufacturing*, *4*(2), 167–189.

Spender, J. C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, *17*(S2), 45–62.

Spender, J. C., & Grant, R. M. (1996). Knowledge and the firm: Overview. *Strategic Management Journal*, *17*(S2), 5–9.

Stam, W., & Elfring, T. (2008). Entrepreneurial orientation and new venture performance: The moderating role of intra-and extraindustry social capital. *Academy of Management Journal*, *51*(1), 97–111.

Viswesvaran, C., & Ones, D. S. (1995). Theory testing: Combining psychometric meta-analysis and structural equations modeling. *Personnel Psychology*, *48*(4), 865–885.

Wang, H. C., He, J., & Mahoney, J. T. (2009). Firm-specific knowledge resources and competitive advantage: The roles of economic-and relationship-based employee governance mechanisms. *Strategic Management Journal*, *30*(12), 1265–1285.

Weigelt, C. (2013). Leveraging supplier capabilities: The role of locus of capability deployment. *Strategic Management Journal*, *34*(1), 1–21.

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, *5*(2), 171–180.

Wiklund, J., & Shepherd, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal*, *24*(13), 1307–1314.

Winter, S. G. (2009). Knowledge and competence as strategic assets. In *The strategic management of intellectual capital* (pp. 165–187). Routledge.

Zack, M. H. (1999). Developing a knowledge strategy. *California Management Review*, *41*(3), 125–145.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Bergh, D. D., D'Oria, L., Crook, T. R., & Roccapriore, A. (2025). Is knowledge really the most important strategic resource? A meta-analytic review. *Strategic Management Journal*, *46*(1), 3–18. https://doi.org/10.1002/smj.3645