“Resource-related diversification and its measures – review of empirical results”

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Resource-related diversification and its measures – review of empirical results

Abstract

Resource-relatedness is considered to be the answer to the criticism associated with traditional product and market based measures of diversification. However, the empirical support of resource-related diversification has not been investigated yet. Therefore, the author conducts a review of 32 statistical tests derived from 18 studies, and finds substantial support. Nevertheless, a dominant measurement approach has not evolved yet. Researchers focus on specific dimensions of resource-relatedness and they apply different indicators and measurement approaches. The author concludes that a measure satisfying the multidimensionality of resource-relatedness and that consensus on a measurement approach are significant for the advancement of research on diversification.

Keywords: diversification, relatedness, resource, measure, review.
JEL Classification: M19.

Introduction

Diversification is a central topic in research on strategic management. In this field of research, the relatedness of a company's business units has long been gauged by assessing the similarity of products and markets (Robins & Wiersema, 1995). Diversification studies defining the relatedness of business units based on product or market similarities have produced inconclusive and contradictory results concerning diversification and economic performance (Bettis, 1981; Grant & Jammine, 1988; Palepu, 1985). Therefore, the product and market based view on relatedness and its focus on the external environment and industry context of the corporation has been challenged. Since the 1990s, numerous studies have evolved determining the relatedness of a firm's business units on the basis of its resources. The underlying assumption of resource-related diversification studies is that firms with a resource-related business portfolio outperform firms with unrelated portfolios because resource-relatedness allows a firm to benefit from synergies (Farjoun, 1994; Markides & Williamson, 1994). Resource-related diversification, therefore, "promises to be an important new source of empirical insights into the link between the corporate strategy and economic performance" (Robins & Wiersema, 1995, p. 278). Peteraf (1993, p. 188) even claims that "the prevailing theory of diversification can be characterized as resource-based".

But does this resource-based approach receive empirical support? And how is resource-related diversification measured? With the focus shifting from product-market diversification to resource-related diversification, questions arose regarding the content validity of existing diversification measures (Robins & Wiersema, 2003). Traditionally, categorical measures, such as Rumelt's measure, or continuous measures, such as the Berry index, have been used to measure relatedness between a firm's business units (Palich, Cardinal & Miller, 2000; Ramanujam & Varadarajan, 1989). These measures, however, assess product-market diversification and have a "weak connection to the forms of relatedness that are important in contemporary strategy theory" (Robins & Wiersema, 2003, p. 44). Despite a significant amount of research on resource-related measures of diversification, no study has yet provided an overview of the different measures of resource-related diversification and their empirical support. A review of resource-related diversification and its measures will add tremendous value to expand the understanding of this approach and scholars even explicitly demanded a synthesis of existing research (Farjoun, 1998).

Therefore, the goal of this paper is to assess the empirical support for resource-related diversification and its measures by conducting a review and analysis of the empirical literature on this topic. I examine 18 studies with a total of 32 statistical tests on resource-related diversification in order to unveil whether the theoretical arguments for a resource-based view of relatedness are supported. Since the studies address numerous sub-dimensions of resource-relatedness and apply a variety of measurement approaches, an analysis of the individual approaches follows to add further value to our understanding.

1. Role of relatedness for diversification

Research on diversification can be dated back to the pioneering works of Chandler (1962) and Ansoff (1965). Within diversification research, the association between firm diversification and performance has probably received the most attention (Chatterjee & Wernerfelt, 1991). Due to the fact that relatedness

between a firm's business units offers the potential for synergies (Markides & Williamson, 1994), related diversifiers are believed to have a competitive advantage compared to unrelated diversifiers, or firms with only one line of business.

The success of the approach, however, is based on an adequate definition of relatedness (Robins & Wiersema, 1995). Traditionally, empirical studies determined relatedness by looking at product or market similarities within a diversified firm's business portfolio (Palepu, 1985; Rumelt, 1974, 1982; Varadarajan & Ramanujam, 1987). However, diversification studies examining the impact of product or market relatedness on the economic performance of firms produced mixed results. Product-market relatedness studies, therefore, have been criticized for not adequately reflecting the relatedness among a firm's business units. Criticism includes the use of SIC-codes from the Standard Industrial Classification system with the underlying assumption of equidistance and the focus on strategy formulation while neglecting strategy implementation (Harrison et al., 1993; Robins & Wiersema, 1995).

Since the 1990s, resource-relatedness evolved as the prevailing approach to assess the relatedness of a firm's corporate portfolio. Relatedness was no longer determined on the basis of products, but on the basis of resources (Szeless, Wiersema & Müller-Stewens, 2003). Studies on resource-related diversification often state that firms consist of a bundle of heterogeneous and immobile resources (Barney, 1991), following the arguments of Penrose (1959). Examples of such resources include: employment of skilled personnel, in-house knowledge of technology, or efficient business procedures (Wernerfelt, 1984). A firm that is able to use its resources in more than one business unit, benefits from sub-additive cost and super-additive value synergies (Szeless et al., 2003; Tanriverdi & Venkatraman, 2005).

Theoretically, resource-relatedness seems to better tackle the underlying phenomenon of synergies in order to better explain superior performance of diversified companies. However, the above stated synergy effects as well as the resources as sources of synergies are manifold. Hence, within the approach of resource-related diversification, varying conceptualization might be found in order to capture resource-relatedness and the pivotal synergy effect. But so far – in contrast to measures from the product-market perspective – no concept seems to have gained the importance in theory and practice. On top of that the support for the theoretical proposition has only been tested for the individual concept, but not for the entire approach of resource-relatedness.

2. Data and method

To identify suitable studies to assess the empirical support for resource-related diversification I followed the approach of David and Han (2004), which was also used by Newbert (2007) to examine the empirical research on the resource-based view. I utilized this explicit, transparent, and reproducible method for identifying the studies to minimize identification and rejection bias (Greenhalgh, 1997). Accordingly, I used the EBSCO Host Business Source Complete database and performed a keyword based search to identify articles with substantive relevance. A combination of keywords was used of which one keyword combination had to be included in the title or abstract of the studies. The four keyword combinations were: "related* and diversification", "resource and diversification", "synergy and acquisition", and "resource and relatedness", where a "*" indicates that variations on the ending of the word were permitted. This search produced 1,440 results. With further keywords that were frequently encountered in resource-related diversification studies (i.e., measure*, empirical, competence, intangible, economies of scope, linkage, performance) the results were reduced to 638. After reading the titles and abstracts of all identified results 27 studies remained. The criterion for inclusion in the literature review was that a measure of resource-relatedness between business units is developed and empirically tested in the studies. After reading all articles, I had to further eliminate studies that determined relatedness by means of traditional product-market measures of diversification. Moreover, articles that do not contain regression analyses were rejected. Finally, the search process resulted in 18 studies to be included in the review. To ensure exhaustiveness of my sample, I also analyzed the references and performed other index searches, only showing the robustness of my search process. Although 18 studies might seem a limited number, it is a comparable sample size from other reviews in management (e.g., Stajkovic & Luthans, 1997; Campbell-Hunt, 2000).

To select the statistical tests contained in the 18 articles of the analysis, I treated the individual hypotheses in the primary studies as the unit of analysis. This enabled a differentiated review of the within-study information (Cooper, 1989). The analysis was restricted to hypotheses that document the results of regression analysis and that test a direct relationship between a dimension of resource-relatedness and a dependent variable. Only those hypotheses were selected that tested for either such a direct relationship or in which such a direct relationship could be inferred from the regression

analysis. Finally, 32 statistical tests were isolated from the 18 articles selected for analysis.

The studies and tests in the sample proved to be highly heterogeneous. Consequently, it seems inappropriate to combine the diverse measures into a single statistic, as required for an empirical meta-analysis. However, in order to analyze the statistical tests of heterogeneous data, the traditional voting method which involves counting significant and nonsignificant findings (Hunter & Schmidt, 1990) offers a straightforward and robust methodology.

To apply this methodology, I divided the statistical tests into three groups: supported tests, partially supported tests, and tests that produced a result counter to the theory. I only counted those tests to the group of supported tests that received significant support. Partially supported tests consist of those hypotheses that include a cluster of variables, sub-hypotheses, or multiple samples with differing support. Tests that were either insignificant or significant with opposite sign than predicted by the theory were classified as tests counter to the theory.

3. Empirical support for resource-related diversification

Of the 32 statistical tests included in the analysis, 21 (66%) were statistically supported, four (12%) were partially supported, and seven (22%) were disapproved. Table 1 lists the author(s) and the year of publication, the number of statistical tests included in each article, and their empirical support. Most of the empirical tests (24) used performance as dependent variable (profitability (e.g., ROA, ROS, Tobin's q), sales growth, or predicted market share), while few (8) used other measures (e.g., market entry, new linkage creation).

Table 1. Results by article

Article (Year of publication)	# tests	# supported	% supported
Davis et al. (1992)	2	2	100%
Harrison et al. (1993)	2	1	50%
Markides & Williamson (1994)	1	1	100%
Ilinitch & Zeithaml (1995)	1	0	0%
Robins & Wiersema (1995)	1	1	100%
Brush (1996)	1	1	100%
Chang (1996)	2	2	100%
Markides & Williamson (1996)	2	0	0%
Farjoun (1998)	1	0	0%
Silverman (1999)	1	1	100%
St. John & Harrison (1999)	1	0	0%
Tsai (2000)	5	5	100%
Szeless et al. (2003)	1	1	100%
D'Aveni et al. (2004)	4	2	50%
Tanriverdi & Venkatraman (2005)	2	1	50%
Miller (2006)	1	1	100%
Pehrsson (2006)	2	1	50%
Tanriverdi (2006)	2	1	50%
18	**32**	**21**	**66%**

As already stated above, almost every study focused on different dimensions of resource-relatedness, applied different measures and measurement approaches. While there seems to be overall empirical support for the basic proposition that resource-related diversification leads to superior performance, the heterogeneity of the studies de-mands to delve deeper into the aspects in which the studies differ. Therefore, in the following, the various dimensions of resource-relatedness, the indicators that have been utilized to operationalize those dimensions, and the different measurement approaches that have been used are analyzed. A detailed coding summary of all studies can be obtained from the author upon request.

4. Dimensions of resource-relatedness

Resource-relatedness based on relatedness of a particular resource was the most popular approach. In the literature, the following resources are distinguished to form a firm's resource basis: physical resources, financial resources, human resources, technological resources, organizational resources, and relational resources (Grant, 1991). According to Barney (1991), those resources, which are valuable, rare, imperfectly imitable, and organizational specific, lend themselves to achieving a sustained competitive advantage. Intangible resources, such as a firm's reputation or human knowledge, seem to meet all of Barney's criteria and are particularly suited to achieve a sustainable competitive advantage.

Intangible resources employed as dimensions of resource-relatedness are for example technological capabilities or organizational structures. The empirical support for the analyzed intangible resources emphasizes that they all seem to be suited, to some extent, to determine resource-relatedness between a firm's business units. In contrast, tangible resources have not been analyzed for resource-relatedness in the 18 articles.

Another group of researchers determined resource-relatedness based on functional relatedness between a firm's lines of business. It is no surprise that functional resource-relatedness is suited to achieve a sustainable competitive advantage since functional relatedness encompasses the intangible resources described above, relevant to a specific function. For example, a firm that consists of multiple business units that are related with respect to inbound logistics can, for instance, share supplier relationships (relational resource) or transfer human expertise in logistics (human resource) between business units. In contrast to the intangible resources described above, functional resource-relatedness was tested less exhaustively in the analyzed articles.

Furthermore, some researchers attempted to capture resource-relatedness in an even broader sense. In this context, managerial capabilities are a particularly important dimension. The role of managers involves coordinating and developing all other resources of a firm (Farjoun, 1994). Penrose (1959) stated that it is not the equipment with superior resources that drives performance, but that a firm makes better use of its resources, which is a responsibility that is attributed to a firm's managers. In this sense, managers are placed above all other resources since their role is to make the most efficient use of a firm's resources. Relatedness in core competencies and strategic relatedness also reflect resource-relatedness in a broader sense. Both may comprise different intangible resources, which may be located within different functions of the firm.

Overall, the dimensions of resource-relatedness from the 32 statistical tests can be grouped into twelve categories as shown in Table 2. Of the twelve dimensions of resource-relatedness, ten dimensions were examined in three or less tests, reflecting no more than 9% of the tests. This emphasizes that a variety of dimensions of resource-relatedness were tested, but few were analyzed in more detail. Seven tests from three articles examined managerial relatedness, representing the dimension of resource-relatedness that is tested most often (D'Aveni et al., 2004; Harrison et al., 1993; Ilinitch & Zeithaml, 1995). Interestingly, however, tests examining managerial relatedness received the lowest rate of support with only 43%. Human relatedness was examined in five tests from three articles and three (60%) of the tests were supported (Chang, 1996; Farjoun, 1998; Tanriverdi & Venkatraman, 2005). Strategic relatedness was examined in three tests from three different articles and two (67%) of the tests were supported (Markides & Williamson, 1994, 1996; Tsai, 2000). The joint effect of strategic and organizational relatedness was examined in three tests from two articles and two (67%) of the tests were supported (Markides & Williamson, 1996; Tsai, 2000). Based on two tests from different articles, with 100% support each, technological relatedness is viewed as being of importance (Miller, 2006; Silverman, 1999). Human and technological relatedness was examined in two tests from two different articles and both (100%) tests were supported (Robins & Wiersema, 1995; Szeless et al., 2003). Production relatedness was examined in two tests from different articles and one (50%) test was supported (Davis et al., 1992; St. John & Harrison, 1999). The remaining five dimensions of resource-relatedness were each tested in just one article. Organizational relatedness was tested in two tests and both (100%) tests received support (Tsai, 2000). Relatedness in core competencies (Pehrsson, 2006) and information technology relatedness (Tanriverdi & Venkatraman, 2005) were each examined in two statistical tests and half of the tests (50%) were supported. Finally, relatedness in functions and relational resources (Brush, 1996) as well as marketing relatedness (Davis et al., 1992) were dealt with in one test each and both tests (100%) were supported.

Table 2. Results by dimension of resource-relatedness

Dimensions of resource-relatedness		# tests	# supported	% supported	# counter	% counter
1	Managerial relatedness	7	3	43%	1	14%
2	Human relatedness	5	3	60%	2	40%
3	Strategic relatedness	3	2	67%	0	0%
4	Strategic and organizational relatedness	3	2	67%	1	33%
5	Technological relatedness	2	2	100%	0	0%
6	Human and technological relatedness	2	2	100%	0	0%
7	Production relatedness	2	1	50%	1	50%
8	Organizational relatedness	2	2	100%	0	0%
9	Relatedness in core competencies	2	1	50%	1	50%

Table 2 (cont.). Results by dimension of resource-relatedness

Dimensions of resource-relatedness		# tests	# supported	% supported	# counter	% counter
10	Information technology relatedness	2	1	50%	1	50%
11	Relatedness in functions and relational resources	1	1	100%	0	0%
12	Marketing relatedness	1	1	100%	0	0%
	Total	**32**	**21**	**66%**	**7**	**22%**

This analysis reveals that researchers have examined different dimensions of resource-relatedness in an attempt to capture the resource-relatedness of a firm's business units. While all of the tested dimensions of resource-relatedness received some empirical support, the level of empirical support varied with the chosen dimension of resource-relatedness. There is no dimension of resource-relatedness that stands out in terms of frequency of use and empirical support. Therefore, a conclusion with respect to the superiority of individual dimensions cannot yet be drawn.

5. Indicators for dimensions of resource-relatedness

Apart from the fact that all investigated dimensions received some support and, thus, play a role in measuring resource-relatedness, these dimensions were also operationalized by different indicators. For instance, managerial relatedness is operationalized in different ways. It is derived from different types of expenditures, such as R&D, advertising, selling, and capital expenditures; but it is also deduced from the value chain stages of a firm's business units. Additionally, some indicators are used to operationalize different dimensions of resource-relatedness. For instance, the value chain stage is not only used to reflect managerial relatedness, it is also used as an indicator for production relatedness. It is notable that the level of support varies with the type of indicator used to operationalize a dimension of resource-relatedness.

The twelve dimensions of resource-relatedness have been operationalized inconsistently and with different indicators, as shown in Table 3. It should be kept in mind that five of the twelve dimensions of resource-relatedness were examined in just one study each. But even dimensions of resource-relatedness that were tested in more than one article were operationalized by means of various indicators. Overall, only four indicators were utilized in more than one article to operationalize a particular dimension of resource-relatedness. Additionally, there seems to be little consensus regarding the operationalization of the remaining dimensions of resource-relatedness, while the level of support varies with the chosen operationalization. Production relatedness, for instance, was operationalized by analyzing plant and equipment, R&D, and products in one statistical test, which was supported (100%). However, it was also operationalized by focusing on the value chain stages of a firm's business units in another test, which was not supported (0%). Managerial relatedness was operationalized by comparing R&D expenditures in one test, that was supported, and by determining the value chain stages of a firm's business units in another test, that was not supported.

Table 3. Results by indicator for dimensions of resource-relatedness

Indicators for dimensions of resource-relatedness	# tests	# supported	% supported	# counter	% counter
Managerial relatedness					
Expenditures: advertising, selling, R&D, and capital	4	2	50%	0	0%
Expenditures: R&D	1	1	100%	0	0%
Expenditures: capital	1	0	0%	1	100%
Value chain stage	1	0	0%	0	0%
Human relatedness					
Occupational distribution	3	2	67%	1	33%
Complementary knowledge: product, customer, managerial	1	1	100%	0	0%
Knowledge: product, customer, managerial	1	0	0%	1	100%
Strategic relatedness					
Strategic assets: customer, channel, input, process, market knowledge	3	2	67%	0	0%
Strategic and organizational relatedness					
Strategic assets: customer, channel, input, process, market knowledge; networks	1	1	100%	0	0%
Strategic assets: customer, channel, input, process, market knowledge; communication	1	1	100%	0	0%
Strategic assets: customer, channel, input, process, market knowledge; Head office involvement, centralization of strategic and financial controls	1	0	0%	1	100%

Table 3 (cont.). Results by indicator for dimensions of resource-relatedness

Indicators for dimensions of resource-relatedness	# tests	# supported	% supported	# counter	% counter
Technological relatedness					
Patent portfolio	2	2	100%	0	0%
Human and technological relatedness					
Technology flows	2	2	100%	0	0%
Production relatedness					
Plant and equipment, R&D, products	1	1	100%	0	0%
Value chain stage	1	0	0%	1	100%
Organizational relatedness					
Communication	1	1	100%	0	0%
Networks	1	1	100%	0	0%
Relatedness in core competencies					
Attributes: product market, resource, value chain	2	1	50%	1	50%
Information technology relatedness					
Complementary IT-resources: infrastructure, strategy-making process, vendor management, human resource management	1	1	100%	0	0%
IT-resources: infrastructure, strategy-making process, vendor management, human resource management	1	0	0%	1	100%
Relatedness in functions and relational resources					
R&D, promotion, relational resources	1	1	100%	0	0%
Marketing relatedness					
Customers, sales force, advertisement, promotion	1	1	100%	0	0%
Total	**32**	**21**	**66%**	**7**	**22%**

6. Measurement approaches for resource-relatedness

So far we have seen that studies establishing resource-related measures of diversification used different dimensions with varying indicators. This level of heterogeneity is even further extended since different measurement approaches are utilized. In total, seven different measurement approaches were applied and the level of support varied for each.

The only measurement approaches that were tested in more than two articles are "business resource profiles" and evaluations by respondents. "Business resource profiles" is a measurement approach that tries to compare wide ranging descriptions of the features of an object. The object typically is a specific bundle of resources, for example technologies (Robins & Wiersema, 1995). The resource profiles try to measure how similar resources are across different business units in order to conclude on their relatedness. As an individual measurement approach, "business resource profiles" fared better than evaluation by respondents.

Other measurement approaches are resource-related industry groups (Chang, 1996; Farjoun, 1998) and intensities (Harrison et al., 1993; D'Aveni et al., 2004). Resource-related industry groups are very similar to resource profiles. While resource profiles establish profiles on the corporate level, industry groups establish profiles on the industry level. Farjoun (1998) grouped industries into resource-related groups according to the similarity of human expertise required in an industry. Intensities are used to approximate managerial relatedness that stems from a similar dominant logic. Business units with similar expenditure-sales-ratios (i.e., intensities) such as R&D or marketing expenditures in relation to sales are deemed to reflect similar characteristics of different business units. However, the use of intensities has been criticized because of their inability to reflect the narrow range of applications for a particular resource (Silverman, 1999).

To even better analyze and differentiate the different measurement approaches, a useful categorization was required. Cecconi et al. (2006) offer a classification for the different methods by distinguishing "measurement" and "evaluation" depending on the objectivity of the measurement process. "Measurement" refers to an assessment based on a replicable and objective rule for categorizing some aspects of observable objects and, thus, is objective as well as empirical. In contrast, "evaluation" is subjective and reflects individual perceptions. "Evaluation" is thus not objective, but attempts to be empirical by providing dimensions of observations.

Five approaches (business resource profiles, intensities, resource-related industry groups, structural indicators, and distance scores) use objective criteria and replicable rules to measure relatedness. Therefore, I grouped these approaches into the cluster "measurement". All tests measuring relatedness based on evaluation by respondents

conduct a questionnaire to obtain primary information from respondents and, thus, the measurement approach depends on the individual perceptions of relatedness by respondents. Finally, structural indicators and evaluation by respondents consist of two measurement approaches and, therefore, form the separate category "measurement and evaluation". The detailed results for the three categories with their respective measurement approaches are shown in Table 4.

Table 4. Results by measurement approach

Measurement approach		# tests	# supported	% supported	# counter	% counter
"Measurement"		**18**	**11**	**61%**	**3**	**17%**
1	Business resource profiles	6	5	83%	1	17%
2	Intensities	6	3	50%	1	17%
3	Resource-related industry groups	3	2	67%	1	33%
4	Structural indicators	2	1	50%	0	0%
5	Distance scores	1	0	0%	0	0%
"Evaluation"		**13**	**10**	**77%**	**3**	**23%**
6	Evaluation by respondents	13	10	77%	3	23%
"Measurement and evaluation"		**1**	**0**	**0%**	**1**	**100%**
7	Structural indicators and evaluation by respondents	1	0	0%	1	100%
	Total	**32**	**21**	**66%**	**7**	**22%**

Six statistical tests draw on business resource profiles to measure relatedness, of which five (83%) were supported. The support for business resource profiles is very convincing since all six tests stem from different articles (Brush, 1996; Miller, 2006; Robins & Wiersema, 1995; Silverman, 1999; St. John & Harrison, 1999; Szeless et al., 2003). In contrast, intensities, used in six statistical tests from two articles, were only supported in three (50%) of the tests. Resource-related industry groups were utilized in three tests from two articles and two (67%) of the tests were supported. Structural indicators were employed in two tests from different articles and one (50%) of the tests was supported. In one test, a distance score – the distances of the value stages of a firm's businesses from its center of gravity – was used. But this test was only partially supported (Ilinitch & Zeithaml, 1995). Evaluation by respondents was the most frequently used measurement approach and was employed in 13 tests from five articles. Ten (77%) of the tests were supported (Davis et al., 1992; Pehrsson, 2006; Tanriverdi, 2006; Tanriverdi & Venkatraman, 2005; Tsai, 2000). Finally, one test is composed of two different measurement approaches – structural indicators and evaluation by respondents. This test examined two different dimensions of resource-relatedness which were each measured by a different measurement approach (Markides & Williamson, 1996). However, the test produced a result opposite to the theory.

In total, 18 (56%) statistical tests from 13 articles are based on objective "measurement" while 13 (40%) statistical tests from five articles belong to the category "evaluation". One (3%) statistical test belongs to the category "measurement and evaluation". Overall, the empirical support for statistical tests in the category "measurement" is 61% while tests based on "evaluation" received support of 77%. Concerning the tests that produced results counter to the theory, "measurement" received better results with 17% compared to 23% for "evaluation".

When jointly analyzing the measurement approaches used for the individual dimensions of resource-relatedness, there seems to be no dominant pattern. For instance, while Tsai (2000) surveyed respondents about strategic relatedness, Markides and Williamson (1994; 1996) employed structural indicators to determine strategic relatedness. Tanriverdi and Venkatraman (2005) surveyed respondents about human relatedness, whereas Chang (1996) and Farjoun (1998) utilized resource-related industry groups to measure this dimension of resource-relatedness. Overall, "evaluation" and "measure-ment" have been used randomly to measure the different dimensions of resource-relatedness.

When analyzing the measurement categories over time, it becomes evident that of the eleven articles published before 2000, ten utilized "measurement" while one article employed "evaluation." However, of those seven articles published in 2000 and later, three articles used "measurement" while four articles were based on "evaluation." This may indicate that contemporary studies regard "evaluation" as a more valid measurement for resource-relatedness while past research relied more heavily on external data sources. However, to conclude, the findings concerning the measurement approaches add to the quite fragmented picture of resource-related measures of diversification.

Discussion and conclusion

The primary objective of this review was to give an overview of existing research on resource-related diversification and its measures. Although resource-relatedness seems to be a suitable view of relatedness of a firm's business units and may contribute to overcome some of the limitations of product-market based diversification, the findings of this study suggest that still more research is needed. As the discussion above showed, despite the general empirical support for the resource-related perspec-tive there is no silver bullet for compre-hensively measuring resource-relatedness.

However, the findings of this study have to be seen in light of its own limitations. Although I attempted to follow a replicable and transparent selection process to identify the studies, there are some limitations to the method. Even though EBSCO is the superior database for full text business journals, it might not include all relevant studies. It is also possible that additional empirical work has been published since I conducted the search process, or is currently in the research process. Moreover, studies that have not been published might also provide interesting insights but could not be included because of non-availability.

But despite of its limitations, I deem this study to be a valuable contribution by helping to condense the knowledge from existing empirical research on resource-related diversification and by supporting the further development of research stream. Subsequently, I derived suggestions for future research in three areas dimensions, indicators, and measurement approach.

First, I found that while a broad range of dimensions of resource-relatedness has been examined, the multidimensionality of resource-relatedness is not yet adequately reflected. I am hopeful that this review about the analyzed dimensions of resource-relatedness will contribute to the development of such a multidimensional concept.

Second, more diligence should be exercised in the operationalization of the dimensions of resource-relatedness by means of indicators. Indicators should be selected in such a way that they adequately capture the complexity of the underlying dimensions of resource-relatedness. Moreover, I found that particular dimensions of resource-relatedness, such as managerial relatedness or human relatedness, are differently understood and operationalized in the studies. A higher level of consent regarding these constructs will further help the advancement of this perspective.

Third, concerning the measurement approach, I found that there is not yet a dominant measure of resource-related diversification comparable with the Berry index. I suggest that consensus regarding the measurement approach would increase the comparability of the resource-related diversification studies. I argued above that the measurement approach "evaluation" is better suited to reflect the multidimensionality of resource-relatedness and, therefore, suggest that further research measuring resource-relatedness by means of managerial perceptions would be desirable.

Generally, it should be noticed that existing research on resource-related diversification is predominantly focused on the manufacturing sector and that only two of the 18 studies incorporate data on firms outside the United States. Since the applicability of the existing measures for the manufacturing industry to the service industry is questionable (Tanriverdi & Venkatraman, 2005) and differences in the institutional environments of different national settings may produce different results (Szeless et al., 2003), future research may focus on the specifics of the service industry and incorporate broader geographical data. This might increases the generalizability of the findings on resource-related diversification.

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