Freie Universität Berlin

Performance Forecasts in Uncertain Environments: Examining the Predictive Power of the VRIO-Framework

Christian Powalla
Rudi K. F. Bresser

School of Business & Economics
Discussion Paper

Strategic Management

2010/22

978-3-941240-34-6

Performance Forecasts in Uncertain Environments: Examining the Predictive Power of the VRIO-Framework

Christian Powalla
Freie Universität Berlin, Department of Business Administration
Garystraße 21, 14195 Berlin, Germany
tel.: +49-30-8385-2280, e-mail: christian.powalla@fu-berlin.de

Rudi K. F. Bresser
Freie Universität Berlin, Department of Business Administration
Garystraße 21, 14195 Berlin, Germany
tel.: +49-30-8385-4055, e-mail: rudi.bresser@fu-berlin.de

September 2010

ABSTRACT

Strategy tools are widely used in the practice of strategic management to yield a good solution with an acceptable problem-solving effort. This paper presents results of an experimental research project that assesses the practical effectiveness of a theory-based decision-making tool, the VRIO-Framework, in predicting the stock-market performance of different companies. The VRIO's predictive power is compared to the predictions derived from Analyst Ratings that are a widespread and commonly used tool in the decision-making context of this study. Our results suggest that the VRIO-Framework is a particularly effective forecasting tool whereas the power of Analyst Ratings is disputable. The results also provide support for the practical usefulness of resource-based theory.

INTRODUCTION

In real-life strategic decision making situations that often can be characterized as highly important, complex, dynamic, and associated with time and information constraints, strategy tools can help boundedly rational managers to achieve good results with reduced efforts (e. g. Clark 1997; Glaister / Falshaw 1999; Jarzabkowski / Kaplan 2008; Knott 2008). Strategy tools are defined as "techniques, tools, methods, models, frameworks, approaches and methodologies which are available to support decision making within strategic management" (Clark 1997: 417).

The strategic management literature traditionally advocates and practitioners use a multitude of strategy tools. However, the extent to which these different heuristics are really effective when applying them in strategic decision making processes is a neglected and unresolved issue. Especially in the case of theory-based and rather complex strategy tools it is necessary to confirm their practical value to convince managers of applying them with regularity.

This empirical research project analyzes the usefulness of a specific problem solving technique – the widespread *VRIO-framework* – by focusing on its power to forecast a firm's market performance. Performance forecasts with regard to alternative strategic choices are often relevant within the strategy formulation process, have a direct influence on the selection of future firm strategies, and should be based on reliable strategy tools. The chosen decision making context is the acquisition of equity in other stock corporations. Firms often acquire other firms' stock both for short-term speculative and long-term strategic purposes. But before the actual decision is made, it is necessary to estimate how the performance of the potential investment will develop in the future. Since *analyst ratings* (*AR*) are a common aid for both private and business investors when making stock selections, they are included as a benchmark to assess the predictive power of the *VRIO-framework*.

Using a resource-based logic, this project contributes to the strategic management literature relative to three tests (Bergh 2003). First, the contribution is valuable to researchers as well as practitioners because it assesses the practical effectiveness of an important theory-based strategic management tool. Second, the potential contribution of this research is specific to the resource-based theory. Since we control for the common financial explanations of market performance by including *AR*, a better predictive power of the *VRIO-framework*, to the extent that it occurs, will be specific to the approach advocated by this tool and its underlying theory (i.e., non-imitable). Third, the final test passed by this research is rareness. To the best of our knowledge, this study is the first systematic attempt to compare the predictive power of the *VRIO-framework* and *AR*, and the results are surprising.

THE VRIO-FRAMEWORK

The *VRIO-framework* represents the practical application of the resource-based view (RBV) (Barney 2007; Barney / Hesterly 2008). Today, the RBV is a leading theoretical concept in the field of strategic management attempting to explain the competitive advantages of firms. A competitive advantage is given when a firm creates more economic value than the competitors in its product market (Peteraf / Barney 2003). The economic value is "the difference between the perceived benefits gained by the purchasers of the good and the economic cost to the enterprise" (Peteraf / Barney 2003: 314). Within the RBV, the emergence of competitive advantage is tied to the existence of firm-specific resources and capabilities that are valuable, rare, non-imitable, and non-substitutable (Barney 1991). A further prerequisite is that resources and capabilities are heterogeneously distributed and immobile between firms.

Competitive advantage and economic value are complex concepts that are not easy to measure directly. However, in practice and for the purposes of applying the *VRIO-framework*, accounting based performance measures such as the return on total assets (ROA) or market based performance measures such as the return to shareholders (RTS) are commonly used indicators (Barney 2007: 17-52; Grant 2009).

The *VRIO-framework* is a systematic approach to analyzing firm resources and capabilities. The framework transforms the RBV into a series of four questions about the resources or capabilities of a firm (Barney 2007: 140): The question of *V*alue ('Do a firm's resources and capabilities enable the firm to respond to environmental threats or opportunities?'), the question of *R*arity ('Is a resource currently controlled by only a small number of competing firms?'), the question of *I*mitability ('Do firms without a resource face a cost disadvantage in obtaining or developing it?'), and the question of *O*rganization ('Are a firm's other policies and procedures organized to support the exploitation of its valuable, rare, and costly-to-imitate resources?'). Based on the results of such analyses, a decision maker should be able to determine the competitive potential of the considered resources and capabilities and classify them as strengths or weaknesses. Such resource-based assessments lead to predictions as to the competitive advantages attainable by a firm and its associated economic performance. More specifically, resources and capabilities are classified as representing a competitive disadvantage, competitive parity, a temporary competitive advantage or a sustained competitive advantage. Arguably, resources and capabilities falling into the latter category are likely to facilitate superior performance for an extended period of time.

Generally speaking, the *VRIO-framework* offers decision makers a structured, theoretically well-grounded list of criteria to identify the strategic value (and other RBV desiderata) of a firm's re-

sources and capabilities and it links these assessments to the sustainability of resource-based competitive advantages and possible performance implications. In the process of applying this strategy tool, not only the internal environment is analyzed but also external aspects are included. Especially, the question of value underlines the complementary use of internal and external analyses within the *VRIO-framework*. In spite of its clear structure, the tool's practical application is, nevertheless, dependent on numerous information requirements and extensive information processing. In particular, the identification and evaluation of intangible resources and capabilities presents a major challenge (Godfrey / Hill, 1995; Levitas / Chi, 2002; Dutta et al. 2005). Thus, the *VRIO-framework* can be regarded as one of the more complex strategic management tools with regard to the methodology applied and the data required. Currently its virtues are taught in business schools on the basis of case studies (Sheehan 2006; Barney / Hesterly 2008). The framework is also widely used in consulting practice. However, a systematic empirical evaluation concerning its effectiveness as an analysis and forecasting tool does not yet exist.

METHODS

In our research, we compare performance forecasts based on the use of the *VRIO-framework* and *AR* with the actual stock-market performance of different companies. Thus, the decision-making context is a firm that desires to acquire equity in other stock corporations and bases its decision on two alternative decision-making tools that assess the likely market performance of these stocks. This decision-making context may involve different time frames, and it is generally of high strategic relevance as the takeover battle between Volkswagen and Porsche has demonstrated during 2008 and 2009. Both automobile companies attempted to acquire each other for long-term strategic purposes with Volkswagen ultimately succeeding. In addition, several banks

and other investors such as the Merckle Group entered the takeover battle by attempting to realize short-term speculative gains (Dalan et al. 2009; Seibel 2009).

The objects of interest in our study were companies listed in the HDAX[1] index. Each company of the index was assigned to an industry based on its NACE-code. The six industries containing the highest number of firms were selected for further consideration: chemicals and chemical products; machinery and equipment; radio, television and communication equipment and apparatus; medical, precision and optical instruments, watches and clocks; financial intermediation (with the exception of insurance and pension funds); and computer and related activities. For each of these industries five companies (a total of 30) were randomly chosen.

Based on an experimental research design, we performed the following tests. First, an expert team of 27 trained MBA-students analyzed the selected 30 firms individually, using the *VRIO-framework* and publicly available information on the firms' resources and capabilities. Based on the results of the VRIO-analyses the students predicted the future stock-market performance of each company. Each participant evaluated the firms of one industry and generated five firm assessments during a two months period. After the individual analyses, all the students assigned to the same industry discussed and harmonized their individual results. The final outcome of these discussions were six industry-specific rankings of the expected stock-market performance of the individual firms over the next six months, ranging from the best to the least performing company respectively (variable: VRIO_forecast). These rankings were completed on January 28, 2008.

Second, also on January 28, 2008, we retrieved the performance forecasts based on the *analysts' ratings* for the 30 HDAX corporations considered. The data were obtained from the website of

[1] The HDAX index includes the stocks of the 110 most highly capitalized German corporations traded on the Frankfurt Stock Exchange.

Cortal-Consors, a subsidiary of the French bank BNP Paribas. On this website, the rankings of different analysts are summarized and distinguished according to the categories 'buy', 'overweight', 'hold', 'underweight', and 'sell'. Based on the average recommendations for each company, we ranked the companies from the most to the least recommended firm within an industry, i.e., the companies with the highest to the lowest expected stock performance (variable: AR_avrec_forecast). In addition to the average recommendations, the price increase potential for a period of one year for each company is estimated by analysts. Thus, we used the reported price increase potential for one year for each company to rank the companies from the highest to the lowest performance within an industry (variable: AR_pip1y_forecast).

After the completion of our two tests we determined the actual stock-market performance of the considered companies for periods of three, six, nine, and twelve months. Although our VRIO-predictions are based on the time interval of six months, we also considered three, nine, and twelve months' periods to validate any findings we might obtain across time.[2] Our performance indicator was defined as the change of a firm's dividend adjusted stock market performance (return to shareholders) in the four time periods considered. The information was obtained from the website of Yahoo Finance. Subsequently, the companies were ranked industry-specifically from the most to the least successfully performing firm (variables: SP_3months_real, SP_6months_real, SP_9months_real, SP_12months _real).

[2] How long does it take for a resource-based competitive advantage or disadvantage to affect a firm's market performance? This question cannot be answered unambiguously (Barney 1995: 51; Barney 2007: 139; Barney / Clark 2007: 53). We used a core interval of six months, because during this period of time, a certain stability of the resources and capabilities of the firms being analysed can be assumed. In addition, the identified competitive implications of a firm's resources and capabilities should have become publicly known through media coverage and statements of financial analysts and other industry experts during six months. It has also been shown that forecasts extending beyond twelve months are highly inaccurate (Schnaars 1989; Makridakis 1990; Hayward 2002). Thus, to assess the stability of our results over time, we considered performance developments of three, nine and twelve months in addition to our core interval of six months.

The transformation of all variables into rankings suggested using a rank correlation coefficient to analyze our data. Specifically, we use Spearman's rho to determine the strength of the relationship between the predicted and the actual stock-market performance of the firms considered in this study. We use these correlations to evaluate the relative predictive power of the *VRIO-framework* and the *AR* respectively.

RESULTS

As shown in Table 1 Spearman's rho correlations reveal highly significant positive correlations between the *VRIO-framework* predictions and the companies' actual stock-market performance in three of the four periods: Concerning the central six months' period the coefficient is .801, for the nine months' period it is .654, and for the twelve months' period .479.

Variables	**1**	**2**	**3**	**4**	**5**	**6**
1 *VRIO*_forecast						
2 *AR*_avrec_forecast	.107					
3 *AR*_pip1year_forecast	-.133	.022				
4 SP_3months_real	.246	-.178	.087			
5 SP_6months_real	.801**	-.012	.002	.550**		
6 SP_9months_real	.654**	.276	-.265	-.074	.595**	
7 SP_12months_real	.479**	.273	-.156	-.197	.368	.763**

** p < 0,01 (two-tailed)

Table 1: Spearman's rho correlations between VRIO-framework-forecast, analyst ratings-forecasts and actual stock-market performance in four time intervals

Regarding the *AR*, insignificant, positive and negative results are found (second and third columns of Table 1). For all four periods, both the forecasts derived from the average recommendations and the estimated one-year price increase potential are only weakly correlated with the actual stock-market performance.

CONCLUSION AND IMPLICATIONS

The results of our study lend empirical support to the RBV and highlight the practical value of the theory-based and rather complex *VRIO-framework* as a tool to support strategic decision making. Competitive (dis)advantages based on an analysis of resources and capabilities are noticeable in a firm's stock market performance over periods of six, nine, and twelve months. Thus, our results are in line with empirical resource-based research that has tested the theory directly (Barney / Arikan 2001; Newbert 2007; Crook et al. 2008) and not, as we do in this study, based on the theory's transformation into a decision-making framework for practitioners. To the best of our knowledge, this is the first systematic attempt to validate the *VRIO-framework* empirically.

It is noteworthy that the time periods where the VRIO predictions were most accurate (six, nine, and twelve months) were typical bear markets. All stocks considered faced a declining market performance during these periods because the worldwide crisis of the finance industry affected the markets in 2008. However, according to our results those firms with superior resources and capabilities sustained lower losses than those with inferior resource endowments. While there are clearly no rules for riches, these results raise the question of whether the *VRIO-framework* is equally effective in bull markets.

Future research can benefit from comparing the predictive power of other theory-based strategy tools, e. g., industry analysis frameworks, to the *VRIO-framework.* In addition, it would be of interest to analyze the *VRIO-framework's* effectiveness in other decision-making contexts, and with larger samples and other participants (e.g., managers or other experts with extensive industry experience rather than trained MBA students). Additionally, a focus on performance measures other than market performance is a promising avenue of this type of strategic management research because a firm's resource-based competitive advantages also should be noticeable, for example, in accounting measures (Barney 2007: 20-24).

Considering the *AR*, our results suggest that their usefulness as forecasting tools is questionable. There is almost no relationship between the predicted and the actual stock-market performance. However, while these results are surprising, they are not unique. Other empirical studies suggested that although performance predictions by financial analysts are typically based on complex mathematical models derived from theory in the field of finance, they may nevertheless often be biased. Such biasing may result because an overoptimistic or overconfident assessment of particular stocks by analysts may override the results generated by mathematical simulations (e.g., Dreman / Berry 1995; Easterwood / Nutt 1999; Henze 2004; Wallmeier 2005). Apart from studying biases (Zajac / Bazerman 1991), it also would be an interesting line of future research to explore how an analysis of firm resources and capabilities could be incorporated into the complex models used by analysts. To date, these models are dominated by theory developed in the field of finance rather than strategic management.

REFERENCES

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

Barney, J. B. (1995): Looking inside for competitive advantage, in: Academy of Management Executive 9 (4), 49-61.

Barney, J. B. (2007): Gaining and sustaining competitive advantage, Upper Saddle River, NJ: Prentice Hall.

Barney, J. B. / Arikan, A. (2001): The resource-based view: Origins and implications, in: Hitt, M. A. / Freeman, E. / Harrison, J. (Eds.), The Blackwell handbook of strategic management, Oxford: Blackwell Business, 124-188.

Barney, J. B. / Clark, D. N. (2007): Resource-based theory, Oxford: Oxford University Press.

Barney, J. B. / Hesterly, W. (2008): Strategic management and competitive advantage: Concepts and cases, Upper Saddle River, NJ: Prentice Hall.

Bergh, D. (2003): Thinking strategically about contribution, in: Academy of Management Journal 46 (2), 135-136.

Clark, D. N. (1997): Strategic management tool usage: A comparative study, in: Strategic Change 6 (7), 417-427.

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

Dalan, M. / Doll, N. / Seidlitz, F. (2009): Spekulation als Geschäftsmodell – Porsche spielte mit der VW-Aktie, in: Welt am Sonntag 52 (19), 37.

Dreman, D. N. / Berry, M. A. (1995): Analyst forecasting errors and their implications for security analysis, in: Financial Analysts Journal 51 (3), 30-41.

Dutta, S. / Narasimahan, O. / Rajiv, S. (2005): Conceptualizing and measuring capabilities: methodology and empirical application, in: Strategic Management Journal 26 (3), 277-285.

Easterwood, J. C. / Nutt, S. R. (1999): Inefficiency in analysts' earnings forecasts: Systematic misreaction or systematic optimism?, in: Journal of Finance 54 (5), 1777-1797.

Glaister, K. W. / Falshaw, J. R. (1999): Strategic planning: Still going strong?, in: Long Range Planning 32 (1), 107-116.

Godfrey, P. C. / Hill, C. W. L. (1995): The problem of unobservables in strategic management research, in: Strategic Management Journal 16 (7), 519-533.

Grant, R. M. (2009): Contemporary strategy analysis, Oxford: Blackwell.

Hayward, M. L. (2002): When do firms learn from their acquisition experience? Evidence from 1990–1995, in: Strategic Management Journal 23 (1), 21-39.

Henze, J. (2004): Was leisten Finanzanalysten?, Lohmar und Köln: Eul.

Jarzabkowski, P. / Kaplan, S. (2008): Strategy tools in practice: An exploration of "technologies of rationality" in use, [Online], available: http://869850982895696184 5-a-1802744773732722657-s-sites.googlegroups.com/site/hyoungkang/mnc/jarzabko wskiand-kaplan-strategytools-mar2008.pdf.

Knott, P. (2008): Strategy tools: Who really uses them?, in: Journal of Business Strategy 29 (5), 26-31.

Levitas, E. / Chi, T. (2002): Rethinking Rouse and Daellenbach's rethinking: Isolating vs. testing for sources of sustainable competitive advantage, in: Strategic Management Journal 23 (10), 957-962.

Makridakis, S. G. (1990): Forecasting, planning, and strategy for the 21st century, New York: Free Press.

Newbert, S. L. (2007): Empirical research on the resource-based view of the firm: An assessment and suggestions for future research, in: Strategic Management Journal 28 (2), 121-146.

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

Schnaars, S. P. (1989): Megamistakes, New York: Free Press.

Seibel, K. (2009): Auf und Ab – Die Kriminalgeschichte der VW-Aktienkurve, [Online], available: http://www.welt.de/finanzen/article4376467/Die-Kriminalgeschichte-der-VW-Aktienkurve.html.

Sheehan, N. T. (2006): Understanding how resources and capabilities affect performance: Actively applying the resource-based view in the classroom, in: Journal of Management Education 30 (3), 421-430.

Wallmeier, M. (2005): Gewinnprognosen von Finanzanalysten: Ein europäischer Vergleich, in: Finanz Betrieb 7 (11), 744-750.

Zajac, E. J. / Bazerman, M. H. (1991): Blind spots in industry and competitor analysis: Implications of interfirm (mis)perceptions for strategic decisions, in: Academy of Management Review 16 (1), 37-56.

Diskussionsbeiträge
des Fachbereichs Wirtschaftswissenschaft
der Freien Universität Berlin

2010

2010/1 BÖNKE, Timm / Sebastian EICHFELDER
Horizontal equity in the German tax-benefit system
Economics

2010/2 BECKER, Sascha / Dieter NAUTZ
Inflation, Price Dispersion and Market Integration through the Lens of a Monetary Search Model
Economics

2010/3 CORNEO, Giacomo / Matthias KEESE / Carsten SCHRÖDER
The Effect of Saving Subsidies on Household Saving
Economics

2010/4 BÖNKE, Timm / Carsten SCHRÖDER / Clive WERDT
Compiling a Harmonized Database from Germany's 1978 to 2003 Sample Surveys of Income and Expenditure
Economics

2010/5 CORNEO, Giacomo
Nationalism, Cognitive Ability, and Interpersonal Relations
Economics

2010/6 TERVALA, Juha / Philipp ENGLER
Beggar-Thyself or Beggar-Thy-Neighbour? The Welfare Effects of Monetary Policy
Economics

2010/7 ABBASSI, Puriya / Dieter NAUTZ
Monetary Transmission Right from the Start: The (Dis)Connection Between the Money Market and the ECB's Main Refinancing Rates
Economics

2010/8 GEYER, Johannes / Viktor STEINER
Public pensions, changing employment patterns, and the impact of pension reforms across birth cohorts
Economics

2010/9 STEINER, Viktor
Konsolidierung der Staatsfinanzen
Economics

2010/10 SELL, Sandra / Kerstin LOPATTA / Jochen HUNDSDOERFER
Der Einfluss der Besteuerung auf die Rechtsformwahl
FACTS

2010/11 MÜLLER, Kai-Uwe / Viktor STEINER
Labor Market and Income Effects of a Legal Minimum Wage in Germany
Economics

2010/12 HUNDSDOERFER, Jochen / Christian SIELAFF / Kay BLAUFUS / Dirk KIESEWETTER / Joachim WEIMANN
The Name Game for Contributions – Influence of Labeling and Earmarking on the Perceived Tax Burden
FACTS

2010/13 MUCHLINSKI, Elke
Wie zweckmäßig ist das Vorbild der Physik für ökonomische Begriffe und Metaphern
Economics

2010/14 MUCHLINSKI, Elke
Metaphern, Begriffe und Bedeutungen – das Beispiel internationale monetäre Institutionen
Economics

2010/15 DITTRICH, Marcus und Andreas Knabe
Wage and Employment Effects of Non-binding Minimum Wages
Economics

2010/16 MEIER, Matthias und Ingo Weller
Wissensmanagement und unternehmensinterner Wissenstransfer
Management

2010/17 NAUTZ, Dieter und Ulrike Rondorf
The (In)stability of Money Demand in the Euro Area: Lessons from a Cross-Country Analysis
Economics

2010/18 BARTELS, Charlotte / Timm Bönke
German male income volatility 1984 to 2008: Trends in permanent and transitory income components and the role of the welfare state
Economics

2010/19 STEINER, Viktor / Florian Wakolbinger
Wage subsidies, work incentives, and the reform of the Austrian welfare system
Economics

2010/20 CORNEO, Giacomo
Stakeholding as a New Development Strategy for Saudi Arabia
Economics

2010/21 UNGRUHE, Markus / Henning KREIS / Michael KLEINALTENKAMP
Transaction Cost Theory Refined – Theoretical and Empirical Evidence from a Business-to-Business Marketing Perspective
Marketing

2010/22 POWALLA, Christian / Rudi K. F. BRESSER
Performance Forecasts in Uncertain Environments: Examining the Predictive Power of the VRIO-Framework
Strategic Management