Analyzing the strategy–performance relationship in Germany – can we still use the common strategic frameworks?

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Abstract
Purpose – This study examines the strategy–performance relationship within publicly traded German firms. Strategic management literature provides several strategic frameworks that offer guidance on promising strategies. However, given major changes, such as globalization, managers wonder whether strategic frameworks are still applicable.
Design/methodology/approach – The authors employ principal component analysis (PCA) to measure competitive strategy and analyze a sample of 6,037 firm-years among 651 firms between 2000 and 2019.
Findings – While the authors find evidence for the existence of efficiency-based strategies, differentiation-based strategies and mixed strategies, only differentiation-based strategies are positively related to performance.
Originality/value – The study’s results contribute to the discourse on the strategy–performance relationship, as they provide insights into promising strategies that are of interest to researchers and practitioners. Further, the authors introduce a new measure of competitive strategy based on PCA.
Keywords Competitive strategy, Strategic framework, Performance, Principal component analysis
Paper type Research paper

1. Introduction
One of the main questions in the field of strategic management is why some firms perform better than others. Managers are concerned to choose the right strategy and “are forever asking the same questions: Where do we go from here, and which strategy will get us there?” (Bingham et al., 2011, p. 71). To guide this decision, prior literature provides several frameworks on promising strategies. Especially the approaches of Miles and Snow (1978) and Porter (1980) have received much attention in practice and are among the most influential works in the literature (Ramos-Rodriguez and Ruiz-Navarro, 2004). Their strategic frameworks contain a set of competitive strategies that help firms to create a competitive advantage and outperform their competitors. In general, competitive strategies are based on efficiency, differentiation or combining both dimensions (Campbell-Hunt, 2000).

Despite the popularity of strategic frameworks, it has been argued that they are no longer applicable in today’s business environment. Fundamental changes over the past 40 years, such as globalization, technological innovations and increasing uncertainty, are expected and found to affect the strategy–performance relationship (Flammer, 2015; Hitt et al., 1997; Kim et al., 2004; Lillis and Van Veen-Dirks, 2008; Pertusa-Ortega et al., 2009; Parnell, 2006a;
Porter, 2001). While it is therefore unclear whether competitive strategies from traditional strategic frameworks are still beneficial, much of the literature has shifted toward non-performance-related outcomes of competitive strategies (e.g. Bentley-Goode et al., 2017, 2019; Hsieh et al., 2018; Jiang et al., 2020; Martinez and Ferreira, 2019). In addition, competitive strategies have been studied extensively in US samples, but rarely in other countries such as Germany. However, there are important differences between German and US firms (e.g. inclusion of employees on corporate boards, more concentrated ownership structures and high proportion of family firms) that might affect the existence of certain strategies and their relation to performance. In this context, Allen et al. (2007) provide some evidence for country-specific strategies that do not correspond to common strategic frameworks. Given the lack of exploratory studies outside the USA, the applicability of strategic frameworks in Germany is an open question.

In this study, we use an exploratory approach to identify strategy types and analyze how they are related to performance. Our two research questions are as follows:

**RQ1.** Which strategy types exist in Germany?

**RQ2.** Which strategy type leads to higher performance?

We analyze a sample of 6,037 firm-years among 651 German firms between 2000 and 2019 using archival data (i.e. data from financial reports). Archival data reflect the actually implemented strategy, whereas survey data reflect perceptions of the strategic position (Mintzberg, 1978). Thus, they appear more reliable as they are free from perceptual bias, validated by an external auditor and enable us to analyze competitive strategies over a longer sample period. The novelty of this study is the usage of principal component analysis (PCA). In the archival-based literature, measures of competitive strategy often appear subjective, especially because the authors choose a specific strategic framework as a starting point, the number of strategies, the variables associated with each strategy and their weighting. PCA analyzes data patterns and identifies strategies based on correlations between strategy-related variables. Therefore, PCA allows us to analyze which typology reflects the behavior of our sample firms, and we do not have to adopt assumptions related to any strategic framework (e.g. whether strategies are mutually exclusive).

Two significant principal components emerge from PCA reflecting differentiation and efficiency. We interpret principal component scores as the extent of focus on a strategic dimension, where higher scores for a given component indicate a higher focus on that strategy. Using these measures, we observe an increasing focus on differentiation, while the focus on efficiency decreases. In addition, about 26% of the firms in our sample pursue a mixed strategy.

We further analyze the effect of these strategies on operating performance, market value and firm growth. This allows us to assess the strategy-performance relationship from different perspectives. Our results suggest that differentiation-based strategies lead to higher operating performance, market value and firm growth. Contrary to our expectations, the firm’s focus on efficiency does not affect operating performance and market value suggesting that efficiency-based strategies are not successful in Germany. Further, we find negative interactions between efficiency and differentiation indicating that mixed strategies lead to lower operating performance and firm growth.

Our results provide a deeper understanding of competitive strategies as we show that strategic frameworks are no longer completely applicable in today’s business environment. These results are of relevance to practitioners concerned about promising strategies and researchers that increasingly focus on non-performance-related outcomes of competitive strategies. Our results imply that German firms have to focus on differentiation to outperform competitors. Contrary to strategic frameworks, efficiency-based strategies are not beneficial...
2. Literature review and hypothesis development

Over the last decades, globalization, digitalization, uncertainty and complexity have dominated the media and significantly affect how firms compete. Nevertheless, traditional strategic frameworks are still popular in research and practice. Porter’s (1980) concept of differentiation and cost leadership is the best-known and dominant framework of competitive strategies (Campbell-Hunt, 2000). Cost leaders have a low-cost advantage due to cost minimization, while firms pursuing a differentiation strategy are perceived as unique due to their technology, image, or other dimensions of differentiation. The bibliometric study of Ramos-Rodríguez and Ruiz-Navarro (2004) suggests that Porter’s (1980) framework had the greatest impact on strategic management literature during 1980–2000 and later publications also show its relevance in current research (Parnell and Brady, 2019).

Miles and Snow (1978) introduced another framework that is also among the most popular typologies. They develop three different types of strategies: prospectors, defenders and analyzers. Defenders focus on improving efficiency, while prospectors continually search for opportunities and innovations. Analyzers combine both strategies as they have areas that follow a defender strategy and areas that follow a prospector strategy.

Moreover, March (1991) distinguishes organizational learning processes between exploitation and exploration. While exploitation captures efficiency, exploration includes discovery and innovation. Additionally, Treacy and Wiersema (1995) developed a strategic framework of product leadership, customer intimacy and operational excellence. Product leadership and customer intimacy refer to differentiation through innovative products or services. Operational excellence captures reliable products at low prices.

In general, generic strategies are based on either efficiency or differentiation or combine both dimensions (Campbell-Hunt, 2000). Efficiency-based strategies can be linked to strategies such as cost leadership, defender, exploitation and operational excellence. Differentiation-based strategies can be linked to differentiation strategy, prospector, exploration and customer intimacy (Bentley et al., 2013; Higgins et al., 2015; Martinez and Ferreira, 2019; Thornhill and White, 2007).

2.1 Efficiency-based strategies

Firms with a strong focus on efficiency attempt to gain advantages over competitors through a low-cost position based on efficient processes and cost minimization. They tend to offer a limited number of standardized products and services. This enables them to increase efficiency through economies of scale, process enhancements and experience curve benefits (Delmas and Pekovic, 2015). Archival-based studies characterize firms with a strong focus on efficiency through productive employees, efficient use and distribution of assets, rigorous cost-cutting programs in non-necessary areas (e.g. research and development [R&D] or marketing) and low employee fluctuations (Abernethy et al., 2019; Anwar and Hasnu, 2016; Balsam et al., 2011; Bentley et al., 2013; Bentley-Goode et al., 2017, 2019; Higgins et al., 2015; Lim et al., 2018; Martinez and Ferreira, 2019).

Porter (1980) states that efficiency protects the firm against various sources of competition, such as rivalry within the industry and the bargaining power of buyers and suppliers. Firms with a low-cost position maintain profitability even when buyers or competitors push prices down or suppliers increase firms’ input costs. Furthermore, a low-cost position is a significant entrance barrier and helps firms to deal with substitutes.
Miles and Snow (1978) argue that efficient firms seal off a portion of the market to become as efficient as possible through concentration on one single-core technology, continuous improvements in that technology, strict cost control and vertical integration. As a result, firms with a strong focus on efficiency tend to ignore developments and trends outside their domains.

However, fundamental changes in the business environment may cause efficiency-based strategies to become obsolete. First, firms focusing on efficiency are less flexible and therefore more vulnerable to changes in the market (Pertusa-Ortega et al., 2009). Moreover, the widespread use of the Internet for price comparisons has reduced the switching costs for customers. Globalization has reinforced this effect by lowering nearly all entry barriers (Kim et al., 2004), leading Hitt et al. (1997) to conclude that competition has shifted from low costs to product development.

In this context, it is difficult for German firms to achieve a low-cost advantage over foreign competitors due to high production costs and strong employee rights. Employees in Germany can exert influence on firm-wide decisions through mandatory board-level codetermination. Campagna et al. (2020) argue and find that employees use this influence to reduce the firm’s focus on efficiency. For example, codetermined firms are more likely to be overstaffed and pay higher wages (Eulerich et al., 2023).

While it appears to be more difficult for German firms to pursue efficiency-based strategies, Duanmu et al. (2018) argue that firms in emerging economies are more likely to benefit from efficiency-based strategies than firms in developed countries because consumers in emerging economies are more sensitive to prices, given their low income. Consistent with this argument, Abernethy et al. (2019) find a negative relation between efficiency and operating performance and Parnell and Brady (2019) find no significant association between cost leadership and financial performance. However, the majority of studies provide evidence for the advantageousness of efficiency-based strategies (Conant et al., 1990; Lechner and Gudmundsson, 2014). Therefore, we hypothesize that

\[ H1. \text{ A firm’s focus on efficiency is positively associated with performance.} \]

2.2 Differentiation-based strategies

Differentiation-based strategies aim at creating products or services that are perceived as unique. This can be done through various dimensions such as quality, image, distribution channels, speed of delivery or customer service and is usually backed by heavy investments in R&D, administration, sales or marketing (Allen et al., 2007; Kim et al., 2004; Spanos et al., 2004). A differentiation strategy enables a firm to charge higher prices to compensate for the higher costs. However, firms need to justify higher prices through advantages, quality and exclusivity of their product (Delmas and Pekovic, 2015; Kim et al., 2004).

If products and services are perceived as unique, the firm is protected against substitutes, competitors, potential entrants and the bargaining power of buyers (Porter, 1980). Moreover, the ability to generate higher prices protects the firm from increasing input costs and price wars (Kim et al., 2004). However, “companies have to show that they can create a steady stream of standout products that will keep customers awake with anticipation” (Treacy and Wiersema, 1995, p. 88). This requires firms following a differentiation strategy to identify and exploit opportunities, be both organizationally and technologically flexible, and coordinate numerous and diverse operations (Miles and Snow, 1978).

Archival-based studies characterize differentiation-based strategies by several indicators, including high expenditures on R&D, marketing and new equipment, high margins and large growth opportunities (Abernethy et al., 2019; Anwar and Hasnu, 2016; Balsam et al., 2011; Bentley et al., 2013; Bentley-Goode et al., 2017, 2019; Higgins et al., 2015; Lim et al., 2018; Martinez and Ferreira, 2019). Further, prior research often categorizes efficiency and
differentiation as two ends of a continuum, where high expenditures in certain areas are associated with differentiation and low expenditures with efficiency (Pertusa-Ortega et al., 2009; Spanos et al., 2004). Thus, differentiation strategies can also be characterized by attributes such as less productive employees or a less efficient use and distribution of assets.

It has been argued that differentiation-based strategies have become even more beneficial as the Internet allows customers to identify and switch to firms that offer additional value through differentiated features with just a few mouse clicks (Kim et al., 2004; Porter, 2001). Moreover, differentiation strategies are most appropriate in a dynamic and uncertain environment, making them even more suitable for the current economic situation than they were 40 years ago (Hambrick, 1983; Miller, 1988). Thus, important changes such as the ongoing process of globalization, digitalization and new technologies may have increased the advantages of differentiation-based strategies.

We expect differentiation-based strategies to be particularly popular in the German market for several reasons. First, Flammer (2015) suggests that it is becoming increasingly difficult for firms in developed countries to compete on a low-cost basis, which increases incentives to focus on differentiation. Second, mandatory employee representation on corporate boards in Germany has been found to increase a firm’s focus on differentiation (Campagna et al., 2020). Finally, the German market is characterized by a high proportion of family firms that are found to make higher investments in R&D (De Massis et al., 2013).

Interestingly, prior literature provides mixed results regarding the relation between differentiation-based strategies and performance. While some studies identify a positive effect (Conant et al., 1990; Lechner and Gudmundsson, 2014; Parnell and Brady, 2019), there are also studies that find a negative or no effect (Anwar and Hasnu, 2016; Abernethy et al., 2019; Spanos et al., 2004). March (1991, p. 73) states that “returns from exploration are systematically less certain, more remote in time, and organizational more distant from the locus of action and adaption.” Accordingly, firms might, for example, not be considered technology leaders, despite high R&D expenditures if improvements cannot be realized or take years to realize. However, we expect investments to pay off on average and assume the following hypothesis:

\[ H2. \text{A firm’s focus on differentiation is positively associated with performance.} \]

2.3 Mixed strategies

Despite the similarities between the mentioned strategic frameworks, there are also differences, including whether strategies are mutually exclusive. Porter (1980) states that differentiation and efficiency are not compatible because they combine a different set of resources, strengths, organizational structures and management styles. He argues that the simultaneous adaptation of a differentiation strategy and cost leadership reflects a firm’s unwillingness to make choices about competitive strategies. Moreover, firms with a pure strategy benefit from greater clarity of their position and actions by avoiding complexity, confusion, mutually exclusive trade-offs and competitor attacks from two flanks. Some authors provide evidence for Porter’s (1980) arguments and find that firms with a mixed strategy are outperformed by firms with a pure strategy (Shinkle et al., 2013; Thornhill and White, 2007).

Contrarily, in the era of global competition and rapidly changing competitive environments, pursuing multiple strategies is expected to yield higher performance (Kim et al., 2004; Lillis and Van Veen-Dirks, 2008). Miles and Snow’s (1978) framework includes mixed strategies (analyzers) that combine efficiency-based areas with differentiation-based areas. Treacy and Wiersema (1995, p. 202) and March (1991, p. 71) also emphasize the need to “balance” both dimensions. Campbell-Hunt (2000) finds that, depending on the context, all-rounder designs may be superior to pure strategies. In this context, Parnell (2010) finds
evidence that even supports a U-shaped relationship between strategic clarity and performance. Murray (1988) argues that external conditions for differentiation primarily stem from customer taste, while external conditions for cost leadership primarily stem from industry structure. As these factors are independent, firms can pursue both an efficiency and a differentiation strategy. According to the different arguments and findings, we assume the following hypothesis:

\[ H3a. \text{ Firms focusing on both efficiency and differentiation have a lower performance.} \]

\[ H3b. \text{ Firms focusing on both efficiency and differentiation have a higher performance.} \]

### 3. Methods

#### 3.1 Sample selection

We obtain financial variables on German firms between 2000 and 2019 from Datastream. We consider all firms that were listed and headquartered in Germany. Our initial sample contains 13,764 firm-years among 1,175 unique firms. Following previous research, we exclude firms from the financial sector (SIC 6000–6999) as our analyses require several variables that are often not reported by financial firms because these variables are not meaningful to them. Moreover, we exclude observations with missing strategy variables, leading to a sample of 6,037 firm-years among 651 firms (Panel A). We further exclude observations with missing performance and control variables. Our final sample (Panel B) consists of 4,133 firm-years among 515 firms. Table 1 presents the sample selection process.

#### 3.2 Measuring strategy

Although strategic frameworks are widely accepted and analyzed in various settings, there are still concerns about the measurement. Prior research often analyzes specific strategic frameworks and adopts the corresponding assumptions, rather than examining which framework fits the sample. For example, several studies based on Porter’s (1980) framework neglect mixed strategies, which are promising in other strategic frameworks (Allen and Helms, 2006; Koo et al., 2004). Additionally, analyzing a specific strategic framework also neglects country-specific strategies (Allen et al., 2007).

Further, the selection and weighting of variables is also a challenge. There are many variables that have been employed to measure competitive strategy, and it appears to be difficult to choose the right set of variables. Several studies use a unidimensional conceptualization (Hambrick, 1983), but it is questionable whether this can capture the complexity of competitive strategies (Conant et al., 1990). However in multidimensional conceptualizations (Bentley et al., 2013), the variables need to be weighted.

<table>
<thead>
<tr>
<th></th>
<th>Firm-years</th>
<th>Firms</th>
</tr>
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<tbody>
<tr>
<td>Publicly traded German firms between 2000 and 2019</td>
<td>13,764</td>
<td>1,175</td>
</tr>
<tr>
<td>– Financial industry or missing industry-classification</td>
<td>2,796</td>
<td>253</td>
</tr>
<tr>
<td>– Missing strategy variables</td>
<td>4,931</td>
<td>271</td>
</tr>
<tr>
<td>Panel A</td>
<td>6,037</td>
<td>651</td>
</tr>
<tr>
<td>– Missing performance variables</td>
<td>720</td>
<td>46</td>
</tr>
<tr>
<td>– Missing control variables</td>
<td>1,184</td>
<td>90</td>
</tr>
<tr>
<td>Panel B</td>
<td>4,133</td>
<td>515</td>
</tr>
</tbody>
</table>

**Table 1.** Sample selection process

**Note(s):** Table 1 presents the sample formation for this study

**Source(s):** Authors’ own creation
Frequently, variables have been equally weighted (Higgins et al., 2015), but it may also be reasonable to use other weights.

Given these limitations, we use PCA to measure competitive strategies. PCA is a statistical technique that analyzes data patterns and identifies principal components based on correlations between variables. The principal components are a linear transformation of the variables and explain most of their variance (Allee et al., 2022). Thus, PCA allows us to identify competitive strategies based on strategically relevant variables and calculates their weights so that competitive strategies reflect the underlying variables as accurately as possible. Due to the mentioned advantages, PCA has been employed in several survey-based studies (Allen and Helms, 2006; Allen et al., 2007; Koo et al., 2004). However, PCA is also suitable for archival data (Allee et al., 2022).

Based on prior research (e.g. Balsam et al., 2011; Bentley et al., 2013; Bentley-Goode et al., 2017, 2019; Higgins et al., 2015), we use six variables for our empirical analysis: wagesales, cogssales, sgasales, rdsales, capacityutilization and capexsales. The ratio of salaries and benefits to sales (wagesales) reflects employee productivity and the firm’s effort to reduce costs. High values often imply that employees conduct non-repetitive activities that are difficult to automate. The ratio of costs of goods sold to sales (cogssales) reveals the spread between sales and production costs. The lower this ratio, the higher the firm’s ability to charge higher prices through advantages, quality and exclusivity of their product. The propensity to search for new projects and marketing efforts is captured by the ratio of selling, general and administrative expenditures to sales (sgasales), while the ratio of R&D expenditures to sales (rdsales) reflects the focus on exploiting new products and services. On average, higher expenditures in these areas are expected to allow for better differentiation from competitors’ products and services. The ratio of property, plant and equipment to sales (capacityutilization) reveals the focus on production assets. Finally, the ratio of capital expenditures to sales (capexsales) reflects the effort to increase production capacity. The focus on production assets and efforts to increase production capacity are both associated with efficiency-based strategies.

The principal component solution obtained after varimax rotation is shown in Table 2. Two significant factors (eigenvalue ≥ 1) emerge from PCA, accounting for 64.21% of the total variance. Each variable exhibited factor loadings greater than ±0.38 on at least one factor. Kim and Mueller (1978) suggest factor loadings of ±0.30 as a cutoff for significance [2]. Principal component 1 (PC1) represents variables related to differentiation-based strategies, as wagesales, cogssales, sgasales and rdsales load significantly on PC1. This leads us to interpret PC1 as the firm’s focus on differentiation. For instance, higher expenditures on R&D relative to sales increase the value of PC1 and hence the firm’s focus on differentiation.

<table>
<thead>
<tr>
<th>Variables</th>
<th>PCI (differentiation)</th>
<th>PC2 (efficiency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>sgasales</td>
<td>0.593</td>
<td>−0.024</td>
</tr>
<tr>
<td>wagesales</td>
<td>0.442</td>
<td>−0.089</td>
</tr>
<tr>
<td>rdsales</td>
<td>0.382</td>
<td>0.026</td>
</tr>
<tr>
<td>cogssales</td>
<td>−0.554</td>
<td>−0.074</td>
</tr>
<tr>
<td>capacityutilization</td>
<td>−0.028</td>
<td>0.699</td>
</tr>
<tr>
<td>capexsales</td>
<td>0.032</td>
<td>0.705</td>
</tr>
<tr>
<td>eigenvalue</td>
<td>2.372</td>
<td>1.481</td>
</tr>
<tr>
<td>proportion of variance explained</td>
<td>39.5%</td>
<td>24.7%</td>
</tr>
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</table>

**Note(s):** Table 2 presents the results of the PCA after varimax rotation. Loadings >0.300 are printed in italics; n = 6,037

Source: Authors’ own creation

**Table 2.** PCA after varimax rotation
Principal component 2 (PC2) contains capacityutilization and capexsales, which are associated with efficiency-based strategies. Moreover, wagesales, sgasales and rdsales load negatively on PC2 reflecting cost minimization behavior. Therefore, we interpret PC2 as the firm’s focus on efficiency [3].

We transform principal component scores to an interval from 0 to 100 for each industry, so that the highest (lowest) principal component score within an industry is given the value 100 (0). This allows us to compare principal component scores across different industries. We treat the transformed principal component scores as indicators of the firm’s strategic focus. Differentiation is the transformed principal component score on PC1 and efficiency is the transformed principal component score on PC2 [4].

3.3 Empirical model

We analyze the strategy–performance relationship using the following model:

\[
\text{Performance}_{t+1} = \beta_0 + \beta_1 \text{efficiency}_t + \beta_2 \text{differentiation}_t + \beta_3 \text{efficiency} \times \text{differentiation}_t + \beta_4 \log \text{assets}_t + \beta_5 \text{forsales}_t + \beta_6 \text{diversified}_t + \beta_7 \text{leverage}_t + \beta_8 \text{marketgrowth}_t + \beta_9 \text{concentration}_t + \beta_{10} \text{lag_performance}_t + \epsilon_t.
\]

We employ several proxies for performance to analyze the effect of differentiation and efficiency on operating performance, market value and firm growth. Return on assets (roa) and return on equity (roe) capture the firm’s operating performance. Tobin’s q (tobinsq) and the market-to-book ratio (markettobook) capture the firm’s market value. Finally, we employ one-year growth of assets (assetgrowth) and sales (salesgrowth) to measure firm growth. We use the performance in year t+1 as the dependent variable for two reasons. First, using lagged performance allows us to deal with potential simultaneity between strategy and performance. Second, competitive strategies reflect long-term investments requiring a time lag to be beneficial.

We include efficiency, differentiation and an interaction term between both variables (efficiency*differentiation) to capture competitive strategy. Moreover, we control for several firm characteristics, including log_assets, forsales, diversified and leverage. We also follow Spanos et al. (2004) and control for the firm’s performance in year t to account for omitted/unobservable factors that may affect performance. Further, we include marketgrowth, concentration and industry-fixed effects to account for industry-specific characteristics. Finally, we control for year-fixed effects to capture time effects. Note that we use robust standard errors to avoid heteroskedasticity in our models. Appendix provides definitions of all variables with Datastream identifiers.

3.4 Descriptive statistics

Table 3 presents descriptive statistics for the variables in our empirical model. Differentiation and efficiency range by construction from 0 to 100 and the mean values are 32.432 and 15.950, respectively.

Table 4 presents Spearman correlations between the variables. While we find some positive and significant correlations between differentiation and performance (i.e. roa, tobinsq and markettobook) that are in line with our predictions, we find negative correlations between efficiency and performance (i.e. tobinsq, markettobook and salesgrowth) suggesting that efficiency-based strategies may not be successful in Germany. Note that we also find significant correlations between explanatory variables. As these correlations are low, multicollinearity is not a problem in our models.
4. Results

4.1 Strategy types in Germany
While our PCA suggests that a firm’s focus on efficiency and differentiation explains explain most of the variance of strategically relevant variables, we further analyze the development of the average focus on efficiency, differentiation and the extent to which firms focus on both dimensions. Consistent with the arguments that efficiency-based strategies are outdated, we find German firms focus less on efficiency. On average, efficiency has decreased by 7.26% (from 17.833 in 2000 to 16.538 in 2019). Contrarily, differentiation has increased by 32.38% during the sample period (from 29.100 in 2000 to 38.522 in 2019) suggesting that German firms increasingly focus on differentiation.

We also find evidence for firms that combine efficiency and differentiation. According to Lillis and van Veen-Dirks (2008), we define firms with above-median focus on both efficiency and differentiation as firms with mixed strategy. Our results suggest that 1,091 firm-years (26.40% of the firm-years in Panel B) pursue a mixed strategy indicating that mixed strategies are popular in Germany.

4.2 Strategies and performance
Table 5 summarized our empirical results for the strategy–performance relation. We analyze the effect of strategy on operating performance in models (1) and (2), on market value in models (3) and (4) and on firm growth in models (5) and (6).

Hypothesis 1 predicts that a firm’s focus on efficiency is positively associated with performance. We find insignificant coefficients on efficiency in models (1)–(5) suggesting that efficiency-based strategies do not affect operating performance and market value. This could be an explanation for the finding that the focus on efficiency has diminished over time. The coefficient on efficiency is significant and positive only in model (6) where salesgrowth is the dependent variable (p = 0.011). However, our overall results lead us to reject hypothesis 1.

Hypothesis 2 predicts that a firm’s focus on differentiation is positively associated with performance. Although some studies find a negative or no effect of differentiation-based strategies on performance, we find positive and significant coefficients on differentiation in most specifications. In particular, a one standard deviation increase in differentiation
<table>
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<td>roa</td>
<td>1.000</td>
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<td>roe</td>
<td>0.914</td>
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<td>tobsq</td>
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<td>markettoobook</td>
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<td>0.940</td>
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<td>assetgrowth</td>
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<td>0.267</td>
<td>1.000</td>
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<td>salesgrowth</td>
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<td>0.268</td>
<td>0.240</td>
<td>0.526</td>
<td>1.000</td>
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<td>differentiation</td>
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<td>0.181</td>
<td>0.128</td>
<td>-0.038</td>
<td>-0.058</td>
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<td>efficiency</td>
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**Note(s):** Table 4 presents Spearman correlations between the variables used in our regressions. Italics if p-value <0.05 (two-tailed); n = 4,133  
**Source(s):** Authors’ own creation
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Note(s): Table 5 presents ordinary least squares regressions of performance on competitive strategy. T-statistics are reported under each coefficient in parentheses. *, ** and *** denote significance level of 0.1, 0.05 and 0.01, respectively.

Source(s): Authors' own creation
increases \textit{roa} by 1.079 ($p < 0.01$), \textit{roe} by 1.744 ($p = 0.023$), \textit{tobinsq} by 0.046 ($p = 0.011$), \textit{markettobook} by 0.079 ($p = 0.078$) and \textit{salesgrowth} by 1.242 ($p = 0.045$). This is in line with the arguments that differentiation-based strategies are beneficial due to technological developments and the ongoing process of globalization. Thus, we can confirm hypothesis 2.

Hypothesis 3a (3b) predicts that firms focusing on both efficiency and differentiation will have a lower (higher) performance. Consistent with Hypothesis 3a, we find negative and significant coefficients on \textit{efficiency*differentiation} in model (1) and (6) ($p < 0.01$ and $p = 0.087$, respectively). While it has been argued that mixed strategies promise higher performance due to global competition and rapidly changing competitive environments, our results suggest that mixed strategies are associated with lower operating performance and firm growth [5].

4.3 Robustness checks
We conduct several tests to examine the robustness of our findings. As our sample consists of several large firms that are likely to pursue multiple strategies, the inclusion of firms with different segments can potentially bias our results. For example, a firm with a strong focus on efficiency in one segment and a strong focus on differentiation in another segment might have a moderate focus on both strategies on firm-level. Therefore, we restrict our sample to focused firms (\textit{diversified} $= 0$) and re-estimate our regressions. Our untabulated results are similar suggesting that the inclusion of firms with different segments has not biased our results.

We also analyze whether firms have to maintain their strategic focus to achieve a competitive advantage. Several scholars argue that the choice of a competitive strategy is a decision that has to be followed over a long time to pay off (Miles and Snow, 1978; Porter, 1980). Firms maintaining their strategic focus benefit from experience curve and learning (Leitner and Güldenberg, 2010) and strategic changes are often risky and require costly investments (Parnell, 2006b). Thus, we may have underestimated the impact of efficiency and differentiation on performance because our strategy measures only capture the strategic focus in a single year. We calculate the firm’s long-run strategy as the three-year average of \textit{efficiency} and \textit{differentiation}, where higher values suggest a higher focus on the respective strategic dimension between year $t-2$ and year $t$. Our untabulated results confirm our previous findings.

To provide more evidence on the long-run relation between strategy and performance, we also calculate three-year averages of our performance measures as dependent variables. Spanos et al. (2004) argue that competitive strategies reflect long-term investments requiring a time lag to be beneficial. Thus, we might find positive effects of efficiency-based strategies or mixed strategies on performance if the time lag is longer than one year. We re-estimate our models using the average performance from year $t+1$ to year $t+3$ as the dependent variable and find similar results.

5. Conclusion
Despite the popularity of strategic frameworks, it has been argued that they are no longer applicable in today’s business environment due to fundamental changes over the past 40 years, such as globalization, technological innovations and increasing uncertainty. In addition, competitive strategies have been mainly studied in the USA, but rarely in other countries. Thus, the applicability of strategic frameworks in countries like Germany is an open question. In this study, we use an exploratory approach to identify strategy types and analyze how they are related to performance. Our results suggest that differentiation and efficiency still explain how firms compete. Nevertheless, firms increasingly focus on
differentiation and less on efficiency. One potential reason for this decline is that efficiency-based strategies do not affect performance. We find only differentiation-based strategies to be positively related to performance.

5.1 Implications

Our results provide numerous theoretical and managerial implications. We inform managers concerned about promising strategies that only differentiation-based strategies are successful in Germany. Accordingly, German firms cannot outperform their competitors by focusing on efficiency or pursuing multiple strategies. In this context, we provide theoretical implications as we question the applicability of common strategic frameworks. While our results call for managers to reflect on their strategic focus, our results also imply that policymakers should encourage firms to focus more on efficiency. An example of a corresponding measure is the German Research & Development Tax Incentive Act 2020, which aims to increase R&D tax incentives and hence the focus on differentiation.

However, our results also have implications for researchers interested in the determinants and consequences of competitive strategies. Although most measurement approaches are designed to identify both highly efficient and highly differentiated firms (e.g. Abernethy et al., 2019; Bentley-Goode et al., 2017, 2019; Jiang et al., 2020), researchers should carefully consider whether certain strategy types really exist in their setting. As we observe both a decreasing focus on efficiency and no performance effect of efficiency-based strategies, research designs comparing highly efficient and highly differentiated firms appear not to be meaningful, at least in our German setting. We contribute to this literature by providing an exploratory approach that is useful to identify and analyze strategy types.

5.2 Suggestions for further research

We encourage further research to analyze why efficiency-based strategies are not related to performance in Germany. One explanation might be the fact that firms from emerging economies take the role of low-cost competitors. As we analyze only German firms, we call for research that examines industry-level competition in more detail and considers the extent to which German firms compete with foreign firms. This possibility has been insufficiently considered in existing strategic frameworks. Moreover, we analyze the average effects of certain strategies, but it would be interesting to understand the conditions under which firms can successfully pursue efficiency-based strategies.

Additionally, we call for more exploratory research on competitive strategies in other countries. Although we expect to find similar results in comparable institutional contexts, we cannot guarantee that our results are generalizable. Furthermore, our sample period includes the financial crisis 2008, but more recent crises (i.e. Covid-19 and the war in Ukraine) may have affected the strategy–performance relationship differently. Given the lack of exploratory studies outside the USA, we encourage further research to rely on our approach to conduct, for example, cross-country studies on competitive strategies. A cross-country study in the European Union might be a useful setting to analyze country-level differences in a large market with free trade among its members.

5.3 Limitations

Nevertheless, our study is also subject to limitations. We measure competitive strategies based on six variables that express the relative investments in certain areas but were unable to take the efficiency of strategic investments into account. For example, firms may offer high-quality products despite low R&D expenditures and customers may perceive other products as less unique despite high R&D efforts. We also classify competitive strategies
relative to other German firms within the same industry, but we did not consider that (1) these firms are not necessarily competitors and (2) firms also compete with foreign firms or firms in other industries.

Notes
1. Note that all analyses are conducted in Stata.
2. There are also studies in this area that treat loadings of ±0.40 or ±0.50 as a cutoff for significance. However, using these more conservative criteria does not affect our strategy measures as insignificant factors are typically retained in PCA. Furthermore, we believe that stricter thresholds do not affect the interpretation of our principal components.
3. In untabulated results, we include the ratio of inventories to sales and growth of sales as additional strategy variables and find similar results. Specifically, the composition of PC1 and PC2 and our empirical results on the strategy–performance relationship do not change. Although both variables significantly load on PC3, the component does not reflect a competitive strategy, has a low eigenvalue (1.046), and reduces the sample size due to missing values.
4. An example of a firm with strong focus on efficiency is E.On. According to Miles and Snow’s (1978) definition of defenders, E.On has a narrow product-market domain and is specialized in operating its power and gas networks. High capital expenditures suggest that the firm’s primary emphasis is on increasing its production capacity and improving the efficiency of its operations. An example of a firm that focuses on differentiation is Beiersdorf. Consistent with Porter (1980) and Miles and Snow (1978), Beiersdorf has well-known brands (e.g. Niveau, Tesa, or Labello) and continuously aims at improving the quality and image of its products. This is manifested in high expenditures on R&D.
5. Note that we find similar results when we follow Duanmu et al. (2018) and calculate the firm’s focus on efficiency (differentiation) as the difference between firm’s efficiency (differentiation) score and the industry-year’s median efficiency (differentiation) score scaled by the range of this differences for each industry-year.

References


Appendix

Variable definitions

**Performance**

- **roa** = \( \frac{\text{net income} + \text{interest expense} \times (1 - \text{tax rate})}{\text{average of last year's and current year's total assets}} \times 100 \) (WC08326), winsorized at 1st and 99st percentiles.
- **roe** = \( \frac{\text{net income} - \text{preferred dividend requirement}}{\text{average of last year's and current year's common equity}} \times 100 \) (WC08301), winsorized at 1st and 99st percentiles.
- **tobinsq** = \( \frac{\text{market value of equity} (\text{WC}08001) + \text{total assets} (\text{WC}02999) - \text{book value of equity} (\text{WC}03501)}{\text{total assets} (\text{WC}02999)} \), winsorized at 1st and 99st percentiles.
- **markettoobook** = \( \frac{\text{market value of equity} (\text{WC}08001)}{\text{book value of equity} (\text{WC}03501)} \), winsorized at 1st and 99st percentiles.
- **assetgrowth** is firm's one-year growth rate of total assets (WC08621)
- **salesgrowth** is firm's one-year growth rate of sales (WC08631)

**Strategy**

- **differentiation** is the transformed principal component score on PC1, where higher values indicate a greater focus on differentiation. See section 3.2 for a detailed description
- **efficiency** is the transformed principal component score on PC2, where higher values indicate a greater focus on efficiency. See section 3.2 for a detailed description
- **sgsales** = \( \frac{\text{selling, general & administrative expense} (\text{WC}01011)}{\text{net sales or revenues} (\text{WC}01001)} \)
- **wagesales** = \( \frac{\text{salaries and benefit expenses} (\text{WC}01084)}{\text{net sales or revenues} (\text{WC}01001)} \)
- **rdsales** = \( \frac{\text{research and development expense} (\text{WC}01201)}{\text{net sales or revenues} (\text{WC}01001)} \), Missing values are set to zero
- **cogssales** = \( \frac{\text{cost of goods sold excluding depreciation} (\text{WC}01051)}{\text{net sales or revenues} (\text{WC}01001)} \)
- **capacityutilization** = \( \frac{\text{property, plant and equipment} (\text{net}) (\text{WC}02501)}{\text{net sales or revenues} (\text{WC}01001)} \)
- **capexsales** = \( \frac{\text{capital expenditures} (\text{WC}04601)}{\text{net sales or revenues} (\text{WC}01001)} \)

**Controls**

- **log_assets** = \( \log \text{of total assets} (\text{WC}02999) \)
- **forsales** = \( \frac{\text{international sales} (\text{WC}07101)}{\text{net sales or revenues} (\text{WC}01001)} \)
- **diversified** is a binary variable that takes a value of 1 when the firm is diversified (i.e. reports segments from different industries using Fama and French’s 12 industry classification). Non-classifiable segments with SIC code 9999 (WC19506-WC19596) are not considered
- **leverage** = \( \frac{\text{long term debt} (\text{WC}03252)}{\text{total assets} (\text{WC}02999)} \)
- **marketgrowth** is the one-year growth rate of net sales or revenues (WC01001) in a given industry
- **concentration** is the Herfindahl index based on net sales or revenues (WC01001) calculated by industry-year
- **lag_performance** is firm's performance in t

Source(s): Authors' own creation

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