Mergers and acquisitions in Germany: 1981–2010

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ABSTRACT

We examine the long-term performance of German acquiring firms for M&A transactions that took place between 1981 and 2010. Over this period, the German corporate governance system experienced substantial changes that led to the emergence of an active M&A market. In contrast to many U.S. studies, we do not find significant negative abnormal long-term performance for our full sample. However, the results support the method-of-payment hypothesis. For our first subsample, from 1981 to 1990, when M&A transactions were rather rare, acquirers exhibit positive abnormal long-term returns compared to their German industry peers. Our findings are robust for various firm and deal characteristics and consistent with our analysis of pre and postmerger operational performance and announcement returns.

1. Introduction

Since the 1980s, mergers and acquisitions (M&A) have attracted considerable interest in academic research. A bulk of empirical studies focuses on short-term stock returns near announcement days. Fewer but still many studies analyze the long-term performance of acquirers in the aftermarket from an investor’s perspective and relate stock performance to deal and firm characteristics as well as regulatory issues. Most of the studies analyze the U.S. market, but we also find studies for the U.K., Canada, and other markets. Although the studies vary greatly in design, datasets, etc., the overall picture indicates some long-term, postmerger acquirer underperformance. Many efforts have been spent on better measurement techniques, benchmark issues, and improved test statistics. Some more recent studies challenge the notion of long-term underperformance, which is inconsistent with the hypothesis of efficient markets.

The German market has been vastly ignored in this field of research. We were not able to identify any comprehensive, recent study that focused on M&A of German acquirers. Our paper seeks to fill this gap. At first glance, this lack of research seems surprising given that Germany has been the third or fourth largest economy globally over the last three decades. We see two main reasons for this disregard. First, M&A played for decades a far less important role in the German economy than in the Anglo-Saxon world. A market for corporate control in the sense of Manne (1965) did not exist until the late 1990s, and although we observe an increase in the number of M&A transactions, it is still far less important than in the Anglo-Saxon world.
and size of transactions since the 1990s, outright hostile takeovers are still very rare. Second, the necessary data, in particular less recent data, are not readily available.

In this paper, we empirically study long-term abnormal returns and the operating performance of German acquirers for a sample of 338 deals that were completed between 1981 and 2010. Over the three decades of our analysis, the German economy developed from an insider-controlled, bank-based system to a more capital-market-oriented system. We first briefly examine the institutional setting that led to the emergence of an active M&A market. In the empirical section, we also divide our sample into three subsamples (1981–1990, 1991–2000, and 2001–2010) to relate our findings to the different stages of the evolution of the M&A market.

The paper proceeds as follows: In Section 2, we briefly describe the evolution of the German system of corporate governance as well as the German capital market with regard to M&A transactions. In Section 3, we introduce our dataset and methods. Section 4 presents the results and discussions. Section 5 concludes.

2. Institutional background

The traditional German system of corporate governance has often been described as insider-controlled and stakeholder-oriented (Franks & Mayer, 1998). Looking back, it is often characterized as a consistent system of corporate governance with complementary features (Hackethal, Schmidt, & Tyrell, 2003): the management board of stock corporations is controlled by a supervisory board that represents the major stakeholder groups. The first group were often blockholders, either families or large banks and insurance firms that channelled savings to firms through direct investments. Firms relied heavily on credit provided by their house banks, which often had a seat on the supervisory board and proxy voting power. Owing to mandatory labor codetermination, the third group on the supervisory board consists of employees, who are typically represented by trade unions. All three groups had a genuine interest in stability and long-term growth. The primary focus was not on maximizing (short-term) shareholder value. Shonfield (1965) noted that this system of corporate governance in postwar Germany was not centrally planned but rather politically orchestrated. It also reflected a postwar settlement between capital and labor. Corporate governance relied heavily on internal information and control, not on the capital market. The large public firms were often interwoven through direct holdings, gross holdings, and pyramid ownership structures, with the large banks and insurance firms in the center. The weak role of the capital market in financing firms is best illustrated by the fact that the number of publicly listed corporations actually declined from approximately 630 in the early 1960s to 440 in the early 1980s.

It is not surprising that in such an insider-controlled and stakeholder-oriented economy, there was no active market for corporate control in the sense of Manne (1965). Legal protection of small or outsider shareholders was rather weak (La Porta, López de Silanes, Shleifer, & Vishny, 1997). In this consensus-oriented governance system, which is deeply interconnected with the concept of the social market economy, M&A activity ultimately required the approval of all stakeholder groups (Hackethal et al., 2003). In particular, employees could fear the breach of implicit contracts. Furthermore, high capital gains taxes on the sale of corporate cross holdings prevented efficient divestiture. The high (by international standards) leverage of German corporations also reduced their ability to engage in levered transactions. Finally, managers had few direct incentives to maximize shareholder value. Despite these obstacles, we observe some M&A activity, although large transactions were rather rare. We hypothesize that owing to the high threshold for engaging in M&A activity, transactions were undertaken only if they were economically very promising.

In the early 1990s, we observe a fundamental sea change in the German capital market and in M&A activity. Between 1990 and 2002, four Acts on the Promotion of Financial Markets were enacted. They were part of harmonization efforts within the European Union, where national regulations on corporate governance and financial markets varied widely. They also laid ground for upcoming privatizations. Concerning M&A transactions, the acts increased the transparency of shareholder structures. Most notably, a Takeover Code became effective in 1995 that stipulated the conduct of the bidder and the target. In particular, it called for a mandatory tender offer to the remaining shareholders after an acquirer gained the majority of shares. It further demanded a neutral stance of the target. About two-thirds of the one hundred largest corporations signed the code.

It was also in the early 1990s that Anglo-Saxon investment banks set up offices in Frankfurt, offering new financing alternatives to the German corporate world. The development of investment banks changed the relation between traditional credit and commission-based businesses and led to an increase in M&A activity. Deutsche Bank made the strategic decision to enter the international investment banking arena. At the end of 1989, Deutsche Bank acquired Morgan Grenfell in the U.K. to gain access to the Anglo-Saxon banking culture and expertise. Dresdner Bank followed with the acquisition of Kleinwort Benson in 1995.

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3 Franks and Mayer (1998) report that in a sample of 171 large German corporations 85% of the firms had blockholders (holding >25% of the shares).
4 The apparent lack of external control did not, however, impede economic growth. By the 1980s, Germany had become the world’s third-largest economy. Deutsche Bank had the largest balance sheet worldwide at that time.
5 A prominent example is the insurers Munich Re and Allianz, which each owned 25% of the other. Böhmer and Becht (2001) reported that two-thirds of all listed corporations in Germany had one blockholder with a share of 25% or above, which allowed vetoing important decisions.
6 The first (and unsuccessful) hostile bid occurred in 1988 for Feldmühle Nobel AG.
7 For an empirical examination of the economic magnitude of this effect at the time when the capital gains tax was repealed in the year 2000, see Edwards, Lang, Maydew, and Shackelford (2004).
8 Stock option plans were in principle possible through the issuance of convertible bonds. We are not aware of a single example of a stock option plan intended to motivate managers before the 1990s.
9 Insider trading became illegal in 1994.

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Several prominent cases illustrate the changing environment for M&A activity in the 1990s (Franks & Mayer, 1998). The Italian tire manufacturer Pirelli attempted to gain control over the German counterpart Continental between 1991 and 1993. This event would have been the first takeover of a large German firm by a foreign bidder, and it was closely followed by the media. A consortium led by Deutsche Bank and including Allianz, Daimler-Benz, Volkswagen, and BMW finally prevented the takeover. The merger between the German steel producers Krupp and Hoesch in 1992, although unfriendly at the beginning, was finally supported by Deutsche Bank because it made “good industrial sense”, and it succeeded. It is often considered to be the first hostile takeover in Germany. The subsequent merger of Hoesch-Krupp with the competing steel manufacturer Thyssen was again hostile at the beginning and accompanied by massive protests by employees. It finally succeeded under the rationale of attaining a competitive size in the international steel industry.

Meanwhile, German corporations engaged in large M&A transactions abroad (e.g., BMW and Rover, Daimler and Chrysler). In 1999, British Vodafone made a hostile bid for Mannesmann, which was one of the largest corporations in Germany with a high free-float and without a major shareholder. This bid was followed by enormous public protests and resistance from the management board. German Chancellor Schröder publicly questioned the ethical legitimacy of a transaction that served only the interest of the shareholders. Despite its close relationship, Deutsche Bank did not protect Mannesmann and refrained from pursuing any national industrial politics. As the majority of the shareholders were willing to transfer their shares, the supervisory board finally approved the acquisition.

The Vodafone Mannesmann deal proved that unfriendly takeovers of large German firms by foreign bidders had become feasible. Shortly before Christmas 1999, German Chancellor Schröder declared that direct holdings in other firms could be sold off without incurring a corporate tax liability, a ruling that accelerated the disintegration of the network of direct holdings and cross holdings. Subsequently, the large banks and insurance firms by and large sold off their direct holdings in German industrial firms, but blockholdings of nonfinancial institutions remained widespread (Weber, 2009). In several legal cases, the European Court declared golden shares held by governments to be illegal, paving the way for large transactions in national telecom and utility firms in Europe. In 2002 the Takeover Code was replaced by a Takeover Act that set the control threshold for a mandatory offer to the remaining shareholders at 30% and explicitly allowed for defensive measures.

The number and size of transactions further increased in the decade after 2000. “Everything” seemed to have become possible in the world of M&A. In 2009, Porsche attempted to gain control over the several times larger Volkswagen Group. The family-owned Schäffer Group attempted to take over (larger) Continental using a financing cascade. Both hostile raids failed. Nevertheless, M&A activity remained considerably lower than in the Anglo-Saxon world, and hostile takeovers are still very rare. Although firms became more capital market oriented over the period of our examination, characteristics of an insider-controlled and stakeholder-oriented system (like high ownership concentration) are still in place. The mandatory labor codetermination with employee representatives on the supervisory board of large corporations further impairs the ability to gain full control in a hostile takeover without consent of trade unions and works councils.

3. Data and methods

3.1. Data

Our study focuses on M&A deals that were completed between 1981 and 2010 in which the acquirer was a German public company. Initially, we collected our data from the Thomson One Security Database. Owing to many missing entries, we manually supplemented our dataset from the various annual editions of the Hoppenstedt (Saling) Aktienführer. Financial firms were excluded. We set ownership thresholds in the target company after the transaction at 25, 50, and 95%. Our final sample consists of 338 corporations. In line with our discussion of the evolution of the German M&A market we divided our sample into three subsamples (1981–1990, 1991–2000, and 2001–2010).

Table 1 summarizes our sample across time (Panel A) and by industry (Panel B). Panel A reports the number of transactions and their total and average values. We observe a pronounced variation in numbers of deals and deal sizes over time. In the early period of our sample, from 1981 to 1990, M&A activity was emerging in the number of deals and transaction volumes, but it was considerably lower than it would be in subsequent decades. In the following two decades we see a substantial increase in the number of transactions and in average sizes. In particular, for the years from 1998 to 2001 and 2006 to 2008 we find peaks in the number of transactions and their sizes, in line with global M&A activity and research on merger waves.

10 Jenkinson and Ljungqvist (2001) argue that the German M&A market is actually more hostile than it is often perceived to be, as banks sometimes help predators accumulate “hostile stakes” to gain control over target firms.
11 For a comprehensive review see Höppner and Jackson (2006).
12 As we were only able to identify a small number of transactions before 1981, and the relevant data were often incomplete, we refrained from including earlier times.
13 In neoclassical theory merger waves are explained by rational reactions of firms to industry or technology shocks (Harford, 2005) or Tobin’s q: firms engage more in M&A activity when stock markets and average q’s are higher (Jovanovic & Rousseau, 2001). In both cases, managers act in the full interest of their shareholders. Gugler et al. (2012) use a behavioral framework to link merger waves to optimism in financial markets. They argue that financial markets can, at times, be overly optimistic. Managers are then more inclined to undertake wealth-destroying mergers, which during normal times would be punished by the capital market. This leads to merger waves during periods of overvaluation and explains negative abnormal returns in the long run. As our empirical results for German acquirers over our whole thirty-year period do not support the notion that shareholders of acquiring firm suffer significant losses over long-term postmerger windows, we decided to use three ten-year subsamples that reflect our discussion of the emergence of the German M&A market instead of defining periods of over- or undervaluation. In Section 4.4, we report empirical results that are consistent with the overvaluation theory of Shleifer and Vishny (2003) and Gugler et al. (2012).
Panel B summarizes the acquisitions by industry. Reflecting the industrial landscape in Germany, nearly half of all deals were in manufacturing, followed by communications. In both industries, we see, on average, larger transaction sizes than in other industries.

Table 2 provides additional descriptive statistics about deal and firm characteristics. We could identify only five hostile takeovers (approximately 1.5% of all cases), a substantial difference from the U.K. or U.S. markets, in which hostile takeover bids account for >20% of all M&A transactions (see, e.g., Ghosh, 2001). Also, only eight transactions were challenged (and only one of the hostile bids was also challenged). In approximately 70% of all cases, the target was publicly listed. In our sample, in more than half of all cases, acquirers owned >95% of their targets after the transaction and could thus squeeze out minority shareholders.

3.2. Methods

For our long-term analysis of stock returns, we investigate three-year abnormal returns starting with the effective date of the deal’s completion. For an event-time approach, we calculate buy-and-hold abnormal returns (BHAR) following Barber and Lyon (1997). For a calendar-time approach, we further apply the Carhart (1997) four-factor model.

As reference portfolios for the BHAR, we choose the respective German industry indices from Datastream. We further employ the German CDAX total return index as a broad measure for the German stock market. We believe that industry-adjusted returns best capture abnormal return effects in our sample14. As alternative benchmarks, we additionally employ the European industry ex U.K. indices as provided by Datastream. We report equally weighted abnormal returns and cumulative abnormal Euro returns that measure

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Table 1
Annual and industry distribution of M&A transactions.

| Year | Number of transactions | Total volume (million USD) | Average value (million USD) |
|------|------------------------|---------------------------|-----------------------------|
| 1981 | 1                      | 284                       | 284                         |
| 1982 | 0                      | –                         | –                           |
| 1983 | 0                      | –                         | –                           |
| 1984 | 1                      | 268                       | 268                         |
| 1985 | 2                      | 2213                      | 553                         |
| 1986 | 6                      | 43                        | 43                          |
| 1987 | 2                      | 64                        | 32                          |
| 1988 | 6                      | 4610                      | 764                         |
| 1989 | 6                      | 1626                      | 406                         |
| 1990 | 2                      | 334                       | 167                         |
| 1991 | 7                      | 13,775                    | 1252                        |
| 1992 | 5                      | 3175                      | 1058                        |
| 1993 | 6                      | 4448                      | 635                         |
| 1994 | 7                      | 810                       | 135                         |
| 1995 | 10                     | 9788                      | 890                         |
| 1996 | 7                      | 12,783                    | 1598                        |
| 1997 | 7                      | 10,609                    | 1516                        |
| 1998 | 8                      | 54,138                    | 6767                        |
| 1999 | 29                     | 102,132                   | 2553                        |
| 2000 | 50                     | 98,291                    | 2137                        |
| 2001 | 26                     | 38,422                    | 1601                        |
| 2002 | 24                     | 20,953                    | 1164                        |
| 2003 | 12                     | 5297                      | 441                         |
| 2004 | 12                     | 17,870                    | 1191                        |
| 2005 | 13                     | 22,370                    | 1491                        |
| 2006 | 20                     | 94,502                    | 5250                        |
| 2007 | 22                     | 255,464                   | 9826                        |
| 2008 | 25                     | 96,803                    | 4610                        |
| 2009 | 17                     | 28,670                    | 2048                        |
| 2010 | 8                      | 11,362                    | 2272                        |
| Total| 338                    | 911,104                   | 2696                        |

Panel B: industry distribution

| SIC group                  | Number of transactions | Total value (million USD) | Average value (million USD) |
|----------------------------|------------------------|---------------------------|-----------------------------|
| 10 Minerals                | 14                     | 12,266                    | 90                          |
| 20–39 Manufacturing        | 164                    | 567,443                   | 3460                        |
| 40 Communications          | 74                     | 302,173                   | 4083                        |
| 50 Trade                   | 16                     | 7246                      | 453                         |
| 65, 67 Real estate, Investors | 24                    | 8957                      | 373                         |
| 70–89 Services             | 46                     | 24,018                    | 522                         |
| Total                      | 338                    | 911,104                   | 2696                        |

This table shows the annual distribution of M&A transactions as well as their volume (Panel A) and the distribution by SIC industry classification (Panel B).

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14 We also applied a control firm approach that matched sample firms against same-industry firms that had similar characteristics, such as firm size and price-to-book values, but did not engage in M&A. However, because the German stock market universe is rather small, this often led to large differences in characteristics of “matched” firms. We therefore decided to use industry indices as benchmarks rather than individual firms.
the change in wealth of acquiring firm shareholders (the only strategy available to shareholders as a whole; Malatesta, 1983). Since ignoring skewness and cross-sectional dependence could lead to a serious overstatement of the test statistics, we calculate adjusted t-statistics using Mitchell and Stafford’s (2000) procedure to account for cross-sectional dependence and Lyon, Barber, and Tsai’s (1999) method to correct for skewness. We also report standard t-statistics to make our results comparable to older studies.

The calendar-time approach overcomes some of the problems associated with event-time methods (Loughran & Ritter, 2000; Mitchell & Stafford, 2000). For the German equity market, Artmann, Finter and Kempf (2012b) and Artmann, Finter, Kempf, Koch and Theissen (2012a) recently developed and tested the necessary factors for the Fama and French (1993) three-factor model and the Carhart (1997) four-factor model. Because of the good performance of the momentum factor (the fourth factor) in the German equity market, we chose the Carhart model:

\[ AR_t = R_{it} - R_f - \beta_1 \left( R_{mt} - R_f \right) - \beta_2 \cdot SMB_t - \beta_3 \cdot HML_t - \beta_4 \cdot WML_t \]

where \( AR_t \) stands for the monthly abnormal return (“alpha”) of the calendar-time portfolio. \( SMB_t \) and \( HML_t \) are the size factor and the book-to-market returns. The momentum factor \( WML_t \) captures the difference between winner and loser portfolios.

4. Results

In the following section, we first present and discuss our results for long-term performance for the event-time and calendar-time approaches. We then examine the effects of various deal and firm characteristics. Finally, we show the results for announcement returns and for pre and postmerger operational performance.

4.1. Long-term performance

Table 3 presents our results for the event-time approach (buy-and-hold returns) for all acquiring firms with deals completed between 1981 and 2010 for a 36-month holding period.

For the full sample period as well as the subperiods we see no significant abnormal returns when we apply an adjusted t-statistic that accounts for cross-sectional dependence and skewness. This holds for all reference portfolios (German and European industry indices with BHARs equally weighted and cumulative abnormal Euro returns and the broad CDAX as benchmarks). These results are quite consistent with those of other recent studies using advanced test statistics, which question whether acquirers receive significant\(^\text{15}\) 

| Factor | Criteria | Number of transactions | Percent of total sample |
|--------|----------|------------------------|------------------------|
| Attitude | Friendly | 302 | 89.09% |
| | Hostile | 5 | 1.47% |
| | Neutral | 31 | 9.14% |
| | Public | 240 | 71.00% |
| | Other | 98 | 28.91% |
| Relatedness | Focus | 192 | 56.64% |
| | Diversification | 146 | 43.36% |
| Acquirer type | Growth | 108 | 31.86% |
| | Value | 29 | 8.55% |
| Cross-border | Cross-border | 201 | 59.99% |
| | German target | 137 | 40.41% |
| Ownership after transaction | Ownership 25–50% | 53 | 15.63% |
| | Ownership 50–95% | 99 | 29.50% |
| | Ownership >95% | 186 | 54.87% |
| Deal type | Tender | 106 | 31.27% |
| | Merger | 71 | 20.94% |
| | Other | 161 | 47.79% |
| Payment type | Cash | 148 | 43.95% |
| | Stock | 44 | 12.98% |
| | Hybrid | 25 | 7.40% |
| Challenged | Yes | 8 | 2.36% |
| | No | 330 | 97.64% |

A deal is classified as friendly if the board supported the deal, as hostile if the board rejected the deal, and as neutral if the board did not comment on the deal. 1: “Other” target status is government, private, subsidiary, or joint-venture ownership of the target. 2: A deal is classified as related if the target and the acquirer share the same 2-digit SIC code and as nonrelated otherwise. 3: Ownership after transaction is the percentage of outstanding shares of the target owned by the acquirer after the transaction. 4: Hybrid means a combination of cash and stock. 5: A deal is classified as challenged (“yes”) if another company challenged the offer and “no” otherwise.

The factors are from the website of the Centre of Financial Research in Cologne (http://www.cfr-cologne.de).

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negative abnormal postmerger returns. E.g. Dutta and Jog (2009) could not find significant abnormal returns for a large sample of Canadian acquirers once they controlled for skewness and cross-sectional dependence.16

For further discussion of the results, we first focus on German industry-adjusted returns as a reference. For the full sample period, we see negative industry-adjusted abnormal returns of 8.9% (Panel A: equally weighted portfolio of acquirers) and −1365 million Euro respectively (Panel B: cumulative abnormal Euro returns) that are weakly significant if we use standard t-statistics.17 For our first subsample, 1981–1990, with only 23 observations, we find a very high positive buy-and-hold abnormal return of 36.4% and a positive Euro return of 1491 million Euro. Firms that were active in M&A considerably outperformed their German industry peers. If we use standard t-statistics, the abnormal returns (equally weighted) are significant once adjusted for skewness and cross-sectional dependence. In our last subsample, from 2001 to 2010, we record the highest number of transactions (n = 179). The abnormal returns are again negative, but only weakly significant (Euro returns) under standard t-statistics.

16 Our adjustment procedure reduces t-statistic values on the order of approximately two times. Dutta and Jog (2009) report reductions on the order of five to six times for a sample of 1300 Canadian firms that were active in M&A over a ten-year period.

17 We also excluded overlapping cases (n = 71) because overlaps can influence the results (Megginson, Morgan, & Nail, 2004). The findings remain qualitatively the same (not reported here, but available from the authors on request).
We believe that the German industry-matched abnormal buy-and-hold returns are more reliable than the abnormal returns from matches with the broad market index CDAX. Nevertheless, our findings for matches with CDAX are qualitatively similar, although less pronounced. For the whole sample as well as the subsamples, we find no significant abnormal returns.

Panel D and Panel E report the results for equally and value weighted portfolios of acquirers with European industry indices as benchmarks. As with the German industry benchmarks, we see negative returns for the full sample period as well as for the two subsamples from 1991 to 2000 and 2001 to 2010 (with very similar magnitudes), returns that become significant only when we apply standard t-statistics. For the first subsample we find negative abnormal returns that contrast with the highly positive abnormal returns we identify when using German industry indices. We believe that for the 1980s European industry indices are not the appropriate benchmark, as the European countries and economies were by far less integrated.

Table 4 presents the results for the calendar-time four-factor regression model. For the full sample, the first sample period (1981–1990), and the last sample period (2001–2010), we see positive alphas; for the 1991–2000 period, a negative alpha. The test statistics indicate only weak significance for the 2001–2010 subsample.

In general, the use of three- or four-factor calendar-time models to detect abnormal returns is in line with more recent literature. We are nevertheless very cautious with respect to the German stock market. The fit of the overall model is considerably lower (adjusted $R^2 = 0.39$) than that in studies of the U.S. and other markets. The market risk premium is highly significant, but the size and book values are not. Momentum plays a significant role in explaining stock returns in Germany. These findings are fully consistent with other studies of the German stock market (Schiereck, DeBondt, & Weber, 1999; Artmann, Finter, & Kempf, 2012; Artmann et al., 2012a, 2012b) and cast doubt on the appropriateness of these models for the German stock market. What we nevertheless find remarkable is the highly significant HML coefficient for the first subsample (1981–1990). The negative coefficient implies that it was mainly growth firms with high market-to-book ratios that were active in the M&A market of the 1980s.

### 4.2. Deal characteristics

In this section, we analyze the impact on long-term performance of the various deal-specific and firm-specific characteristics that are typically discussed in the literature. We rely on German and European industry-adjusted BHARs and report standard t-statistics as well as t-statistics adjusted for skewness and cross-sectional dependence. We study target type (private or public), relatedness (focus or diversification), acquirer type (growth or value), whether the deal is domestic or cross-border, ownership after transaction, whether the deal is tender or merger, payment type, whether the deal is challenged or not, and whether it is friendly or hostile. Table 5 presents the results for the different factors.

For most of the deal and firm characteristics, we find no significant values when using the adjusted t-statistics. However, the method-of-payment hypothesis, according to which acquirers pay with stock when their own stocks are overvalued (Shleifer & Vishny, 2003) or they are uncertain about the target valuations, is well supported. We see a significant negative abnormal return for bidders that pay with stocks, a finding that is in line with empirical literature (e.g., Agrawal, Jaffe, & Mandelker, 1992; Martynova & Renneboog, 2011). Mergers are typically negotiated between the acquirer and the target, whereas tender offers are often less friendly. Mergers significantly underperformed in our sample. Outright hostile takeovers and challenged transactions were very rare events in Germany and occurred only after 1990. We could identify only 5 hostile and 8 challenged transactions. We therefore do not expect statistical significance. Challenged transactions exhibit the highest positive abnormal returns (with German industry indices as reference) among all our firm and deal characteristics. Bidders on average did not overpay in challenged deals. We see slightly positive abnormal returns for hostile acquirers, compared with negative returns for friendly acquisitions, for German industry-adjusted BHARs, in line with numerous studies that report positive abnormal returns for bidders after hostile takeovers (e.g., Franks, Harris, & Sheridan, 1991; Loughran & Vijh, 1997). The European industry-adjusted returns are both negative. Concerning ownership after the transaction, we observe a U-shaped effect. Ownership of 25–50% and above 95% is related to negative long-term performance. For ownership of 50–95%, we find positive performance. The negative performance for minority ownership (below 50%) fits well into our expectations, but not for ownership above 95%, which allows for a squeeze-out of minority shareholders. Our findings exhibit no differences for value vs. growth acquirers or for national vs. cross-border acquisitions. Only with the less reliable standard t-statistics do we see some effects for target type and relatedness. The t-values weakly indicate underperformance of focused acquisitions compared with diversifying ones.

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18 The European Union (EU) was established only in 1992 with the Treaty of Maastricht, which created a single market. The 1980s were characterized by many moves and initiatives toward the European Union. The Euro as a single currency for most countries of the European Union was introduced only in 1999 (first as an accounting currency). European industry indices for the period from 1981 to 1990 substantially outperformed their (pure) German counterparts. This run-up in share prices was very much driven by countries that joined the European Economic Community, the EU’s forerunner, in the 1980s (Spain and Portugal) or were expected to join soon (e.g., Austria, Finland, Sweden).

19 One of the hostile takeovers was also challenged. Excluding this case, the results remain qualitatively the same.

20 A potential explanation could be expensive squeeze out procedures of the minority shareholders following the transaction.

21 In 1990, Germany reunited. The Treuhandanstalt (Trust Agency), a newly established public institution, was mandated to privatize the former Eastern German economy. We also checked whether our results were influenced by potential bargain deals in former Eastern Germany after the reunification and the subsequent privatizations. We could not identify any systematic effect.

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Table 4
Carhart 4-factor regression.

| Period   | A                | B                | SMB               | HML               | WML               | Adj. R² | s(e)     | F-Stat | Sig. |
|----------|------------------|------------------|-------------------|-------------------|-------------------|---------|----------|--------|------|
| Full sample | 0.409 (1.11)     | 0.835*** (10.53) | −0.113 (−0.91)    | −0.054 (−0.51)    | −0.288*** (−3.18) | 0.39    | 6.54     | 57.91  | 0.000|
| Subsamples |                  |                  |                   |                   |                   |         |          |        |      |
| 81–90     | 0.135 (0.42)     | 1.043*** (14.35) | 0.161 (1.19)      | −0.616*** (−4.72) | −0.099 (−0.88)    | 0.70    | 3.22     | 92.63  | 0.000|
| 91–50     | −0.424 (−1.64)   | 0.771*** (11.75) | 0.039 (0.39)      | 0.092 (1.48)      | −0.190*** (−2.00) | 0.66    | 2.56     | 61.19  | 0.000|
| 01–10     | 1.739* (1.71)    | 0.778*** (3.72)  | −0.305 (−1.08)    | −0.086 (−0.30)    | −0.356 (−1.80)    | 0.26    | 10.42    | 11.54  | 0.000|

This table presents the regression results for the Carhart 4-factor model over 36 months following the M&A. It is the market risk premium represented by the difference between the market (CDAX) and the risk-free rate (one-month money market rate). SMB is the return difference of three equally weighted small-stock and three equally weighted large-stock portfolios. HML is the return difference between two equally weighted growth and two equally weighted value portfolios in terms of book-to-market equity. WML is the return difference between the winner and loser portfolios. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

4.3. Short-term abnormal returns

To analyze the acquirer’s short-term abnormal returns near the announcement, we employ standard event methodology (Brown & Warner, 1985). Table 6 reports cumulative average abnormal returns (CAARs) and standard t-statistics near the announcement.

Table 5
Firm and deal characteristics that affected long-term performance.

| Panel A: 3-year German industry-adjusted BHAR | Panel B: 3-year European industry-adjusted BHAR |
|---------------------------------------------|---------------------------------------------|
| BHAR SD t-value Adj. t-value | BHAR SD t-value Adj. t-value |
| Target type\(^1\) | Target type\(^2\) |
| Public (1) | 0.126 | 0.82 | −2.14 ** 1.07 | 0.135 | 0.75 | −2.78 *** | 1.20 |
| Other (2) | −0.014 | 1.15 | −0.12 0.09 | −0.107 | 0.80 | −1.32 0.79 |
| Relatedness\(^3\) | Relatedness\(^4\) |
| Focus (1) | −0.106 | 0.95 | −0.93 0.70 | −0.027 | 0.76 | −0.30 0.19 |
| Diversification (2) | −0.177 | 1.01 | −2.43 1.34 | −0.157 | 0.77 | −2.83 *** 1.32 |
| Type of acquirer | Type of acquirer |
| Growth (1) | 0.027 | 0.88 | 0.38 0.20 | 0.087 | 0.76 | −1.37 0.73 |
| Value (2) | 0.026 | 0.95 | −1.96 * 1.46 | −0.071 | 0.76 | −0.84 0.53 |
| Cross-border | Cross-border |
| Cross-border (1) | 0.109 | 0.99 | −1.30 0.79 | −0.193 | 0.90 | −2.52 ** 1.31 |
| National (2) | 0.034 | 0.95 | 0.32 0.19 | 0.113 | 0.76 | 1.33 0.96 |
| Ownership after transaction\(^5\) | Ownership after transaction\(^6\) |
| 25%–50% (1) | −0.178 | 0.61 | −2.11 ** 1.81 * 0.286 | 0.52 | −4.00 *** | 2.34 |
| 50%–95% (2) | 0.108 | 1.00 | 1.05 0.63 | 0.008 | 1.00 | 0.08 0.07 |
| Cross-border | Cross-border |
| Cross-border (3) | −0.163 | 1.00 | −2.23 ** 1.23 | −0.150 | 0.66 | −3.05 *** | 1.42 |
| National (4) | −0.287 | 0.86 | −1.92 1.84 * 0.295 | 0.85 | −2.02 ** | 1.41 |
| Type of transaction | Type of transaction |
| Tender (1) | −0.016 | 0.93 | −0.11 0.11 | −0.136 | 0.64 | −1.37 0.97 |
| Merger (2) | 0.271 | 1.00 | 2.16 ** 1.34 | 0.158 | 0.79 | 1.59 1.24 |
| Payment type | Payment type |
| Cash (1) | 0.137 | 1.00 | 1.07 0.63 | 0.114 | 0.64 | −2.16 ** | 1.12 |
| Stock (2) | 0.328 | 0.67 | 3.25 *** 3.13 *** 0.421 | 0.87 | −3.21 ** | 2.02 ** |
| Hybrid (3) | 0.271 | 0.60 | −2.21 ** 2.34 ** | −0.146 | 0.55 | −1.30 0.97 |
| Challenged\(^7\) | Challenged\(^8\) |
| Yes (1) | 0.260 | 0.74 | 2.06 ** 1.37 | 0.307 | 0.69 | 2.58 ** 2.49 ** |
| No (2) | 0.204 | 0.74 | 1.26 0.92 | −0.073 | 0.74 | −0.80 0.53 |
| Challenged\(^9\) | Challenged\(^10\) |
| Yes (1) | 0.557 | 0.95 | 1.64 1.06 | 0.174 | 0.76 | 0.64 0.73 |
| No (2) | −0.102 | 0.95 | −1.94 * 0.84 | −0.131 | 0.77 | −3.10 *** 1.18 |

We calculated 36-month industry-adjusted long-term buy-and-hold abnormal returns (BHAR). In Panel A we use German industry indices and in Panel B European industry indices as benchmarks. Adjusted t-statistics are corrected for skewness and cross-sectional dependence. 1: “Other target” type means the target is private-ly owned, government owned, or subsidiary owned before the transaction. 2: A deal is classified as related if the target and the acquirer share the same 2-digit SIC code and as unrelated otherwise. 3: Ownership after transaction is the percentage of the target’s outstanding shares that the acquirer owns after the transaction. 4: A deal is classified as challenged (“yes”) if another company challenged the offer and “no” otherwise. 5: A deal is classified as hostile if the management board opposed the deal, friendly if the management board supported the deal, and neutral if the board did not comment on the deal at all. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

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postacquisition industry-adjusted operational performance that depends on the type of payment. We conclude that
merger underperformed their respective industries. However, we cannot detect a signi-
hance deals signiﬁcantly underperformed cash-
acquirers show a higher operational performance than their peer group. Firms that used their own stocks as means of pay-
approximately twice as high as that of
Panel B of Table 7. The unadjusted ratios reveal that the operational performance of
ferences in operational performance or whether the long-term return effect was caused by valuation effects. The results are shown in
returns in Section 4.1.

**Table 6**

| CAAR       | Time windows | [0, +20] | [−1, +1] | [−5, +5] | [−10, +10] | [−20, +20] |
|------------|--------------|----------|----------|----------|------------|------------|
| Full sample| −0.009       | 0.001    | 0.006    | −0.003   | −0.005     |            |
| t-value    | −1.587       | 0.297    | 1.075    | −0.398   | −0.562     |            |
| Subsamples            |              |          |          |          |            |            |
| 1981–1990 | −0.009       | 0.004    | 0.004    | 0.033    | 0.010      |            |
| t-value    | 0.580        | 0.543    | 0.701    | 0.206    | 0.734      |            |
| 1991–2000 | 0.016        | −0.005   | −0.006   | −0.022   | −0.016     |            |
| t-value    | −1.762**     | −1.028   | −0.695   | −2.412** | −1.235     |            |
| 2001–2010 | −0.003       | 0.006    | 0.017    | 0.010    | 0.004      |            |
| t-value    | −0.341       | 1.494    | 2.001**  | 1.037    | 0.338      |            |

This table presents the cumulative average abnormal returns (CAARs) for acquirers for five different event windows. The announcement date is \( t = 0 \). We report standard t-statistics. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

date. For the whole sample, CAARs are not significantly different from zero in most of the time windows. This finding is consistent with earlier studies of the European and the U.S. markets (e.g., Andrade, Mitchell, & Stafford, 2001; Faccio & Stolin, 2006), but it differs from findings in two European studies, by Goergen and Renneboog (2004) and Martynova and Renneboog (2011). In general our results are also consistent with our long-term abnormal performance analysis, which shows no significant abnormal returns for the full sample period.

For our earliest subsample (1981–1990), we observe no signiﬁcant effects except for one time window. The capital market appeared to be indifferent to M&A announcements, although the subsequent German long-term industry-adjusted returns were highly positive. In our 1991–2000 subsample, we find negative returns in all ﬁve time windows near the actual announcement, two of which are (weakly) signiﬁcant. This ﬁnding is also consistent with our long-term abnormal return analysis for the 1990s. The market reacts unfavorably to M&A announcements and partially anticipates long-term negative effects of the events. In contrast, for the European market other studies tend to ﬁnd positive but often insigniﬁcant announcement returns (e.g., Faccio & Stolin, 2006; Goergen & Renneboog, 2004; Martynova and Renneboog, 2006). For 2001–2010, we see a signiﬁcant positive return only for the [−5, +5] day window, which is partially corrected over the twenty-day postannouncement window.

4.4. Pre and postacquisition performance

In this section, we present the results for pre and postacquisition operating performance as a robustness check. As a proxy for operating performance, we use Earnings Before Interest, Taxes, Depreciation and Amortisation (EBITDA), standardized by total assets.

Table 7 reports the raw and industry-adjusted median values for the three years preceding the transaction and the three subsequent years (excluding the year of the transaction). Panel A exhibits the results for the whole sample and the subsamples. For the whole sample we observe a signiﬁcant (by the Wilcoxon signed-rank test) decline in operational performance in the raw data that is only weakly signiﬁcant when adjusted for industry performance. For our ﬁrst subsample, covering the period from 1981 to 1990, we detect no signiﬁcant changes in either the raw ratios or the industry-adjusted calculations. For the subsequent two subsamples (1991–2000 and 2001–2010), we observe a signiﬁcant deterioration of the unadjusted ratios after the acquisition. For industry-adjusted operational performance, we observe only a weakly signiﬁcant effect for the latter subsample. The results support our ﬁndings for long-term returns in Section 4.1.

In Section 4.2, we reported that stock-ﬁnanced deals signiﬁcantly underperformed cash-ﬁnanced deals by approximately 26% over three years, with German industry indices as reference. We therefore also analyzed whether there were pre and postacquisition differences in operational performance or whether the long-term return effect was caused by valuation effects. The results are shown in Panel B of Table 7. The unadjusted ratios reveal that the operational performance of ﬁrms that financed transactions with cash was approximately twice as high as that of ﬁrms that paid with shares. This ﬁnding is conﬁrmed by the industry-adjusted ratios, in which cash acquirers show a higher operational performance than their peer group. Firms that used their own stocks as means of payment underperformed their respective industries. However, we cannot detect a signiﬁcant difference between pre and postacquisition industry-adjusted operational performance that depends on the type of payment. We conclude that ﬁrms ﬁnancing deals with stocks have a lower operational performance but that the industry-adjusted posttransaction underperformance of their shares is rather caused by valuation effects (using overpriced stock to pay or overpay for the transaction). This result is consistent

22 We checked whether our results were biased by thin trading. Our study is based on closing prices. About 80% of the closing prices are taken from call auctions (since the mid-1990s) where liquidity is consolidated. Almost all acquirers are large and mid-cap ﬁrms for which thin trading should not be an issue. We carefully examined the acquirers of our earliest sample period (1981–1990). Large ﬁrms clearly dominate the ﬁrst sample period. We therefore refrained from applying the technique of Scholes and Williams (1977). Nevertheless, we additionally applied a generalized sign test (Cowan, 1992) as a nonparametric alternative to address potential methodological issues arising from event-induced volatility and thin trading. The results are qualitatively the same and available from the authors on request. We further checked whether our results were signiﬁcantly weaker than those of earlier studies. For our earliest subsample (1981–1990), we observe no signiﬁcant changes in either the raw ratios or the industry-adjusted calculations. For the subsequent two subsamples (1991–2000 and 2001–2010), we observe a signiﬁcant deterioration of the unadjusted ratios after the acquisition. For industry-adjusted operational performance, we observe only a weakly signiﬁcant effect for the latter subsample. The results support our ﬁndings for long-term returns in Section 4.1.

23 German stock-listed corporations have been legally required to publish cash-ﬂow statements only since 1998. Because of data availability, we choose the EBITDA rather than cash ﬂow as a proxy for operating performance.

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We conjecture that due to high barriers to M&A activity, only the most economically meaningful transactions were executed.

with the overvaluation theory and the empirical findings of Shleifer and Vishny (2003) and Gugler, Mueller, Weichselbaumer, and Yurtoglu (2012).

### Table 7
Pre and postmerger operating performance.

| Median (z-score) | Firm median | Post average: mean of years −1, −2, and −3 | Post-pre difference | Industry-adjusted firm median | Post average: mean of years −1, −2, and −3 | Post-pre difference |
|-----------------|-------------|------------------------------------------|---------------------|--------------------------------|------------------------------------------|---------------------|
| **Panel A: time** |             |                                          |                     |                                |                                          |                     |
| Full sample     | 0.123       | 0.097                                    | −0.017*** (5.28)    | 0.009*** (3.39)               | 0.007* (1.73)                          | −0.004* (1.89)      |
| 1981–1990       | 0.124       | 0.137                                    | −0.011 (0.74)       | −0.003 (0.03)                 | 0.001 (0.59)                           | 0.003 (0.29)        |
| 1991–2000       | 0.123       | 0.093                                    | −0.026*** (4.19)    | −0.005** (2.04)               | −0.007 (1.02)                          | 0.004 (1.25)        |
| 2001–2010       | 0.115       | 0.090                                    | −0.011*** (4.07)    | 0.0392*** (4.66)              | 0.020*** (3.02)                       | −0.004* (1.70)      |
| **Panel B: type of payment** |          |                                          |                     |                                |                                          |                     |
| Cash            | 0.131       | 0.106                                    | −0.012*** (3.48)    | 0.034*** (4.01)               | 0.013*** (3.06)                       | −0.004 (1.51)       |
| Stock           | 0.027       | 0.049                                    | 0.012 (0.38)        | −0.051** (2.26)               | −0.049* (1.81)                        | 0.003 (0.54)        |
| Cash and stock  | 0.501       | 0.086                                    | −0.017 (1.45)       | 0.006 (0.30)                  | 0.011 (0.27)                          | −0.095 (0.81)       |

This table presents the median abnormal operating performance (EBITDA) of the average of the three-year periods before and after the M&A. T = 0 is defined as the year in which the effective date falls. The industry benchmark is based on all German peer companies in the same 2-digit SIC group. Z-scores (Wilcoxon signed-rank test) are presented in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

5. Conclusion

During the 1980s, German M&A transactions were rather scarce because they could have impaired the interests of various stakeholder groups. In the early 1990s, there was a gradual move toward a capital market orientation, and the number and volume of M&A transactions increased considerably, though the number of hostile takeovers remained very low. In contrast to many studies of the U.S. market, we find no significant negative abnormal buy-and-hold returns for our full sample when we adjust t-statistics for cross-correlation and skewness. Standard t-statistics indicate only weak significance. These results are robust across various deal and firm characteristics. However, similar to Anglo-Saxon studies, the method-of-payment hypothesis (that acquirers prefer to pay with their stock when it is overvalued) is well supported. Mergers significantly underperform, whereas the very few outright hostile transactions show a slight positive (although not significant) abnormal return when compared to their German peer industries. For our earliest subsample (1981–1990), when M&A transactions were rare, we find positive returns based on German industry indices. We conjecture that due to high barriers to M&A activity, only the most economically meaningful transactions were executed.

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