ESSAYS ON BEHAVIORAL FINANCE: STRATEGIC AND FINANCIAL DECISION-MAKING IN MERGERS AND ACQUISITIONS

DISSERTATION

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Contents

Introduction

1.1. Research Context and Scope

Over the last few decades, behavioral corporate finance has revolutionized the view of decision-making by investors, executives, and advisors, synthesizing theories and findings from economics, finance, strategy, and psychology. While traditional corporate finance theory assumes that these actors decide fully rationally and thus maximize their self-interest, behavioral corporate finance aims to explain behavioral patterns that emerge from the interactions of crucial actors. Behavioral corporate finance replaces the traditional assumption of rationality with behavioral foundations that are more evidence-driven, based on the notion that managers and investors are partly subject to behavioral biases that limit fully rational decision-making (Baker et al., 2007).

The behavioral patterns of mergers and acquisitions (M&A) decision-makers have received considerable attention from both scholars and practitioners, as M&A decisions are among the most critical that top executives are required to make. M&A is defined as the process of acquiring assets, an entire firm, or an operating business of a firm, from another party. The total value of announced deals in 2019 was $2.99 trillion (Ahmed & Foerster, 2019). The nature of M&A transactions means that most top executives make these decisions rather rarely; they thus lack experience and seek advisory services from external consultants, typically investment banks.

Key branches of research on behavioral corporate finance analysis in the context of M&A have focused on questions like whether M&A transactions create value (Andrade et al., 2001; Moeller et al., 2004; Renneboog & Vansteenkiste, 2019), how biases and personality traits of executives (such as hubris, overconfidence, and overoptimism) impact the pricing of acquisition targets and offer a potential explanation of why overvaluation is prevalent in many

M&A deals (Hayward & Hambrick, 1997; John et al., 2011; Malmendier & Tate, 2005; Roll, 1986), and whether advisors help create value for their clients (Agrawal et al., 2013, 2018; Bao & Edmans, 2011; Chang et al., 2016a, 2016b; Sleptsov et al., 2013; Wang et al., 2021). The scope of this dissertation encompasses empirical studies on the decision-making behavior and interactions of advisors, executives, and investors in the M&A field.

1.2. Research Objectives and Contribution

In Chapter 2, my co-author Stefan Trautmann and I suggest an additional perspective to the hubris and overconfidence hypotheses (Malmendier & Tate, 2005; Roll, 1986) by considering the rational self-interest of top executives to maximize their bonuses, which is reflected in the contractual terms they close with advisors. There is strong evidence that advisor choice is an important strategic decision and that it has substantial effects on M&A outcomes (Agrawal et al., 2013, 2018; Bao & Edmans, 2011; Chang et al., 2016a, 2016b; Sleptsov et al., 2013; Wang et al., 2021). However, there is not yet a clear picture of whether and how advisors on both sides of a deal benefit the different parties involved. The literature has typically focused on specific industries and countries and on either the seller or buyer side of the deal. We zoom out and analyze transactions across various industries and countries and investigate the effect of advisor engagement on both the buy and sell sides in publicly and privately held targets. We study both key dimensions of the M&A deal—pricing and completion rate—in the same data sample, aiming to identify general principles for the effects of advisors on M&A outcomes and relating these effects to governance issues in the context of executives' financial incentives and career paths. Our results indicate that top executives have strong financial incentives to secure potentially overpriced deals.

Investigating the association of advisor engagement with relative deal pricing, premiums, bidder returns, and deal completion, we observe that both sell- and buy-side advisors

positively correlate with deal prices, premiums, and completion. Matching estimators and an instrumental variable (IV) analysis using the impact of the Lehman failure on Lehman clients support a causal interpretation in terms of advisor effects, over and above possible selection effects due to endogenous advisor engagement and identification of potential deals by advisors. While the direction of the effects is in line with the expectation and evidence that sell-side advisors negotiate higher prices for targets (Agrawal et al., 2018; Golubov et al., 2012), we find that buy-side advisors also increase prices and premiums — which might be an additional explanation for value destruction in mergers. Our analysis of deal completion similarly supports a causal effect, with both sell- and buy-side advisors increasing deal completion likelihood. Interpretations in terms of either improving deals (identifying important synergies and thus acquirer's willingness to pay) or value destruction (flawed incentive structure for executives and advisors) are possible. In several analyses zooming in on this question, the evidence points in the direction of value destruction by acquirer advisors. We find that acquirer advisors do not play out their bargaining power and that their presence increases prices most if the stakes for their own reputations are low. These findings are consistent with the broader M&A literature, which shows that even for ex-post efficient deals, acquirer shareholders do not typically benefit from acquisitions.

Further, our results support a critical perspective on incentive structures, advisor roles, and prioritization of deal objectives. Considering target shareholders' interest in maximizing deal value by achieving high M&A selling prices, the contractual incentives of both top executives and sell-side advisors are closely aligned with shareholder interests. However, the incentive schemes for acquirers' top executives and their respective advisors run the risk of misalignment with shareholders' interests. Roll (1986), Hayward and Hambrick (1997), and Malmendier and Tate (2005) are all prominent sources who suggest that buyers often overpay due to CEO hubris or overconfidence, destroying the value of shareholder equity. Our findings offer an additional explanation for overpayments in M&A. Both top buy-side executives and

acquirer advisors maximize their payoffs, based on incentives provided by M&A bonuses and advisor contracts, by prioritizing deal completion and benefitting from high prices. More junior executives, meanwhile, obtain career benefits by playing along (Botelho et al., 2018).

A second interesting element of our results involves the potential role of overconfidence on the sell side of M&A transactions, as only 62% of the transactions involved a target advisor. This appears to be at odds with the unambiguous and simultaneously positive effects of target advisors on pricing and deal completion likelihood, especially given that a similar share of acquirers engage a buy-side advisor (for whom engagement is costly both in terms of fees and share prices, as we show below). One interpretation for these results is provided by the work of Malmendier and Tate (2005) and Roll (1986) on overconfidence and hubris. While these authors focus on the buy side, the evidence suggests that these effects may also alter behavior on the sell side.

Assuming the validity of our interpretations of the aforementioned misaligned incentives, stricter supervisory control in M&A projects may thus be warranted to improve decisions. However, while Goranova et al. (2017) show that increased monitoring by supervisory boards helps contain M&A losses, they also observe that tighter control reduces M&A gains. We conclude that the decision to engage an advisor and the subsequent effects of that advisor on transaction outcomes are likely influenced both by aspects of a potentially misaligned incentive structure and by psychological aspects like executives' overconfidence. Biases may also be present at the level of supervisory boards. Further research is needed, though, to identify the precise decision processes and unambiguously separate incentive effects from potentially irrational, hubris-driven behavioral influences.

With the observations made in the first paper, I continued my investigation by disentangling buy-side advisor types in terms of reputation, industry, and country experience, aiming to understand if what I call *top advisors* create or destroy value compared to less experienced advisors or those with lesser reputations (Chapter 2). Top advisors in the literature

are typically referred to as advisors with a rank in the league tables, evaluated based on the total deal value and volume in which an advisor engaged during a specific year or other period (Golubov et al., 2012; Hunter & Jagtiani, 2003; Ismail, 2010; Kale et al., 2003). Departing from this common league table definition, I define top advisors based on prior industry and country experience that is directly relevant to the client and acquisition with which they are engaged at a given point. I segment advisors into four distinct types: *Experience-Based Top Advisors*, defined as investment banks with high experience in both the industry and country of the current M&A target; *Country Specialists*, investment banks with substantial experience in the M&A target's country but rather low experience in its industrial sector; *Industry Specialists* have substantial experience in the M&A target's sector but comparatively little experience in its country; and *Rookies*, advisors with rather low industry and country experience. The results suggest that experience-based top advisors not only negotiate prices down but also achieve significantly higher returns for acquirers. Further, neither country specialists nor industry specialists achieve the same level of positive returns for acquirers as experience-based top advisors. Finally, rookies can even destroy value for their clients in terms of announcement returns.

With these results, I contribute an important novel perspective from which to answer the complex question of whether top buy-side advisors create value for their clients and suggest redefining the typical understanding of a top advisor based on prior experience rather than simply deal volume and value. This thesis suggests that top advisors create significant value thanks to their extensive experience in their advised M&A target's industry and country rather than their general reputation, overall deal size, and the volume of deals with which they have been engaged. These results are also relevant for the practitioner aiming to improve decision-making in terms of advisor engagement. Which type of advisor creates value in a buy-side acquisition? The results presented here suggest that acquirers should refrain from

hiring inexperienced advisors. The complexity of an M&A transaction appears to require understanding both the sector-related particularities and country-specific aspects of the target.

In my third article (Chapter 3), I sought to understand how a formative experience such as the collapse of Lehman Brothers in 2008 affected the M&A strategies of former Lehman clients; I thus investigate how the Lehman bankruptcy changed the M&A strategic conduct of former clients in terms of their preferences for size, industrial sector, regional footprint, profitability, and willingness to pay in terms of relative deal pricing (EBITDA multiples) and premiums. Thus, did the shocking collapse of a former trusted advisor that had helped shape a corporate M&A strategy over years affect the beliefs and risk preferences of former Lehman clients? Prior research shows that executives' exposure to macroeconomic events impacts their corporate finance strategy and risk preferences (Dittmar & Duchin, 2013, 2015; Graham & Narasimhan, 2004; Knüpfer et al., 2017; Malmendier & Nagel, 2011; Schoar & Zuo, 2017). Another branch of the literature shows the effect of personal life experiences on executives' decision-making in terms of corporate financial policies (Bernile et al., 2016; Cameron & Shah, 2015; Malmendier et al., 2011). In this study, I provide insights into how the 2008 financial crisis impacted executives' strategic and financial decision-making regarding M&As. More precisely, I examine how the collapse of Lehman Brothers impacted the strategic and financial decision-making of acquirers who were former Lehman clients. The demise of this once-prestigious investment bank serves as a unique natural experimental setting: I investigate whether and to what degree former Lehman clients changed their strategic growth agendas in terms of cross-industry and cross-country acquisitions and how their appetite for large deals and willingness to pay changed. The identification strategy is based on investigating the behavioral change of our treatment group by implementing difference-in-differences and fixed effects models. With *former Lehman clients* defined as the treatment group, I measure the effects against two control groups. First, I implement *all other acquirers* in the respective period; second, I use *other former top investment bank clients*. To understand the extent to

which the downfall of Lehman Brothers may have affected decision-making among not only former Lehman clients but also the entire group of acquirers who trusted top investment banks in general, I replicate the difference-in-differences and fixed effects models with other former top investment bank clients as the second treatment group and measure them against all other acquirers in the respective period.

The findings suggest that former Lehman clients significantly reduced their appetite for large deals and had a lower willingness to pay, mirroring a reduced preference to take risks. Interestingly, this group of clients maintained a strategic growth agenda by focusing on *product and technology expansion* and *diversification*. Therefore, it can be concluded that former Lehman clients' decision behavior retained its strategic direction but did so on a smaller and thus less risky level. I also find that the Lehman shock did not have the same effect on peers; that is, acquirers who engaged one of the other top investment banks. I observe that this group slightly reduced their risk appetite in terms of strategic growth paths by directing their acquisitions more toward lower-risk strategies like *core expansion*. However, unlike their peers, this group of acquirers actually increased its appetite for large deals and significantly boosted its willingness to pay high premiums. Therefore, I not only conclude that the Lehman shock had a significantly different effect on comparable types of acquirers but also that the direct relationship with the collapsed bank resulted in a difference in strategic and financial decision-making behavior: former Lehman clients had their fingers burned. This conclusion is supported by findings that the group significantly reduced its engagements with investment bankers after the Lehman collapse. In the chapters below, detailed information on the data, variables, methodologies, and results of the three research projects are presented, discussed, and concluded.

Chapter 2: Done Deal! Advisor Impact on Pricing, Premiums, Returns, and Deal Completion in M&A

Abstract: We study the role of financial advisors in M&A for different advisor engagement constellations. We observe positive effects of both target and acquirer advisors on deal completion and prices. The unexpected positive price effect of acquirer advisors is further supported by evidence for higher premiums and lower announcement bidder returns. We establish causality of pricing effects using matching and instrumental-variable approaches, making use of the impact of Lehman's collapse on former Lehman clients. We explain our findings in terms of governance: advisors' and executives' incentives form a potential source of value destruction.[1]

[1] This chapter was co-authored by Stefan. T. Trautmann. We are grateful for helpful comments by Malcolm P. Baker, Daniel Metzger, Zacharias Sautner, Christiane Schwieren, Yilong Xu, and Letian Zhang.

2.1. Introduction

The decision to engage an advisor is central in any M&A process and is affected by the different parties' expectations regarding advisors' effects on deal completion and the resulting prices, premiums paid, and returns achieved. This chapter provides evidence on how advisor engagement on both sides of the M&A transaction is associated with deal completion, relative deal pricing, and premiums: do sell-side financial advisors achieve higher prices and premiums for sellers? Do buy-side financial advisors achieve lower prices and support negotiating lower acquisition premiums for buyers? We also assess the effect of advisor engagement on cumulative abnormal announcement returns. We establish a framework to discuss how client objectives to both secure transactions and optimize deal pricing might be a source of value destruction.

Aiming to identify general lessons about the effect of advisor engagement on the outcome of M&A deals, our analysis proceeds as follows. We first show that advisors on both sides of a transaction correlate positively with prices, premiums, and the likelihood of deal completion. We find no association with bidder returns for either target or acquirer advisors. We next consider the potential causality problem arising from endogenous advisor engagement. We aim to partly overcome selection issues by applying a matching procedure to compare similar deals with and without advisors. We find robust evidence for a positive relationship between advisor engagement and deal completion, prices, and premiums, and a negative relationship with bidder returns, for both acquirers and targets. We next apply an IV approach, using advisor clients affected by the Lehman failure to instrument for endogenous advisor engagement. The IV analysis confirms the causality of the unexpected positive effect of acquirer advisors on prices. We shed more light on the underlying mechanism of positive acquirer-advisor price effects by comparing listed to non-listed firms and by looking at differences in bargaining power.

The literature suggests that, despite many mergers being efficient, overpricing and value destruction from the acquirer shareholders' perspective are prevalent in M&A deals (Andrade et al., 2001; Moeller et al., 2004; Renneboog & Vansteenkiste, 2019). Executives' overconfidence and hubris have been shown to be important causes of overpayment for acquisition targets (Hayward & Hambrick, 1997; John et al., 2011; Malmendier & Tate, 2005; Roll, 1986). We suggest an additional perspective by considering the rational self-interest of top executives to maximize their bonuses, which is then reflected in the contractual terms they close with advisors. Grinstein and Hribar (2003) find that approximately 39% of acquiring firms reward their CEOs with a bonus for the successful completion of an M&A deal (M&A bonus). Further, they indicate that CEOs receive higher M&A bonuses when deals are larger and observe that CEOs' effort and skills do not explain a significant amount of the variation in these bonuses. They also find that M&A bonuses do not appear to be linked to deal performance. Grinstein and Hribar (2003) conclude that this misalignment of incentives, allowing CEOs to extract rents from shareholders through additional bonuses, may lead to self-serving behavior at the cost of shareholders' equity. Seo et al.'s (2015) results point in a similar direction, showing that CEOs with below-average pay engage more often in acquisition activity to realign their pay with that of their peers. The governance-problems-based framework is further supported by recent insights into private versus public acquirers. Golubov and Xiong (2020) show that private acquirers pay lower prices for targets and have a better post-acquisition performance. They further show that the different governance arrangements in private firms contribute to the observed effects.

To better understand the incentive structure of financial advisors, McLaughlin (1990) studies the structure of investment banking contracts, observing that advisors are incentivized by a high share (about 80%) of the total advisor fee being conditional upon successful completion of the deal. He also documents that this feature is found among both sell-side and buy-side advisors. This is interesting in light of a missing contractual incentive for acquirer

advisors to minimize the deal price, in the context of the general responsibility of senior executives to manage their shareholders' equity efficiently. Rau (2000) examined the determinants of the market share of investment banks acting as advisors, finding that it is positively related to the contingent fee payments charged by the bank and the completion rate of transactions. The pressure on financial advisors to gain market share might thus exacerbate the consequences of the missing incentive for lowering prices. Hunter and Jagtiani (2003) investigate deal completion in the context of top-tier advisors and find that they are more likely to complete deals and to do so in less time than lower-tier advisors, while synergistic gains realized by acquirers declined when top advisors were used. This observation can be interpreted in terms of clients sacrificing synergistic gains and thus shareholder value for higher deal completion likelihood: buyers and their advisors seem to focus strongly on deal completion.[2] Consistent with these results, Ismail (2010) finds in a sample of U.S. M&A deals that tier-one advisors destroy substantial value for their clients, while Hayward (2003) shows that financial advisors derive power over their clients from specialized expertise, leading them to complex solutions with potentially adverse outcomes.

There is strong evidence that advisor choice is an important strategic decision and has substantial effects on M&A outcomes.[3] However, there is as yet no clear picture of whether and how advisors on both sides of a deal benefit the different parties involved. The literature has

[2] We can only speculate whether top-tier advisors can influence analyst opinions, which have been shown to be a powerful determinant of deal completion through their effect on target shareholders' willingness to accept a deal (Becher et al., 2015).

[3] Bao and Edmans (2011) show that investment banks matter for M&A outcomes. Wang et al. (2020) find that acquirers create higher shareholder returns when advised by investment banks with more experience in the target industry, while Chang et al. (2016a) report that acquirer advisor industry expertise is associated with higher deal completion, but not with pricing. In another study, Chang et al. (2016b) show that acquirers advised by a target's ex-advisors pay lower takeover premiums and secure a larger proportion of merger synergies. Sleptsov et al. (2013) suggest that exclusive buy-side advisor engagement decreases expected acquisition performance. Agrawal et al. (2013) find that transactions with common advisors take longer to complete and provide lower premiums to sellers. They argue that common advisors are somewhat better for acquirers, because in such an engagement constellation the acquiring client is the "surviving" entity and could thus hire the advisor again. Agrawal et al. (2018) investigate the determinants and consequences of private sellers' choice of M&A advisors or top-tier advisors. They find that advisors, especially top top-tier advisors, can identify and negotiate better deals for sellers; this result is consistent with our findings for sell-side advisors.

typically focused on specific industries and countries and on either the seller or buyer side of the deal. In the current paper, we zoom out and analyze transactions across various industries and countries. M&A is a global business, and the contractual incentives that we have described are highly homogenous across countries and industries. We study the effect of advisor engagement on both the buy and sell sides in publicly and privately held targets, examining both pricing and completion rate, the two key dimensions of M&A deals, in the same data sample in an effort to identify general principles for the effects of advisors on M&A outcomes. We relate these principles to governance issues in the context of executives' financial incentives and career paths. We argue that top executives have strong financial incentives to secure potentially overpriced deals. Similarly, lower-tier executives may substantially benefit in career terms from pushing costly deals to completion: involvement in successful mergers has become a career accelerator (Botelho et al., 2018), if not a precondition for reaching the C-Suite (Groysberg et al., 2011).

In the following sections, we implement our identification strategy with regression, propensity score matching, and IV models. Using different approaches to answer the question, we provide converging evidence that advisors cause increases in price and premiums on both the sell side (as expected, creating value for owners) and the buy side (potentially destroying value for acquirer shareholders). But advisor engagement on both sides also increases deal completion likelihood. In our sample, 55% of the transactions involve an acquirer advisor and 62% a target advisor. Thus, from the perspective of acquirer shareholders, advisor engagement may increase the risk that value is destroyed by an acquisition. From the perspective of the target shareholders, it is, by contrast, surprising that only 62% take up the opportunity to employ advisor support for a better and more secure deal. We provide further interpretations of these results in the concluding discussion.

2.2. Data and Methodology

2.2.1. Data

We use the Thomson Reuters SDC Platinum database on M&A transactions to gather all initiated M&A transactions reported between 1978 and 2020, including all types of transactions conducted by strategic investors, such as corporations, and financial investors, such as private equity firms. Data were sourced through direct deal submissions from global banking and legal contributors, coupled with extensive research performed by a global research team that collected data from regulatory filings, corporate statements, media, and pricing wires. According to Thomson Reuters, more than 2,500 control validations occur at the point of data entry. We focus on transactions with a deal size above $0.5M and exclude transactions that do not report relative deal pricing (*EBITDA Multiple*) as well as deals with negative *EBITDA Margins* or *EBITDA Margins* larger than 1 and negative *Sales Absolute* (the variables are technically defined below)[4] but otherwise make use of the full data set. Contracts with advisors in full-scope transactions are rather comparable to transactions of a partial set of assets. Moreover, the contract structure in terms of variable and fixed components is comparable across different client industries and countries (Lessem & Wright, 2019). We include additional data sets on stocks and indexes from the Center for Research in Security Prices (CRSP) to compute cumulative abnormal announcement returns since this data are not included in the main data set obtained from Thomson Reuters SDC Platinum. CRSP maintains the most comprehensive collection of security price, return, and volume data for the NYSE, AMEX, and NASDAQ stock markets.

[4] Firms with a negative *EBITDA Margin* and negative *Sales Absolute* are excluded from our analysis because the *EBITDA Multiple* is not a robust valuation indicator for such assets. We exclude a total of 607 initiated transactions due to negative *EBITDA Margins* or *EBITDA Margins* larger than 1 and negative *Sales Absolute*.

2.2.2. Variables

The key variables of interest in this study are the relative deal price, premiums paid, and deal completion status. We also provide an analysis of bidder returns. To construct a measure of relative deal pricing, we make use of *Deal Size*, i.e., the selling price, and the target's earnings forecast over the next 12 months, *EBITDA Absolute*, in the year of the transaction. *EBITDA Absolute* is a profitability indicator defined by the absolute amount of earnings before interest, tax, depreciation, and amortization (see Appendix 2A). *EBITDA Absolute* and *Deal Size* values are reported in U.S. dollars. We measure relative deal price using the *EBITDA Multiple*, defined as the ratio of *Deal Size* to *EBITDA Absolute* of the M&A target; this measure indicates relative deal pricing in transactions, which is widely used in M&A and valuing businesses in general (Damodaran, 2005; Koller et al., 2010; Loughran & Wellman, 2011). The *EBITDA Multiple* enables comparisons of negotiated deal terms regardless of the size of an M&A target. This is essential for our analysis because we observe a substantial variation in transactions and firm sizes in our data set. Because of the highly skewed distribution of the *EBITDA Multiple*, we transform it into its logarithm, indicated by the variable *EBITDA Multiple (Log)* in our analyses. We define the premiums paid by acquirers, *Premium 1 Day*, *Premium 1 Week*, and *Premium 1 Month*, as the difference between the offer price and the target's closing stock market price one day (one week; one month) prior to the original announcement date, expressed as a percentage. To account for outliers, we winsorize the premiums at the 1% and 99% levels. Data on premiums are available in the Thomson Reuters SDC Platinum data set.

We measure bidder cumulative abnormal returns (*CARs*) with the variables *CAR(-1/+1)*, *CAR(-2/+2)*, *CAR(-3/+3*), *and CAR(-4/+4)*. We use the CRSP database to model *CARs* and estimate the model over a 255-day window ending 46 days prior to the announcement date, using the CRSP Value-Weighted Index as our market proxy. We report CAR over a three-, five-, seven-, and nine-day windows. Further, *Deal Status* is registered in the data set at five possible status levels: deal completed, deal pending, deal intended, deal withdrawn, and other

deal status. For our analysis, we create the binary variable *Deal Completed*, which is coded one if *Deal Status* equals deal completed and zero otherwise.

The presence of target or acquirer advisors[5] is measured by binary indicators. The variable *Target Advisor* is one if a target advisor is reported and zero otherwise, and the variable *Acquirer Advisor* is one if an acquirer advisor is reported and zero otherwise. The indicators of the presence of target and acquirer advisors are the key independent variables in our study. As McLaughlin (1990) reports, advisor contracts are typically structured with a fixed payment and a payment contingent on successful deal completion depending on deal size (the contingent portion is approximately 80% of the total advisor fee). Acquirer advisors, typically investment banks and management consultants, manage the buy-side process, which includes deal sourcing through the identification of M&A targets, target screening (the first filter of relevant M&A targets regarding strategic and financial fit), drafting indicative offers, due diligence, and support in negotiating, signing, and closing deals. Specific demands vary by client, so not all services described are contracted in every case. Contracts of buy-side advisors are also structured with a high variable payment contingent on deal completion, raising substantial governance concerns about the lack of incentive to negotiate prices down. Bidding processes[6] vary between auction processes and exclusive negotiations between only two parties.

Given the heterogeneity of our sample of transactions, we include a set of control variables. These include the size of the M&A target, defined by the variable *Sales Absolute*, measured in U.S. dollars.[7] We transform *Sales Absolute* into its logarithm, indicated by the variable *Sales Absolute (Log)*, because of its highly skewed distribution. Further, we use the

[5] As defined in Appendix 2A, acquirer advisors are financial advisors to acquiring companies and target advisors are financial advisors to target companies and their respective management and/or boards of directors on a transaction, providing M&A consulting that thus accompanies the entire M&A process from initiation to closing. These types are to be differentiated from specialized consultants with regard to due diligence services, which clients sometimes engage in addition to a financial advisor.

[6] The data sample does not provide information how many bidders submitted indicative or binding offers in each transaction.

[7] The data sample does not provide information on the sales size of the acquirer.

profitability of the M&A target, defined by the variable *EBITDA Margin*, which is calculated by annual *EBITDA Absolute* over annual *Sales Absolute*. We add further controls at the level of the deal: *Deal Attitude* (indicated by the dummy variables friendly, neutral, or hostile attitude of the acquirer towards the seller), *Form of the Transaction* (indicated by the dummy variables acquisition, merger, or other form of transaction) and *Target Public Status* (indicated by the dummy variables public, private, and other public status). To account for potential information asymmetry between acquirer and seller due to geographical distance or industry specialization (Uysal et al., 2008), we add the dummy variables *Same Country* (coded one if acquirer and seller headquarters are located in the same country and zero otherwise) and *Same Industry* (coded one if the acquirer and seller operate in the same industry and zero else). Finally, we include target country, year, and industry fixed effects.

Tables 2.1. and 2.2. provide descriptive statistics for the variables used in this study for two subsamples, Completed Transactions (Table 2.1.) and Incomplete Transactions (Table 2.2.). They summarize data on transaction financials, the status of the M&A targets, and deal properties over two time periods: 1978 to 1999 and 2000 to 2020. We split our sample into two time periods to capture potential time effects beyond the use of year fixed effects. For the entire sample, the average *EBITDA Multiple* equals 19.5. The average *Deal Size* is approximately $719 million, and the average *Sales Absolute* is about $730M. Just over four-fifths (81%) of the initiated transactions in our sample are completed.

Table 2.1. Summary Statistics: Completed Transactions

Period	1978–1999					2000–2020				
Variable	Obs.	Mean	Std. Dev.	Min.	Max.	Obs.	Mean	Std. Dev.	Min.	Max.
Financials										
EBITDA Multiple	9,293	17.859	49.78	0.001	977.275	19,654	20.84	57.147	.001	985.898
EBITDA Multiple (Log)	9,293	2.207	1.05	-6.908	6.885	19,654	2.244	1.17	-6.908	6.894
Sales Absolute ($M)	9,197	564.444	1,708.79	1.483	14,426.23	19,630	753.643	2,016.124	1.483	14,426.23
Sales Absolute (Log)	9,197	4.461	1.934	0.394	9.577	19,630	4.866	1.931	0.394	9.577
EBITDA Absolute ($M)	9,182	75.165	243.004	-0.146	2,184.6	19,395	111.759	307.065	-0.146	2,184.6
EBITDA Absolute (Log)	9,084	2.355	2.058	-5.521	7.689	19,162	2.783	2.11	-6.215	7.689
EBITDA Margin	9,293	0.171	0.148	0.001	1	19,654	0.189	0.177	0.001	1
Deal Size ($M)	9,293	488.204	1,544.519	0.505	15,025.07	19,654	972.606	4,286.124	0.001	16,5000
Deal Size (Log)	9,293	4.309	2.013	-5.298	12.22	19,654	783.756	2,136.208	0.505	15,025.07
Target Advisor	9,293	0.642	0.479	0	1	19,654	0.652	0.476	0	1
Acquirer Advisor	9,293	0.55	0.498	0	1	19,654	0.592	0.491	0	1
Premium 1 Day	4,585	32.595	36.352	-70.83	202.2	11,699	25.324	38.037	-70.83	202.2
Premium 1 Week	4,506	37.968	38.288	-71.43	212	11,692	27.879	39.219	-71.43	212
Premium 1 Month	4,505	43.058	41.017	-72.03	223.56	11,680	31.017	41.806	-72.03	223.56
CAR (-1/+1)	3,888	0.001	0.041	-0.132	0.149	3,435	0.002	0.039	-0.132	0.149
CAR (-2/+2)	3,888	0.004	0.081	-0.233	0.28	3,435	0.002	0.078	-0.233	0.28
CAR (-3/+3)	3,888	0.003	0.089	-0.259	0.298	3,435	0.001	0.087	-0.259	0.298
CAR (-4/+4)	3,888	0.003	0.095	-0.269	0.311	3,435	0.001	0.092	-0.269	0.311
Target Public Status										
Public	9,293	0.685	0.464	0	1	19,654	0.696	0.46	0	1
Subsidiary	9,293	0.113	0.317	0	1	19,654	0.126	0.332	0	1
Private	9,293	0.195	0.396	0	1	19,654	0.173	0.379	0	1
Other Status	9,293	0.004	0.06	0	1	19,654	0.001	0.032	0	1
Deal Attitude										
Friendly	9,293	0.934	0.248	0	1	19,654	0.928	0.258	0	1
Neutral	9,293	0.007	0.086	0	1	19,654	0.03	0.17	0	1
Hostile	9,293	0.027	0.162	0	1	19,654	0.004	0.062	0	1
Other Attitude	9,293	0.031	0.174	0	1	19,654	0.038	0.191	0	1

Notes: We use the Thomson Reuters SDC Platinum database on M&A transactions to gather all reported M&A transactions between 1978 and 2020. Data are sourced through direct deal submissions from global banking and legal contributors, coupled with extensive research performed by a global research team that collected data from regulatory filings, corporate statements, media, and pricing wires. According to Thomson Reuters, more than 2,500 control validations occur at the point of data entry. We use the CRSP database to model *CARs*. We estimate the model over a 255-day window ending 46 days prior to the announcement date, using the CRSP Value-Weighted Index as our market proxy. We report CAR over three-, five-, seven-, and nine-day windows. To account for outliers, we winsorize the variables *Premium* (*1 day*, *1 week*, *1 month*) and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*). Further, we focus on transactions with a deal size above $0.5M and exclude transactions with a negative *EBITDA Margin*; otherwise, we make use of the full data set. This table summarizes all completed transactions.

Table 2.2. Summary Statistics: Incomplete Transactions

Period	1978 to 1999					2000 to 2020				
Variable	Obs.	Mean	Std. Dev.	Min.	Max.	Obs.	Mean	Std. Dev.	Min.	Max.
Financials										
EBITDA Multiple	2,462	15.296	41.692	0.002	754.516	4,570	19.312	55.655	0.004	984.56
EBITDA Multiple (Log)	2,462	2.033	1.085	-6.215	6.626	4,570	2.128	1.188	-5.521	6.892
Sales Absolute ($M)	866.64	2,212.229	1.483	14,426.23	866.64	4,564	892.483	2,290.827	1.483	14,426.23
Sales Absolute (Log)	4.992	1.96	0.394	9.577	4.992	4,564	5	1.985	0.394	9.577
EBITDA Absolute ($M)	109.761	296.855	-0.146	2,184.6	109.761	4,534	138.723	361.291	-0.146	2,184.6
EBITDA Absolute (Log)	2,397	2.805	2.063	-4.075	7.689	4,484	2.915	2.186	-6.215	7.689
EBITDA Margin	2,462	0.161	0.149	0.001	0.994	4,570	0.183	0.166	0.001	0.989
Deal Size ($M)	2,462	671.709	1,964.001	0.505	15,025.07	4,570	935.128	2,570.408	0.505	15,025.07
Deal Size (Log)	2,462	4.503	2.105	-3.963	11.641	4,570	4.44	2.433	-6.908	11.91
Target Advisor	2,462	0.503	0.5	0	1	4,570	0.494	0.5	0	1
Acquirer Advisor	2,462	0.38	0.486	0	1	4,570	0.455	0.498	0	1
Premium 1 Day	1,555	31.724	38.168	-70.83	202.2	3,415	23.92	42.183	-70.83	202.2
Premium 1 Week	1,520	35.768	40.223	-71.43	212	3,421	26.37	44.128	-71.43	212
Premium 1 Month	1,514	39.42	42.605	-72.03	223.56	3,414	29.191	47.048	-72.03	223.56
CAR (-1/+1)	648	-0.001	0.044	-0.132	0.149	460	-0.005	0.039	-0.132	0.149
CAR (-2/+2)	648	-0.004	0.079	-0.233	0.28	460	-0.011	0.082	-0.233	0.28
CAR (-3/+3)	648	-0.009	0.084	-0.259	0.298	460	-0.013	0.092	-0.259	0.298
CAR (-4/+4)	648	-0.01	0.09	-0.269	0.311	460	-0.017	0.101	-0.269	0.311
Target Public Status										
Public	2,462	0.894	0.308	0	1	4,570	0.884	0.32	0	1
Subsidiary	2,462	0.042	0.201	0	1	4,570	0.048	0.215	0	1
Private	2,462	0.061	0.24	0	1	4,570	0.066	0.248	0	1
Other Status	2,462	0.002	0.04	0	1	4,570	0	0.021	0	1
Deal Attitude										
Friendly	2,462	0.686	0.464	0	1	4,570	0.794	0.404	0	1
Neutral	2,462	0.006	0.08	0	1	4,570	0.022	0.147	0	1
Hostile	2,462	0.18	0.385	0	1	4,570	0.037	0.188	0	1
Other Attitude	2,462	0.127	0.333	0	1	4,570	0.147	0.354	0	1

Notes: We use the Thomson Reuters SDC Platinum database on M&A transactions to gather all reported M&A transactions between 1978 and 2020. Data are sourced through direct deal submissions from global banking and legal contributors, coupled with extensive research performed by a global research team that collected data from regulatory filings, corporate statements, media, and pricing wires. According to Thomson Reuters, more than 2,500 control validations occur at the point of data entry. We use the CRSP database to model CARs. We estimate the model over a 255-day window ending 46 days prior to the announcement date, using the CRSP Value-Weighted Index as our market proxy. We report CAR over three-, five-, seven-, and nine-day windows. To account for outliers, we winsorize the variables *Premium* (*1 day*, *1 week*, *1 month*) and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*). Further, we focus on transactions with a deal size above $0.5M and exclude transactions with a negative *EBITDA Margin*, but we otherwise make use of the full data set. This table summarizes all transactions that were not completed.

Table 2.3. presents the summary statistics of key variables of interest, segmented by the different advisor engagement constellations we consider: TA+AA+ (advisors engaged on both sides), TA-AA+ (only acquirer advisor is engaged), TA+AA- (only target advisor is engaged), and TA-AA- (no advisor is engaged). The raw numbers show that deal completion is positively associated with advisor presence. Moreover, both target and acquirer advisor engagement appear to be positively associated with realized *EBITDA Multiples*. In the next section, we systematically assess these associations, after which we consider the causality underlying these relationships.

Table 2.3. Summary Statistics: Key Variables by Advisor Engagement Constellation

	All	TA+ AA+	TA+ AA-	TA- AA+	TA- AA-
Transactions	35,979	15,923	6,347	3,835	9,874
Share of Transactions (Relative %)		44.26	17.64	10.66	27.44
Completed Deals	28,947	13,587	5,188	3,157	7,015
Share of Completed Deals (Relative %)	80.46	85.33	81.74	82.32	71.05
Deal Size (Mean) in $M	718.978	1185.674	496.22	198.85	89.65
EBITDA Multiple (Mean)	19.497	20.038	19.594	20.176	19.666
Premium 1 Day	27.135	29.392	30.218	19.744	18.908
Premium 1 Week	30.352	32.798	33.58	23.226	21.503
Premium 1 Month	33.893	36.457	37.435	26.957	24.974
CAR (-1/+1)	0.0010	-0.001	0.002	0.004	0.007
CAR (-2/+2)	0.0014	-0.007	0.007	0.018	0.024
CAR (-3/+3)	0.0004	-0.008	0.008	0.018	0.023
CAR (-4/+4)	0.0003	-0.008	0.007	0.024	0.022
Sales Absolute (Mean) in $M	730.399	1,013.217	570.944	439.344	275.815
EBITDA Margin	0.182	0.192	0.178	0.182	0.172
EBITDA Absolute (Mean) in $M	105.607	150.776	79.029	59.738	34.241

Notes: TA+ (TA-) indicates the engagement (non-engagement) of a target advisor in the transaction. AA+ (AA-) indicates the engagement (non-engagement) of an acquirer advisor in the transaction. Based on this definition, the four advisor engagement constellations TA+AA+ (advisors on sell and buy sides), TA+AA- (advisor only on sell side), TA-AA+ (advisor only on buy side), and TA-AA- (no advisor engaged on either side) are defined.

2.3. Main Result: Association of Advisor Engagement with Relative Deal Pricing, Premiums, Cumulative Abnormal Returns, and Deal Completion

In this section, we present our main results regarding the association of advisor engagement with deal pricing, premiums, CARs, and the likelihood of deal completion. We split our sample into two time periods, 1978 to 1999 and 2000 to 2020, and investigate advisor effects across industries and countries. The results for the full period are presented in Appendix 2C. Table 2.4 shows the results for deal pricing, premiums paid, and CARs in the 1978 to 1999 period. Multivariate regression analysis with a full set of controls and country, year, and industry fixed effects of *EBITDA Multiples* on advisor dummies in model (1) shows a positive correlation of both target and acquirer advisor with pricing multiples. Models (2) to (4) show no significant association of advisors on either side with acquisition premiums paid. Models (5) to (8) show no significant association of either kind of advisor with acquirer CARs. Marginally significant negative interaction terms for the four-day and two-day window suggest that a negative market reaction when both advisors are present. F-tests show that there is a significant difference between coefficients of target advisor and acquirer advisor in terms of *EBITDA Multiples* (stronger effect for acquirer advisor, $F = 2{,}946$, $p < 0.001$). In Table 2.5., we conduct the same analysis for the period 2000 to 2020, confirming the results for *EBITDA Multiples*. Moreover, we find a strong and positive association between both kinds of advisors and premiums paid. There is again no association for either advisor with acquirer CARs, but there is again a significant negative interaction term for the four-day window.

Table 2.4. OLS Regressions: Advisor Engagement on Pricing, Premiums, and CARs: 1978–1999

	(1) EBITDA Multiple (Log)	(2) Premium 1 Day	(3) Premium 1 Week	(4) Premium 1 Month	(5) CAR -4/+4	(6) CAR -3/+3	(7) CAR -2/+2	(8) CAR -1/+1
Target Advisor	0.292***	1.758	0.876	1.848	0.003	0.003	0.001	0.001
	(0.035)	(3.034)	(3.228)	(3.490)	(0.006)	(0.005)	(0.005)	(0.003)
Acquirer Advisor	0.308***	-2.686	-1.956	0.345	0.013	0.006	0.005	-0.001
	(0.045)	(3.596)	(3.811)	(4.288)	(0.009)	(0.008)	(0.007)	(0.003)
TA x AA	-0.038	2.105	2.296	1.005	-0.019*	-0.013	-0.014*	-0.000
	(0.050)	(3.975)	(4.193)	(4.694)	(0.010)	(0.009)	(0.008)	(0.004)
Sales Absolute (Log)	-0.178***	-0.576	-0.595	-0.882*	-0.001	-0.001	-0.001	-0.000
	(0.010)	(0.426)	(0.433)	(0.456)	(0.001)	(0.001)	(0.001)	(0.001)
EBITDA Margin	-2.311***	-13.372***	-17.462***	-22.918***	-0.019	-0.018	-0.024**	0.002
	(0.118)	(4.917)	(5.347)	(5.672)	(0.013)	(0.013)	(0.011)	(0.006)
Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	3.058***	37.019***	43.288***	49.072***	0.010	0.014*	0.016**	0.002
	(0.047)	(3.302)	(3.488)	(3.728)	(0.007)	(0.007)	(0.006)	(0.003)
Observations	9,180	4,534	4,456	4,458	3,844	3,844	3,844	3,844
R-squared	0.238	0.099	0.097	0.103	0.092	0.099	0.107	0.046

Notes: Entries show coefficients of OLS regressions. Standard errors are in parentheses. The dependent variables are *EBITDA Multiple (Log)*, *Premium* (*1 day*, *1 week*, *1 month*), and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*), indicating the relative deal price of the transaction, premiums paid by the acquirer, and CARs earned by the bidder in the various event windows. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the period (year), the industry of the M&A target, and the country of the target's headquarters. We analyze the effect of buy- and sell-side advisor engagement on pricing, premiums, and CARs in the period from 1978 to 1999. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 2.5. OLS Regressions: Advisor Engagement on Pricing, Premiums, and CARs: 2000–2020

	(1) EBITDA Multiple (Log)	(2) Premium 1 Day	(3) Premium 1 Week	(4) Premium 1 Month	(5) CAR -4/+4	(6) CAR -3/+3	(7) CAR -2/+2	(8) CAR -1/+1
Target Advisor	0.300***	3.474*	4.413**	4.647**	0.003	0.001	-0.005	-0.003
	(0.030)	(1.802)	(1.835)	(1.960)	(0.006)	(0.006)	(0.005)	(0.003)
Acquirer Advisor	0.356***	3.268*	4.504**	5.101***	0.007	-0.002	-0.008	-0.004
	(0.031)	(1.672)	(1.759)	(1.860)	(0.009)	(0.009)	(0.007)	(0.004)
TA x AA	0.032	-0.666	-1.885	-1.837	-0.019*	-0.010	-0.001	0.001
	(0.038)	(2.050)	(2.117)	(2.221)	(0.010)	(0.009)	(0.008)	(0.004)
Sales Absolute (Log)	-0.185***	-1.509***	-1.582***	-2.122***	-0.000	0.000	-0.000	0.001
	(0.007)	(0.240)	(0.254)	(0.266)	(0.001)	(0.001)	(0.001)	(0.000)
EBITDA Margin	-2.095***	-18.582***	-19.639***	-21.076***	0.001	-0.004	-0.009	-0.001
	(0.070)	(2.586)	(2.711)	(2.860)	(0.013)	(0.013)	(0.012)	(0.005)
Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	3.119***	32.170***	34.441***	40.057***	0.008	0.008	0.014**	0.004
	(0.035)	(1.867)	(1.953)	(2.117)	(0.008)	(0.007)	(0.007)	(0.003)
Observations	19,616	11,681	11,675	11,663	3,415	3,415	3,415	3,415
R-squared	0.222	0.097	0.097	0.094	0.091	0.089	0.102	0.071

Notes: Entries show coefficients of OLS regressions. Standard errors are in parentheses. The dependent variables are *EBITDA Multiple (Log)*, *Premium* (*1 day*, *1 week*, *1 month*), and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*), indicating the relative deal price of the transaction, premiums paid by the acquirer, and CARs earned by the bidder in the various event windows. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and further include the deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the period (year), the industry of the M&A target, and the country of the target's headquarters. We analyze the effect of buy- and sell-side advisor engagement on pricing, premiums, and CARs in the period from 2000 to 2020. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

The economic significance of the associations of advisor engagement with *EBITDA Multiple* are substantial (29.2% and 30.8% larger *EBITDA Multiples* than in the absence of the respective advisor during the earlier period and 30.0% and 35.6% during the later period). Further, during the 2000–2020 period, we find that premiums paid by acquirers were 3.3% to 5.1% higher when engaging a buy-side advisor and 3.5% to 4.7% higher with a target advisor present.

While the positive correlation of target advisors with prices and premiums is consistent with an interpretation of a positive advisor effect on value creation for the target owners, the positive association of prices and premiums with acquirer advisors is difficult to square with value creation for the buy side (causality is assessed below): ceteris paribus, higher prices and premiums paid mean higher acquisition costs and therefore lower potential gains for the acquiring firm; the different interpretations are discussed below. We look next at deal completion.

Table 2.6. shows that the presence of both target and acquirer advisors is significantly correlated with higher deal completion likelihood in both periods. This holds in both probit models and linear probability models. There is no significant difference between the coefficients of target and acquirer advisors in either period or model. We observe a negative interaction between target and acquirer advisors. Interaction terms are not easy to interpret in nonlinear models, but the linear probability models confirm the sign of the observed effect (Hoetker, 2007). This result is consistent with the raw data showing that the presence of either buy-side or sell-side advisors increases the completion rate from about 70% to above 80%, with no additional benefit from the presence of both advisors. Marginal effects analysis of the OLS model suggests a higher completion likelihood of about 13% for target advisors between 1978 and1999 and 9% between 2000 and 2020 and about 14% and 10% for acquirer advisors for the same periods. Considering the strategic relevance of an acquisition or a divestiture for a company to successfully implement its long-term business objectives, these differences in completion rates are substantial.

Table 2.6. Probit and OLS: Advisor Engagement Effect on Deal Completion: 1978–1999 and 2000–2020

	1978–1999	1978–1999	2000–2020	2000–2020
	Deal Completed Probit (1)	Deal Completed OLS (2)	Deal Completed Probit (3)	Deal Completed OLS (4)
Target Advisor	0.725***	0.165***	0.495***	0.120***
	(0.051)	(0.010)	(0.035)	(0.007)
Acquirer Advisor	0.788***	0.180***	0.514***	0.129***
	(0.067)	(0.013)	(0.039)	(0.008)
TA x AA	-0.261***	-0.059***	-0.222***	-0.053***
	(0.081)	(0.016)	(0.048)	(0.010)
Sales Absolute (Log)	-0.071***	-0.016***	-0.023***	-0.004***
	(0.010)	(0.002)	(0.008)	(0.001)
EBITDA Margin	0.037	0.007	0.091	0.031**
	(0.125)	(0.026)	(0.072)	(0.015)
Deal-Level Controls	Yes	Yes	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes
Constant	-0.917	0.694***	1.116**	0.703***
	(1.001)	(0.012)	(0.452)	(0.008)
Observations	11,515	11,592	24,129	24,179
R-squared	0.283	0.305	0.212	0.256

Notes: Columns (1) and (3) show the coefficients of probit regressions, while columns (2) and (4) show the coefficients of OLS regressions; standard errors are in parentheses. The dependent variable is *Deal Completed*, indicating the status of the transaction. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include the further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the period (year), the industry of the M&A target, and the country of the target's headquarters. We analyze the effect of buy- and sell-side advisor engagement on deal completion likelihood in two time periods: 1978 to 1999 and 2000 to 2020. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

2.4. Investigating Causal Effects of Advisor Engagement: A Matching Approach

2.4.1. Matching Methodology

Having shown the presence of substantial positive associations of advisor engagement with pricing indicators and deal completion, we aim next to establish how these correlations can be interpreted in terms of causal effects. Several selection issues may be important in this setting. Firms may be more likely to hire advisors, or advisors may more actively recruit engagements on potentially larger and more likely deals. Advisors may also identify higher-synergy deals, which should not be interpreted as price effects. Given our large data set, we can use the matching methodology (Caliendo & Kopeinig, 2008) to overcome some selection issues.[8] The idea is to compare similar deals (in terms of observable pre-deal target properties) with and without an advisor present. To draw inferences about the impact of advisor engagement on deal pricing and completion, we need to examine how the transaction outcome would differ had there been no advisor engagement. Because the counterfactual for a given transaction is not observed, we formalize the problem as the potential outcome approach or Roy-Rubin-model (Caliendo & Kopeinig, 2008; Roy, 1951; Rubin, 1974). The fundamentals of the Roy-Rubin model are individuals (here: transactions), treatments (here: with or without advisor engagement), and outcomes (here: *EBITDA Multiple*, *Premiums*, *CARs*, and *Deal Completed*).

To estimate the treatment effects of advisors on relative deal pricing, premiums, bidder returns, and deal completion, we apply propensity score matching. Our matching model assigns the data to two groups: the "treated" group, which includes those transactions with an advisor, and a control group that includes transactions without an advisor. Treatment D is a binary variable: D=1 for treated observations and D=0 for control observations. In a first step, we estimate a logit model with D as a latent variable for the propensity of transactions to be

[8] We also ran a Heckman selection model analysis. This analysis yields estimates very similar to the OLS model of Table 2.4. and 2.5.; these results are available in the Appendix 2E and 2F.

conducted with the support of an advisor. The vector of explanatory variables *x* includes the variables *Sales Absolute (Log)*, *EBITDA Margin*, *Industry of M&A Target*, *Country of M&A Target*, *Deal Attitude*, *Target Public Status*, and *Year of Transaction*. The propensity score *p(x)* is the predicted probability that an acquirer advisor will be engaged given the characteristics *x*:

$$p(x) = logit(D = 1|x) = E(D|x) \quad (1)$$

In a second step, the model matches transactions from the treated and control sub-samples based on their propensity scores. Following Caliendo and Kopeinig (2008), we choose the nearest neighbor matching estimator with replacement. Thus, our estimator selects those transactions without advisors as matching partners for a transaction with an advisor that is closest in terms of the propensity score. Transactions from the control group can be used multiple times to match for a transaction in the treated sample, which increases matching quality and reduces model bias. In a third step, we calculate the average treatment effect (ATE) for the dependent variable of interest *y* (e.g., *EBITDA Multiple (Log)*), which is the difference between outcomes *y* of the matched transactions with an advisor and those without an advisor:

$$ATE = E(y|\mathrm{x}, D = 1) - E(y|\mathrm{x}, D = 0) \quad (2)$$

We apply the matching model to both the entire sample and to a restricted sample of those transactions that include advisor engagement on the other side of the transaction (e.g., presence of target advisor when analyzing acquirer advisor effects). We expect these sub-samples to allow for even more robust identification of causality as they focus on transactions that share some features that lead to the engagement of an advisor on at least one side of the deal. ATE is only defined if the variables in *x* do not perfectly predict treatment *D*. The *region*

of common support is defined by the overlap in propensity score between the treated and controlled observations. As Caliendo and Kopeinig (2008) suggest, we visualize the support of the treatment and control groups to confirm the common support assumption.[9]

2.4.2. Matching Analysis

Table 2.7. shows the results of the matching estimation for both acquirer and target advisors for the dependent variables *EBITDA Multiple*, *Deal Completed*, *Premium* (*1 day*, *1 week*, *1 month*), and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*). We find significant treatment effects for the whole sample for both advisor types for *Deal Completed*, as well as for *EBITDA Multiples* and *Premiums*, confirming the main results reported in section 2.3. Additionally, a negative effect of acquirer advisors on announcement returns is now significant for all event windows. The results are qualitatively and quantitatively robust if restricted to the sample of transactions with at least one advisor present (specifications b). The effects are less sizable for completion rates in the restricted sample because the differences between groups are less substantial.

We assess the validity of the matching estimators using the visual inspection procedure recommended by Caliendo and Kopeinig (2008). Figures 1 to 8 (acquirer advisor) and 9 to 16 (target advisor) in Appendix 2D visualize the support of the propensity scores for treated and control observations (left panels) and for treated and matched observations (right panels) for both the full and restricted samples. We find a complete overlap of propensity scores for treated and controls in all cases and that all scores between zero and one are covered, although the distribution of propensity scores is often quite different for treated and control observations.

[9] In a linear probability model, approximately 26% of the variance in acquirer advisor engagement is explained by observable variables included in the model. The vector of explanatory variables *x* includes the variables *Sales Absolute (Log)*, *EBITDA Margin*, *Industry of M&A Target*, *Country of M&A Target*, *Deal Attitude*, *Target Public Status*, and *Year of Transaction*.

Table 2.7. Propensity Score Matching: ATEs of Advisor Engagements on Pricing, Premiums, CARs, and Deal Completion

	(1a) Acquirer Advisor ATE	(1b) Acquirer Advisor ATE	(2a) Target Advisor ATE	(2b) Target Advisor ATE
EBITDA Multiple (Log)	0.409***	0.375***	0.453***	0.439***
	(0.021)	(0.022)	(0.025)	(0.062)
Deal Completed	0.123***	0.085***	0.170***	0.101***
	(0.006)	(0.009)	(0.011)	(0.019)
Premium 1 Day	3.409***	3.903***	5.230***	1.371
	(0.838)	(1.345)	(1.439)	(2.754)
Premium 1 Week	4.749***	5.095***	5.190***	-0.229
	(0.895)	(1.346)	(1.215)	(2.561)
Premium 1 Month	5.712***	4.050***	6.023***	4.386
	(0.920)	(1.412)	(1.523)	(2.872)
CAR -1/+1	-0.005***	-0.004**	-0.001	-0.002
	(0.002)	(0.002)	(0.002)	(0.005)
CAR -2/+2	-0.011***	-0.013***	-0.009**	-0.011
	(0.003)	(0.003)	(0.004)	(0.012)
CAR -3/+3	-0.010**	-0.014**	-0.007*	-0.0129
	(0.004)	(0.006)	(0.004)	(0.008)
CAR -4/+4	-0.009**	-0.012**	-0.009***	-0.0157*
	(0.004)	(0.005)	(0.003)	(0.001)

Notes: The table shows propensity score matching models (nearest neighbor estimator with replacement) results. Models (1a) and (2a) include the full sample of transactions, while models (1b) and (2b) use samples restricted to transactions in which target advisors and acquirer advisors, respectively, are absent. ATE is defined as the average treatment effect of *EBITDA Multiple (Log)*, *Deal Completed*, *Premium* (*1 day*, *1 week*, *1 month*), and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*), indicating the difference between outcomes of transactions with and without the presence of an advisor. Bootstrap standard errors are in parentheses. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and further include further deal-level controls *Deal Attitude* (friendly, neutral, hostile) and *Target Public Status* (public, private). We use fixed effects variables for the period (year), the industry of the M&A target, and the country of the target's headquarters. We analyze the causal effect of buy- and sell-side advisor engagement on relative deal pricing and deal completion likelihood. Further, we analyze the advisor engagement effect on premiums paid and CARs. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

However, given our large data set and matching with replacement, we can achieve a nearly perfect overlap of the distributions (they are visually indistinguishable in most figures). There are no gaps in the supports. We conclude that the matching procedure has been executed efficiently. Sensitivity analysis following Becker and Caliendo (2007) shows that results are not sensitive to violations of the confoundedness assumption, namely unobserved joint

influences on advisor selection and outcomes (available in the replication package).

Given the support for the validity of the propensity score matching approach presented here, we are inclined to interpret the correlational results presented in Section 2.3. as causal effects of advisor engagement on relative deal prices, premiums, and the likelihood of deal completion. There is also evidence of the negative effects of both advisors on announcement returns. For target advisors, this raises the question of why the management of target firms only engages advisors in about 62% of cases. For acquirer advisors, it implies an unexpected effect of advisor engagement on pricing, premiums, and CARs. In Section 2.6. we probe more deeply into interpreting the price effects induced by acquirer advisors. Before moving to the interpretation, we present another perspective on the causality of this unexpected effect, using an alternative, IV approach.

2.5. Instrumental Variable (IV) Approach: The Lehman Failure and Advisor Engagement

2.5.1. Instrument

In this section, we present a different approach to establishing a causal interpretation of the associations of advisor engagement with pricing and deal completion, using IV.[10] We introduce the instrument *Former Lehman Client Post Crisis*. The basic rationale is that we predict an exogenously induced change of advisor engagement behavior by a specific group (former Lehman clients[11]) that was triggered by the collapse of Lehman Brothers on September 15, 2008. The IV we construct represents the interaction between two variables: *Former Lehman Client*, referring to clients who engaged the investment bank Lehman Brothers as buy-side or sell-side advisor at least once in the two years prior to its collapse; and *Post Crisis*, which

[10] Our sample does not provide sufficient data on premiums and CARs to implement these variables in our IV model, which needs to work with the substantially reduced sample of the post-Lehman failure period.
[11] Testing the difference of the treatment group (former Lehman clients) and the control group (all other acquirers), we find that these groups are not significantly different from each other (see Appendix 2G).

indicates the two years after the Lehman collapse. To identify a causal interpretation of behavioral change among this group of clients, we implement a fixed effects model in which we test the effect of the interaction of *Former Lehman Clients* and the *Post Crisis* period. Table 2.8. shows that the interaction of these two variables is significantly negatively correlated with the engagement of an acquirer advisor, indicating that this group of acquirers reduced its engagement of buy-side advisors after the crisis.[12] We interpret this observation that former Lehman clients partly lost trust in external financial advice in general and thus significantly reduced their advisor engagement after the collapse of the once-prestigious advisor. In the following, we use the variable *Former Lehman Clients Post Crisis* to instrument the presence of acquirer advisors and test the robustness of the causal interpretation offered in section 2.4.[13]

We replace the potentially endogenous variable *Acquirer Advisor* with predicted values from a regression on our instrument. Our model is given by a two-stage structure: (1) estimate the first stage by predicting the potentially endogenous variables with only exogenous regressors, and (2) calculate the predicted values $\hat{y}_2$ and substitute them in the structural equation model:

$$y_2 = x_1'\gamma_1 + x_2'\gamma_2 + \varepsilon \quad (3)$$

$$y_1 = \hat{y}_2'\beta_1 + x_1'\beta_2 + u \quad (4),$$

where y_1 is the dependent variable *EBITDA Multiple or Deal Completed*, y_2 is the potentially endogenous variable *Acquirer Advisor*, and x_1 are the other control variables: *Sales Absolute (Log)*, *EBITDA Margin*, and the deal-level controls. We use fixed effects variables for each acquirer, period (month), industry of the M&A target, and country of the target's headquarters.

[12] Testing the impact of the Lehman collapse on clients of other top investment bank clients (direct competitors, such as Goldman Sachs, J.P. Morgan, and Morgan Stanley), we do not observe a decrease in advisor engagement.
[13] The group of former Lehman clients prior to the collapse of the investment bank is not significantly different from non-clients in the same period in terms of relative deal pricing, premiums paid, and CARs.

Table 2.8. Fixed Effects Model—Behavioral Change among Former Lehman Clients (Before and After the Lehman Crisis, September 15, 2008)

	Acquirer Advisor
Former Lehman Clients Post Crisis	-0.115***
	(0.036)
Sales Absolute (Log)	0.097***
	(0.003)
EBITDA Margin	0.214***
	(0.035)
Constant	0.168
	(0.146)
Further Deal-Level Controls	Yes
Year, Industry, and Country Fixed Effects	Yes
Observations	5,403
R-squared	0.1645

Notes: The entries show coefficients of OLS regression; standard errors are in parentheses. The dependent variable is *Acquirer Advisor* and indicates the engagement of a buy-side advisor for a transaction. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls such *as Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the acquirer, period (year), industry of the M&A target, and country of the target's headquarters. We analyze behavioral changes among former Lehman clients after the crisis, which we date to September 15, 2008. The *Former Lehman Clients Post Crisis* variable is our IV in the subsequent IV analyses. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

2.5.2. IV Results

By instrumenting the presence of the acquirer advisor, we confirm the causal interpretation of our main results: a positive effect of acquirer advisor engagement on both deal completion likelihood and relative deal pricing (Tables 2.9. and 2.10.).

Table 2.9. IVs 2SLS Model: Acquirer Advisor Effects on Deal Completion

	(1) Deal Completed OLS	First Stage	(2) Deal Completed 2SLS
Acquirer Advisor	0.041*** (0.012)		0.527** (0.273)
Sales Absolute (Log)	-0.013*** (0.003)	0.093*** (0.003)	-0.044* (0.026)
EBITDA Margin	0.005 (0.029)	0.206*** (0.034)	-0.075 (0.064)
Former Lehman Clients Post Crisis		-0.113*** (0.034)	
Constant	1.101*** (0.116)		
Deal-Level Controls	Yes	Yes	Yes
Year, Industry, Acquirer, and Country Fixed Effects	Yes	Yes	Yes
Observations	5,403	5,403	5,403

Notes: Column (1) shows coefficients of probit regression, and column (2) shows coefficients of 2SLS regression; standard errors are in parentheses. The dependent variable is *Deal Completed*, indicating the status of the transaction. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include the further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the acquirer, period (year), industry of the M&A target, and country of the target's headquarters. We instrument the presence of an acquirer advisor with the instrument *Former Lehman Clients Post Crisis* as described in Table 2.8. In order to test whether the equation is identified and thus that the excluded instruments are relevant, meaning correlated with the endogenous regressors, we implement the under-identification test (Anderson canon. corr. N*CCEV LM statistic Chi-sq(1) = 11.19 , $p = 0.0008$). Further, we tested the model for weak identification; i.e., whether the excluded instruments are correlated with the endogenous regressors (Cragg-Donald *F* statistic: 11.197; Chi-sq(1) = 11.22, $p = 0.0008$). The test results reject the null hypothesis that our model is underidentified or weakly identified. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 2.10. IVs 2SLS: Acquirer Advisor Engagement Effects on Relative Deal Pricing

	(1) EBITDA Multiple (Log) OLS	First Stage	(2) EBITDA Multiple (Log) 2SLS
Acquirer Advisor	0.525*** (0.034)		2.166** (1.074)
Sales Absolute (Log)	-0.175*** (0.009)	0.097*** (0.003)	-0.334*** (0.104)
EBITDA Margin	-1.649*** (0.088)	0.214*** (0.035)	-1.999*** (0.252)
Former Lehman Clients Post Crisis		-0.101*** (0.04)	
Constant	5.781*** (0.359)	0.1675 (0.146)	5.374*** (0.504)
Further Deal-Level Controls	Yes	Yes	Yes
Year, Industry, Acquirer, and Country Fixed Effects	Yes	Yes	Yes
Observations	5,403	5,403	5,403

Notes: Column (1) shows the coefficient of OLS regressions, while column (2) shows the coefficient of 2SLS regression; standard errors are in parentheses. The dependent variable is the *EBITDA Multiple (Log)* of the transaction of the acquisition. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include the further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the acquirer, period (year), industry of the M&A target, and country of the target's headquarters. We instrument the presence of the acquirer advisor with the instrument *Former Lehman Clients Post Crisis* as described in Table 2.8. In order to test whether the equation is identified and thus that the excluded instruments are relevant, meaning correlated with the endogenous regressors, we implement the under-identification test (Anderson canon. corr. N*CCEV LM statistic Chi-sq(1) = 11.19, p = 0.0008). Further, we tested the model for weak identification thus whether the excluded instruments are correlated with the endogenous regressors (Cragg-Donald F statistic: 11.197; Chi-sq(1)=11.22, p = 0.0008). The test results reject the null hypothesis that our model is underidentified or weakly identified. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

In order to test whether the equation is identified and thus that the excluded instruments are relevant, meaning correlated with the endogenous regressors, we implement the under-identification test (Anderson canon. corr. N*CCEV LM statistic Chi-sq(1) = 11.19, p =0.0008). Further, we tested the model for weak identification and thus whether the excluded instruments are correlated with the endogenous regressors (Cragg-Donald F statistic: 11.197; Chi-sq(1)=11.22, p = 0.0008). The test results reject the null hypothesis that our model is underidentified or weakly identified.

2.6. Price Effects for Acquirer Advisors: Interpretation

Having established a causal link between advisor engagement on both sides of the deal and higher prices, we now focus on the mechanism and interpretation of that effect. We argue that the institutional setting promotes a focus on deal completion and higher prices for both acquirer and target executives and advisors, but these goals are only aligned with the shareholder interests of target firms. The price-driving effect observed for acquirer advisors is therefore consistent with an interpretation of overpayment and negative advisor effects for acquirer shareholders. We have found strong evidence that premiums increase and announcement returns decrease if acquirer advisors are engaged. Our interpretation is also consistent with the broader literature showing that even with deals that are efficient overall, buy-side owners do not typically benefit from acquisitions, while target owners benefit strongly (Andrade et al., 2001; Moeller et al., 2004). However, an alternative explanation is possible. Acquirer advisors may help complete a deal in which unadvised buyers may not succeed because they are too unwilling to increase prices, even though the target is more valuable. That is, advisors may identify important synergies that are not identified by unadvised buyers. We probe this alternative interpretation in two additional analyses.

2.6.1. Listed versus Non-Listed Targets

Several studies have argued information asymmetries when acquiring a private versus a publicly listed target have powerful ramifications for the M&A process and the role of financial advisors (Agrawal et al., 2018; Custódio & Metzger, 2013; Golubov et al. 2012). Due to stricter accounting and reporting standards for listed firms, publicly listed M&A targets provide qualitatively and quantitatively better information. Deals with public targets are therefore easier to assess by both acquirers and the market and are also followed more closely by the market. Consequently, there will be smaller discounts for public than for private targets (Agrawal et al.,

2018), and the increased market scrutiny will lead reputation-oriented acquirer financial advisors to cut better deals for their clients (Golubov et al., 2012).

Table 2.11. presents the results for a specification that restricts the sample to deals with a target advisor present. We focus on the effect of acquirer advisors, the listing status of the target, and the interaction of the two variables on prices, premiums, and announcement returns. We replicate the positive effect of acquirer advisors on *EBITDA Multiples* and also find a positive effect of target public listing, as suggested in the literature (Agrawal et al., 2018). We replicate the negative effects of public targets on announcement returns and observe a negative effect, confirming evidence provided by (Capron & Shen, 2007). Further, consistent with the reputation argument of Golubov et al. (2012), the interaction between advisor engagement and public status is significant and substantially negative for *EBITDA Multiples*. That is, the price-driving effect of acquirer advisors is more pronounced in private deals, where reputational concerns are reduced. In contrast, there are significantly lower announcement returns for advised acquirers for public targets, suggesting a negative market assessment of these deals involving public targets. These results speak against acquirer advisors improving on otherwise overly conservative acquirer bids.

Table 2.11. Deal Pricing: Differences in the Degree of Information Asymmetries, Listed vs. Non-Listed targets with Target Advisor Present

Model	(1) EBITDA Multiple (log)	(2) Premium 1 Day	(3) Premium 1 Week	(4) Premium 1 Month	(5) CAR -4/+4	(6) CAR -3/+3	(7) CAR -2/+2	(8) CAR -1/+1
Acquirer Advisor	0.382***	-9.007	-7.554	-9.125	0.009	0.007	0.007	-0.001
	(0.036)	(7.226)	(7.902)	(8.358)	(0.006)	(0.006)	(0.005)	(0.003)
Public Target	0.035	-2.526	-1.057	-1.174	-0.012**	-0.009*	-0.009**	-0.005**
	(0.035)	(6.714)	(7.347)	(7.826)	(0.006)	(0.005)	(0.005)	(0.002)
Acquirer Advisor and Public Target	-0.083**	10.226	9.116	11.100	-0.024***	-0.024***	-0.022***	-0.002
	(0.041)	(7.238)	(7.932)	(8.388)	(0.007)	(0.006)	(0.006)	(0.003)
Sales Absolute (Log)	-0.145***	-0.993***	-1.054***	-1.410***	-0.001	-0.001	-0.001	0.000
	(0.006)	(0.233)	(0.246)	(0.254)	(0.001)	(0.001)	(0.001)	(0.000)
EBITDA Margin	-1.943***	-18.331***	-20.262***	-21.715***	-0.013	-0.011	-0.018**	0.001
	(0.067)	(2.622)	(2.755)	(2.852)	(0.010)	(0.010)	(0.008)	(0.004)
Constant	3.187***	39.938***	42.273***	47.944***	0.023***	0.020***	0.022***	0.005**
	(0.041)	(6.781)	(7.420)	(7.929)	(0.006)	(0.006)	(0.005)	(0.003)
Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, Acquirer, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,701	12,802	12,742	12,748	5,506	5,506	5,506	5,506
(Pseudo) R-squared	0.238	0.087	0.095	0.102	0.080	0.081	0.093	0.047

Notes: Columns (1) to (8) show the coefficients of OLS regressions. The dependent variables are *EBITDA Multiple (Log)*, *Premium* (*1 day*, *1 week*, *1 month*), and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*), indicating the relative deal price of the transaction, premiums paid by the acquirer, and CARs earned by the bidder in the respective event windows. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the acquirer, period (year), industry of the M&A target, and country of the target's headquarters. We estimate the interaction effect of the target's public status on relative deal pricing in transactions with an acquirer advisor present. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

2.6.2. Bargaining Power

Previous studies have shown that it is easier for the buy side to capture acquisition gains if the target is unadvised (Agrawal et al., 2018; Golubov et al., 2012). In Table 2.12. we show the specifications using samples restricted to deals with a target advisor either present (model 1) or absent (model 2). In the absence of a target advisor, the acquirer advisor should be able to play out its beneficial influence more effectively than in the presence of a target advisor, realizing lower multiples, paying lower premiums, and higher bidder returns for clients. Table 2.12. shows that the effects of acquirer advisors are similar and significantly positive for both advised and unadvised targets. There is no indication that acquirer advisors make use of their increased bargaining power in terms of relative deal pricing. We find that acquirer advisors, while facing a target advisor on a transaction, realize significantly negative returns for their clients – indicating the stronger bargaining position of sellers and their target advisors. The acquirer advisor is able to make use of the target advisor's absence in terms of bidder returns. We see that when a target advisor is absent, bidder returns are no longer significantly negative.

Table 2.12. Advisor Engagement Effects on Pricing, Premiums, and CARs, with Target Advisor Present and Absent

	(1) EBITDA Multiple (Log)	(2) EBITDA Multiple (Log)	(1) Premium 1 Day	(2) Premium 1 Day	(1) Premium 1 Week	(2) Premium 1 Week	(1) Premium 1 Month	(2) Premium 1 Month	(1) CAR -4/+4	(2) CAR -4/+4	(1) CAR -3/+3	(2) CAR -3/+3	(1) CAR -2/+2	(2) CAR -2/+2	(1) CAR -1/+1	(2) CAR -1/+1
Acquirer Advisor	0.318***	0.369***	1.109	1.590	1.465	2.840	1.859*	4.002**	-0.009***	0.006	-0.010***	-0.001	-0.009***	-0.006	-0.003*	-0.004
	(0.019)	(0.028)	(0.994)	(1.664)	(1.015)	(1.750)	(1.078)	(1.870)	(0.003)	(0.007)	(0.003)	(0.006)	(0.002)	(0.006)	(0.001)	(0.003)
Sales Abs.(Log)	-0.148***	-0.261***	-0.986***	-2.354***	-1.049***	-2.251***	-1.404***	-2.988***	-0.001	0.004*	-0.001	0.002	-0.001	0.003*	0.000	0.001
	(0.006)	(0.011)	(0.233)	(0.535)	(0.246)	(0.559)	(0.254)	(0.605)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.000)	(0.001)
EBITDA Margin	-1.946***	-2.491***	-18.39***	-17.44***	-20.32***	-19.15***	-21.79***	-24.01***	-0.013	0.008	-0.012	-0.004	-0.019**	0.002	0.001	0.005
	(0.067)	(0.101)	(2.625)	(5.132)	(2.757)	(5.399)	(2.855)	(5.841)	(0.010)	(0.020)	(0.010)	(0.019)	(0.008)	(0.017)	(0.004)	(0.008)
Constant	3.221***	3.402***	37.426***	32.294***	41.216***	34.555***	46.771***	41.781***	0.011**	0.007	0.011**	0.016*	0.012***	0.012	0.001	0.003
	(0.034)	(0.047)	(1.552)	(3.053)	(1.614)	(3.185)	(1.659)	(3.466)	(0.005)	(0.010)	(0.005)	(0.009)	(0.004)	(0.009)	(0.002)	(0.004)
Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,700	10,077	12,801	3,411	12,742	3,389	12,748	3,372	5,505	1,754	5,505	1,754	5,505	1,754	5,505	1,754
R-squared	0.238	0.220	0.087	0.134	0.095	0.135	0.102	0.124	0.078	0.102	0.078	0.105	0.091	0.104	0.047	0.074

Notes: Model 1 shows the coefficients of OLS regressions when a target advisor is present; model 2 shows the coefficients when a target advisor is absent. The dependent variables are *EBITDA Multiple (Log)*, *Premium* (*1 day*, *1 week*, *1 month*), and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*), indicating the relative deal price of the transaction, premiums paid by the acquirer, and CARs earned by the bidder in the respective event windows. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and further include the deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the acquirer, period (year), industry of the M&A target, and country of the target's headquarters. Given that advisors on both sides of the deal will be similarly affected by incentives and anticipation of deal worth, we further reduce selection problems by focusing on those transactions with at least a target advisor present. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

2.7. Discussion of Acquirer Advisor Impact in Monetary Terms

We have shown a positive causal effect of advisor engagement on *EBITDA Multiples* in M&A. For acquirer advisors, we have argued for an interpretation in terms of overpayment, supported by our data and consistent with the governance-failure framework supported by the broader literature. If buy-side advisors destroy value for acquirer owners, it is of interest to establish an intuitive interpretation of the observed price effect. We suggest a financial model that quantifies marginal effects in monetary terms. We analyze the residual transaction value in U.S. dollars that is caused by the presence of an acquirer advisor versus a zero effect. That is, we use a neutral benchmark rather than demanding that advisors realize cheaper deals. To quantify this value, we discount the reported average *EBITDA Multiple* by the marginal effects derived from the regression analysis. We use the results presented in Table 2.12 to calculate the effect using the estimates of 31.8% for all transactions in which the acquirer advisor completed a transaction in which a target advisor was present and 36.9% in the absence of the target advisor. We discount the reported average *EBITDA Multiple* from 20.04 (AA and TA present) and 20.18 (only AA present) to 15.23 and 14.64 to determine the average *EBITDA Multiple* if the acquirer advisor effect were zero over these two constellations. We do this for all transactions with an acquirer advisor present and separately for transactions with the target advisor present and absent.

In the next step, we apply the adjusted *EBITDA Multiple* on the average deal size and number of transactions that reported an acquirer advisor, resulting in a lower total transaction value. The difference between the actual transaction value and the transaction value based on the adjusted average *EBITDA Multiple* indicates the portion of deal value that is caused by the presence of an acquirer advisor. Since the impact (i.e., the coefficient in the regression model) of the acquirer advisor is positive, the monetary impact of the acquirer advisor on the transaction

value is positive, which we follow the literature in interpreting as an overpayment. Applying the financial model as described to all transactions in which acquirer advisors had been engaged, we estimate the total impact of acquirer advisor at $7 trillion between 1978 and 2020 (excluding acquirer advisor fees, reported in 2019 dollars;[14] details are in Appendix 2B).

2.8. Conclusion

M&A is the process of acquiring assets, an entire firm, or an operating business of a firm from another party. Throughout the process of identifying, analyzing, and negotiating an M&A transaction as a buyer or seller, financial advisors can be hired to facilitate the process by providing services and technical expertise in valuation, negotiation, and industry-specific knowledge. Advisor roles encompass M&A management, including the initiation and subsequent coordination of transaction parties' management meetings and negotiations, often as the counterpart to the advisors on the other side of transactions. In this orchestrator role, the financial advisor usually also supports the coordination of other advisors, such as the client's legal, tax, and strategic advisors. On the sell side, clients usually demand support in the identification of potential buyers, preparation of the key selling document, drafting the information memorandum, which includes a detailed description of the target's strategic and financial position, and, in particular, the projections of revenues, costs, and profits, and ultimately free cash flows that the management of the seller expects to achieve in the upcoming three to five years.

Projections are modeled based on assumptions for macroeconomic, volume, price, and cost drivers and impediments. Due to the sensitivity of discounted cash flow models concerning the assumptions for such financial line items and to assumptions about the weighted average

[14] Nominal deal size values are converted into 2019 dollars by adjusting for inflation as reported by the International Monetary Fund.

cost of capital and terminal growth rates, a thorough triangulation of the set of assumptions is one of the buyer's primary goals. Therefore, buy-side financial advisors support not only the identification of the M&A target but also deliver essential commercial and financial due diligence services, which refer to the validation of the seller's price expectation based on the management business case shared with the potential buyer.

Ultimately, firms acquiring an asset are obliged to create value for shareholders and thus close transactions at a price that allows them to realize gains from potential synergies with the existing assets of the acquiring firm. This leads to the expectation that the engagement of an acquirer financial advisor will be associated with comparatively lower prices in the form of relatively lower premiums and higher CARs. Similarly, the management of the target should hire a financial advisor to obtain services to optimize the transaction from their perspective, achieving comparatively higher prices by negotiating higher selling premiums, which should lead to lower bidder returns. Both sides may be interested in improving the likelihood of deal completion and the CARs of the merged entity by using an advisor.

This paper set out to clarify the role of financial advisors in M&A. Several scholars have studied the role of advisors in specific segments of the market (non-listed firms, the role of top-tier advisors) or specific contexts (industry experience, cross-border transactions). We took a broader look at the role of advisors on both the buy and sell sides of the market, looking for general principles of how governance issues may translate into deal pricing and value creation. Investigating the association of advisor engagement with relative deal pricing, premiums, bidder returns, and deal completion, we observe that both sell- and buy-side advisors positively correlate with deal prices, premiums, and completion. Matching estimators and an IV analysis using the impact of the Lehman failure on Lehman clients support a causal interpretation in terms of advisor effects, over and above any possible selection effects due to endogenous advisor engagement and the identification of potential deals by advisors. While the direction of

these effects is in line with the expectation and evidence that sell-side advisors negotiate higher prices for targets (Agrawal et al., 2018; Golubov et al., 2012), we find that buy-side advisors also increase prices and premiums and decrease bidder returns, which might be an additional explanation for value destruction in mergers. Our analysis of deal completion similarly supports a causal effect, with both sell- and buy-side advisors improving the likelihood of deal completion. Interpretations that involve either improving deals (identifying important synergies and thus the acquirer's willingness to pay) or value destruction (flawed incentive structure for executives and advisors) are possible. In several analyses zooming in on this question, the evidence points in the direction of value destruction by acquirer advisors. We find that acquirer advisors do not play out their bargaining power and increase prices most if the stakes for their own reputations are low. These findings are consistent with the broader M&A literature, which shows that even for ex-post efficient deals, acquirer shareholders do not typically benefit from acquisitions.

Our results support a critical perspective on incentive structures, advisor roles, and prioritization of deal objectives. Grinstein and Hribar (2003) show that top executives are incentivized by deal completion and high prices, even in the process of buying assets. They find that approximately 39% of acquiring firms reward their CEOs with an M&A bonus for the successful completion of a deal. Further, the authors suggest that CEOs receive higher M&A bonuses when deals are larger, observing that CEOs' effort and skills do not explain a significant amount of the variation in these bonuses. Grinstein and Hribar (2003) find that M&A bonuses do not appear to be linked to deal performance[15] and conclude that this misalignment of incentives, which allows CEOs to extract rents from shareholders through additional bonuses, may lead to self-serving behavior at the costs of shareholders' equity. Consistent with this

[15] Grinstein and Hribar (2003) use deal premium as a measure of deal performance and define it as the target price in the deal divided by the market value of the target four weeks before the deal. They obtain information on the number of board meetings from proxy statements and on the number of advisors and the market premium from Thomson Reuters SDC.

perspective, McLaughlin (1990) finds that both target and acquirer advisors are contractually incentivized by a high variable payment linked to successful deal completion and deal size: the higher the negotiated deal price, the higher the payoff for the advisor. Work by Coffman and Real (2018) on the justifiability of difficult managerial decisions suggests that delegation to advisors plays an important role for executives. This is likely also the case in implementing and justifying M&A deals in the current governance structure. Recent work by Golubov and Xiong (2020) shows that private acquirers with less severe governance problems do indeed pay lower prices for targets. Assuming an overpayment interpretation, we estimate the monetary effect of acquirer advisor engagement at $7 trillion between 1978 and 2020 (excluding acquirer advisor fees, reported in 2019 dollars).

As to target shareholders' interest in maximizing deal value by achieving high M&A selling prices, the contractual incentives of both top executives and sell-side advisors are closely aligned. However, incentive schemes for top executives and advisors on the buy side run the risk of misalignment with shareholders' interests. Roll (1986), Hayward and Hambrick (1997), and Malmendier and Tate (2005) are all prominent sources who suggest that buyers often overpay due to CEO hubris or overconfidence, destroying the value of shareholder equity. Our findings contribute an additional explanation for overpayments in M&A. Both top buy-side executives and acquirer advisors maximize their payoffs, based on incentives provided by M&A bonus clauses and advisor contracts, respectively, by prioritizing deal completion and benefitting from high prices. More junior executives, meanwhile, improve their career prospects by playing along (Botelho et al., 2018).

A second notable element of our results regards the potential role of overconfidence on the sell side of M&A transactions. Only 62% of transactions involved a target advisor, which appears to be at odds with the unambiguous and simultaneously positive effects of target advisors on pricing and deal completion likelihood and the fact that a similar proportion of

acquirers engaged a buy-side advisor, even though such engagement is costly in terms of both fees and prices, as we have shown. Custódio and Metzger (2013) also show that CEOs with target-industry experience are less likely to engage an advisor in diversifying acquisitions. One interpretation for these results is provided by Malmendier and Tate (2005) and Roll (1986) in terms of evidence for executive overconfidence and hubris. While these authors focus on the buy side, current evidence suggests that these effects may also affect sell-side behavior.

Assuming the validity of our interpretations, stricter supervisory control in M&A projects may thus be warranted to improve decisions, given the misaligned incentives described above. However, while Goranova et al. (2017) show that increased monitoring by supervisory boards helps contain M&A losses, they also observe that tighter control reduces M&A gains. We conclude that the decision to engage an advisor and the subsequent effects of that advisor on transaction outcomes are likely influenced by both a potentially misaligned incentive structure and psychological aspects like executive hubris and overconfidence. Biases may also be present at the level of supervisory boards. Further research is needed, however, to identify the exact decision processes and unambiguously separate incentive effects from potentially irrational, hubris-driven behavioral influences.

Appendix 2A: Definition of Terms

Term	Definition
Target Advisor	Financial advisor(s) to the target company, its management, or board of directors on a transaction.
Acquirer Advisor	Financial advisor(s) to the acquirer company, its management, or board of directors on a transaction.
Deal Size	Value of transaction ($M): Total value of the consideration paid by the acquirer, excluding fees and expenses. The dollar value includes the amount paid for all common stock, common stock equivalents, preferred stock, debt, options, assets, warrants, and stake purchases made within six months of the announcement date of the transaction. Liabilities assumed are included in the value if they are publicly disclosed. Preferred stock is included only if it is being acquired as part of a 100% acquisition. If a portion of the consideration paid by the acquirer is common stock, the stock is valued using the closing price on the last full trading day prior to the announcement of the terms of the stock swap. If the exchange ratio of shares offered changes, the stock is valued based on its closing price on the last full trading date prior to the date of the exchange ratio change. For publicly listed targets in 100% acquisitions, the number of shares at the date of announcement is used.
EBITDA Multiple	A financial ratio that compares a company's enterprise value to its annual EBITDA, it is used to determine the value of a company and compare it to the value of similar businesses. A company's EBITDA Multiple provides a normalized ratio for differences in capital structure, taxation, and fixed assets and enables comparing disparate operations in different companies. The ratio takes a company's enterprise value (which represents market capitalization plus net debt) and compares it to the EBITDA for a given period.
Premium 1 day	Premium of the offer price to target closing stock price one day prior to the original announcement date, expressed as a percentage.
Premium 1 Week	Premium of the offer price to target closing stock price one week prior to the original announcement date, expressed as a percentage.
Premium 1 Month	Premium of the offer price to target closing stock price four weeks prior to the original announcement date, expressed as a percentage.
Cumulative Abnormal Return (-1/+1)	The sum of the differences between the expected return (S&P 500 Index) on the acquirer's stock (for U.S. publicly listed firms) and the actual return during the event windows of one day prior and one day after the announcement of the acquisition.
Cumulative Abnormal Return (-2/+2)	The sum of the differences between the expected return (S&P 500 Index) on the acquirer's stock (for U.S. publicly listed firms) and the actual return during the event windows of two days prior and two days after the announcement of the acquisition.
Cumulative Abnormal Return (-3/+3)	The sum of the differences between the expected return (S&P 500 Index) on the acquirer's stock (for U.S. publicly listed firms) and the actual return during the event windows of three days prior and three days after the announcement of the acquisition.
Cumulative Abnormal Return (-4/+4)	The sum of the differences between the expected return (S&P 500 Index) on the acquirer's stock (for U.S. publicly listed firms) and the actual return during the event windows of four days prior and four days after the announcement of the acquisition.
Sales Absolute	Net sales represent sales receipts for products and services, net cash discounts, trade discounts, excise tax, and sales returns and allowances. Revenues are recognized according to applicable accounting principles.
EBITDA Absolute	Earnings before the deduction of interest, taxes, depreciation, and amortization; this is a non-GAAP calculation based on data from a company's income statement used to measure a company's operating profitability. Because EBITDA adds back to net income the non-cash accounting charges of depreciation and amortization and disregards interest paid on debt financing and income taxes on earnings, it is useful for measuring a company's operating cash flow and for comparing the profitability of companies with different capital structures and in different tax brackets. However, EBITDA does not measure and should not be confused with the actual cash flow of a company, which does account for interest paid on debt financing, income taxes, and other cash charges.
EBITDA Margin	EBITDA Absolute as a percentage of Sales Absolute.
Target Industry	Industry in which the M&A target operates.

Target Country	Country where the target company has its headquarters.
Acquirer Industry	Industry in which the acquiring company operates.
Acquirer Country	Country where the acquiring company has its headquarters.
Deal Status	Status of the transaction: (1) deal completed, (2) deal pending, (3) deal intended, (4) deal withdrawn, or (5) other deal status.
Form of Transaction	Scope of the transaction (e.g., full acquisition vs. acquisition of shares).

Appendix 2B: Acquirer Advisor Impact in Monetary Terms—Estimation Based on an Adjusted EBITDA Multiple Model

Price Effect Caused by Acquirer Advisor Engagement ($M in Nominal and Real Terms, 1978-2019)

Model		Reported EBITDA Multiple (Mean)	Reported Deal Size ($M)	Reported Number of Transactions (Completed)	AA Impact	Adjusted EBITDA Multiple (Mean)	Adjusted Deal Size (Mean, $M)	Overpayment per Transaction ($M)	Overpayment Total ($M)
1	**TA+AA+**	20.04	1,186	15,923	31.80%	15.23	901	285	4,533,372
2	**TA-AA+**	20.18	199	3,835	36.90%	14.64	144	55	209,186
				19,758				**Nominal**	**4,742,559**
								Real	**7,004,976**

Notes: Our financial model quantifies the price effect by discounting the reported average EBITDA Multiples by the coefficients from the OLS regression shown in Table 2.12 and multiplying the adjusted average EBITDA Multiple with the average EBITDA Absolute of transactions in which an acquirer advisor was involved. The nominal deal size values were converted into 2019 dollars by adjusting for inflation as reported by the International Monetary Fund.

Appendix 2C: OLS Regressions—Advisor Engagement on Pricing, Premiums, and Cumulative Abnormal Returns: 1978–2020

	(1) EBITDA Multiple (log)	(2) Premium 1 Day	(3) Premium 1 Week	(4) Premium 1 Month	(5) CAR -4/+4	(6) CAR -3/+3	(7) CAR -2/+2	(8) CAR -1/+1
Target Advisor	0.292***	3.369**	3.934**	4.279**	0.001	0.000	-0.002	-0.000
	(0.023)	(1.544)	(1.588)	(1.702)	(0.004)	(0.004)	(0.004)	(0.002)
Acquirer Advisor	0.332***	1.772	2.990*	3.873**	0.009	0.001	-0.001	-0.002
	(0.026)	(1.514)	(1.592)	(1.693)	(0.006)	(0.006)	(0.005)	(0.002)
TA x AA	0.012	-0.333	-1.218	-1.387	-0.018***	-0.011*	-0.008	-0.000
	(0.030)	(1.804)	(1.870)	(1.980)	(0.007)	(0.006)	(0.006)	(0.003)
Sales Absolute (Log)	-0.177***	-1.229***	-1.285***	-1.755***	-0.000	-0.000	-0.000	0.000
	(0.006)	(0.207)	(0.217)	(0.229)	(0.001)	(0.001)	(0.001)	(0.000)
EBITDA Margin	-2.137***	-17.829***	-19.704***	-22.030***	-0.012	-0.013	-0.017**	0.001
	(0.060)	(2.309)	(2.438)	(2.585)	(0.009)	(0.009)	(0.008)	(0.004)
Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	3.078***	33.329***	36.494***	42.224***	0.010*	0.012**	0.015***	0.002
	(0.028)	(1.652)	(1.729)	(1.868)	(0.005)	(0.005)	(0.004)	(0.002)
Observations	28,807	16,223	16,141	16,130	7,274	7,274	7,274	7,274
R-squared	0.217	0.092	0.098	0.100	0.073	0.076	0.085	0.042

Notes: Entries show coefficients of OLS regressions; standard errors are in parentheses. The dependent variables are *EBITDA Multiple (Log)*, *Premium* (*1 day*, *1 week*, *1 month*), and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*), indicating the relative deal price of the transaction, premiums paid by the acquirer, and CARs earned by the bidder in the various event windows. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the period (year), the industry of the M&A target, and the country of the target's headquarters. We analyze the effect of buy- and sell-side advisor engagement on pricing, premiums, and CARs in the period from 1978 to 2020. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Appendix 2D: Propensity Score Matching Balance

Figure 2.1. Propensity Score Matching: Acquirer Advisor Engagement Common Support Assessment on EBITDA Multiple (Full vs. Restricted Sample)

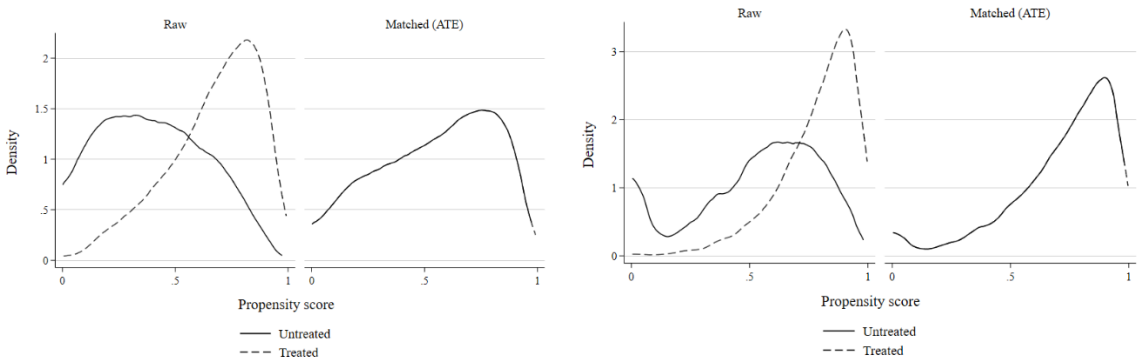


Figure 2.2. Propensity Score Matching: Acquirer Advisor Engagement Common Support Assessment on Deal Completed (Full vs. Restricted Sample)

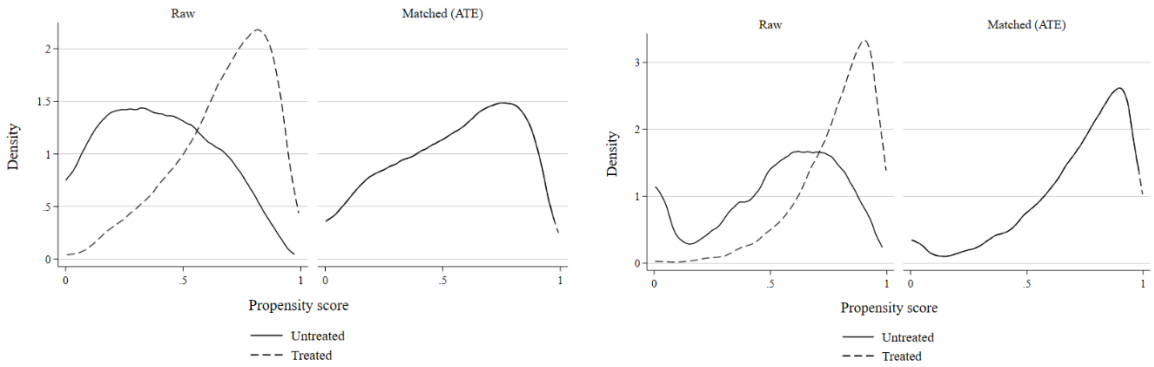


Figure 2.3. Propensity Score Matching: Acquirer Advisor Engagement Common Support Assessment on Premium 1 Day (Full vs. Restricted Sample)

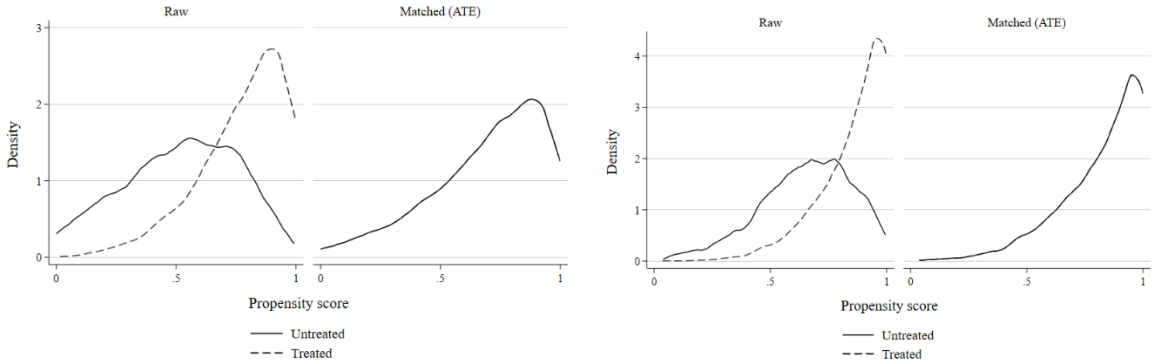


Figure 2.4. Propensity Score Matching: Acquirer Advisor Engagement Common Support Assessment on Premium 1 Week (Full vs. Restricted Sample)

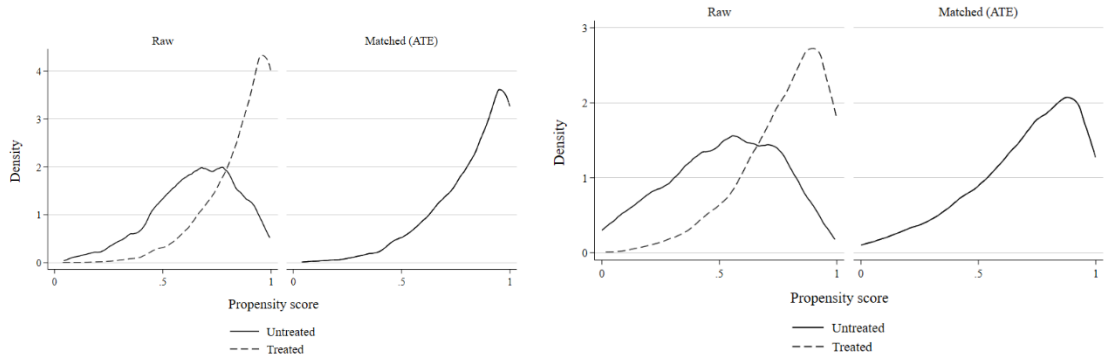


Figure 2.5. Propensity Score Matching: Acquirer Advisor Engagement Common Support Assessment on Premium 1 Month (Full vs. Restricted Sample)

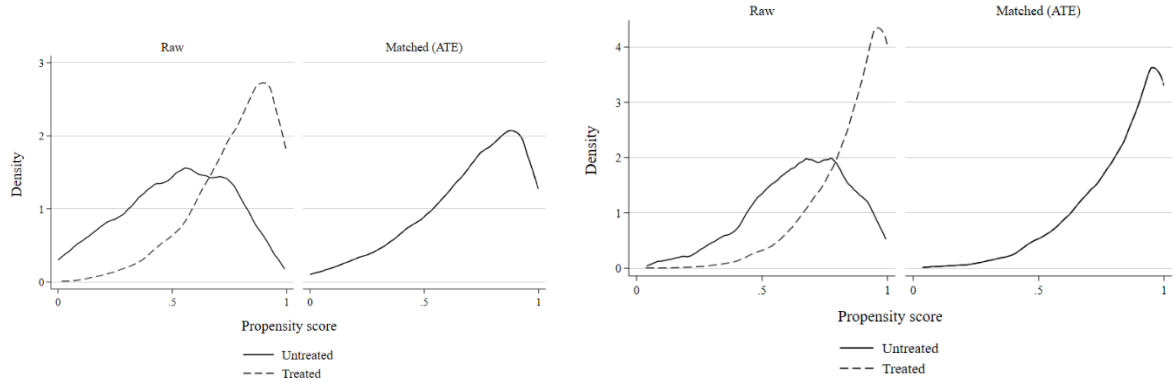


Figure 2.6. Propensity Score Matching: Acquirer Advisor Engagement Common Support Assessment on CAR(-1/+1) (Full vs. Restricted Sample)

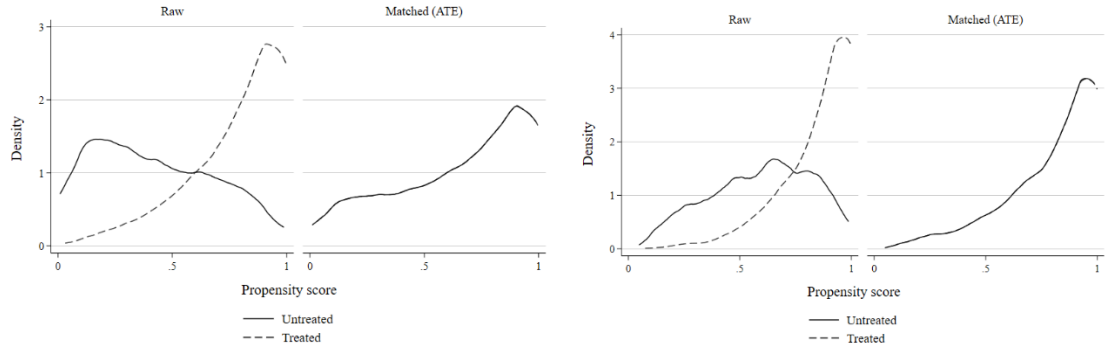


Figure 2.7. Propensity Score Matching: Acquirer Advisor Engagement Common Support Assessment on CAR(-2/+2) (Full vs. Restricted Sample)

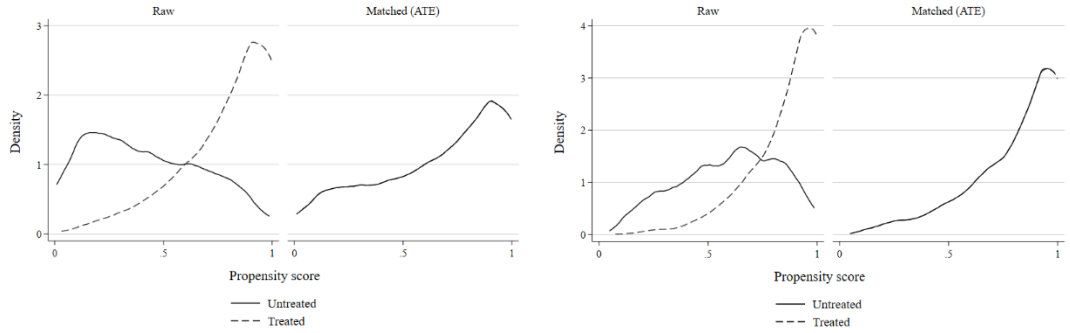


Figure 2.8. Propensity Score Matching: Acquirer Advisor Engagement Common Support Assessment on CAR(-3/+3) (Full vs. Restricted Sample)

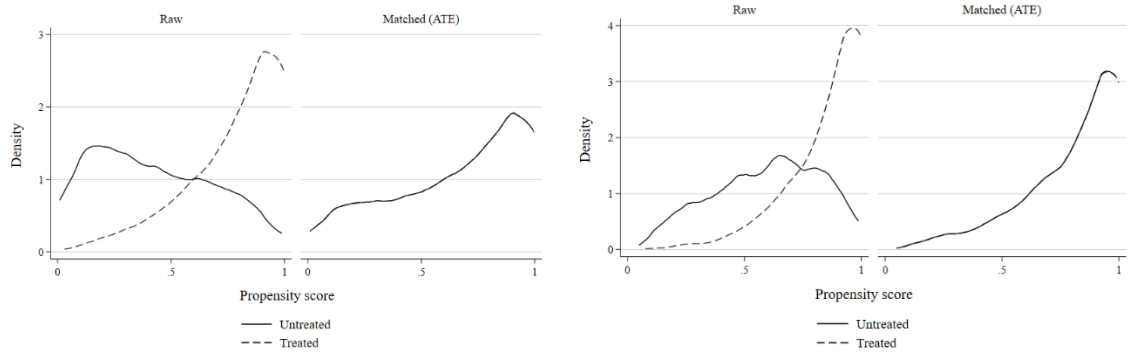


Figure 2.9. Propensity Score Matching: Acquirer Advisor Engagement Common Support Assessment on CAR(-4/+4) (Full vs. Restricted Sample)

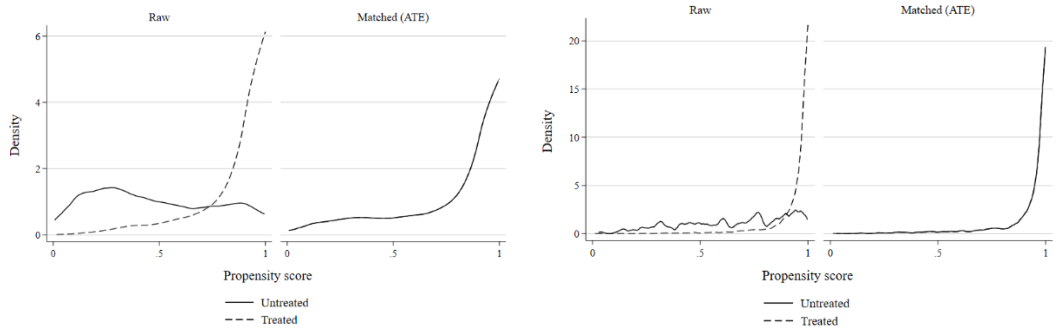


Figure 2.10. Propensity Score Matching: Target Advisor Engagement Common Support Assessment on EBITDA Multiple (Full vs. Restricted Sample)

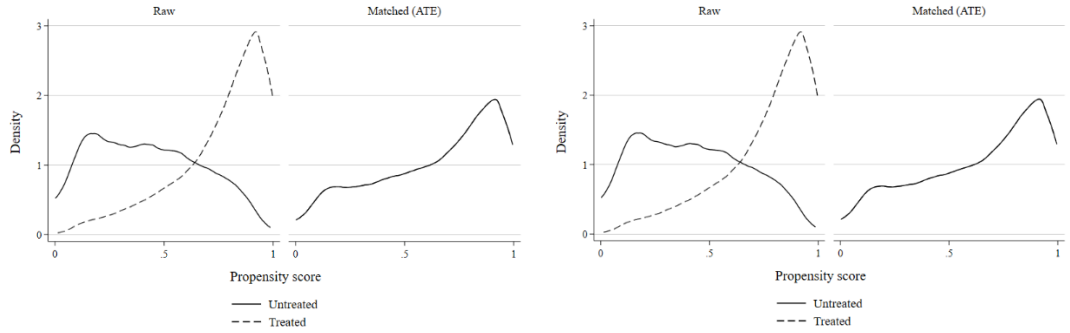


Figure 2.11. Propensity Score Matching: Target Advisor Engagement Common Support Assessment on Deal Completed (Full vs. Restricted Sample)

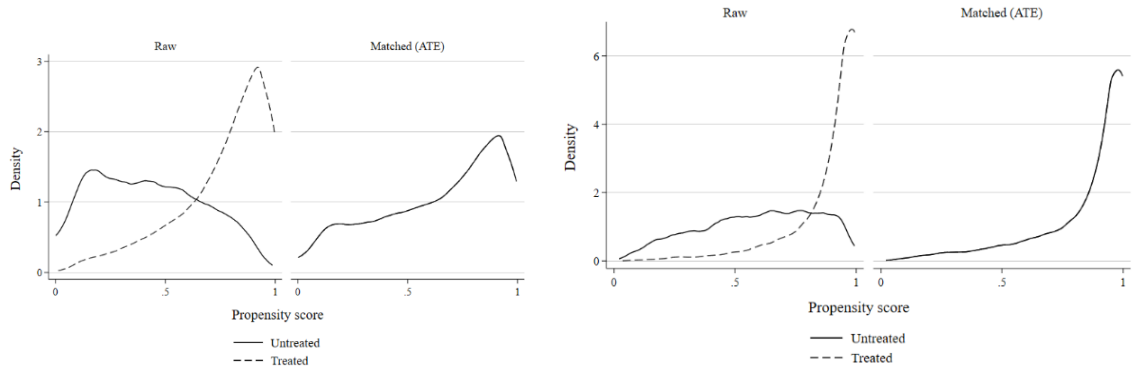


Figure 2.12. Propensity Score Matching: Target Advisor Engagement Common Support Assessment on Premium 1 Day (Full vs. Restricted Sample)

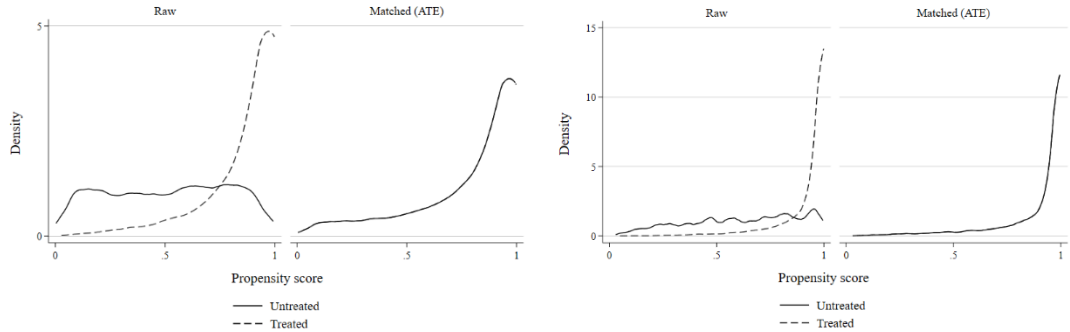


Figure 2.13. Propensity Score Matching: Target Advisor Engagement Common Support Assessment on Premium 1 Week (Full vs. Restricted Sample)

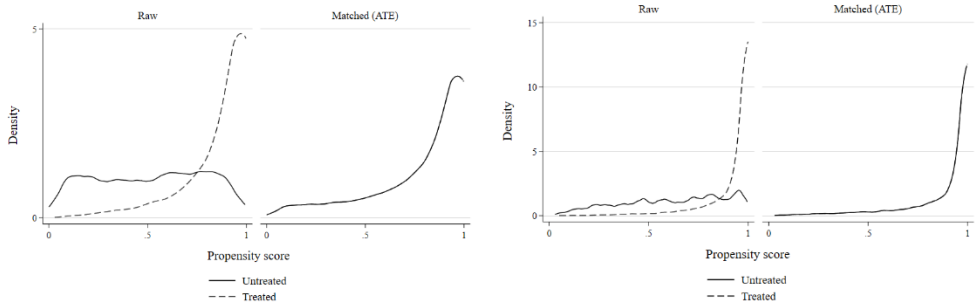


Figure 2.14. Propensity Score Matching: Target Advisor Engagement Common Support Assessment on Premium 1 Month (Full vs. Restricted Sample)

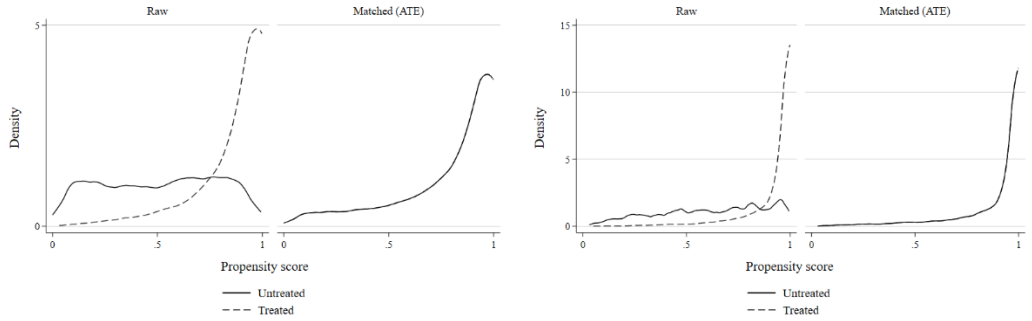


Figure 2.15. Propensity Score Matching: Target Advisor Engagement Common Support Assessment on CAR(-1/+1) (Full vs. Restricted Sample)

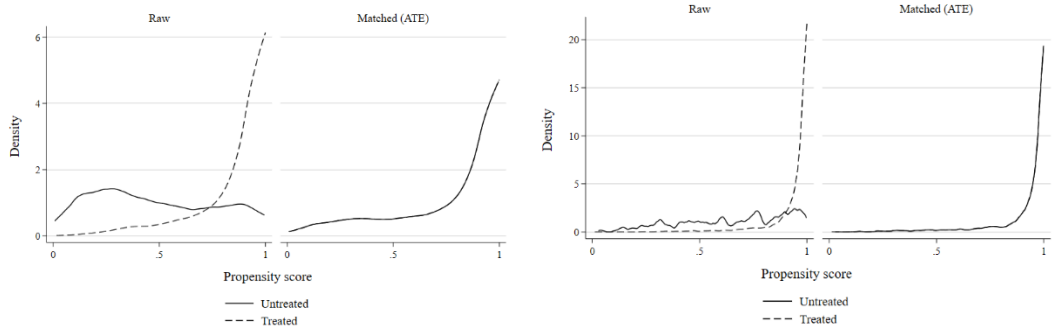


Figure 2.16. Propensity Score Matching - Target Advisor Engagement Common Support Assessment on CAR(-2/+2) (Full vs. Restricted Sample)

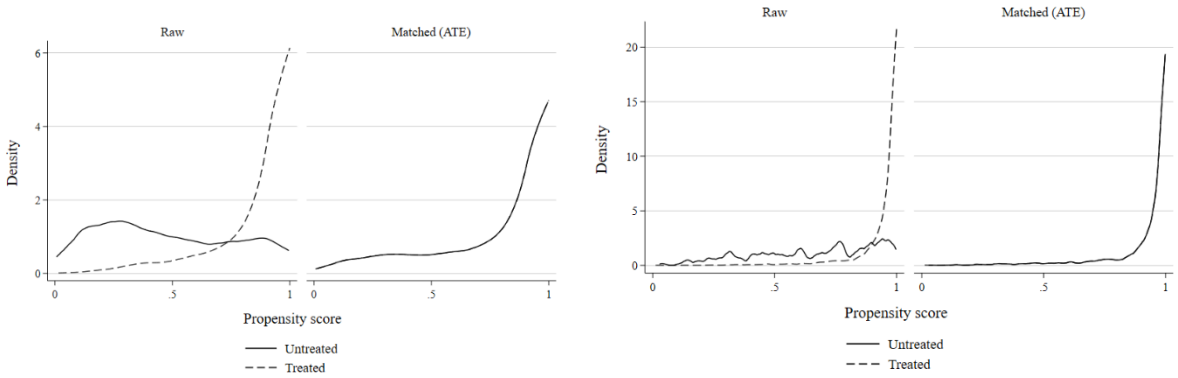


Figure 2.17. Propensity Score Matching: Target Advisor Engagement Common Support Assessment on CAR(-3/+3) (Full vs. Restricted Sample)

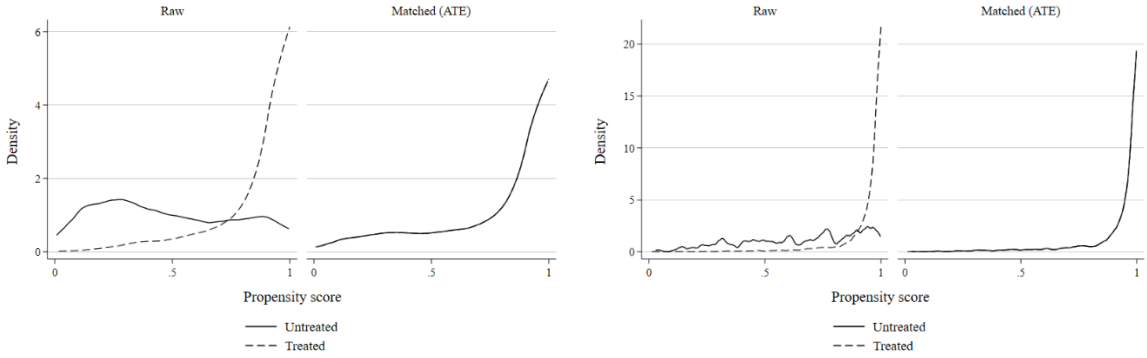
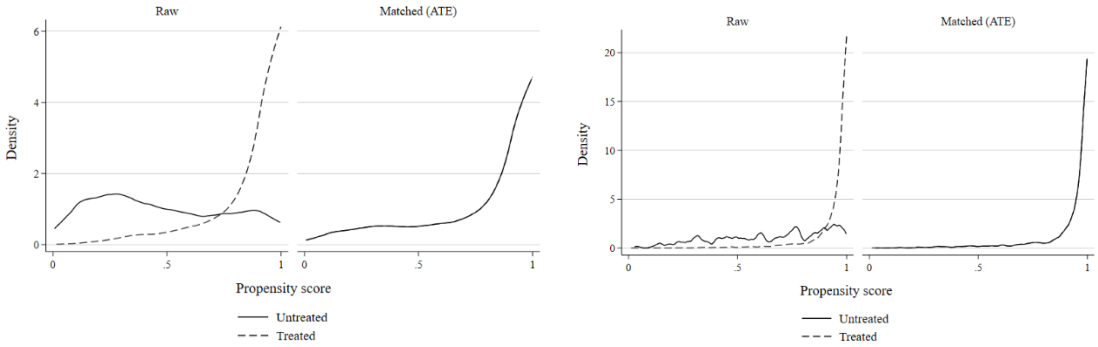


Figure 2.18. Propensity Score Matching: Target Advisor Engagement Common Support Assessment on CAR(-4/+4) (Full vs. Restricted Sample)



Appendix 2E: Heckman Selection Model—Advisor Engagement on Relative Deal Pricing, 1978–1999

	EBITDA Multiple (Log) OLS	EBITDA Multiple (Log) (Selection)
Acquirer Advisor	0.334***	0.550***
	(0.049)	(0.038)
Target Advisor	0.318***	0.546***
	(0.043)	(0.040)
Sales Absolute (Log)	-0.178***	-0.072***
	(0.008)	(0.010)
EBITDA Margin	-2.299***	-0.001
	(0.076)	(0.120)
Constant	2.701**	4.427
	(1.319)	(0.001)
Deal-Level Controls	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes
Observations	11,621	9,197

Notes: Entries report results from the Heckman treatment-effect model for the 1978–1999 period. The dependent variable is the *EBITDA Multiple (Log)* of the transaction of the acquisition. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for acquirer, time period (year), industry of the M&A target, and the country of the target's headquarters. Given that advisors on both sides of the deal will be similarly affected by incentives and anticipation of deal worth, we further reduce selection problems by focusing on those transactions with at least a target advisor present. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Appendix 2F: Heckman Selection Model—Advisor Engagement on Relative Deal Pricing, 2000–2020

	EBITDA Multiple (Log) OLS	EBITDA Multiple (Log) (Selection)
Acquirer Advisor	0.342***	0.391***
	(0.036)	(0.025)
Target Advisor	0.277***	0.437***
	(0.035)	(0.026)
Sales Absolute (Log)	-0.183***	-0.031***
	(0.005)	(0.007)
EBITDA Margin	-2.095***	0.058
	(0.051)	(0.071)
Constant	3.543***	1.143**
	(0.350)	(0.507)
Deal-Level Controls	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes
Observations	24,194	19,630

Notes: Entries report results from the Heckman treatment-effect model for the 2000–2020 period. The dependent variable is the *EBITDA Multiple (Log)* of the transaction of the acquisition. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and further include the deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for acquirer, time period (year), industry of the M&A target, and the country of the target's headquarters. Given that advisors on both sides of the deal will be similarly affected by incentives and anticipation of deal worth, we further reduce selection problems by focusing on those transactions with at least a target advisor present. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Appendix 2G: Difference between Groups—Treatment Group (Former Lehman Clients) versus Control Group (All Other Acquirers)

	Advisor Engagement	EBITDA Multiple	Premium 1 Day	Premium 1 Week	Premium 1 Month	CAR -4/+4	CAR -3/+3	CAR -2/+2	CAR -1/+1	Deal Completed
Before Lehman Collapse										
Control	0.038	3.164	25.195	28.952	34.467	0.037	0.039	0.036	0.011	0.878
Treated	0.031	3.239	25.898	29.188	34.106	0.055	0.053	0.045	0.012	0.826
Difference	-0.008	0.075	0.703	0.235	-0.361	0.018	0.013	0.009	0.001	-0.052***
(Treatment-Control)	(0.023)	(0.059)	(2.589)	(2.696)	(2.870)	(0.014)	(0.013)	(0.012)	(0.006)	(0.020)

Notes: Entries show the difference between the treatment group (former Lehman clients) and the control group (all other acquirers); standard errors are in parentheses. The dependent variables are *Advisor Engagement*, *EBITDA Multiple (Log)*, *Premiums* (*1 Day*, *1 Week*, *1 Month*), and *CARs* (*1/+1*, *2/+2*, *-3/+3*, *4/+4*). We use the covariates *Sales Absolute (Log)* and *EBITDA Margin*, and *Target Financial Advisor* and further include the deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We analyze whether there is a significant difference between treatment and control groups before the event. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Chapter 3: The Impact of Advisors' Industry and Country Experience on Announcement Returns in Buy-Side M&A

Abstract: This study examines the effect of prior advisor industry and country experience on pricing, premiums, returns, and deal completion. We segment four distinct types in a 2x2 factor design of investment banks according to their track record in prior country and industry projects: *Experience-Based Top Advisors* (high industry and country experience), *Industry Specialists* (high industry experience and low country experience), *Country Specialists* (low industry experience and high country experience), and *Rookies* (low industry and country experience). We further compare our results with another definition of top advisors, *Reputation-Based Top Advisors*, which is commonly based on deal value, deal volume, reputation, and league tables. Implementing regression, fixed effects, propensity score matching, and Heckman selection models, we find that *Experience-Based Top Advisors* negotiate significantly better deals for their clients on the buy side than do *Rookies*: they achieve higher *CARs* by negotiating lower prices and premiums.[16]

[16] I am grateful for helpful comments by Christiane Schwieren, Christian König, Hannes Rau, and Stefan T. Trautmann.

3.1. Introduction

The question of whether investment bank advisors deliver value to their clients has received considerable attention in the literature. However, the extant research on buy-side M&A provides rather ambiguous guidance. In this chapter, we examine the impact of top advisors on value creation for acquirers. Top advisors in the literature are typically referred to as advisors with high rankings in league tables, evaluated based on total deal value and volume. Departing from that typical definition, we define top advisors based on their prior industry and country experience directly relevant to the acquisition on which they are consulting. In our experience-based advisor typology, we segment investment banks into four distinct types of advisors based on their prior industry and country experience. First, *Experience-Based Top Advisors* are those with high experience in both the industry and country of the M&A target. Second, *Country Specialists* are investment banks with high experience in the target's country but not its industry. Third, *Industry Specialists* only have high experience in the industrial sector of the M&A target. Fourth, *Rookies* are those investment banks with no more than medium (and often lower) industry and country experience relevant to the client. We use the Thomson Reuters SDC Platinum database on M&A transactions to gather all reported M&A transactions initiated between 1978 and 2020. We further include data sets on stocks and indexes from the CRSP database to compute cumulative abnormal announcement returns, since these data are not included in the main data set from Thomson Reuters SDC.

Our identification strategy addresses the question of whether *Experience-Based Top Advisors* create value for their clients, comparing our observations with the impact that other advisor types have on acquisitions. We disentangle the effect of industry and country expertise, investigating if and how *Industry Specialists* and *Country Specialists* create value

in buy-side engagements. Finally, we investigate the effectiveness of *Rookies* in acquisitions: do they add or destroy value for acquirers in terms of announcement returns?

To implement our identification strategy, we apply regression, fixed effects, propensity score matching, and Heckman selection models to investigate the impact of these four types of investment banks on pricing, acquisition returns, and deal completion. We situate the results in the context of the *Reputation-Based Top Advisors'* impact, contributing a novel perspective to the definition and value creation of a top investment bank. In the next section, we describe the theoretical foundation of this chapter and how it contributes to the literature in this field.

3.2. Literature Review

Servaes and Zenner (1996), Rau (2000), and Ecer and Trautmann (2020) report a negative or insignificant effect of buy-side advisors on M&A transactions in general, while other research suggests a fairly positive effect of buy-side advisors (Bao & Edmans, 2011; Golubov et al., 2012). A further branch of research focuses on top investment advisors: those with the highest deal value and volume as reported in league tables. Hunter and Jagtiani (2003) suggest that top-tier advisors are more likely to complete deals in less time than lower-tier advisors but also find that gains for buy-side clients decline with top advisor engagement. Similarly, Ismail (2010) finds that top advisors destroy value for their clients, while lower-tier advisors achieve gains for their clients. However, Golubov et al. (2012) find that top-tier advisors deliver higher bidder returns but only in public deals. A potential explanation for this ambiguity might be rooted in the definition of top advisors. While the dominant definition relies on league tables that tabulate investment banks' market share, Bao and Edmans (2011), among others, question this definition and suggest that advisors' prior track record in value creation is a better criterion for advisor choice than market share.

3.2.1. Motives for Advisor Engagement

Large investment banks dominate the M&A advisory market specifically because of their track record of successfully closed transactions. League tables and other rankings consider the number of transactions, deal volume, and deal value as the key criteria for ranking investment advisors. Ultimately, decisions made to engage an investment advisor are partly driven by indications given through league tables. Bao and Edmans (2011) find that mandates are awarded based on the past market share of the advisor and thus the league tables. Francis et al. (2014) find that shareholders care more about the advisor being U.S.-based than having experience in the target country; they argue that certification is most important for shareholders. Servaes and Zenner (1996) find that the choice to use an investment bank depends on the complexity of the transaction, the type of transaction, the acquirer's prior acquisition experience, and the degree of diversification of the target firm. The authors suggest that transaction costs are the main determinant of investment bank choice. Chang et al. (2016a) show that M&A advisors' industry expertise increases their likelihood of being chosen by clients. The determinants of advisor engagement are mainly driven by reputation and league tables. However, further research is required to address the effectiveness and efficiency of decisions based on this selection criterion. Bao and Edmans (2011) address the question of how acquirers should select their advisors, suggesting that advisor engagement decisions should be based on past performance measures. With the present study, we contribute to the effort to reassess what matters in the selection of investment advisors by suggesting using advisors' industry and country experience—rather than reputation, deal volume, and deal value— as primary decision criteria.

3.2.2. Definition and Value Creation of Reputation-Based Top Advisors

Despite many mergers being efficient, overpricing and value destruction for acquirers' shareholders are prevalent in M&A (Andrade et al. 2001; Ecer & Trautmann, 2020; Moeller

et al., 2004; Renneboog & Vansteenkiste, 2019). Hunter and Jagtiani (2003) define top advisors based on deal value and deal volume, suggesting that top-tier advisors are more likely to complete deals in less time than lower-tier advisors, but they also find that gains for buy-side clients decline with top advisor engagement. Similarly, Ismail (2010) defines top advisors based on rankings in terms of deal volume and value, finding those top advisors (tier-one advisors based on rankings for deal size and the number of deals advised) destroy value for their clients, while lower-tier advisors achieve gains for their clients. Kale et al. (2003) define top advisors based on market share in the year of the transaction; thus, deal value and volume again serve as the key criteria in distinguishing this type of advisor from average advisors. Kale et al. (2003) examine the effect of financial advisor reputation on wealth gains, finding that advisor reputation is positively related to the probability of deal completion. Further, the authors conclude that clients with better advisors are more likely to withdraw from potentially value-destroying deals.

Golubov et al. (2012), meanwhile, define top advisors based on the total dollar value of transactions. They suggest that top-tier advisors deliver higher bidder returns than lower-tier advisors in public transactions, elaborating that top-tier advisors achieve higher gains for bidders due to their ability to identify more synergistic combinations and negotiate a higher share of total synergies in their clients' favor. Overall, it remains unclear whether and to what extent *Reputation-Based Top Advisors* create value for acquirers. We contribute to this discussion by proposing a different perspective on advisor quality. Instead of selecting top advisors based on reputation, we promote industry and country experience as better criteria to find valuable external support in buy-side transactions. Before presenting our main results in section 3.5., we link our results to this stream of the corporate finance literature in section 3.2.3. and present our analytical framework for our identification strategy in section 3.3.

3.2.3. Definition and Value Creation of Experience-Based Top Advisors

Song et al. (2013) investigate the performance of boutique advisors with specialized industry experience and suggest that they deliver more favorable deal outcomes for their clients because of their focused industry expertise. Stock (2015) seeks to discover when advisor industry experience matters most, suggesting that prior experience in a specific industrial sector has a positive impact on acquisition returns, completion speed, and deal likelihood, along with a higher probability of completing value-increasing acquisitions and withdrawing from value-destroying ones. Wang et al. (2021) find that acquirers create higher shareholder returns when advised by investment banks with more experience in the target industry. Hayward (2003) shows that financial advisors derive power over their clients from specialized expertise, leading them toward complex solutions with potentially adverse outcomes. Chang et al. (2016a) also examine the role of financial advisors in M&A and focus on the industry expertise of the acquirer advisor; they find that industry expertise is associated with higher deal completion but not with any valuation effects of acquisitions.

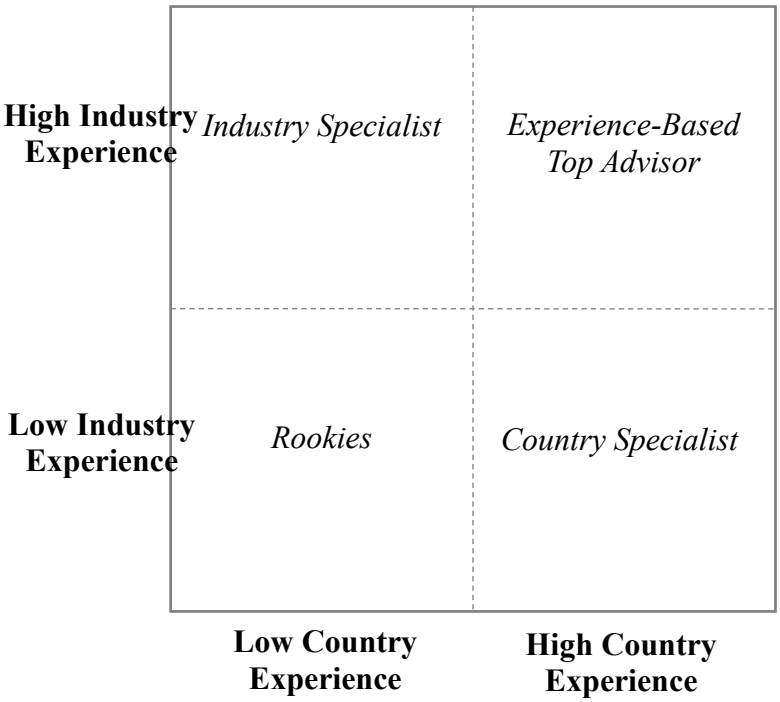
While the literature suggests a widespread definition of top advisors in terms of market share, the value creation of top advisors defined in this manner remains unclear. In the following, we segment advisors into four distinct types based on our experience-based advisor typology, which is the analytical framework for our identification strategy.

3.3. Theoretical Framework: Experience-Based Advisor Typology

We construct a 2x2 matrix with the dimensions *Industry Experience* and *Country Experience*, differentiating the degree of advisor experience in terms of high and low; we define advisor types based on the number of transactions they completed in the two dimensions.

Since the average number of deals an acquirer advisor was engaged in the respective industry of their client is approximately five and the average number of deals in the headquarters country of their client was eight, we establish two thresholds. *Low industry experience* applies when an acquirer advisor has consulted on one to four deals, *medium industry experience* is defined as five to nine deals, and *high advisor experience* had 10 or more prior industry transactions relevant to the client's industry. The average number of transactions advisors had concluded in the same country as the client in their current transaction was eight, so we define *low country experience* as one to seven transactions, *medium country experience* as 8 to 15, and *high country experience* as 16 or more transactions. Thus, *Experience-Based Top Advisors* are those with 10 or more prior transactions in the industry and 16 or more in the country of the advised M&A target. *Country Specialists* are investment banks with 16 or more transactions in the M&A target's country, but with fewer than 10 transactions in its industry. *Industry Specialists* have 10 or more transactions of prior experience in the M&A target's industry but fewer than 16 transactions in its headquarters country. Fourth, *Rookies* are those advisors that are comparatively new to the industry and the country on which they are advising, having reported fewer than 10 prior transactions in the same industry as the M&A target they advise and fewer than 16 transactions in its headquarters country.

Figure 3.1. Experience-Based Advisor Typology



In our identification strategy, we use this framework (Figure 3.1.) to establish regression, fixed effects, propensity score matching, and Heckman models to identify the association between *Experienced-Based Top Advisors*, *Industry Specialists*, *Country Specialists*, and *Rookies* in terms of value creation for their clients. We then use the results of these analyses to contrast with the results found using the common definition of top advisors: *Reputation-Based Top Advisors*. We lay out our data set and define variables in section 3.4.

3.4. Data and Methodology

3.4.1. Data

We use the Thomson Reuters SDC Platinum database on M&A transactions to gather all reported M&A transactions initiated between 1978 and 2020. Data are sourced through direct deal submissions from global banking and legal contributors, coupled with extensive

research performed by a global research team that collected data from regulatory filings, corporate statements, media, and pricing wires. According to Thomson Reuters, more than 2,500 control validations occur at the point of data entry. We focus on transactions with a deal size above $0.5M and exclude transactions with a negative *EBITDA Margin* or an *EBITDA Margin* larger than 1 and negative *Sales Absolute* (defined technically below);[17] otherwise, we make use of the full data set. We further include additional data sets on stocks and indexes from the CRSP to compute cumulative abnormal announcement returns, since these data are not included in the main data set from Thomson Reuters SDC.

3.4.2. Variables

The key variables of interest in this study are *Cumulative Acquirer Advisor Industry Experience (CAAIE)*, *Cumulative Acquirer Advisor Country Experience (CAACE)*, *CARs*, *Premium*, *EBITDA Multiple*, and *Deal Completion*.

To measure the degree to which an advisor accumulated transaction experience through the number of transactions in the industry and/or country of the advised M&A target, we constructed the variables *CAAIE* and *CAACE*, which indicate the cumulative number of transactions an advisor[18] conducted in the industry and country, respectively, before the transaction of interest in the sample.

We use the CRSP database to model CARs. We measure bidders' CARs with the variables *CAR(-1/+1)*, *CAR(-2/+2)*, *CAR(-3/+3)*, *and CAR(-4/+4)*, all expressed in percentages. We estimate the model over a 255-day window ending 46 days prior to the announcement date, using the CRSP Value-Weighted Index as our market proxy. We report

[17] Firms with a negative *EBITDA Margin* and negative *Sales Absolute* are excluded from our analysis because the *EBITDA Multiple* is not a robust valuation indicator for such assets. We exclude a total of 607 initiated transactions due to negative *EBITDA Margins* or *EBITDA Margins* larger than 1 and negative *Sales Absolute*.
[18] "Advisor" is defined as one advisor or a combination of advisors reported in the sample, as acquirers in some cases not only hire a single buy-side advisor but multiple ones to enhance the efficiency of the transaction.

CARs over three-, five-, seven-, and nine-day windows. We define the premiums paid by acquirers, *Premium 1 Day*, *Premium 1 Week*, and *Premium 1 Month*, as the difference between the offer price and the target's closing stock price one day (one week, one month) before the original announcement date, all expressed as percentages. To account for outliers, we winsorize the premiums at the 1% and 99% levels. Further, we use *EBITDA Multiple* as a measure for relative deal pricing. Because of the highly skewed distribution of the *EBITDA Multiple*, we transform it into its logarithm, indicated by the variable *EBITDA Multiple (Log)*, in our analyses. Moreover, *Deal Status* is registered in the data set with five possible status levels: deal completed, deal pending, deal intended, deal withdrawn, and other deal status. For our analysis, we create the indicator variable *Deal Completed*, coded as one if *Deal Status* equals deal completed and zero otherwise.

The presence of target or acquirer advisors is measured by binary indicators. Target advisors consult the selling firm on the transaction, while acquirer advisors consult the buy side. The variable *Target Advisor* is one when a target advisor was reported and zero otherwise, and the variable *Acquirer Advisor* is one when an acquirer advisor was reported and zero otherwise. Acquirer advisors, typically investment banks and management consultants, manage the buy-side process, which includes deal sourcing through the identification of M&A targets, target screening (the first filter of relevant M&A targets regarding strategic and financial fit), drafting indicative offers, due diligence, and support in negotiating, signing, and closing deals. Contracts of buy-side advisors are structured with a high variable payment contingent upon deal completion, raising substantial governance concerns about the absence of an incentive to negotiate prices down. As defined in section 3.3., we segment acquirer advisors in our experience-based advisor typology as the analytical basis of our identification strategy.

Given the heterogeneity of our transaction sample, we include a set of control variables. These include the size of the M&A target, defined by the variable *Sales Absolute*

and measured in U.S. dollars. We transform *Sales Absolute* into its logarithm, indicated by the variable *Sales Absolute (Log)*, because of its highly skewed distribution. Further, we use the profitability of the M&A target, defined by the variable *EBITDA Margin*, which is calculated by annual *EBITDA Absolute* over annual *Sales Absolute*. We add further controls at the deal level: *Deal Attitude* (indicated by the dummy variables *Friendly*, *Neutral*, or *Hostile* to reflect the attitude of the acquirer towards the seller), *Form of the Transaction* (indicated by the dummy variables *Acquisition*, *Merger*, or *Other Form*), and *Target Public Status* (indicated by the dummy variables *Public*, *Private*, or *Other Status*). Finally, we include target country, year, and industry fixed effects.

Tables 3.1. and 3.2. present descriptive statistics for the variables used in this study. We report 35,979 transactions. For the entire sample, the average *Deal Size* is $719 million, the *EBITDA Multiple* is 19.5, and the average *Sales Absolute* is approximately $730 million; average *Premiums* range from 27.1% to 33.9%, while *CARs* range between -26.9% to 31.1%.

To implement our identification strategy, we use the experience-based advisor typology framework to establish regression, fixed effects, propensity score matching, and Heckman models. We disentangle the association between *Experienced-Based Top Advisors*, *Industry Specialists*, *Country Specialists*, and *Rookies* in terms of each advisor type's value creation for acquirers. We then use the results of these analyses to contrast with the results found using the common definition of top advisors: *Reputation-Based Top Advisors*.

Table 3.1. Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min.	Max.
Experience-Based Top Advisor	35,979	0.485	0.5	0	1
Industry Specialist	35,979	0.012	0.111	0	1
Country Specialist	35,979	0.094	0.291	0	1
Rookies	35,979	0.409	0.492	0	1
Deal Size ($M)	35,979	718.978	2,057.644	0.505	15,025.07
Deal Size (Log)	35,979	4.512	2.151	-0.683	9.617
EBITDA Multiple	35,979	19.497	54.213	0.001	985.898
EBITDA Multiple (Log)	35,979	2.205	1.138	-6.908	6.894
Sales Absolute	35,815	730.399	1,997.318	1.483	14,426.23
Sales Absolute (Log)	35,815	4.788	1.951	0.394	9.577
EBITDA Absolute ($M)	35,531	105.607	299.635	-0.146	2,184.6
EBITDA Absolute (Log)	35,127	2.691	2.113	-6.215	7.689
EBITDA Margin	35,979	0.182	0.167	0.001	1
Premium 1 Day	21,254	27.135	38.538	-70.83	202.2
Premium 1 Week	21,139	30.352	40.186	-71.43	212
Premium 1 Month	21,113	33.893	42.918	-72.03	223.56
CARs (+1/-1)	8,431	0.001	0.04	-0.132	0.149
CARs (+2/-2)	8,431	0.001	0.08	-0.233	0.28
CARs (+3/-3)	8,431	0	0.088	-0.259	0.298
CARs (+4/-4)	8,431	0	0.094	-0.269	0.311
Acquirer Advisor	35,979	0.549	0.498	0	1
Target Advisor	35,979	0.619	0.486	0	1
Public	35,979	0.731	0.444	0	1
Subsidiary	35,979	0.107	0.309	0	1
Private	35,979	0.158	0.364	0	1
Other Status	35,979	0.002	0.041	0	1
Friendly	35,979	0.896	0.305	0	1
Neutral	35,979	0.021	0.145	0	1
Hostile	35,979	0.026	0.16	0	1
Other Attitude	35,979	0.056	0.23	0	1
Completed	35,979	0.805	0.397	0	1
Incomplete	35,979	0.195	0.397	0	1

Notes: We use the Thomson Reuters SDC Platinum database to gather all reported M&A transactions between 1978 and 2020. Data are sourced through direct deal submissions from global banking and legal contributors, coupled with extensive research performed by a global research team that collected data from regulatory filings, corporate statements, media, and pricing wires. According to Thomson Reuters, more than 2,500 control validations occur at the point of data entry. We use the CRSP database to model CARs. We estimate the model over a 255-day window ending 46 days prior to the announcement date, using the CRSP Value-Weighted Index as our market proxy. We report CARs over three-, five-, seven-, and nine-day windows. To account for outliers, we winsorize the variables *Premium* (*1 day*, *1 week*, *1 month*) and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*). Further, we focus on transactions with a deal size above $0.5M and exclude transactions with a negative *EBITDA Margin*, but we otherwise make use of the full data set.

Table 3.2. Summary Statistics: Acquirer Advisor Types

	All	Rookies	Country Specialists	Industry Specialists	Experience-Based Top Advisors
Number of Deals	35,979	14,710	3,368	448	17,453
Share of Completed Deals	0.805	0.836	0.8845	0.821	0.762
Deal Size (Mean, $M)	718.978	1,119.308	1,080.381	1,074.801	302.689
EBITDA Multiple (Mean)	19.497	19.148	21.185	19.58	19.462
Premium 1 Day	27.135	27.21	30.721	21.535	26.047
Premium 1 Week	30.352	30.58	34.227	25.267	28.935
Premium 1 Month	33.893	33.836	38.275	30.617	32.607
CAR (-1/+1)	0.001	-0.001	-0.001	-0.001	0.003
CAR (-2/+2)	0.001	-0.005	-0.006	-0.014	0.01
CAR (-3/+3)	0	-0.006	-0.007	-0.007	0.009
CAR (-4/+4)	0	-0.005	-0.008	-0.014	0.008
Sales Absolute (Mean, $M)	730.399	1,045.21	844.492	1,288.758	428.035
EBITDA Margin	0.182	0.192	0.178	0.217	0.174

Notes: We use the Thomson Reuters SDC Platinum database to gather all reported M&A transactions between 1978 and 2020. Data are sourced through direct deal submissions from global banking and legal contributors, coupled with extensive research performed by a global research team that collected data from regulatory filings, corporate statements, media, and pricing wires. According to Thomson Reuters, more than 2,500 control validations occur at the point of data entry. We use the CRSP database to model CARs. We estimate the model over a 255-day window ending 46 days prior to the announcement date, using the CRSP Value-Weighted Index as our market proxy. We report CARs over three-, five-, seven- and nine-day windows. To account for outliers, we winsorize the variables *Premium* (*1 day*, *1 week*, *1 month*) and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*). Further, we focus on transactions with a deal size above $0.5M and exclude transactions with a negative *EBITDA Margin*; otherwise, we make use of the full data set.

3.5. Main Result: Association of Advisor Industry and Country Experience with Acquirer Announcement Returns

In this section, we establish our main results regarding the association of advisor industry and country experience with deal pricing, premiums, CARs, and the likelihood of deal completion. Implementing our fixed effects regression model, we analyze the impact of top advisors based on their accumulated deal value and deal volume (*Reputation-Based Top Advisors*), which are commonly used to determine rankings in league tables (see Table 3.3).

In line with prior research (Hunter & Jagtiani, 2003; Ismail, 2010), we find that top buy-side advisors based on this definition do not create returns for their clients; they increase deal completion likelihood while leading to higher prices. In a second step, we disentangle buy-side advisors into the four types defined in section 3.3: *1) Experience-Based Top Advisors*, *2) Industry Specialists*, *3) Country Specialists*, and *4) Rookies*.

Table 3.4. shows the divergent results for the association of *Experience-Based Top Advisors* with pricing, premiums, returns, and deal completion. We find that this type negotiates significantly lower EBITDA multiples and premiums, resulting in significantly higher CARs. At the same time, this group closes deals at a lower rate. In a context with positive CARs, we interpret this decrease in deal completion rate as efficient selection and negotiation skill by experienced advisors, who strike the right balance by not compromising and agreeing to exaggerated price demands by the seller. Table 3.5. reports *Experience-Based Top Advisors'* effect on pricing, premiums, returns, and deal completion compared to the other types. Compared to *Experience-Based Top Advisors*, *Rookies* on the buy side not only have an increasing effect on prices but also achieve significantly lower CARs. While *Country Specialists* and *Industry Specialists* do not significantly destroy value, we do observe an increasing effect on relative deal pricing. In terms of *Country Specialists*, we see a negative trend in CARs. *Industry Specialists*, *Country Specialists*, and *Rookies* all have a positive impact on deal completion.

Table 3.3. Reputation-Based Top Advisors Compared to All Others

	EBITDA Multiple (Log)	Premium 1 Day	Premium 1 Week	Premium 1 Month	CAR (-4/+4)	CAR (-3/+3)	CAR (-2/+2)	CAR (-1/+1)	Deal Completed
Reputation-Based Top Advisors	0.454***	0.177	0.663	1.483*	0.002	0.002	0.001	0.001	0.050***
	(0.016)	(0.680)	(0.708)	(0.760)	(0.003)	(0.002)	(0.002)	(0.001)	(0.005)
Sales Absolute (Log)	-0.191***	-0.733***	-0.807***	-1.166***	-0.004***	-0.004***	-0.004***	-0.001**	-0.010***
	(0.005)	(0.204)	(0.216)	(0.228)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
EBITDA Margin	-2.136***	-9.975***	-11.136***	-11.511***	-0.024***	-0.027***	-0.030***	-0.003	0.058***
	(0.057)	(2.280)	(2.411)	(2.562)	(0.009)	(0.009)	(0.008)	(0.004)	(0.014)
Target Advisor	0.346***	2.692***	2.996***	2.920***	-0.006**	-0.006**	-0.008***	-0.002	0.122***
	(0.016)	(0.817)	(0.851)	(0.940)	(0.003)	(0.003)	(0.003)	(0.001)	(0.005)
Relative Deal Size		2.658***	2.697***	3.805***	-0.007***	-0.007***	-0.006***	-0.002***	0.008***
		(0.422)	(0.443)	(0.461)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Constant	3.211***	24.758***	28.143***	30.966***	0.044***	0.045***	0.046***	0.012***	0.738***
	(0.025)	(1.775)	(1.861)	(1.952)	(0.006)	(0.006)	(0.005)	(0.003)	(0.009)
Further Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, Acquirer, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35,788	21,181	21,069	21,044	8,370	8,370	8,370	8,370	35,788
R-squared	0.224	0.120	0.122	0.123	0.122	0.127	0.129	0.082	0.246

Notes: The entries show coefficients of OLS regressions; standard errors are in parentheses. The dependent variables are *EBITDA Multiple (Log)*, *Premiums* (*1 day*, *1 week*, *1 month*), and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*), indicating the relative deal price of the transaction, premiums paid by the acquirer, and CARs earned by the bidder in the various event windows. We use the covariates *Sales Absolute (Log)*, *EBITDA Margin*, *Target Advisor*, and *Relative Deal Size*; we also include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the period (year), industry of the M&A target, and country of the target's headquarters. We analyze the effect of *Reputation-Based Top Advisors'* engagement on pricing, premiums, CARs, and Deal Completed compared to investment banks that are not defined as *Reputation-Based Top Advisors*. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 3.4. Experience-Based Top Advisors Compared to Rookies, Country Specialists, and Industry Specialists

	EBITDA Multiple (Log)	Premium 1 Day	Premium 1 Week	Premium 1 Month	CAR (-4/+4)	CAR (-3/+3)	CAR (-2/+2)	CAR (-1/+1)	Deal Completed
Experience-Based Top Advisors	-0.292***	-1.283**	-2.125***	-2.327***	0.003	0.005**	0.005**	0.002**	-0.076***
	(0.012)	(0.611)	(0.638)	(0.682)	(0.002)	(0.002)	(0.002)	(0.001)	(0.005)
Sales Absolute (Log)	-0.168***	-0.733***	-0.816***	-1.119***	-0.004***	-0.004***	-0.004***	-0.001***	-0.023***
	(0.003)	(0.174)	(0.181)	(0.194)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
EBITDA Margin	-2.100***	-10.221***	-11.469***	-11.548***	-0.022**	-0.024***	-0.027***	-0.002	0.031**
	(0.038)	(2.029)	(2.119)	(2.264)	(0.008)	(0.008)	(0.007)	(0.004)	(0.015)
Target Advisor	0.301***	2.987***	3.226***	3.404***	-0.010***	-0.009***	-0.011***	-0.002	0.096***
	(0.014)	(0.724)	(0.756)	(0.809)	(0.003)	(0.003)	(0.002)	(0.001)	(0.005)
Relative Deal Size		2.640***	2.672***	3.834***	-0.007***	-0.007***	-0.007***	-0.002***	0.003
		(0.289)	(0.302)	(0.323)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Constant	3.347***	25.140***	29.075***	31.510***	0.047***	0.045***	0.046***	0.011***	0.881***
	(0.022)	(1.498)	(1.565)	(1.672)	(0.006)	(0.006)	(0.005)	(0.003)	(0.010)
Further Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, Acquirer, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35,788	21,182	21,069	21,045	8,370	8,370	8,370	8,370	35,788
R-squared	0.217	0.116	0.119	0.119	0.115	0.120	0.122	0.079	0.111

Notes: The entries show coefficients of OLS regressions; standard errors are in parentheses. The dependent variables are *EBITDA Multiple (Log)*, *Premiums* (*1 day*, *1 week*, *1 month*), and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*), indicating the relative deal price of the transaction, premiums paid by the acquirer, and CARs earned by the bidder in the various event windows. We use the covariates *Sales Absolute (Log)*, *EBITDA Margin*, *Target Advisor*, and *Relative Deal Size*; we also include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the period (year), the industry of the M&A target, and the country of the target's headquarters. We analyze the effect of *Experience-Based Top Advisors*' engagement on pricing, premiums, CARs, and Deal Completed compared to *Rookies*, *Country Specialists*, and *Industry Specialists*. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 3.5. Rookies, Country Specialists, and Industry Specialists Compared to Experience-Based Top Advisors

	EBITDA Multiple (Log)	Premium 1 Day	Premium 1 Week	Premium 1 Month	CAR (-4/+4)	CAR (-3/+3)	CAR (-2/+2)	CAR (-1/+1)	Deal Completed
Rookies	0.272***	1.521**	2.326***	2.368***	-0.003	-0.005**	-0.006**	-0.003**	0.074***
	(0.013)	(0.640)	(0.668)	(0.715)	(0.003)	(0.003)	(0.002)	(0.001)	(0.005)
Country Specialists	0.371***	0.573	1.467	2.042**	-0.004	-0.005	-0.005*	-0.002	0.087***
	(0.021)	(0.909)	(0.947)	(1.013)	(0.003)	(0.003)	(0.003)	(0.001)	(0.008)
Industry Specialists	0.376***	-0.070	1.551	3.605	0.006	0.010	0.004	0.005	0.078***
	(0.050)	(2.157)	(2.249)	(2.403)	(0.016)	(0.015)	(0.014)	(0.007)	(0.019)
Experience-Based Top Advisors					(*excluded advisor category*)				
Sales Absolute (Log)	-0.168***	-0.729***	-0.814***	-1.122***	-0.004***	-0.004***	-0.004***	-0.001***	-0.023***
	(0.003)	(0.174)	(0.181)	(0.194)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
EBITDA Margin	-2.100***	-10.237***	-11.488***	-11.566***	-0.022**	-0.024***	-0.027***	-0.002	0.031**
	(0.038)	(2.029)	(2.120)	(2.264)	(0.008)	(0.008)	(0.007)	(0.004)	(0.015)
Target Advisor	0.300***	2.987***	3.228***	3.409***	-0.010***	-0.009***	-0.011***	-0.002	0.095***
	(0.014)	(0.724)	(0.756)	(0.809)	(0.003)	(0.003)	(0.002)	(0.001)	(0.005)
Relative Deal Size		2.649***	2.679***	3.834***	-0.007***	-0.007***	-0.007***	-0.002***	0.002
		(0.289)	(0.302)	(0.323)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Constant	3.055***	23.810***	26.919***	29.192***	0.050***	0.050***	0.051***	0.013***	0.805***
	(0.018)	(1.336)	(1.396)	(1.491)	(0.005)	(0.005)	(0.005)	(0.002)	(0.009)
Further Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, Acquirer, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35,788	21,182	21,069	21,045	8,370	8,370	8,370	8,370	35,788
R-squared	0.217	0.116	0.119	0.119	0.115	0.121	0.123	0.079	0.111

Notes: Entries show coefficients of OLS regressions; standard errors are in parentheses. The dependent variables are *EBITDA Multiple (Log)*, *Premiums* (*1 day*, *1 week*, *1 month*), and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*), indicating the relative deal price of the transaction, premiums paid by the acquirer, and CARs earned by the bidder in the various event windows. We use the covariates *Sales Absolute (Log)*, *EBITDA Margin*, *Target Advisor*, and *Relative Deal Size*; we include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We use fixed effects variables for the period (year), the industry of the M&A target, and the country of the target's headquarters. We analyze the effect of *Experience-Based Top Advisors*' engagement on pricing, premiums, CARs, and Deal Completed compared to *Rookies*, *Country Specialists*, and *Industry Specialists*. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

To summarize, we observe that prior industry and country experience is crucial for valuable external advice in buy-side M&As. We find that highly experienced advisors are more efficient for acquirers' shareholders by creating value in terms of CARs. Further, we suggest that advisors specialized in a specific sector (*Industry Specialists*) support a favorable outcome in terms of returns for their clients. *Country Specialists* help in closing deals but do not create value in terms of returns for clients. Finally, we see a value-destroying trend when acquirers engage advisors that do not have no extensive prior experience in the industry and country on which they are advising.

These findings add further evidence to our understanding of which types of advisors create value for their clients. They support the notion of redefining a top advisor in terms of value creation rather than reputation built largely on league tables. The present study also contributes to practitioners' decision-making in terms of advisor engagement. Based on our findings, we suggest hiring advisors based on their prior industry and country experience relative to a given M&A target and that advisors be chosen for the value they create rather than for their reputations. Since M&A decisions are among the most crucial decisions a CEO can make (Bao & Edmans, 2011), we emphasize the practical relevance of our findings.

3.6. Investigating Causal Effects of Experienced-Based Top Advisor Engagement

3.6.1. Matching Methodology

In section 3.5., we demonstrate the significant impact of *Experience-Based Top Advisors* on CARs for acquirers' shareholders. We now aim to establish whether these correlations can be interpreted in terms of causal effects. Several selection issues may be important in the current setting. Firms may be more likely to hire experienced advisors, or experienced advisors may be better able to select engagements on potentially more valuable and more

likely deals; experienced advisors may also be better at identifying higher-synergy deals. Given our large data set, we can use the matching methodology (Caliendo and Kopeinig, 2008) to overcome selection issues. The idea is to compare similar deals (in terms of observable pre-deal properties of the target) with and without the presence of the various advisor types. To make inferences about the impact of advisor engagement on deal pricing, premiums, returns, and completion, we need to examine how the transaction outcome would have differed had there been no advisor engagement. Because the counterfactual for a given transaction is not observed, we formalize the problem as the potential outcome approach or Roy-Rubin model (Caliendo and Kopeinig, 2008; Roy, 1951; Rubin, 1974). The fundamentals of the Roy-Rubin model are individuals (here: transactions), treatments (here: with or without advisor engagement), and outcomes (here: *EBITDA Multiple*, *Premiums*, *CARs*, and *Deal Completed*).

To estimate the causal treatment effects of advisors on relative deal pricing, premiums, bidder returns, and deal completion, we apply propensity score matching. Our matching model sorts the data into two groups: the "treated" group, which includes those transactions with an *Experience-Based Top Advisor*, and the control group, which includes transactions without that kind of advisor. Treatment *D* is a binary variable that equals *D*=1 for treated observations and *D*=0 for control observations. In a first step, we estimate a logit model with *D* as the latent variable for the propensity of transactions to be conducted with the support of an *Experience-Based Top Advisor*. The vector of explanatory variables *x* includes the variables *Sales Absolute (Log)*, *EBITDA Margin*, *Industry of M&A Target*, *Country of M&A Target*, *Deal Attitude*, *Public Status of the Target*, and *Year of Transaction*. The propensity score *p(x)* is the predicted probability that an acquirer advisor will be engaged, given the characteristics *x*:

$$p(x) = logit(D = 1|x) = E(D|x) \quad (1)$$

In a second step, the model matches transactions from the treated and control sub-samples based on their propensity scores. Following Caliendo and Kopeinig (2008), we choose the nearest neighbor matching estimator with replacement. Thus, our estimator selects those transactions without advisors as matching partners for a transaction with an advisor that is closest in terms of the propensity score. Transactions from the control group can be used multiple times as a match for a transaction in the treated sample, increasing matching quality and reducing model bias. In a third step, we calculate the ATE for the dependent variable of interest *y* (e.g., *EBITDA Multiple (Log)*), which is the difference between the outcomes *y* of matched transactions with and without an advisor:

$$ATE = E(y|x, D = 1) - E(y|x, D = 0) \quad (2)$$

We apply the matching model to the entire sample. ATE is only defined if the variables in *x* do not perfectly predict treatment *D*. The region of common support is defined by the overlap between the treated and controlled observations in terms of their propensity score. As Caliendo and Kopeinig (2008) suggest, we visualized the support of the treatment and control groups to confirm the common support assumption in Appendix 3B.

3.6.2. Matching Analysis

Table 3.6. shows the results of the matching estimation for *Experience-Based Top Advisors* in comparison to all other advisor types (*Industry Specialists*, *Country Specialists*, and *Rookies*) for the dependent variables *EBITDA Multiple*, *Premium (1 day*, *1 week*, *1 month*), *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*), and *Deal Completed*. We observe a significant effect of *Experience-Based Top Advisors* on announcement returns, supporting our main results. Overall, we interpret these results as further support of our finding that extensive industry and country experience is crucial for efficient advice on the buy side in M&A transactions.

Table 3.6. Propensity Score Matching: Average Treatment Effects of Experience-Based Top Advisors on Pricing, Premiums, CARs, and Deal Completion

	Experience-Based Top Advisors
EBITDA Multiple (Log)	-0.302***
	(0.020)
Premium 1 Day	-1.282
	(0.933)
Premium 1 Week	-2.280**
	(0.885)
Premium 1 Month	-2.481**
	(1.101)
CAR (-1/+1)	0.005***
	(0.002)
CAR (-2/+2)	0.004
	(0.003)
CAR (-3/+3)	0.003
	(0.003)
CAR (-4/+4)	-0.0004
	(0.002)
Deal Completed	-0.093***
	(0.006)

Notes: The table shows propensity score matching models results (nearest neighbor estimator with replacement), indicated by ATE, which is the average treatment effect of *EBITDA Multiple (Log)*, *Deal Completed*, *Premium* (*1 day*, *1 week*, *1 month*), and *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*), indicating the difference between outcomes of transactions with and without the presence of an advisor. Bootstrap standard errors are in parentheses. We use the covariates *Sales Absolute (Log)*, *EBITDA Margin*, *Target Advisor*, and *Relative Deal Size*; we include the further deal-level controls *Deal Attitude* (friendly, neutral, hostile) and *Target Public Status* (public, private). We use fixed effects variables for the period (year), the industry of the M&A target, and the country of the target's headquarters. We analyze the causal effect of *Experience-Based Top Advisors* on relative deal pricing, premiums, announcement returns, and deal completion likelihood compared to the other three advisor types: *Rookies*, *Country Specialists*, and *Industry Specialists*. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

We assess the validity of the matching estimators using the visual inspection procedure recommended by Caliendo and Kopeinig (2008). Figures 3.2. to 3.10. in Appendix 3B visualize the support of the propensity scores for treated and control observations (left panels) and the treated and the matched observations (right panels) for both the full and restricted samples. We see a full overlap of propensity scores for treated and controls in all cases and that all scores between zero and one are covered, although the

distribution of propensity scores is often quite different for treated and control observations. However, given our large data set and matching with replacement, we observe a nearly perfect overlap of the distributions; in fact, they are visually indistinguishable in most figures. There are no gaps in the supports. We conclude that the matching procedure has been executed efficiently. Sensitivity analysis following Becker and Caliendo (2007) shows that results are not sensitive to violations of the confoundedness assumption (i.e., unobserved joint influences on the advisor selection and outcomes).

Given the support for the validity of the propensity score matching approach presented here, we interpret the correlational results presented in Section 3.5. as causal effects of the different advisor types on relative deal prices, premiums, CARs, and the likelihood of deal completion. In Section 3.6.3., we further probe our interpretation.

3.6.3. Heckman Model Methodology

To further test our main results about the impact of different advisor types on *CARs*, we use the Heckman selection model as an additional approach to establish a causal interpretation of the associations of advisor engagement types with announcement returns, which allows us to correct bias from our sample by explicitly modeling the individual sampling probability of each observation (selection model) together with the conditional expectation of the dependent variable (outcome equation).

The Heckman methodology is implemented in the following procedure. The first step is to establish the selection equation, which is estimated using a probit estimator:

$$Prob(D = 1 \mid Z) = \Phi(Z\gamma) \quad (3),$$

where D indicates our binary outcome variable (*Acquirer Advisor Types*), Z is the vector of explanatory variables, which in our model are *Sales Absolute (Log)*, *EBITDA Margin*,

and *Relative Deal Size (EBITDA Multiple Log)*, γ is the vector of unknown parameters, and Φ is the cumulative distribution function of the standard normal distribution. Once the Heckman selection equation is estimated, the error term (residuals) from this equation is used to form a new variable, the Inverse Mills Ratio $\hat{\lambda}$ (IMR), where ϕ is the probability density function:

$$\hat{\lambda}(Z\gamma) = \frac{\phi(Z\hat{\gamma})}{\Phi(Z\hat{\gamma})} \quad (4)$$

The value of the IMR indicates the predicted probability of the acquirer advisor type. The IMR includes not only observed but also unobserved variables that are captured through the error term and included in the nonlinear function used to estimate the IMR. The next step in the Heckman method is to include the IMR variable in the initial regression model. We now estimate the expected value of our dependent variable, *CAR* (for each event window):

$$E(y|D = 1) = x'\beta + \rho\sigma\hat{\lambda}(Z\gamma) \quad (5),$$

where ρ is the correlation between unobserved determinants of propensity that an acquirer advisor is hired ε and unobserved determinants of CARs u. Further, σ is the standard deviation of u and $\hat{\lambda}$ is the IMR evaluated at $Z\gamma$.

3.6.4. Heckman Model Analysis

Implementing our Heckman selection model, we confirm the causal interpretation of our main results in Table 3.7. Compared to Experience-Based Top Advisors, Rookies negotiate deals in a way that leads to significantly negative announcement returns.

Table 3.7. Heckman Selection Model: Rookies, Country Specialists, and Industry Specialists Compared to Experience-Based Top Advisors in Terms of CARs

	CAR (-4/+4)	CAR (-3/+3)	CAR (-2/+2)	CAR (-1/+1)
Rookies	-0.002	-0.005*	-0.006**	-0.003**
	(0.003)	(0.003)	(0.003)	(0.001)
Country Specialists	-0.006	-0.007	-0.008	-0.003
	(0.006)	(0.006)	(0.005)	(0.003)
Industry Specialists	-0.003	0.002	-0.006	-0.000
	(0.017)	(0.016)	(0.014)	(0.007)
Experience-Based Top Advisors		(*excluded advisor category*)		
Sales Absolute (Log)	-0.001	-0.001	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.000)
EBITDA Margin	-0.028***	-0.029***	-0.031***	-0.004
	(0.010)	(0.009)	(0.008)	(0.004)
Relative Deal Size	-0.007***	-0.007***	-0.006***	-0.002**
	(0.002)	(0.002)	(0.002)	(0.001)
Target Advisor	-0.006	-0.005	-0.006	-0.000
	(0.006)	(0.005)	(0.005)	(0.002)
Further Deal-Level Controls	Yes	Yes	Yes	Yes
Time, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes
Constant	0.169*	0.133	0.128	0.013
	(0.100)	(0.094)	(0.084)	(0.043)
Selected				
Rookies	-0.140***	-0.140***	-0.140***	-0.140***
	(0.018)	(0.018)	(0.018)	(0.018)
Country Specialists	0.550***	0.550***	0.550***	0.550***
	(0.026)	(0.026)	(0.026)	(0.026)
Industry Specialists	-0.654***	-0.654***	-0.654***	-0.654***
	(0.090)	(0.090)	(0.090)	(0.090)
Experience-Based Top Advisors		(*excluded advisor category*)		
Sales Absolute (Log)	-0.048***	-0.048***	-0.048***	-0.048***
	(0.005)	(0.005)	(0.005)	(0.005)
EBITDA Margin	0.479***	0.479***	0.479***	0.479***
	(0.048)	(0.048)	(0.048)	(0.048)
Relative Deal Size	0.134***	0.134***	0.134***	0.134***
	(0.008)	(0.008)	(0.008)	(0.008)
Target Advisor	0.464***	0.464***	0.464***	0.464***
	(0.019)	(0.019)	(0.019)	(0.019)
Constant	-1.308***	-1.308***	-1.308***	-1.308***
	(0.033)	(0.033)	(0.033)	(0.033)
/Athrho	-0.042	-0.043	-0.035	-0.034
	(0.139)	(0.139)	(0.136)	(0.143)
/Lnsigma	-2.404***	-2.468***	-2.574***	-3.246***
	(0.009)	(0.009)	(0.009)	(0.009)
Observations	35,815	35,815	35,815	35,815

Notes: Entries report results from the Heckman selection model. The dependent variables are the *CARs* (*-1/+1*, *-2/+2*, *-3/+3*, *-4/+4*) of the acquirer. We use the covariates *Sales Absolute (Log)*, *EBITDA Margin*, *Target Advisor*, and *Relative Deal Size*. We replicate our analysis from section 3.5. to account for sample selection issues, analyzing the effect of *Experience-Based Top Advisors* on *CARs* compared to *Rookies*, *Country Specialists*, and *Industry Specialists*. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

3.7. Discussion and Conclusion

While the literature suggests the widespread defining of top advisors by market share, the value creation of top advisors (Golubov et al., 2012; Hunter & Jagtiani, 2003; Ismail, 2010; Kale et al., 2003) defined in this manner remains unclear. Contributing to another branch of literature in this field that addresses the impact of advisors' industry experience in the context of value creation on the buy side (Chang et al., 2016a; Hayward, 2003; Song et al., 2013; Stock, 2015; Wang et al., 2021), we have introduced the novel experience-based advisor typology, segmenting advisors into four distinct types based on prior industry and country experience as the basis for our identification strategy. We investigated the difference between two definitions of top advisors, disentangling reputation (deal volume, deal value, league tables ranking) from experience (industry and country track record) to contribute new insights that help us understand *when* advisors create value for their clients' shareholders. We implemented our identification strategy with regression, fixed effects, propensity score matching, and Heckman selection models, finding that deal volume and value as a combined indicator is not sufficient to assess the quality of an advisor for an acquirer. By segmenting buy-side advisors based on experience rather than pure deal volume and value, we find that advisor track record in the industry or country in which a specific client operates matters significantly to achieving higher CARs for clients' shareholders on the buy side.

We find that *Reputation-Based Top Advisors* do not create significantly positive *CARs* for their clients when compared to lower-ranked advisors. Segmenting the sample of advisors based on experience in the industrial sector and country of headquarters leads to result that reveal a significantly different effect of *Experience-Based Top Advisors* on pricing, premiums, returns, and deal completion than *Country Specialists*, *Industry Specialists*, and *Rookies*. We find that *Experience-Based Top Advisors* not only negotiate prices down but also achieve significantly higher returns for acquirers. Further, we

disentangle the impact of advisor specialization on specific industries and countries. Neither specialization provides significantly positive returns for acquirers in comparison to *Experience-Based Top Advisors*. Finally, we tested whether the most inexperienced advisors destroy value for their clients, finding that they do destroy value for their clients in terms of CARs. With these results, we contribute a new and important perspective to help answer the complex question of whether top buy-side advisors create value for their clients and suggest redefining the typical understanding of a top advisor based on industry and country experience rather than simply deal volume and value.

These results are also relevant for practitioners aiming to improve decision-making around advisor engagement. Which type of advisor creates value in a buy-side acquisition? Our research suggests that top advisors create significant value but should be chosen based on extensive experience in the industry and country of the advised M&A target rather than on deal volume, deal value, and league table positions. Further, our results suggest that acquirers should refrain from hiring inexperienced advisors or those with only an industry or a country specialization, as we see that *Rookies* destroy value. The complexity of an M&A transaction appears to require understanding both the sector-related particularities of an M&A target and that firm's country-specific aspects.

Appendix 3A: Definition of Terms

Term	Definition
Target Advisor	Financial advisor(s) to the target company, its management, or board of directors on a transaction.
Acquirer Advisor	Financial advisor(s) to the acquirer's company, its management, or board of directors on a transaction.
Deal Size	Value of Transaction ($M): Total value of the consideration paid by the acquirer, excluding fees and expenses. The dollar value includes the amount paid for all common stock, common stock equivalents, preferred stock, debt, options, assets, warrants, and stake purchases made within six months of the announcement date of the transaction. Liabilities assumed are included in the value if they are publicly disclosed. Preferred stock is included only if it is being acquired as part of a 100% acquisition. If a portion of the consideration paid by the acquirer is common stock, the stock is valued using the closing price on the last full trading day prior to the announcement of the terms of the stock swap. If the exchange ratio of shares offered changes, the stock is valued based on its closing price on the last full trading date prior to the date of the exchange ratio change. For publicly listed targets in 100% acquisitions, the number of shares at the date of announcement is used.
EBITDA Multiple	A financial ratio that compares a company's enterprise value to its annual EBITDA, it is used to determine the value of a company and compare it to the value of similar businesses. A company's EBITDA multiple provides a normalized ratio for differences in capital structure, taxation, and fixed assets and enables comparing disparate operations in different companies. The ratio takes a company's enterprise value (which represents market capitalization plus net debt) and compares it to the EBITDA for a given period.
Premium 1 day	Premium of the offer price to target closing stock price one day prior to the original announcement date, expressed as a percentage.
Premium 1 Week	Premium of the offer price to target closing stock price one week prior to the original announcement date, expressed as a percentage.
Premium 1 Month	Premium of the offer price to target closing stock price four weeks prior to the original announcement date, expressed as a percentage
Cumulative Abnormal Return(-1/+1)	The sum of the differences between the expected return (S&P 500 Index) on the acquirer's stock (for U.S. publicly listed firms) and the actual return during the event windows of one day prior and one day after the announcement of the acquisition.
Cumulative Abnormal Return (-2/+2)	The sum of the differences between the expected return (S&P 500 Index) on the acquirer's stock (for U.S. publicly listed firms) and the actual return during the event windows of two days prior and two days after the announcement of the acquisition.
Cumulative Abnormal Return (-3/+3)	The sum of the differences between the expected return (S&P 500 Index) on the acquirer's stock (for U.S. publicly listed firms) and the actual return during the event windows of three days prior and three days after the announcement of the acquisition.
Cumulative Abnormal Return (-4/+4)	The sum of the differences between the expected return (S&P 500 Index) on the acquirer's stock (for U.S. publicly listed firms) and the actual return during the event windows of four days prior and four days after the announcement of the acquisition.
Sales Absolute	Net sales represent sales receipts for products and services, net cash discounts, trade discounts, excise tax, and sales returns and allowances. Revenues are recognized according to applicable accounting principles.
EBITDA Absolute	Earnings before the deduction of interest, taxes, depreciation, and amortization; this is a non-GAAP calculation based on data from a company's income statement used to measure a company's operating profitability. Because EBITDA adds back to net income the non-cash accounting charges of depreciation and amortization and disregards interest paid on debt financing and income taxes on earnings, it is useful for measuring a company's operating cash flow and for comparing the profitability of companies with different capital structures and in different tax brackets. However, EBITDA does not measure and should not be confused with the actual cash flow of a company, which does account for interest paid on debt financing, income taxes, and other cash charges.
EBITDA Margin	EBITDA Absolute as a percentage of Sales Absolute.
Target Industry	Industry in which the M&A target operates.
Target Country	Country where the target company has its headquarters.
Acquirer Industry	Industry in which the acquiring company operates.
Acquirer Country	Country where the acquiring company has its headquarters.

Deal Status	Status of the transaction: (1) deal completed, (2) deal pending, (3) deal intended, (4) deal withdrawn, or (5) other deal status.
Form of Transaction	Scope of the transaction (e.g., full acquisition vs. acquisition of shares).

Appendix 3B: Figures - Propensity Score Matching Balance

Figure 3.2. Propensity Score Matching: Experience-Based Top Advisors Engagement Common Support Assessment on EBITDA Multiple

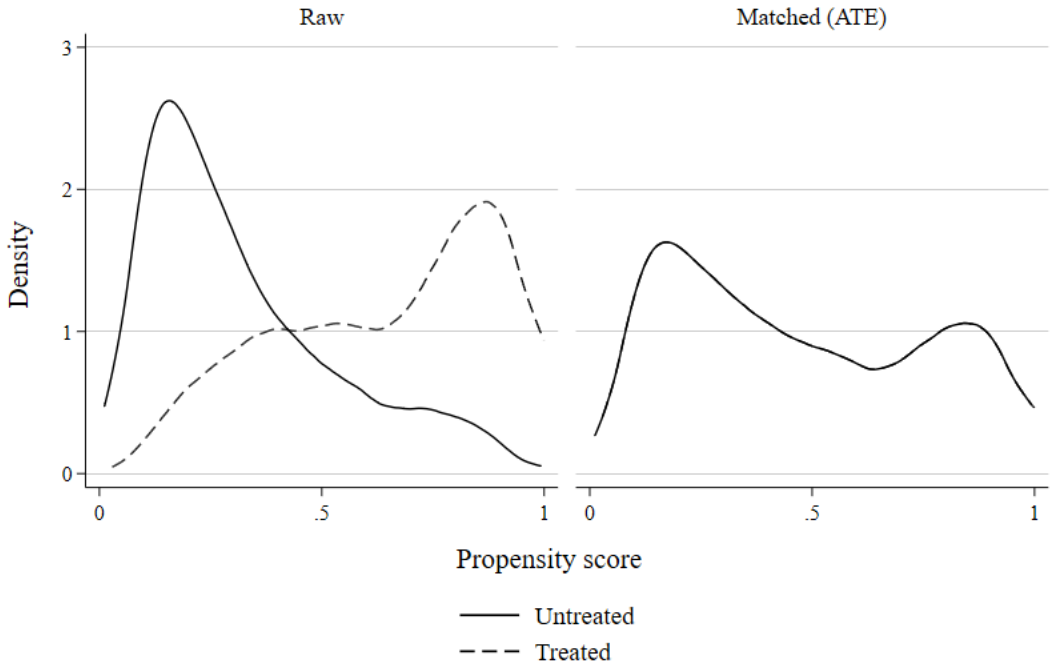


Figure 3.3. Propensity Score Matching: Experience-Based Top Advisor Engagement Common Support Assessment on Premium 1 Day

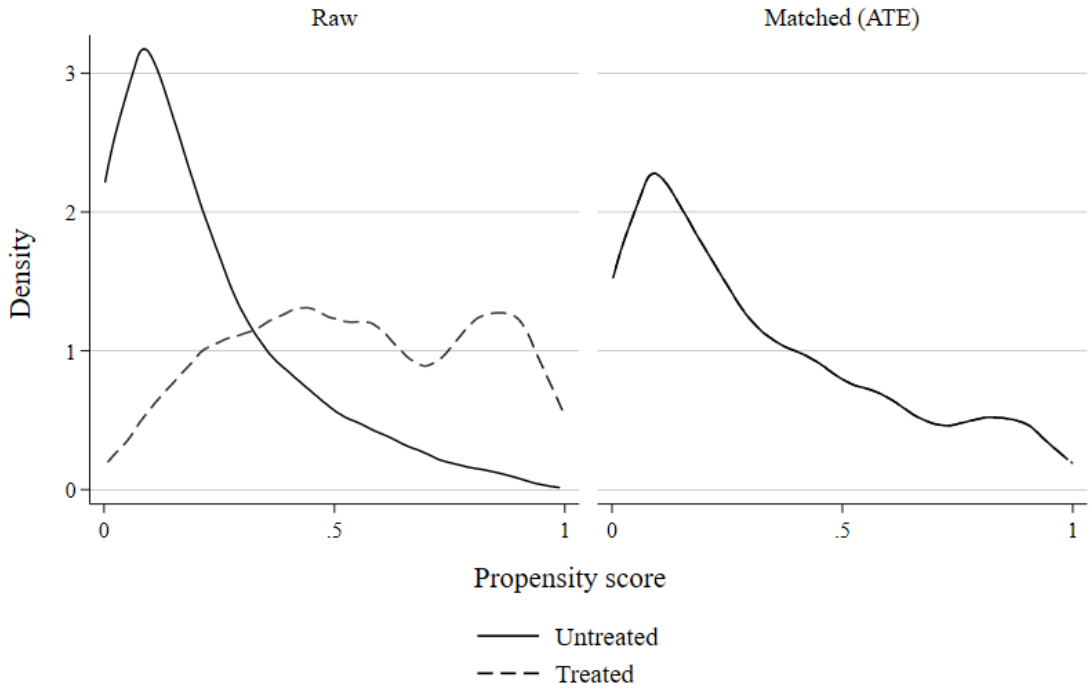


Figure 3.4. Propensity Score Matching: Experience-Based Top Advisor Engagement Common Support Assessment on Premium 1 Week

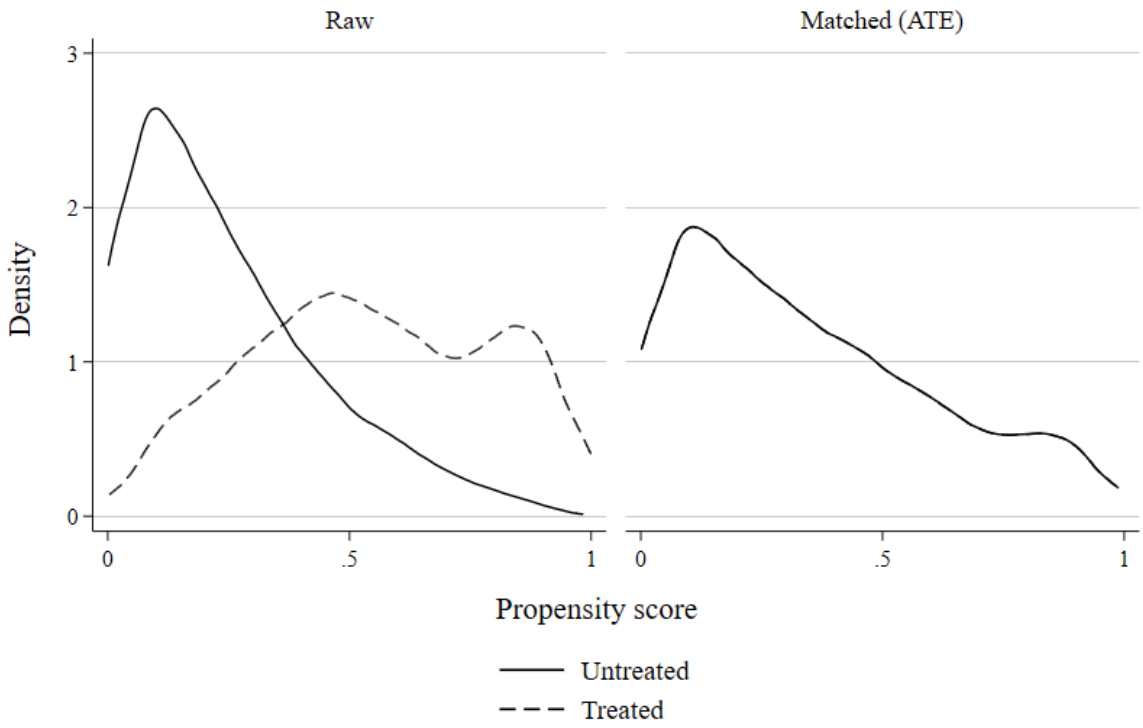


Figure 3.5. Propensity Score Matching: Experience-Based Top Advisor Engagement Common Support Assessment on Premium 1 Month

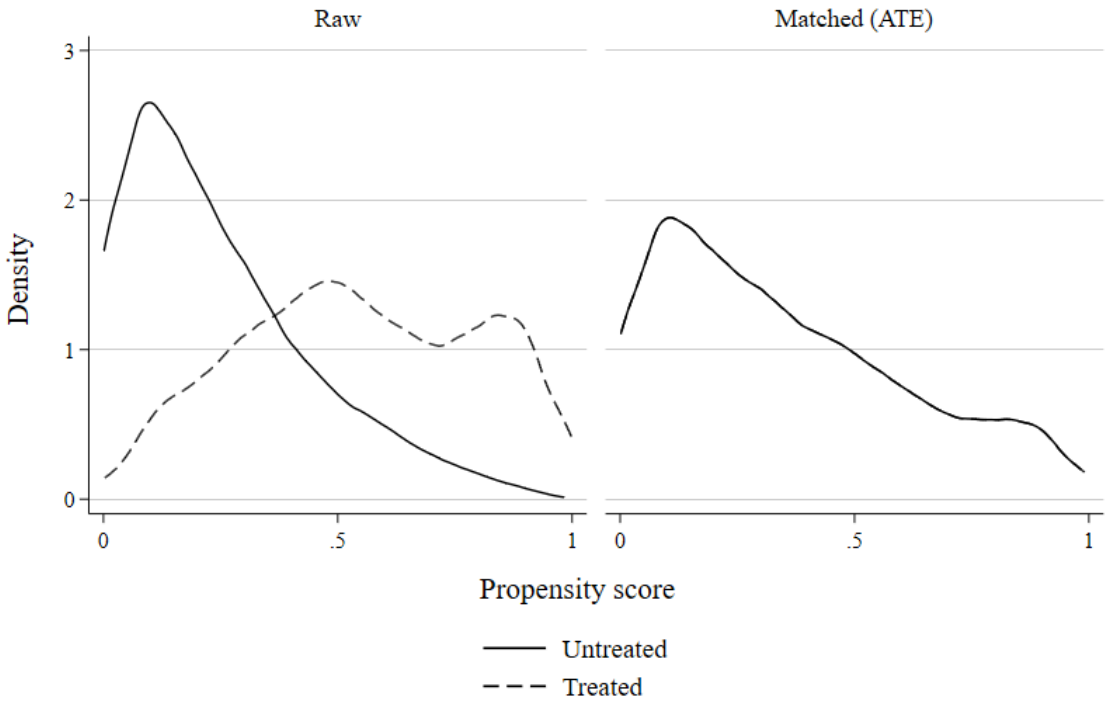


Figure 3.6. Propensity Score Matching: Experience-Based Top Advisor Engagement Common Support Assessment on CARs (+1/-1)

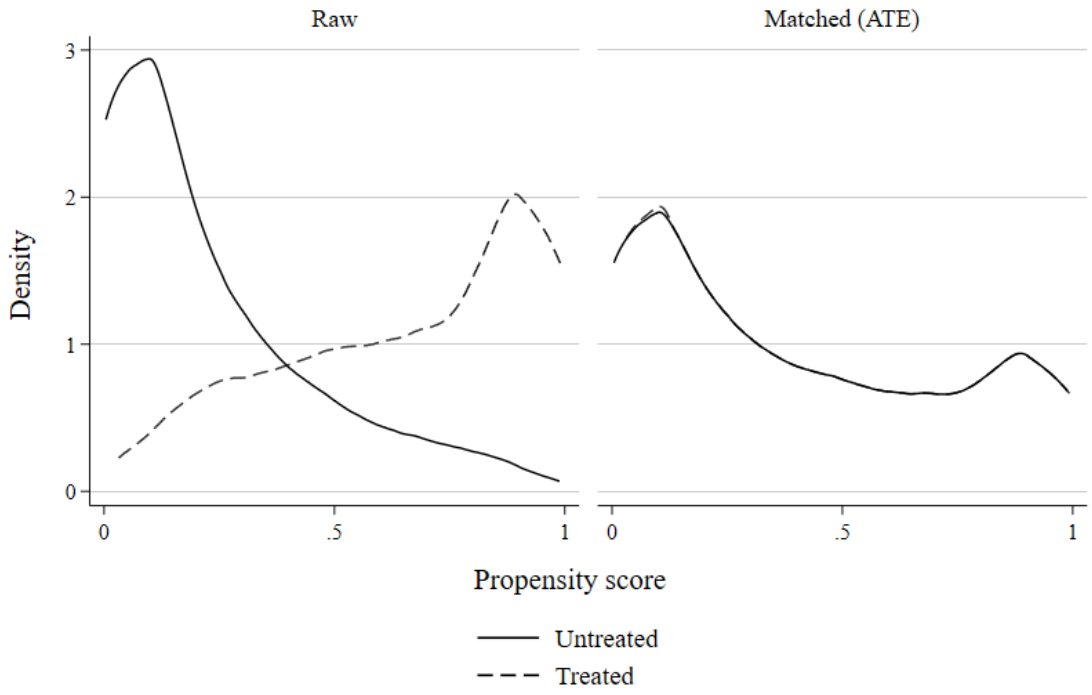


Figure 3.7. Propensity Score Matching: Experience-Based Top Advisor Engagement Common Support Assessment on CARs (+2/-2)

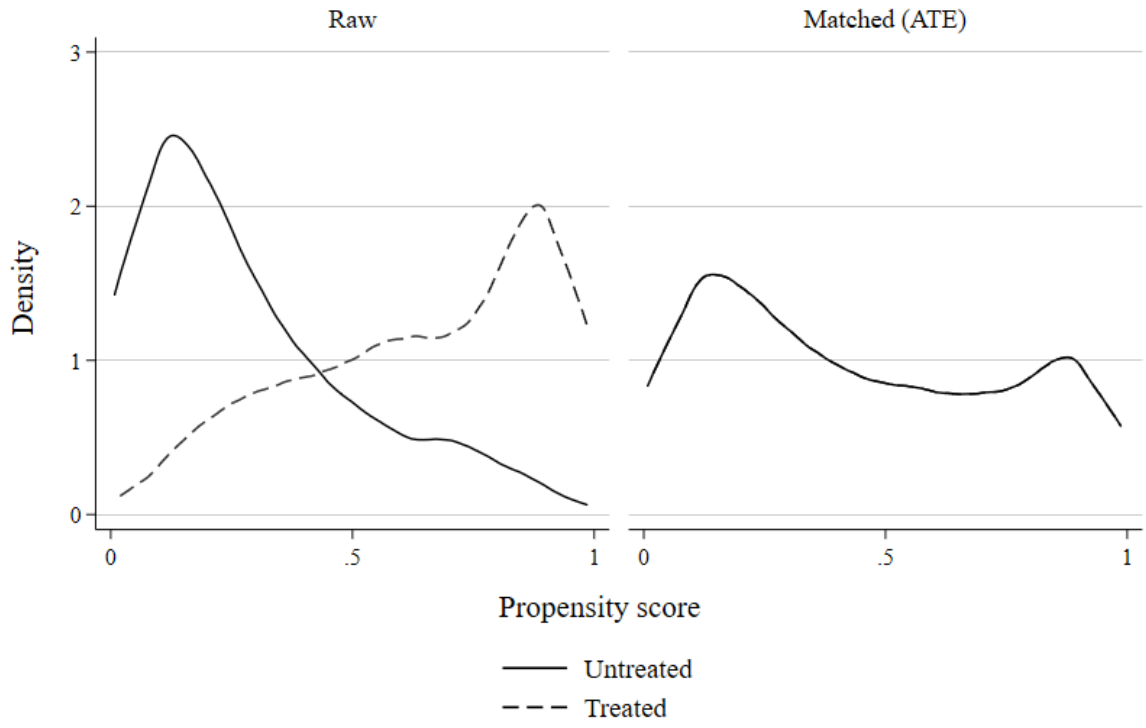


Figure 3.8. Propensity Score Matching: Experience-Based Top Advisor Engagement Common Support Assessment on CARs (+3/-3)

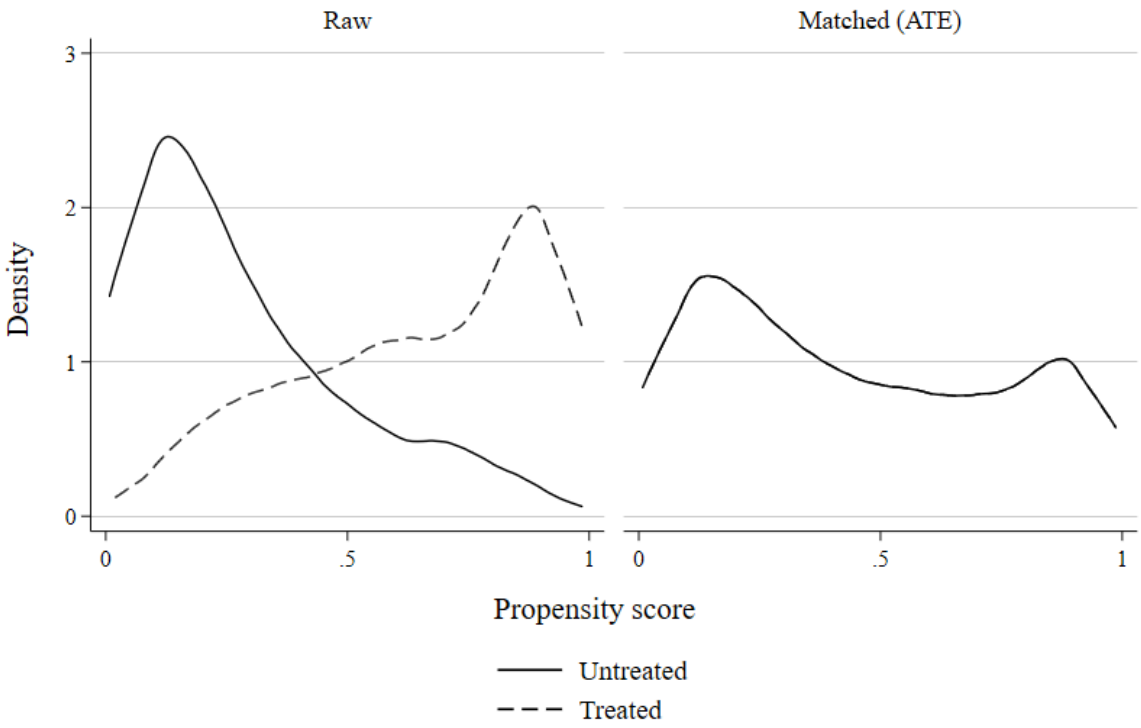


Figure 3.9. Propensity Score Matching: Experience-Based Top Advisor Engagement Common Support Assessment on CARs (+4/-4)

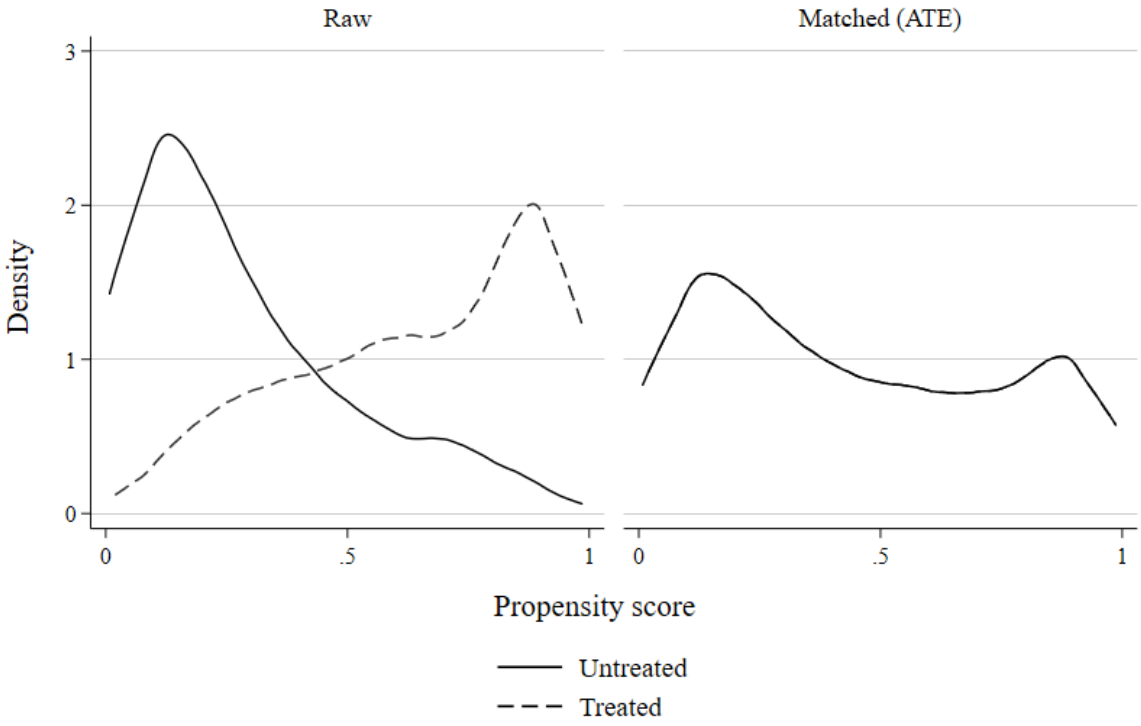
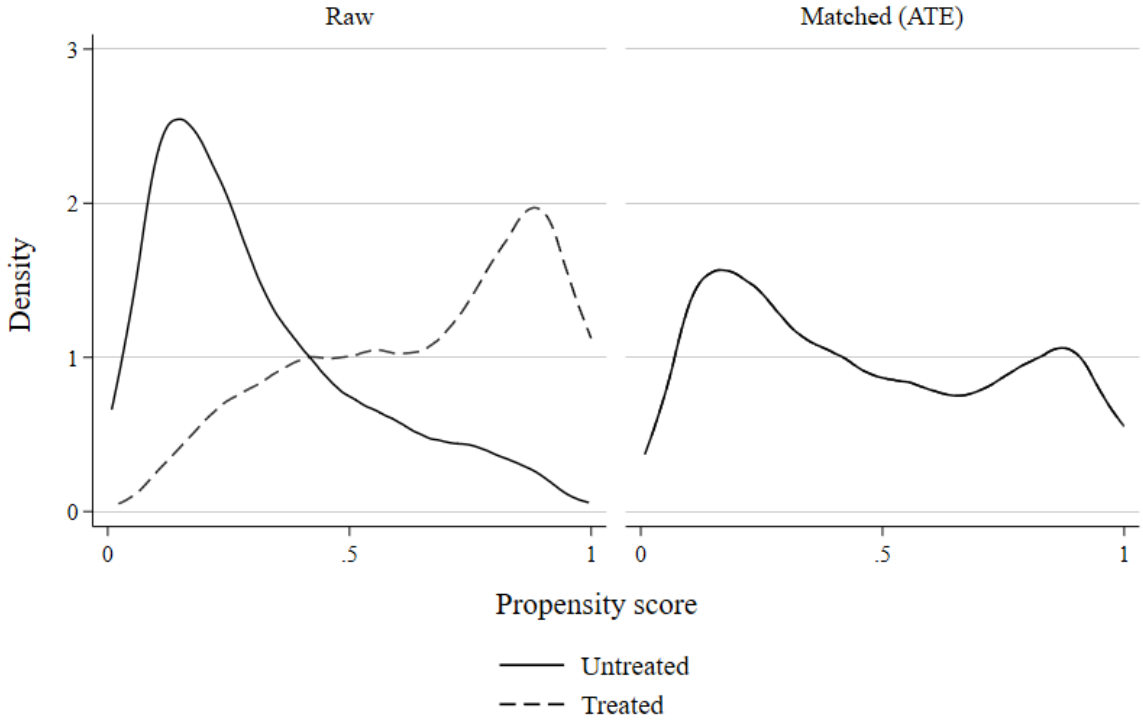


Figure 3.10. Propensity Score Matching: Experience-Based Top Advisor Engagement Common Support Assessment on Deal Completed



Chapter 4: The Impact of the Lehman Shock on the Strategic and Financial Decision-Making of Former Clients in M&A

Abstract: We examine the impact of the collapse of Lehman Brothers on the strategic and financial decision-making of its former clients in the M&A context. First, we investigate whether and how those clients changed their risk appetite in terms of strategic growth paths. Second, we analyze how firms' risk preferences in terms of deal size and willingness to pay have changed as a consequence of the demise of their former M&A advisor. In our event study, we implement difference-in-differences and fixed effects models for the periods six years prior to and six years after the collapse of Lehman. We find converging evidence that, after that event, this group showed a lower risk appetite in their strategic expansion paths and preferred smaller transactions while displaying less of a willingness to pay high premiums. Further, this group reduced its trust in external advice and was less likely to complete deals. We compare these behavioral patterns with comparable acquirers (other top investment banks' clients), finding that this group even increased its preference for large deals, paid higher premiums, and placed greater trust in external advice. We conclude that the Lehman shock changed the strategic and financial decision-making of acquirers with a direct relationship to the bank toward less risky M&A conduct, even as the risk appetite of their peers increased. These results offer supporting evidence to prior research on the effects of macroeconomic, natural, or personal-life shocks on decision-making and risk preferences of firms and top executives.[19]

[19] I am grateful for the helpful comments by Malcolm P. Baker, Christian Conrad, and Christiane Schwieren.

4.1. Introduction

The question of how formative experiences, such as macroeconomic crises like the Great Depression or early-life disasters, impact strategic and financial decision-making has received considerable attention in the corporate behavioral finance literature. Prior research shows that executives' exposure to macroeconomic events impacts their corporate finance strategy and risk preferences (Dittmar & Duchin, 2013, 2015; Graham & Narasimhan, 2004; Knüpfer et al., 2017; Malmendier & Nagel, 2011; Schoar & Zuo, 2017). Another stream of research shows the effect of personal life experiences on executives' decision-making in terms of corporate financial policies (Bernile et al., 2016; Cameron & Shah, 2015; Malmendier et al., 2011). In this chapter, we contribute insights into how the 2008 financial crisis impacted executives' strategic and financial decision-making in terms of M&A. More precisely, we examine how the collapse of Lehman Brothers impacted the strategic and financial decision-making of acquirers that were its former clients. The demise of this once-prestigious investment bank serves as a unique natural experimental setting: we investigate whether and to what degree former Lehman clients changed their strategic growth agendas in terms of cross-industry and cross-country acquisitions and how their appetite for large deals and willingness to pay changed.

M&A are among the largest investments that a firm will ever undertake. Thus, few strategic and financial decisions have such crucial importance for the success or failure of a firm as the decision to engage in M&A. Inspired by the framework established by Ansoff (1965), we define four different strategic growth paths for acquirers. First, acquirers can choose to expand the core business (*Core Expansion*) by acquiring firms that operate in the same sector and country of the firm's existing operations and headquarters location. Second, acquirers can decide to buy M&A targets in the same sector but in a different and thus complementary

country of operations (*Regional Expansion*). Third, they can choose to acquire firms in a different industrial sector but in the same country (*Product or Technology Expansion*). Finally, acquirers can diversify their business portfolio by taking over firms from a different industrial sector in a different country of operations (*Diversification*). In our analysis, we use this framework to investigate how the collapse of Lehman Brothers changed the strategic agenda of firms it had previously advised. Further, we investigate whether and how the financial decision-making of former Lehman clients changed with its collapse. More specifically, we analyze whether former Lehman clients changed their acquisition preferences in terms of deal size and willingness to pay in terms of EBITDA Multiples and Premiums. By investigating both strategic and financial decision-making, we derive converging evidence of these acquirers' general decision-making behavior, as these dimensions represent the two most important decision sets that are made by firms and thus their boards of directors. To summarize, our research investigates the following research questions:

1. *How did the risk appetite of former Lehman Brothers clients change after the Lehman collapse in terms of strategic decision-making?*
2. *How did the risk preference of former Lehman Brothers clients change after the Lehman collapse in terms of financial decision-making?*
3. *How did trust in external advice and ability or willingness to close deals change after the Lehman shock?*
4. *How did strategic and financial decision-making of peer acquirers who engaged other top investment banks change in terms of risk-taking?*

Our identification strategy relies on investigating the behavioral change of our treatment group by implementing difference-in-differences and fixed effects models. While *Former Lehman Clients* is defined as our treatment group, we measure the effects each has against two control groups. We implement *All Other Acquirers* in the relevant period as our first control group and *Other Former Top Investment Bank Clients* as our second control group. To understand the

extent to which the Lehman collapse may have affected the decision-making of not only former Lehman clients but also the entire group of acquirers who trusted top investment banks in general, we replicate our difference-and-differences and fixed effects models with *Former Other Top Investment Bank Clients* as our second treatment group and measure them against *All Other Acquirers* in each period. We explain our results, considering the impact of experience and external advice on strategic and financial decision-making.

4.2. Literature Review

4.2.1. The Impact of Formative Experiences on Strategic and Financial Decision-Making in M&A

The question of how experience impacts managerial decision-making has been the subject of a large body of research. Dittmar and Duchin (2015) study the effect of a manager's professional experience on corporate financial policy, finding that experience has a stronger influence when it is more recent and occurs during salient periods in a manager's career. Graham and Narasimhan (2004) examine whether experiences during the Great Depression had a lasting effect on corporate decisions, finding that the economic downturn affected the decision-making of executives in terms of the use of debt. They find that firms led by managers who experienced the Depression chose to carry relatively little debt. Xianjie et al. (2017) found that economic conditions at the time an auditor enters the labor market have a long-term impact on that person's decision-making. Auditors who started their careers during economic downturns issue audit adjustments more frequently. Knüpfer et al. (2017) trace the impact of formative experiences on portfolio choice in the context of the Finnish Great Depression (1991–1993). They found that adversely affected professionals are less likely to invest in risky assets; they observe a similar effect in private-life decisions, finding that individuals whose neighbors and

family members experience adverse circumstances also avoid risky investments. Malmendier and Nagel (2011) investigate whether individuals' experiences of macroeconomic shocks affect financial risk-taking, finding that individuals who have experienced low stock market returns throughout their lives report less of a willingness to take financial risks, are less likely to participate in the stock market, invest a lower fraction of their liquid assets in stocks if they participate at all, and are more pessimistic about future stock returns. They also found that recent experiences have a stronger effect. Schoar and Zuo (2017) show that managers who enter the job market during recessions have more conservative decision-making styles, such as lower investment in capital expenditure, less funding of research and development, a tendency toward cost-cutting, and lower leverage and working capital needs.

Malmendier et al. (2011) investigate how early-life experiences of managers impact their later decision-making and report that CEOs who grew up during the Great Depression are averse to debt and lean excessively on internal finance, while CEOs with military experience pursue more aggressive policies, including increasing leverage. Bernile et al. (2016) examine the effect of early-life disasters on CEO behavior, suggesting that CEOs who experience fatal disasters without extremely negative consequences to themselves lead firms that behave more aggressively. They found that these decision patterns manifest across decisions upon leverage, cash holdings, and acquisition activities, concluding that CEOs' disaster experiences have real economic consequences on firm riskiness and cost of capital. Cameron and Shah (2015) investigate whether experiencing a natural disaster affects risk-taking behavior, finding that individuals who have recently suffered a flood or earthquake exhibit greater risk aversion. Fernando et al. (2012) analyze whether firms derive value from investment banking relationships by studying how the Lehman collapse affected industrial firms that received underwriting, advisory, analyst, and market-making services from Lehman.

Traumatic events such as economic shocks, natural catastrophes, or highly negative life experiences not only have an impact on individual career choices and paths but also influence general strategic and financial decision-making behavior. In this chapter, we provide evidence showing how the Lehman collapse influenced its former clients in their strategic and financial M&A decision-making. Further, we compare the effects of the collapse of Lehman on the decision-making of acquirers who engaged a direct competitor of Lehman and are thus other top investment advisors. We investigate how the collapse of one leading investment bank affects the general perception of investment bank advice among corporate acquirers and their subsequent decision-making.

4.2.2. The Engagement of Advisors for Strategic and Financial Decision-Making in M&A

M&A decision-making is supported and influenced by external advisors. Throughout the process of identifying, analyzing, and negotiating an M&A transaction, financial advisors can be hired to facilitate the process by providing services and technical expertise in valuation, negotiation, and industry-specific factors. Advisor roles encompass M&A management, including the initiation and subsequent coordination of transaction parties' management meetings and negotiations, often as the counterpart to advisors on the other side of a transaction. In this role as orchestrator, the financial advisor usually also supports the coordination of other advisors, such as the client's legal, tax, or strategic advisors. Buy-side financial advisors support not only the identification of the M&A target but also deliver essential strategic and financial due diligence services, which refer to the validation of the seller's price expectation based on the management business case shared with the potential buyer.

Therefore, the motives to engage advisors are mainly to support strategic and financial decision-making. Chang et al. (2016a) identify M&A advisors' industry experience and market knowledge as key decision factors for firms in hiring them, supporting the effectiveness and

efficiency of strategic and financial decision-making of their clients. Servaes and Zenner (1996) suggest that the main motive for a firm to engage a financial advisor in M&A is to reduce transaction costs, aiming to capitalize on the advisor's prior industry and country experience.

With our event study, we contribute further evidence on how the relationship between the treatment group and buy-side advisors has changed. More precisely, we investigate whether and how the dramatic experience of Lehman's collapse altered not only strategic and financial decision-making, but also whether the treatment group lost trust in advisors in general after the collapse of the once-renowned investment bank.

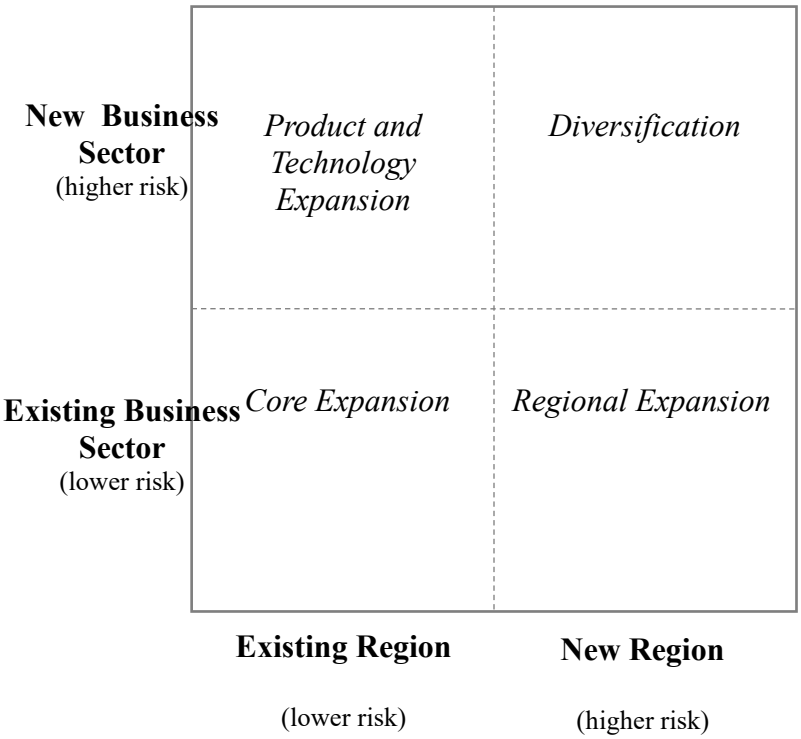
4.3. Theoretical Framework

4.3.1. Theoretical Framework for Strategic Decision-Making in M&A

The decision to acquire a firm or asset is driven by two central aspects: strategic and financial rationales (Haspeslagh & Jemison, 1991; Singh & Montgomery, 1987; Straub et al., 2012; Walter & Barney, 1990). Strategic decision-making is driven by the question, "Where to play?" (Lafley & Martin, 2013; Stanwick & Stanwick, 2001), considering strategic growth paths such as penetration of the core business, expansion into adjacent industries and geographies, and exploring new and emerging fields. The authors suggest M&A as one lever for successfully implementing corporate strategy. Grave et al. (2012) investigate how the global financial crisis has changed the landscape for M&A and suggest that companies have started to focus more intently on implementing M&A strategies that include gaining access to new geographies. Ansoff (1965) suggests a framework for strategic growth that comprises penetration and/or expansion of existing products and customer markets. Inspired by Ansoff's matrix, which primarily refers to organic strategic growth focused on products and customer markets, we

introduce the M&A growth matrix as an analytical framework to measure the key decision dimensions on which acquirers primarily base their strategic growth paths (see Figure 4.1.).

Figure 4.1. M&A Growth Matrix: Framework for Strategic Decision-Making in M&A



First, *Core Expansion* refers to growth via acquisitions of M&A targets that operate in the same sector and region, such as the takeover of a direct competitor. This mode allows acquirers to gain market share and eliminate competition and seeks to strengthen the core strategic positioning and improve bargaining power with suppliers and customers. For example, in 2005, Siegwerk, a German packaging ink supplier, acquired the Swiss group SICPA's packaging ink business. With this acquisition, Siegwerk gained significant market share in the packaging ink industry, becoming one of the top three suppliers in the world.

Second, *Product and Technology Expansion* defines the strategic mode for acquiring assets that operate in the same region but complement the acquirer in terms of products and services or with new technologies. The strategic rationale for this type of acquisition is to

broaden the portfolio of offerings to better meet customer needs in the domestic market. An example of this strategic mode is the acquisition of LinkedIn by Microsoft in 2016, which expanded the latter firm's product and technology portfolio with the world's leading professional social network.

Third, *Regional Expansion* refers to the strategic mode of acquiring assets that operate in the same business sector but are production facilities or sales operations in areas where the acquirer is not currently active. The rationale for this acquisition path is to expand a firm's regional footprint, gaining access to new customers but also hedging potential country risks, thus lowering risk exposure to country-related issues like political changes or new domestic regulations affecting the business model of the larger firm. Here, the acquisition of the Swiss chemical firm Syngenta by the Chinese chemical firm ChemChina is an example. ChemChina strengthened its geographical presence in Europe, increasing its proximity to European customers.

Fourth, *Diversification* is the most complex and thus riskiest strategic path. It refers to acquisitions of firms with a complementary product and/or technology portfolio and a complementary regional footprint. The strategic rationale is based on the ambition to "re-invent" or "refresh" the existing business model, often triggered by the anticipation of rapidly changing customer needs or macroeconomic trends threatening the core business.

4.3.2. Theoretical Framework for Financial Decision-Making in M&A

The decision to define the strategic growth path of the decision is woven into the question of which prices and premiums to pay to realize the envisioned growth ambition. The price and premium of an M&A target are driven by the size of that target, its profitability, and, as a consequence, its expected cash flow. In addition, the acquirer's expected revenue and cost synergies, its opportunity cost of capital, and confidence in the M&A target's long-term

business model and growth as reflected in the terminal growth rate are all key factors in the valuation process. Finally, the historical and current relative price levels paid for comparable transactions are relevant factors to consider when making a price decision in M&A. Therefore, to investigate financial decision-making, we consider the variables *Deal Size*, *Sales Absolute*, *EBITDA Margin*, *EBITDA Multiple*, and *Premiums* to measure the effects of the Lehman collapse on acquirers' preferences in terms of size of transactions and willingness to pay. The decision in favor of a large or small transaction is driven by the acquirer's preference for risk, as the opportunity for a big deal and thus larger absolute gains in areas like sales, profits, and cash flows also imply the threat of larger amounts of absolute losses rooted in unrealized synergies and/or overpayment. The acquirer's willingness to pay is reflected in the *EBITDA Multiples* and *Premiums* to which it agrees. Ultimately, the higher the willingness to pay, the more absolute synergies with the existing business the acquirer expects and/or the higher the confidence of the acquirer in the future cash flows of the business it is acquiring. Therefore, a preference for bigger deals and higher premiums reflects a preference for larger opportunities while accepting larger risks.

The strategic and financial dimensions represent the two key decision fields in M&A; thus, understanding how behavioral patterns changed in these dimensions will help reveal any change in a firm's policy in terms of inorganic growth. Below, we conduct an event study with data from Thomson Reuters SDC and implement difference-in-differences and fixed effects models to investigate whether and how the strategic and financial decision-making of former Lehman and other top investment bank clients changed as a consequence of the Lehman collapse on September 15, 2008.

4.4. Data and Methodology

4.4.1. Data

We used the Thomson Reuters SDC database on M&A transactions to gather all reported M&A transactions between 2002 and 2014, which represent the six years prior to and after Lehman's collapse. Data are sourced through direct deal submissions from global banking and legal contributors, coupled with extensive research carried out by a global research team that collected data from regulatory filings, corporate statements, media, and pricing wires. According to Thomson Reuters, more than 2,500 control validations occur at the point of data entry. Further, we focus on transactions with a deal size above $0.5M and exclude transactions with negative *EBITDA Margins* (technically defined below).[20]

4.4.2. Variables to Measure Strategic Decision-Making in M&A

The key variables of interest for measuring strategic decision-making in this study are *SameIndustrySameCountry*, *SameIndustryDifferentCountry*, *DifferentIndustrySameCountry*, and *DifferentIndustryDifferentCountry*; all four are binary indicators. *SameIndustry-SameCountry* is coded one when the acquirer took over a firm in the same industrial sector with its headquarters in the same country; otherwise, it is zero. This variable refers to the strategic mode *Core Expansion* as defined in our M&A growth matrix in Section 4.3. Similarly, *SameIndustryDifferentCountry* is coded one when the transaction was reported as an acquisition in the same industrial sector but a different headquarters country. This variable indicates the growth strategy *Regional Expansion* from our analytical framework. Acquisitions conducted with the strategic mode of *Product and Technology Expansion* in the same country

[20] Firms with a negative *EBITDA Margin* and negative *Sales Absolute* are excluded from our analysis because the *EBITDA Multiple* is not a robust valuation indicator for such assets. We exclude a total of 607 initiated transactions due to negative *EBITDA Margins* or *EBITDA Margins* larger than 1 and negative *Sales Absolute*.

as the buyer's headquarters refer to the variable *DifferentIndustrySameCountry*, which is coded one if that is the case; otherwise, it is zero. Finally, *DifferentIndustryDifferentCountry* is set at one for a transaction in a different industrial sector and a different country, indicating the strategic growth path *Diversification* in our M&A growth matrix. Besides these indicators, we further include *Acquirer Advisor Engagement* and *Deal Completion* as (binary) variables for investigating the strategic decision behavior of our treatment group. *Acquirer Advisor Engagement* is reported as one when a buy-side financial advisor was reported in the respective transaction; otherwise, it is zero. *Deal Completion* is reported as one when the transaction is reported as completed; otherwise, it is zero.

4.4.3. Variables to Measure Financial Decision-Making in M&A

The key variables of interest in this study for measuring financial decision-making are *Deal Size* (selling price), *Sales Absolute* (revenues), and *EBITDA Margin* (profitability). To construct a measure of relative deal pricing, we use *Deal Size* and the target's next twelve months' earnings forecast, *EBITDA Absolute*, in the year of the transaction. *EBITDA Absolute* is a profitability indicator defined by the absolute amount of earnings before interest, tax, and depreciation, and amortization (see Appendix 4A). *EBITDA Absolute* and *Deal Size* values are reported in U.S. dollars. We measure relative deal price using the *EBITDA Multiple*, defined as the ratio of *Deal Size* to *EBITDA Absolute* of the M&A target. This is a measure for indicating relative deal pricing in M&A transactions and is widely used in the M&A context and valuing businesses in general (Damodaran, 2005; Koller et al., 2010; Loughran & Wellman, 2011). The *EBITDA Multiple* allows for the comparison of negotiated deal terms regardless of the size of the M&A target. This is essential in our analysis, as we observe a high variation of transactions and firm sizes in our data set. Because of the highly skewed distribution of the *EBITDA Multiple*, we transform it into its logarithm, indicated by the

variable *EBITDA Multiple (Log)*, in our analyses. Finally, we define the premiums paid by acquirers, *Premium 1 Day*, *Premium 1 Week*, and *Premium 1 Month*, as the difference between the offer price and the target's closing stock price one day (one week, one month) before the original announcement date, all expressed as percentages. To account for outliers, we winsorize the premiums at the 1% and 99% levels. *Premiums* and *EBITDA Multiple* are our key variables for investigating the treatment group's willingness to pay.

Given the heterogeneity of our sample of transactions, we include an extensive set of control variables. These include the size of the M&A target, defined by the variable *Sales Absolute* and measured in U.S. dollars. We transform *Sales Absolute* into its logarithm, indicated by the variable *Sales Absolute (Log)*, because of its highly skewed distribution. Further, we use the profitability of the M&A target, defined by the variable *EBITDA Margin*, which is calculated by annual *EBITDA Absolute* over annual *Sales Absolute*. Finally, we include time, country, and industry fixed effects.

4.4.4. Design of Event Study

We set up our event study with three different specifications in terms of treatment and control groups. First, we construct the presence of former buy-side Lehman clients with a binary indicator. The variable *Former Lehman Client* is one if the acquirer engaged Lehman Brothers at least once as a buy-side advisor in the six years before September 15, 2008; it is zero otherwise. All acquirers indicated as *Former Lehman Clients* form Treatment Group 1. Second, we define the binary variable *All Other Acquirers*, which refers to acquirers that had not engaged Lehman in the six years before its collapse. The firms that make up *All Other Acquirers* are Control Group 1. The objective of this specification is to understand whether and how the behavior of former Lehman clients changed compared to all other acquirers, allowing them to derive general observations in a first step.

For our second experimental specification, we create the binary variable *Other Top IB Clients*, which is one for an acquirer that hired a top investment bank other than Lehman Brothers at least once in the six years before the Lehman bankruptcy. The top investment banks are Goldman Sachs, Morgan Stanley, JP Morgan, Merrill Lynch, Citi Group, Barclays, Credit Suisse, RBC Capital Markets, UBS, and Wells Fargo (Shobhit, 2019). We then designate all *Top IB Clients* as Control Group 2 and compare the behavioral change of *Former Lehman Clients* with *Top IB Clients*. The function of this specification is to understand how former Lehman clients' behavior changed compared to clients from other top investment banks.

Our third experimental setup defines *Top IB Clients* as Treatment Group 2 and *All Other Acquirers* as Control Group 2. With this analysis, we investigate differences in the behavior of other top investment banks compared to all other acquirers, allowing us to observe general behavioral changes.

Table 4.1. presents descriptive statistics for all variables used in this chapter. We summarize the data for the two time periods of our event study. Period 1 runs from September 15, 2002 to September 15, 2008, and Period 2 begins immediately after the collapse and runs from September 16, 2008 to September 15, 2014.

Table 4.1. Summary Statistics—Before and After Lehman Collapse

	September 15, 2002 to September 15, 2008					*September 16, 2008 to September 15, 2014*				
Variable	Obs.	Mean	Std. Dev.	Min.	Max.	Obs.	Mean	Std. Dev.	Min.	Max.
Strategic Growth Mode										
Core Expansion	8,598	0.279	0.448	0	1	6,335	0.26	0.439	0	1
Regional Expansion	8,598	0.1	0.3	0	1	6,335	0.102	0.302	0	1
Product and Technology Expansion	8,598	0.489	0.5	0	1	6,335	0.495	0.5	0	1
Diversification	8,598	0.132	0.339	0	1	6,335	0.143	0.35	0	1
Financial Transaction Profile										
Deal Size ($M)	8,598	762.66	2151.898	0.505	15025.07	6,335	702.646	1944.095	0.505	15025.07
Deal Size (Log)	8,598	4.548	2.168	-0.683	9.617	6,335	4.468	2.225	-0.683	9.617
EBITDA Multiple	8,598	20.701	51.557	0.003	917.582	6,335	18.809	54.13	0.001	978.167
EBITDA Multiple (Log)	8,598	2.277	1.153	-5.809	6.822	6,335	2.132	1.194	-6.908	6.886
Sales Absolute ($M)	8,590	707.325	1961.42	1.483	14426.23	6,330	777.189	2054.144	1.483	14426.23
Sales Absolute (Log)	8,590	4.728	1.979	0.394	9.577	6,330	4.958	1.888	0.394	9.577
EBITDA Margin	8,598	0.183	0.175	0.001	1	6,335	0.182	0.169	0.001	1
Premium 1 Day	4,904	21.221	33.472	-70.83	202.2	4,072	29.076	43.555	-70.83	202.2
Premium 1 Week	4,904	23.836	34.955	-71.43	212	4,076	31.238	44.722	-71.43	212
Premium 1 Month	4,900	26.974	37.466	-72.03	223.56	4,063	34.442	47.464	-72.03	223.56
Acquirer and Advisor Types										
Former Lehman Clients	8,598	0.138	0.345	0	1	6,335	0.098	0.297	0	1
Top IB Clients	8,598	0.487	0.5	0	1	6,335	0.461	0.499	0	1
Target Advisors	8,598	0.622	0.485	0	1	6,335	0.617	0.486	0	1
Acquirer Advisors	8,598	0.566	0.496	0	1	6,335	0.558	0.497	0	1
Target and Public Status										
Completed	8,598	0.83	0.375	0	1	6,335	0.822	0.382	0	1
Public	8,598	0.668	0.471	0	1	6,335	0.744	0.437	0	1
Subsidiary	8,598	0.121	0.326	0	1	6,335	0.117	0.322	0	1
Private	8,598	0.206	0.404	0	1	6,335	0.134	0.34	0	1
Deal Attitude										
Friendly	8,598	0.889	0.314	0	1	6,335	0.912	0.283	0	1
Neutral	8,598	0.051	0.219	0	1	6,335	0.019	0.135	0	1
Hostile	8,598	0.011	0.102	0	1	6,335	0.008	0.088	0	1
Other Attitude	8,598	0.049	0.217	0	1	6,335	0.061	0.24	0	1

Notes: We used the Thomson Reuters SDC Platinum database to gather all reported M&A transactions six years prior to and after the collapse of Lehman Brothers on September 15, 2008. Data are sourced through direct deal submissions from global banking and legal contributors, coupled with extensive research performed by a global research team that collected data from regulatory filings, corporate statements, media, and pricing wires with more than 2,500 control validations. To account for outliers, we winsorize the variables *Premium* (*1 day*, *1 week*, *1 month*) and *Deal Size* ($M). Further, we focus on transactions with a deal size above $0.5M and exclude transactions with negative *EBITDA Margins* but otherwise make use of the full data set.

Our sample includes 8,598 transactions and 6,335 transactions in Periods 1 and 2, respectively. In terms of acquirers' chosen strategic growth path, *Product and Technology Expansion* was the most frequent choice via M&A, involving approximately 48.9% and 49.5% of all transactions in the pre- and post-collapse time frames, respectively. *Core Expansion* was 27.9% and 26.0%, respectively. *Diversification* was 13.2% and 14.3% in Periods 1 and 2, respectively, and *Regional Expansion* accounted for 10.0% and 10.2% in the two time periods. In terms of financial profiles of transactions conducted, our sample includes an average *Deal Size* of approximately $762.66 million before and $702.65 million after Lehman collapsed. The size of the M&A targets was on average $707.33 million and $777.19 million, respectively, while *EBITDA Margins* were reported at an average of 18.3% for Period 1 and 18.2% for Period 2. *Premiums* paid on average in Period 1 ranged between 21% and 27%; they were 29%–34% in the six years after the collapse.

4.5. Identification Strategy and Main Results

4.5.1. Difference-in-Differences Methodology

To identify treatment effects, we implement our difference-in-differences model for the three specifications described in Section 4.4.4. We derive difference-in-differences estimates using OLS in repeated cross-sections of data on M&A clients with the support of top investment banks at least once six years before the collapse of Lehman Brothers, referring to our Treatment Group 1 and Control Group 1 in this period. We compare the results of the periods six years prior to and six years after the event. We estimate the following regression using OLS:

$$y = \beta_0 + \beta_1 dB + \delta_0 d2 + \delta_1 d2 * dB + u \quad (1),$$

where *y* is the dependent variable and *d2* is a dummy variable for the second period. The binary variable *dB* captures possible differences between the treatment and control groups before the

event. The coefficient of interest, δ_1, multiplies the interaction term, *d2 * dB*, which is the same as a dummy variable equal to one for those observations in the treatment group in the second period. The difference-in-differences estimate is as follows:

$$\hat{\delta} = (\bar{y}_{B,2} - \bar{y}_{B,1}) - (\bar{y}_{A,2} - \bar{y}_{A,1}) \quad (2)$$

On this basis, we specify our difference-in-differences as follows: our dependent variables *y* to analyze the behavioral change in terms of strategic decision-making are (1) *Core Expansion*, (2) *Regional Expansion*, (3) *Product or Technology Expansion*, and (4) *Diversification*. Further, we add (5) *Acquirer Advisor Engagement* and (6) *Deal Completion*. Our treatment variable is *Former Lehman Clients after Crisis*. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include the further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form).

To investigate the behavioral change in financial decision-making, we specify our models similarly, except we use the dependent variables *Deal Size (Log)*, *Sales Absolute (Log)*, *EBITDA Margin*, *EBITDA Multiple (Log)*, and *Premium* (*1 day*, *1 week*, *1 month*) to investigate changes in terms of decision-making on M&A target profiles (size of deal, size of the target, and profitability of target) and the acquirer's willingness to pay. We replicate this model by implementing *Top IB Clients* as Control Group 2. Finally, we implement the model, using *Top IB Clients* as the treatment group and *All Other Acquirers* as the control group.

4.5.2. Difference-in-Differences Analysis

Implementing our first difference-in-differences model, we observe that the strategic decision-making of former Lehman clients (Treatment Group 1) was significantly different from all other acquirers in both periods. Table 4.2. shows that former Lehman clients preferred

Product and Technology Expansion and *Diversification* as their growth strategy both before and after the collapse of Lehman Brothers. Further, Treatment Group 1 invested significantly less in *Core Expansion* and *Regional Expansion*. While their strategic decision-making did not change significantly, we see that this group reduced its trust in external advice, as it significantly reduced its engagement of buy-side advisors after September 2008. Interestingly, the deal-closing ability of Lehman clients was significantly lower than all other acquirers in both periods. In terms of financial decision-making (Table 4.3.), we find that prior to the collapse, Lehman clients decided on significantly larger deals (*Deal Size*) with significantly higher *Sales Absolutes* and *EBITDA Margins* than all other acquirers. We also see that Lehman clients paid significantly higher premiums. However, the now-former Lehman clients significantly changed their financial decision-making in the M&A area after the bank collapsed. We find that this group of acquirers reduced its preference for larger deals and reduced its willingness to pay, which means significantly lower premiums.

These observations can be explained in that former Lehman clients maintained a strategic growth agenda but significantly reduced their openness to paying high prices. Therefore, the reduced willingness to pay after the collapse can be explained by the reduced use of financial advisors for transactions. From another perspective, this group of acquirers might have cut its appetite for risk-taking, which is in line with observations made by Malmendier and Nagel (2011), Graham and Narasimhan (2004), and Dittmar and Duchin (2015), who found that severe economic experiences affected top executives' risk appetite with regard to corporate financial policy.

In our second specification, we measured the behavioral change of former Lehman clients against Control Group 2 (*Former Top Investment Bank Clients*) to provide evidence of how behavioral patterns changed among comparable types of acquirers (Table 4.4.). Again, former Lehman clients decided strategically in favor of *Product and Technology Expansion* and *Diversification* and allocated significantly less investment to *Core Expansion* and *Regional*

Expansion. We again find that former Lehman clients used external advice significantly less for their acquisitions but were also less likely to close deals. Regarding financial decision-making, we see that former Lehman clients had a significantly lower preference for large M&A deals than did clients from other top investment banks. In addition, the willingness to pay of Lehman clients decreased significantly after its bankruptcy (Table 4.5.). This indicates that there was a significantly lower risk appetite among former Lehman clients in terms of strategic and financial decision-making. Again, this confirms evidence provided by prior research into other functions of corporate finance. In our third difference-in-differences model (Table 4.6.), we investigate behavioral changes among former top investment bank clients in comparison to all other acquirers in the respective period.

Table 4.2. Difference-in-Differences Model: Behavioral Change in Strategic Decision-Making of Former Lehman Clients —Control Group: All Other Acquirers

	Strategic Growth Paths					
	Core Expansion	Regional Expansion	Product and Technology Expansion	Diversification	Acquirer Advisor Engagement	Deal Completed
Before Lehman Collapse						
Control	0.279	0.051	0.553	0.118	0.092	0.832
Treated	0.088	-0.019	0.764	0.166	0.125	0.804
Difference	-0.191***	-0.070***	0.212***	0.048***	0.032**	-0.028**
(Treatment-Control)	(0.014)	(0.09)	(0.015)	(0.011)	(0.015)	(0.012)
After Lehman Collapse						
Control	0.256	0.048	0.564	0.131	0.072	0.828
Treated	0.055	-0.031	0.807	0.169	0.038	0.798
Difference	-0.201***	-0.079 ***	0.242***	0.037**	-0.034*	-0.030*
(Treatment-Control)	(0.019)	(0.013)	(0.021)	(0.015)	(0.020)	(0.016)
Difference in	-0.010	-0.010	0.030	-0.011	-0.067***	-0.002
Differences	(0.023)	(0.016)	(0.026)	(0.018)	(0.024)	(0.020)
Observations	14,920	14,920	14,920	14,920	14,920	14,920
R-squared	0.03	0.01	0.04	0.01	0.12	0.02

Notes: Entries show average treatment effects of difference-in-differences OLS model; standard errors are in parentheses. The dependent variables are *Core Expansion, Regional Expansion, Product and Technology Expansion, Diversification, Acquirer Advisor Engagement*, *and Deal Completed.* The treatment variable is *Former Lehman Clients Post-Crisis*, indicating those clients that engaged Lehman Brothers at least once in the period of six years before its collapse. The control group includes all other acquirers in the relevant period. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We analyze the behavioral change of former Lehman clients with regard to strategic M&A decisions in the six years after September 15, 2008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 4.3. Difference-in-Differences Model: Behavioral Change in Financial Decision-Making of Former Lehman Clients—Control Group: All Other Acquirers

	Financial Profile of M&A Target				*Acquirer's Willingness to Pay*		
	Deal Size (Log)	Sales Absolute (Log)	EBITDA Margin	EBITDA Multiple (Log)	Premium 1 Day	Premium 1 Week	Premium 1 Month
Before Lehman Collapse							
Control	-0.320	3.803	0.230	3.000	22.414	24.996	30.751
Treated	-0.101	4.232	0.244	3.036	26.059	28.873	34.430
Difference	0.220***	0.429***	0.014***	0.037	3.645**	3.878**	3.679**
(Treatment-Control)	(0.220)	(0.054)	(0.05)	(0.034)	(1.589)	(1.645)	(1.751)
After Lehman Collapse							
Control	-0.530	4.089	0.234	2.903	31.769	33.872	39.658
Treated	-0.466	4.249	0.241	2.910	28.160	31.264	37.201
Difference	0.064	0.160**	0.007	0.008	-3.609*	-2.608	-2.457
(Treatment-Control)	(0.055)	(0.160)	(0.007)	(0.046)	(2.020)	(2.088)	(2.277)
Difference in	-0.156**	-0.268***	-0.007	-0.029	-7.254***	-6.485**	-6.136**
Differences	(0.069)	(0.091)	(0.009)	(0.058)	(2.567)	(2.654)	(2.829)
Observations	14,920	14,920	14,920	14,920	8,973	8,977	8,960
R-squared	0.65	0.21	0.03	0.12	0.03	0.02	0.02

Notes: Entries show average treatment effects of difference-in-differences OLS model; standard errors are in parentheses. The dependent variables are *Deal Size (Log)*, *Sales Absolute (Log)*, *EBITDA Margin*, and *Premiums* (*1 Day*, *1 Week*, *1 Month*). The treatment variable is *Former Lehman Clients Post-Crisis*, indicating those clients who engaged Lehman Brothers at least once in the six years before its collapse. The control group includes all other acquirers in that period. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We analyze behavioral changes in former Lehman clients with regard to financial decisions in M&A in the six years after September 15, 20008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 4.4. Difference-in-Differences Model: Behavioral Change in Strategic Decision-Making of Former Lehman Clients—Control Group: Top IB Clients

	Strategic Growth Paths					
	Core Expansion	Regional Expansion	Product and Technology Expansion	Diversification	Acquirer Advisor Engagement	Deal Completed
Before Lehman Collapse						
Control	0.145	0.108	0.593	0.155	0.314	0.913
Treated	0.007	-0.002	0.810	0.185	0.242	0.857
Difference	-0.138***	-0.109***	0.217***	0.030**	-0.072***	-0.056***
(Treatment-Control)	(0.014)	(0.011)	(0.017)	(0.013)	(0.015)	(0.012)
After Lehman Collapse						
Control	0.134	0.085	0.607	0.174	0.279	0.915
Treated	-0.018	-0.015	0.844	0.189	0.151	0.848
Difference	-0.153***	-0.100***	0.237***	0.015	-0.128***	-0.067***
(Treatment-Control)	(0.019)	(0.015)	(0.022)	(0.017)	(0.020)	(0.016)
Difference in Differences	-0.015	0.010	0.020	0.015	-0.056**	-0.011
	(0.023)	(0.018)	(0.027)	(0.017)	(0.025)	(0.020)
Observations	7,100	7,100	7,100	7,100	7,100	7,100
R-squared	0.05	0.03	0.09	0.01	0.09	0.02

Notes: Entries show average treatment effects of difference-in-differences OLS model; standard errors are in parentheses. The dependent variables are *Core Expansion, Regional Expansion, Product and Technology Expansion, Diversification, Acquirer Advisor Engagement*, *and Deal Completed.* The treatment variable is *Former Lehman Clients Post-Crisis*, indicating those clients who engaged Lehman Brothers at least once in the six years before its collapse. The control group includes all acquirers advised by other top investment banks in that period. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We analyze behavioral changes among former Lehman clients (compared to peers) with regard to strategic decisions in M&A in the six years after September 15, 2008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 4.5. Difference-in-Differences Model: Behavioral Change in Financial Decision-Making of Former Lehman Clients—Control Group: Top IB Clients

	Financial Profile of M&A Target				*Acquirer's Willingness to Pay*		
	Deal Size (Log)	Sales Absolute (Log)	EBITDA Margin	EBITDA Multiple (Log)	Premium 1 Day	Premium 1 Week	Premium 1 Month
Before Lehman Collapse							
Control	-0.182	4.633	0.243	3.259	25.012	28.501	36.802
Treated	-0.222	4.330	0.236	3.083	27.440	31.013	38.295
Difference	-0.040	-0.303	-0.007	-0.176***	2.427	2.512	1.493
(Treatment-Control)	(0.042)	(0.058)	(0.006)	(0.034)	(1.508)	(1.580)	(1.685)
After Lehman Collapse							
Control	-0.290	4.912	0.253	3.199	36.074	39.288	47.024
Treated	-0.557	4.327	0.234	2.962	29.514	33.319	40.787
Difference	-0.267***	-0.585***	-0.019**	-0.237***	-6.559***	-5.969***	-6.236***
(Treatment-Control)	(0.055)	(0.096)	(0.007)	(0.045)	(1.934)	(2.025)	(2.162)
Difference in	-0.227	-0.282***	-0.012	-0.062	-8.987***	-8.481***	-7.729***
Differences	(0.069)	(0.096)	(0.009)	(0.056)	(2.436)	(2.551)	(2.721)
Observations	7,100	7,100	7,100	7,100	4,633	4,632	4,626
R-squared	0.66	0.16	0.03	0.16	0.04	0.04	0.04

Notes: Entries show average treatment effects of difference-in-differences OLS model; standard errors are in parentheses. The dependent variables are *Deal Size (Log)*, *Sales Absolute (Log)*, *EBITDA Margin*, and *Premiums* (*1 Day*, *1 Week*, *1 Month*). The treatment variable is *Former Lehman Clients Post-Crisis*, indicating those clients who engaged a top investment bank at least once in the six years before Lehman's collapse. The control group includes all acquirers advised by other top investment banks in that period. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), *Form of the Transaction* (acquisition, merger, other form). We analyze behavioral changes among former Lehman clients (compared to peers) with regard to financial decisions in M&A in the six years after September 15, 2008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 4.6. Difference-in-Differences Model: Behavioral Change in Strategic Decision-Making of Former Top Investment Bank Clients—Control Group: All Other Acquirers

	Strategic Growth Paths					
	Core Expansion	Regional Expansion	Product and Technology Expansion	Diversification	Acquirer Advisor Engagement	Deal Completed
Before Lehman Collapse						
Control	0.256	0.045	0.572	0.127	0.102	0.836
Treated	0.118	0.089	0.617	0.176	0.271	0.868
Difference	-0.138***	0.044***	0.045***	0.049***	0.169***	0.032***
(Treatment-Control)	(0.010)	(0.007)	(0.012)	(0.08)	(0.011)	(0.009)
After Lehman Collapse						
Control	0.220	0.059	0.581	0.140	0.102	0.831
Treated	0.113	0.076	0.623	0.188	0.227	0.872
Difference	-0.107***	0.017**	0.042***	0.047***	0.126***	0.041***
(Treatment-Control)	(0.012)	(0.08)	(0.013)	(0.009)	(0.012)	(0.010)
Difference in	0.031**	-0.027***	-0.003	-0.002	-0.043***	0.009
Differences	(0.015)	(0.010)	(0.016)	(0.011)	(0.015)	(0.012)
Observations	14,920	14,920	14,920	14,920	14,920	14,920
R-squared	0.02	0.01	0.02	0.001	0.14	0.02

Notes: Entries show average treatment effects of difference-in-differences OLS model; standard errors are in parentheses. The dependent variables are *Core Expansion, Regional Expansion, Product and Technology Expansion, Diversification, Acquirer Advisor Engagement*, *and Deal Completed.* The treatment variable is *Former Top Investment Bank Clients Post Crisis*, indicating those clients who engaged a top investment bank at least once in the six years before Lehman collapsed. The control group includes all other acquirers in the relevant period. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We analyze behavioral changes among former top investment bank clients with regard to strategic decisions in M&A in the six years after September 15, 2008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 4.7. Difference-in-Differences Model: Behavioral Change in Financial Decision-Making of Former Top Investment Bank Clients—Control Group: All Other Acquirers

	Financial Profile of M&A Target				*Acquirer's Willingness to Pay*		
	Deal Size (Log)	Sales Absolute (Log)	EBITDA Margin	EBITDA Multiple (Log)	Premium 1 Day	Premium 1 Week	Premium 1 Month
Before Lehman Collapse							
Control	-0.202	3.568	0.235	3.064	23.668	26.507	32.250
Treated	0.378	4.825	0.277	3.456	27.680	31.004	38.333
Difference	0.579***	1.256***	0.043***	0.392***	4.012***	4.497***	6.083***
(Treatment-Control)	(0.030)	(0.037)	(0.004)	(0.025)	(1.163)	(1.203)	(1.281)
After Lehman Collapse							
Control	-0.461	3.864	0.237	2.959	31.998	34.251	40.605
Treated	0.231	5.065	0.286	3.398	36.698	39.823	46.778
Difference	0.692***	1.201***	0.050***	0.439***	4.700***	5.572***	6.173***
(Treatment-Control)	(0.034)	(0.042)	(0.04)	(0.029)	(1.260)	(1.303)	(1.389)
Difference in	0.112***	-0.055	0.007	0.047	0.688	1.075	0.090
Differences	(0.042)	(0.054)	(0.006)	(0.036)	(1.617)	(1.672)	(1.782)
Observations	14,920	14,920	14,920	14,920	8,973	8,977	8,960
R-squared	0.66	0.29	0.05	0.15	0.03	0.03	0.03

Notes: Entries show average treatment effects of difference-in-differences OLS models; standard errors are in parentheses. The dependent variables are *Deal Size (Log)*, *Sales Absolute (Log)*, *EBITDA Margin*, and *Premiums* (*1 Day*, *1 Week*, *1 Month*). The treatment variable is *Former Top Investment Bank Clients Post-Crisis*, indicating those clients who engaged a top investment bank at least once in the six years before Lehman collapsed. The control group includes all other acquirers in the respective period. We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). We analyze behavioral changes among former top investment bank clients with regard to financial decisions in M&A in the six years after September 15, 2008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

We find that, prior to the collapse, this group allocated significantly more investments to *Regional Expansion*, *Product and Technology Expansion*, and *Diversification* than all other acquirers, who preferred *Core Expansion* as their growth strategy. With the collapse of Lehman Brothers, the strategic decision-making behavior of former top investment bank clients shifted toward a less risky profile. We find that this group significantly increased their investment in the lower risk growth path (*Core Expansion*) while decreasing their activities in riskier growth strategies like *Regional Expansion*. We also find that buy-side advisors were engaged less frequently after the collapse, potentially indicating a more general trend to reject external advice. In terms of deal-closing capabilities, former top investment bank clients performed significantly better in both periods. As to financial decision-making, we observe that former top investment bank clients even increased their appetite for large deals and their willingness to pay premiums, which stands in sharp contrast to the behavior of our other treatment group, the former Lehman clients. This contrast shows that there is a significant difference in how experiencing (or not experiencing) Lehman's failure impacted comparable firms in their post-collapse financial risk-taking preferences (Table 4.7.).

With the three different specifications of our difference-in-differences model, we conclude that former Lehman clients reduced their risk appetite both strategically and financially. At the same time, we see that their peers that were clients of other top investment banks slightly reduced their risk appetite in terms of growth paths but did so while demonstrating a greater preference for larger and thus riskier deals and being willing to pay significantly higher premiums. To further investigate these observations, we implement fixed effects models in an effort to establish a robustness test of our causal interpretations.

4.5.3. Fixed Effects Model Methodology

As a second approach to analyze causal effects, we implement a fixed effects model that allows the individual-specific effects α_i to be correlated with the regressor *x*; we include α_i as intercepts. Each individual has a different intercept term and the same slope parameters:

$$y_{it} = \alpha_i + x_{it}\beta + u_{it} \quad (3),$$

where α_i (*i*=1….*n*) is the unknown intercept for each entity (*n* entity-specific intercepts), y_{it} is our dependent variable, with *i* = entity and *t* = time; x_{it} represents one independent variable, while β is the coefficient for that independent variable, and u_{it} is the error term. We can recover the individual-specific effects after estimation as

$$\hat{\alpha}_i = \bar{y}_i - \bar{x}'_i\hat{\beta} \quad (4)$$

More precisely, the individual-specific effects are the leftover variation in the dependent variable that cannot be explained by the regressor.

To estimate the effect of the collapse of Lehman Brothers on the strategic decision-making behavior of its former clients, we specify our model as follows. The dependent variables are *(1) Core Expansion*, *(2) Regional Expansion*, *(3) Product or Technology Expansion*, and *(4) Diversification*. Further, we add *(5) Acquirer Advisor Engagement* and *(6) Deal Completion*.

We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include the further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). Further, we use fixed effects variables for the acquirer, period (month), industry of the M&A target, and country of the target's headquarters. Similarly, we estimate the effect of the collapse of Lehman Brothers

on the financial decision-making behavior of former Lehman clients, implementing this specification with several dependent variables—*Deal Size (Log)*, *Sales Absolute (Log)*, *EBITDA Margin*, *EBITDA Multiple (Log)*, and *Premium* (*1 day*, *1 week*, *1 month*)—to investigate changes in terms of decision-making on M&A target profiles (size of deal, size of target, and profitability of target) and the acquirer's willingness to pay. We replicate this model by implementing *Top IB Clients* (Control Group 2). Finally, we implement the model using *Top IB Clients* as Treatment Group 2 and *All Other Acquirers* as Control Group 2.

4.5.4. Fixed Effects Model Analysis

Table 4.8. presents the results of the fixed effects analysis comparing the strategic decision-making of former Lehman clients to all other acquirers in the relevant period. Our findings support the results of our difference-in-differences analysis in the previous section. While former Lehman clients significantly reduced their appetite for acquisitions in core business and regional expansion, M&A targets that would expand those clients' product and technology portfolios were especially prioritized in their growth agendas. Further, we find confirming results in terms of the reduced use of buy-side advisors and a significantly lower deal completion rate. In Table 4.9., we show that former Lehman clients reduced their focus on large deals and paying high premiums. However, the results in this model do not show the statistical significance that was observed in the difference-in-differences model.

In Table 4.10., we define other former top investment bank clients as a control group to the treatment group of former Lehman clients. We find confirming results that former Lehman clients channeled their growth paths toward *Product and Technology Expansion*, while significantly reducing their investments in *Core Expansion*, *Regional Expansion*, and *Diversification*.

We also find confirming results that former Lehman clients significantly reduced their hiring of buy-side advisors and decreased their deal-making ability. In terms of financial

decision-making (Table 4.11.), we find confirming results that former Lehman clients significantly reduced their aspirations for big deals and large M&A targets and significantly lowered their willingness to pay high *Premiums* and *EBITDA Multiples*.

Table 4.12. presents behavioral changes in strategic decision-making among former top investment bank clients in comparison to all other acquirers in this period. With this analysis, we aim to understand how powerful the impact of Lehman's downfall was on the decision-making behavior of its main competitors' clients. Confirming our results from the difference-in-differences model, we find that this group of acquirers significantly reduced its inorganic growth in *Core Business* while focusing on acquisitions in *Product and Technology Expansion* and *Diversification*. Interestingly, we find that former top investment bank clients increased their engagement of buy-side advisors and showed significantly better performance in terms of completing deals. Table 4.13. presents the biggest difference in the behavior of clients from former top investment bank clients. The firms in this group increased their appetite for large deals, meaning large M&A targets with high *EBITDA Margins*, and significantly increased their willingness to pay high premiums compared to their behavior before the collapse of Lehman Brothers.

The implementation of our identification strategy with difference-in-differences and fixed effects models provided converging results showing that former Lehman clients reduced their appetite for risky transactions in terms of strategic growth paths, transaction size, and willingness to pay high premiums and *EBITDA Multiples*.

Table 4.8. Fixed Effects Model: Behavioral Change in Strategic Decision-Making of Former Lehman Clients—Control Group: All Other Acquirers

	Strategic Growth Paths					
	Core Expansion	Regional Expansion	Product and Technology Expansion	Diversification	Acquirer Advisor Engagement	Deal Completed
Former Lehman Clients Post-Crisis	-0.796***	-0.717***	0.683***	0.072	-0.115**	-0.144**
	(0.077)	(0.104)	(0.057)	(0.063)	(0.056)	(0.065)
Sales Absolute (Log)	-0.015**	0.060***	-0.027***	0.025***	0.273***	-0.028***
	(0.007)	(0.009)	(0.006)	(0.008)	(0.007)	(0.008)
EBITDA Margin	0.421***	0.428***	-0.667***	0.150**	0.715***	0.058
	(0.065)	(0.081)	(0.063)	(0.076)	(0.066)	(0.079)
Target Advisor Engagement	-0.097***	-0.135***	0.143***	-0.029		0.518***
	(0.037)	(0.049)	(0.034)	(0.042)		(0.042)
Acquirer Advisor Engagement	0.016	0.164***	-0.098***	0.011		0.406***
	(0.040)	(0.049)	(0.037)	(0.045)		(0.045)
TA x AA	0.160***	0.011	-0.116**	-0.004		-0.154***
	(0.052)	(0.066)	(0.048)	(0.059)		(0.059)
Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.144	-1.953***	-0.115	-1.778***	-2.239***	2.613***
	(0.431)	(0.346)	(0.444)	(0.333)	(0.450)	(0.489)
Observations	14,920	14,920	14,920	14,920	14,920	14,920

Notes: Entries show coefficients of the OLS fixed effects model; standard errors are in parentheses. The dependent variables are *Core Expansion, Regional Expansion, Product and Technology Expansion, Diversification, Acquirer Advisor Engagement*, *and Deal Completed.* We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include the further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). Further, we use fixed effects variables for the acquirer, period (year), industry of the M&A target, and country of the target's headquarters. We analyze the behavioral change of former Lehman clients with regard to strategic M&A decisions in the six years after September 15, 2008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 4.9. Fixed Effects Model: Behavioral Change in Financial Decision-Making of Former Lehman Clients—Control Group: All Other Acquirers

	Financial Profile of M&A Target			*Acquirer's Willingness to Pay*			
	Deal Size (Log)	Sales Absolute (Log)	EBITDA Margin	EBITDA Multiple (Log)	Premium 1 Day	Premium 1 Week	Premium 1 Month
Former Lehman Clients Post-Crisis	-0.073	0.142**	0.002	-0.084*	-1.954	-0.983	-0.790
	(0.054)	(0.071)	(0.007)	(0.046)	(2.012)	(2.080)	(2.217)
Sales Absolute (Log)	0.707***			-0.187***	-1.414***	-1.483***	-1.958***
	(0.006)			(0.005)	(0.245)	(0.253)	(0.270)
EBITDA Margin	3.313***	-1.753***		-1.641***	-12.804***	-13.406***	-15.433***
	(0.062)	(0.081)		(0.053)	(2.551)	(2.642)	(2.817)
Target Advisor Engagement	0.885***	0.869***	0.008*	0.341***	9.498***	9.514***	10.381***
	(0.033)	(0.043)	(0.004)	(0.029)	(1.466)	(1.516)	(1.615)
Acquirer Advisor Engagement	0.516***	0.821***	0.005	0.349***	-0.426	1.123	2.233
	(0.037)	(0.049)	(0.005)	(0.032)	(1.586)	(1.640)	(1.751)
TA x AA	0.035	0.227***	0.008	0.019	0.105	-0.625	-1.940
	(0.047)	(0.062)	(0.006)	(0.041)	(1.979)	(2.047)	(2.183)
Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.903***	0.827***	0.184***	2.606***	2.478	16.869	32.105*
	(0.125)	(0.165)	(0.017)	(0.108)	(16.471)	(17.039)	(18.272)
Observations	14,920	14,920	14,933	14,920	8,973	8,977	8,960

Notes: Entries show coefficients of the OLS fixed effects model; standard errors are in parentheses. The dependent variables are *Deal Size (Log)*, *Sales Absolute (Log)*, *EBITDA Margin*, and *Premiums* (*1 Day*, *1 Week*, *1 Month*). We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). Further, we use fixed effects variables for the acquirer, period (year), industry of the M&A target, and country of the target's headquarters. We analyze behavioral changes of former Lehman clients with regard to financial M&A decisions in the six years after September 15, 2008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 4.10. Fixed Effects Model: Behavioral Change in Strategic Decision-Making of Former Lehman Clients—Control Group: Top IB Clients

	Strategic Growth Paths					
	Core Expansion	Regional Expansion	Product and Technology Expansion	Diversification	Acquirer Advisor Engagement	Deal Completed
Former Lehman Clients Post-Crisis	-0.654***	-0.820***	0.701***	-0.040	-0.430***	-0.234***
	(0.082)	(0.108)	(0.061)	(0.068)	(0.062)	(0.072)
Sales Absolute (Log)	0.021*	0.044***	-0.032***	-0.011	0.257***	-0.055***
	(0.011)	(0.013)	(0.010)	(0.012)	(0.011)	(0.013)
EBITDA Margin	0.552***	0.358***	-0.740***	0.164	0.906***	-0.151
	(0.105)	(0.120)	(0.097)	(0.112)	(0.110)	(0.124)
Target Advisor Engagement	-0.065	-0.285***	0.188***	-0.046		0.665***
	(0.075)	(0.088)	(0.061)	(0.072)		(0.076)
Acquirer Advisor Engagement	0.214***	0.170**	-0.277***	0.067		0.531***
	(0.077)	(0.081)	(0.064)	(0.074)		(0.078)
TA x AA	0.071	0.149	-0.124	0.061		-0.300***
	(0.093)	(0.106)	(0.079)	(0.092)		(0.098)
Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-1.237***	-1.803***	0.651*	-1.457***	-1.845***	2.178***
	(0.397)	(0.413)	(0.378)	(0.335)	(0.519)	(0.535)
Observations	7,100	7,100	7,100	7,100	7,100	7,100

Notes: Entries show coefficients of the OLS fixed effects model; standard errors are in parentheses. The dependent variables are *Core Expansion, Regional Expansion, Product and Technology Expansion, Diversification, Acquirer Advisor Engagement*, *and Deal Completed.* We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include the further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). Further, we use fixed effects variables for the acquirer, period (year), industry of the M&A target, and country of the target's headquarters. We analyze behavioral changes of former Lehman clients (compared to peers) regarding strategic M&A decisions in the six years after September 15, 2008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 4.11. Fixed Effects Model: Behavioral Change in Financial Decision-Making of Former Lehman Clients—Control Group: Top IB Clients

	Financial Profile of M&A Target			*Acquirer's Willingness to Pay*			
	Deal Size (Log)	Sales Absolute (Log)	EBITDA Margin	EBITDA Multiple (Log)	Premium 1 Day	Premium 1 Week	Premium 1 Month
Former Lehman Clients Post-Crisis	-0.367***	-0.521***	-0.011	-0.323***	-3.993**	-3.355*	-3.397
	(0.053)	(0.074)	(0.007)	(0.045)	(1.925)	(2.014)	(2.148)
Sales Absolute (Log)	0.684***			-0.207***	-1.467***	-1.673***	-2.315***
	(0.009)			(0.007)	(0.318)	(0.333)	(0.355)
EBITDA Margin	3.114***	-1.658***		-1.594***	-22.153***	-23.992***	-28.413***
	(0.086)	(0.119)		(0.073)	(3.320)	(3.482)	(3.713)
Target Advisor Engagement	1.035***	0.741***	0.002	0.363***	9.233***	8.985***	9.728***
	(0.053)	(0.073)	(0.007)	(0.044)	(2.340)	(2.452)	(2.611)
Acquirer Advisor Engagement	0.674***	0.731***	0.011	0.434***	-0.073	1.485	3.226
	(0.058)	(0.080)	(0.008)	(0.049)	(2.409)	(2.523)	(2.694)
TA x AA	-0.008	0.322***	0.011	-0.006	0.780	0.436	-1.119
	(0.070)	(0.097)	(0.010)	(0.058)	(2.902)	(3.040)	(3.243)
Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-1.542***	1.274***	0.139***	2.491***	11.521	28.484	41.405**
	(0.172)	(0.240)	(0.024)	(0.145)	(16.919)	(17.720)	(18.968)
Observations	7,100	7,100	7,106	7,100	4,633	4,632	4,626

Notes: Entries show coefficients of the OLS fixed effects model; standard errors are in parentheses. The dependent variables are *Deal Size (Log)*, *Sales Absolute (Log)*, *EBITDA Margin*, and *Premiums* (*1 Day*, *1 Week*, *1 Month*). We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). Further, we use fixed effects variables for the acquirer, period (year), industry of the M&A target, and country of the target's headquarters. We analyze behavioral changes of former Lehman clients (compared to peers) with regard to financial M&A decisions in the six years after September 15, 2008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively

Table 4.12. Fixed Effects Model: Behavioral Change in Strategic Decision-Making of Former Top Investment Bank Clients—Control Group: All Other Acquirers

	Strategic Growth Paths					
	Core Expansion	Regional Expansion	Product and Technology Expansion	Diversification	Acquirer Advisor Engagement	Deal Completed
Top IB Clients Post-Crisis	-0.221***	0.021	0.081**	0.128***	0.316***	0.077*
	(0.035)	(0.042)	(0.032)	(0.039)	(0.034)	(0.040)
Sales Absolute (Log)	-0.009	0.057***	-0.028***	0.020**	0.260***	-0.031***
	(0.007)	(0.009)	(0.006)	(0.008)	(0.007)	(0.008)
EBITDA Margin	0.442***	0.415***	-0.665***	0.133*	0.671***	0.047
	(0.065)	(0.081)	(0.063)	(0.076)	(0.066)	(0.079)
Target Advisor Engagement	-0.091**	-0.139***	0.142***	-0.035		0.514***
	(0.037)	(0.049)	(0.034)	(0.042)		(0.042)
Acquirer Advisor Engagement	-0.091**	-0.139***	0.142***	-0.035		0.514***
	(0.037)	(0.049)	(0.034)	(0.042)		(0.042)
TA x AA	0.169***	0.016	-0.125***	-0.004		-0.151**
	(0.052)	(0.065)	(0.048)	(0.059)		(0.059)
Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.252	-1.723***	-0.244	-1.608***	-1.759***	2.782***
	(0.436)	(0.341)	(0.446)	(0.341)	(0.458)	(0.493)
Observations	14,920	14,920	14,920	14,920	14,920	14,920

Notes: Entries show coefficients of the OLS fixed effects model; standard errors are in parentheses. The dependent variables are *Core Expansion, Regional Expansion, Product and Technology Expansion, Diversification, Acquirer Advisor Engagement*, *and Deal Completed.* We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). Further, we use fixed effects variables for the acquirer, period (year), industry of the M&A target, and country of the target's headquarters. We analyze behavioral changes among clients of the top investment banks with regard to strategic M&A decisions in the six years after September 15, 2008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 4.13. Fixed Effects Model: Behavioral Change in Financial Decision-Making of Former Top Investment Bank Clients—Control Group: All Other Acquirers

	Financial Profile of M&A Target			*Acquirer's Willingness to Pay*			
	Deal Size (Log)	Sales Absolute (Log)	EBITDA Margin	EBITDA Multiple (Log)	Premium 1 Day	Premium 1 Week	Premium 1 Month
Top IB Clients Post-Crisis	0.278***	0.934***	0.019***	0.190***	6.711***	7.397***	7.790***
	(0.032)	(0.040)	(0.004)	(0.027)	(1.165)	(1.204)	(1.284)
Sales Absolute (Log)	0.696***			-0.194***	-1.681***	-1.776***	-2.265***
	(0.006)			(0.005)	(0.249)	(0.257)	(0.274)
EBITDA Margin	3.275***	-1.820***		-1.667***	-13.918***	-14.628***	-16.722***
	(0.062)	(0.079)		(0.053)	(2.554)	(2.644)	(2.819)
Target Advisor Engagement	0.870***	0.790***	0.007	0.331***	9.114***	9.081***	9.918***
	(0.033)	(0.043)	(0.004)	(0.029)	(1.465)	(1.514)	(1.614)
Acquirer Advisor Engagement	0.504***	0.755***	0.003	0.341***	-0.850	0.637	1.713
	(0.037)	(0.048)	(0.005)	(0.032)	(1.585)	(1.639)	(1.749)
TA x AA	0.040	0.231***	0.008	0.023	0.312	-0.395	-1.689
	(0.047)	(0.061)	(0.006)	(0.041)	(1.976)	(2.043)	(2.179)
Deal-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year, Industry, and Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.433***	2.255***	0.213***	2.939***	15.363	30.717*	46.545**
	(0.134)	(0.173)	(0.018)	(0.115)	(16.569)	(17.135)	(18.373)
Observations	14,920	14,920	14,933	14,920	8,973	8,977	8,960

Notes: Entries show coefficients of the OLS fixed effects model; standard errors are in parentheses. The dependent variables are *Deal Size (Log)*, *Sales Absolute (Log)*, *EBITDA Margin*, and *Premiums* (*1 Day*, *1 Week*, *1 Month*).We use the covariates *Sales Absolute (Log)* and *EBITDA Margin* and include further deal-level controls *Deal Attitude* (friendly, neutral, hostile), *Target Public Status* (public, private), and *Form of the Transaction* (acquisition, merger, other form). Further, we use fixed effects variables for the acquirer, period (year), industry of the M&A target, and country of the target's headquarters. We analyze behavioral changes among clients of the top investment banks with regard to financial M&A decisions in the six years after September 15, 2008. ***, **, and * denote significance at the 0.01, 0.05, and 0.1 levels, respectively.

4.6. Discussion and Conclusion

While prior research has provided convincing evidence on how firms and top executives have changed their financial and investment behavior in areas like corporate finance policy and cash to adopt a less risky approach because of macroeconomic shocks, natural disasters, or personal traumas, we contribute evidence of how the Lehman collapse changed the strategic and financial decision-making of those with a direct business relationship with Lehman Brothers in the six years before its collapse. We find that former Lehman clients significantly reduced their appetite for large deals and had a lower willingness to pay, mirroring their reduced interest in taking risks. Interestingly, this group of clients maintained a strategic growth agenda by focusing on *Product and Technology Expansion* and *Diversification*. Therefore, we can conclude that former Lehman clients' decision behavior kept their strategic direction but did so on a smaller and thus less risky level.

We also find that the Lehman shock did not have the same effect on these firms' peers: acquirers who engaged one of the other top investment banks. We observe that firms in this group slightly reduced their risk appetite in terms of strategic growth paths by directing their acquisitions toward lower-risk strategies like *Core Expansion*. However, unlike the former Lehman clients, this group of acquirers increased their appetite for large deals and significantly increased their willingness to pay high premiums. Therefore, we can not only conclude that the Lehman shock had a significantly different effect on comparable types of acquirers, but we also find that the direct relationship with the collapsed bank resulted in a difference in subsequent strategic and financial decision-making behavior. Former Lehman clients had their fingers burned. This conclusion is supported by findings that firms in this group significantly reduced their engagement with investment bankers after the collapse.

In the light of the findings presented in chapter 2 that advisors drive prices and potentially overreach in their ambition to close deals, the reduced risk appetite of former Lehman clients can be supported by the reduced use of external advice. This interpretation is supported by our findings that comparable acquirers preferred riskier financial profiles and were more willing to pay high premiums while also significantly increasing their engagement with external financial advisors. While our results provide insights into the general behavioral change of acquirers' strategic and financial decision-making behaviors, further experimental research is needed to identify the exact decision processes and risk preferences.

Appendix 4A: Definition of Terms

Term	Definition
Former Lehman Client	Corporate acquirer that engaged the investment bank Lehman Brothers at least once in the six years before its collapse on September 15, 2008.
Top IB Client	Corporate acquirer that engaged one of the top ten investment banks at least once in the six years before the collapse of Lehman Brothers on September 15, 2008. These banks are Goldman Sachs, Morgan Stanley, JP Morgan, Merrill Lynch, Citi Group, Barclays, Credit Suisse, RBC Capital Markets UBS, and Wells Fargo.
Target Advisor	Financial advisor(s) to the target company, its management, or board of directors on a transaction.
Acquirer Advisor	Financial advisor(s) to the acquirer's company, its management, or board of directors on a transaction.
Deal Size	Value of Transaction ($M): Total value of the consideration paid by the acquirer, excluding fees and expenses. The dollar value includes the amount paid for all common stock, common stock equivalents, preferred stock, debt, options, assets, warrants, and stake purchases made within six months of the announcement date of the transaction. Liabilities assumed are included in the value if they are publicly disclosed. Preferred stock is included only if it is being acquired as part of a 100% acquisition. If a portion of the consideration paid by the acquirer is common stock, the stock is valued using the closing price on the last full trading day prior to the announcement of the terms of the stock swap. If the exchange ratio of shares offered changes, the stock is valued based on its closing price on the last full trading date prior to the date of the exchange ratio change. For publicly listed targets in 100% acquisitions, the number of shares at the date of announcement is used.
EBITDA Multiple	A financial ratio that compares a company's enterprise value to its annual EBITDA; it is used to determine the value of a company and compare it to the value of similar businesses. A company's EBITDA Multiple provides a normalized ratio for differences in capital structure, taxation, and fixed assets and enables comparing disparate operations in different companies. The ratio takes a company's enterprise value (which represents market capitalization plus net debt) and compares it to the EBITDA for a given period.
Premium 1 Day	Premium of the offer price to target closing stock price one day before the original announcement date, expressed as a percentage.
Premium 1 Week	Premium of the offer price to target closing stock price one week before the original announcement date, expressed as a percentage.
Premium 1 Month	Premium of the offer price to target closing stock price four weeks before the original announcement date, expressed as a percentage.
Sales Absolute	Net sales represents sales receipts for products and services, net cash discounts, trade discounts, excise tax, and sales returns and allowances. Revenues are recognized according to applicable accounting principles.
EBITDA Absolute	Earnings before the deduction of interest, taxes, depreciation, and amortization. It is a non-GAAP calculation based on data from a company's income statement used to measure a company's operating profitability. Because EBITDA adds back to net income the non-cash accounting charges of depreciation and amortization and disregards interest paid on debt financing and income taxes on earnings, it is useful for measuring a company's operating cash flow and for comparing the profitability of companies with different capital structures and in different tax brackets. However, EBITDA does not measure and should not be confused with the actual cash flow of a company which accounts for interest paid on debt financing, income taxes, and other cash charges.
EBITDA Margin	EBITDA Absolute as a percentage of Sales Absolute.
Target Industry	Industry in which the M&A target operates.
Target Country	Country where the target company has its headquarters.
Acquirer Industry	Industry in which the acquiring company operates.
Acquirer Country	Country where the acquiring company has its headquarters.
Deal Status	Status of the transaction: (1) deal completed, (2) deal pending, (3) deal intended, (4) deal withdrawn, or (5) another deal status.
Form of Transaction	Scope of the transaction (e.g., full acquisition vs. acquisition of shares).

Chapter 5: Discussion and Conclusion

A growing body of research has studied the role of advisors in specific segments of the market. We took a wider look at the roles of both buy-and sell-side advisors to seek out general principles of how governance issues might impact deal pricing and value creation. Examining the association of advisor engagement with relative deal pricing, premiums, announcement returns, and deal completion, we find that advisors on both the buy and sell sides are positively correlated with deal prices, premiums, and deal completion. Propensity score matching and IV analyses support a causal interpretation in terms of advisor effects, accounting for possible selection effects due to endogenous advisor engagement and identification of potential deals by advisors.

While the direction of these effects accords with our expectations and previously published evidence that advisors on the sell side negotiate higher prices for targets (Agrawal et al., 2018; Golubov et al., 2012), the present study's results show that buy-side advisors also increase prices and premiums and decrease announcement returns for acquirers, which might be an additional explanation for the value destruction that is often seen in mergers. As to deal completion, our examination also supports a causal effect: advisors on both the buy-side and sell-side increased the likelihood of deal completion. Interpretations connected with either improving deals by identifying important synergies and thus increasing the acquirer's willingness to pay or value destruction cause by a flawed incentive structure for executives and advisors are possible.

We focused on this issue in our analyses, and the preponderance of the evidence indicates value destruction driven by acquirer advisors. Our results support a critical perspective on incentive structures, advisor roles, and prioritization of deal objectives. The findings are consistent with broad trends in the M&A literature (Grinstein & Hribar, 2003; McLaughlin, 1990). In addition, recent work by Golubov and Xiong (2020) indicates that

private acquirers with less challenging governance issues do indeed pay less for targets. In quantitative terms, we estimate the monetary effect of acquirer advisor engagement at $7 trillion between 1978 and 2020 (excluding acquirer advisor fees, reported in 2019 dollars).

Considering target shareholders' interest in maximizing deal value by achieving high M&A selling prices, the contractual incentives of both target firms' top executives and sell-side advisors are closely aligned. However, incentive structures for top managers and advisors on the acquirer's side can become misaligned with shareholders' interests. Roll (1986), Hayward and Hambrick (1997), and Malmendier and Tate (2005) all suggest that buyers often overpay and thus destroy the value of shareholder equity due to CEO hubris or overconfidence. Our findings offer an additional explanation to overpayments in M&A. Both top buy-side executives and acquirer advisors maximize their payoffs based on incentives provided by M&A bonus clauses and advisor contracts, respectively, by prioritizing deal completion and benefitting from high prices. A second important perspective of our results involves the potential influence of overconfidence on the sell side of M&A transactions. Only 62% of transactions involved a target advisor, which is striking given the unambiguous and positive effects of target advisors on pricing and likelihood of deal completion and given that a similar share of acquirers engages a buy-side advisor, even though engagement is costly in terms of fees and prices, as we have shown in this study.

Malmendier and Tate (2005) and Roll (1986) offer evidence for overconfidence and hubris that may explain these results. While these authors focus on the buy side, the evidence presented here suggests that these effects may also affect sell-side behavior. Based on the results of our analysis and given the misaligned incentives detailed above, stricter supervisory control in M&A projects may be necessary to improve decisions. We conclude that the decision to engage an advisor and the subsequent effects of that advisor on transaction outcomes are likely influenced by both a potentially misaligned incentive structure and psychological aspects

like executive overconfidence. Biases may also be present at the level of supervisory boards. However, further research is needed to track the precise decision processes and unambiguously separate incentive effects from behaviors that could be attributed to potentially irrational, hubris-driven influences.

The second study in this dissertation focused on the effect of advisors' industry and country experience on announcement returns for acquirers. We introduced a novel typology to segment buy-side advisors into four distinctive types: *Experience-Based Top Advisors*, *Country Specialists*, *Industry Specialists*, and *Rookies*. We implemented our identification strategy with regression, fixed effects, propensity score matching, and Heckman selection models, finding that an advisor's track record in the industry and country in which a client operates plays an important role in acquirers achieving higher CARs. Overall, the results of this study contribute evidence on the impact of buy-side advisors on value creation for acquirers. We also compared two definitions of top advisors: *Experience-Based Top Advisors* had a significantly different effect on pricing, premiums, returns, and deal completion than the standard definition of top advisors (*Reputation-Based Top Advisors*). In this context, we find that *Reputation-Based Top Advisors* do not create more positive announcement returns for their clients than do lower-ranked advisors. We find that *Experience-Based Top Advisors* not only negotiate prices down but also achieve significantly higher returns for acquirers. Further, we isolated the impact of advisor specialization on M&A in specific industries and countries. Neither specialization provides significantly positive returns for acquirers when compared to *Experience-Based Top Advisors*. Finally, we tested whether inexperienced advisors (*Rookies*) destroy value for their clients, finding that inexperienced advisors do indeed destroy value for their clients in terms of announcement returns.

The third study in this dissertation (Chapter 4) showed how former clients of the investment bank Lehman Brothers changed their strategic M&A agendas after the collapse of

their long-trusted advisor. To measure change regarding these clients' M&A agendas, we introduced a novel framework that differentiates four paths of growth: the M&A growth matrix. Inspired by Ansoff's earlier matrix (1965), the four distinctive growth paths are *Core Expansion*, *Regional Expansion*, *Product and Technology Expansion*, and *Diversification*. While prior research delivered convincing evidence on how firms and top executives changed their financial and investment behavior in areas like corporate finance policy and cash holdings to adopt a more risk-averse approach as a result of macroeconomic shocks, natural disasters, or personal traumas, we show how the Lehman shock changed the strategic and financial decision-making of those with a direct relationship with the firm before its collapse. We find that former Lehman clients significantly reduced their appetite for large deals and had a lower willingness to pay, mirroring their reduced preference to take risks. Interestingly, this group of clients maintained their strategic growth agenda by focusing on *Product and Technology Expansion* and *Diversification*. Therefore, we can conclude that former Lehman clients' decision behavior maintained the same strategic direction but did so on a smaller and thus less risky level.

We also find that the Lehman shock did not have the same effect on peer acquirers who engaged one of the other top investment banks. We observe that firms in this group slightly reduced their risk appetite in terms of strategic growth paths by directing their acquisitions toward lower-risk strategies like *Core Expansion*. However, unlike former Lehman clients, these acquirers increased their appetite for large deals and significantly increased their willingness to pay in terms of higher premiums. Therefore, we can not only conclude that the Lehman shock had a significantly different effect on comparable types of acquirers but also find that the direct relationship with the collapsed bank resulted in a difference in subsequent strategic and financial decision-making behavior. Simply put, former Lehman clients had their

fingers burned. This conclusion is supported by findings that the group significantly reduced its engagement with investment bankers after the collapse.

Summarizing the findings, we note several implications for practitioners and suggest considering a number of future research avenues. Assuming the validity of our interpretations and the misaligned incentives identified above, stricter supervision over M&A projects may be warranted to improve the selection of advisors. However, while Goranova et al. (2017) show that increased monitoring by supervisory boards helps contain M&A losses, they also observe that tighter control reduces M&A gains. We conclude that the decision to engage an advisor and the subsequent effects of the advisor on transaction outcomes are likely influenced by both a potentially misaligned incentive structure and psychological aspects like executive overconfidence. Biases may also be present at the level of supervisory boards. Further research is needed to identify the exact decision processes and separate incentive effects from irrational, hubris-driven influences.

With these results, we contribute an additional perspective to help answer the complex question of whether top buy-side advisors create value for their clients. suggesting the need to redefine the accepted understanding of a top advisor by basing it on prior experience rather than merely deal volume and value. These results are also relevant for the practitioner aiming to improve decision-making in terms of advisor engagement, as there is strong evidence that advisor choice is a crucial strategic decision with substantial effects on M&A outcomes (Agrawal et al., 2013, 2018; Bao and Edmans, 2011; Chang et al., 2016a, 2016b; Sleptsov et al., 2013; Wang et al., 2021). Thus the question is, “Which type of advisor creates value in a buy-side acquisition?” This dissertation suggests that *Experience-Based Top Advisors* create significant value thanks to their familiarity with the industry and country of the advised M&A target rather than on their general reputation, overall deal size, and volume of transactions. It also cautions acquirers against hiring inexperienced advisors. The complexity of an M&A

transaction appears to require simultaneously understanding both the sector-related particularities of an M&A target and its country-specific aspects.

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