# Corporate Acquisitions, Profitability, and Markup: Evidence from Europe*

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**Abstract**

This paper assesses how corporate mergers and acquisitions (M&As) affect firms' profitability and markups. Using financial data (2007 – 2018) for 10 European countries, we compare firms that went through M&As with similar non-M&A firms before and after the event. We find that acquirers' and targets' markups remain unchanged, while their profit margins fall substantially. Additional heterogeneity analyses based on sectors and industries reveal that our results are inconsistent with the market power channel. Taken together, these results suggest that corporate acquisitions do not seem to contribute to a rise in firms' market power in the medium-run.

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# 1 Introduction

Competition among firms is crucial for spurring innovation and growth in the economy. Firms with market power may have incentives to reduce the supply of their goods to maintain higher prices (Harberger, 1995), which will dampen investment in capital and innovation (Aghion et al., 2005). An important policy tool the government can use to promote competition is the regulation on mergers and acquisitions (M&As henceforth), as M&As may allow firms to exploit higher market power, leading them to increase markups and profits. However, theoretical predictions on the effects of M&As on firms' profits or markups are ambiguous. On the one hand, M&As may allow firms to be more productive and to reduce costs, which could increase their profit margins. On the other hand, M&As may be initiated by empire-building motives (Jensen, 1986) or misaligned CEO incentives (Morck, Shleifer and Vishny, 1988), which can lead to a fall in profits. Therefore, how M&As will affect corporate profits and markups is an empirical question.

In this paper, we study how corporate M&As impact firms' profitability and markups in the medium-run. We compare the outcomes of firms that went through M&As with a matched sample of non-M&A firms before and after the event. Using financial data merged with M&A data at the firm-level across 10 European countries from 2007 to 2018, we exploit a large number of M&A activities to implement a matched difference-in-differences design. Given that these countries all share a comparable set of antitrust regulations and are governed by the European Union, our main estimates pool all countries together, although we additionally explore country-level heterogeneity.

We find that acquirers' and targets' markups remained unchanged, while their profit margins decreased significantly after M&As. We estimate that both acquiring and target firms' profit margins decreased by 1 percentage point on average relative to non-M&A firms within five years after the event, which is about a 15 percent decline. Furthermore, we find that acquirers increase their debts and reduce investment in fixed assets after M&As to finance part of their acquisition costs.

The fall in profit margins and unchanged markups are consistent with the idea that M&As are not associated with a rise in firms' market power (De Loecker, Eeckhout and Unger, 2020). Next, we explore whether the estimated impacts on profit margins are smaller in non-tradable sectors, the logic being that tradable sectors are close to competitive and a single merger is unlikely to impact global competition. We find that profits decline in both tradable and non-tradable M&As. We also consider the distinction between horizontal and vertical mergers, where a horizontal merger is between two firms in the same 4-digit industry. Contrary to the market power channel, we find no significant difference in profit or markup outcomes between these two types of mergers. Taken together, our findings suggest that a recent rise in M&A activities across Europe in the last decade may not have been associated with a rise in profitability, markups or market power.

In all of our results, the key identification assumption is that M&A firms and non-M&A firms would have followed similar trajectories in the absence of a merger or an acquisition. This may be a strong assumption in our setting. For example, M&A events may be undertaken by productive acquiring firms that will continue to expand. In this case, high profitability could be correlated with M&A events, biasing our estimates. Furthermore, spillover effects could contaminate our estimates if increased market power from an M&A event impacts all firms in an industry, and not just the merging parties.

We provide a number of tests to corroborate our findings. First, we find parallel trends in our main outcomes between M&A firms and non-M&A firms prior to the M&A event. Second, our results are robust across various specifications, as discussed in detail in Section 4.3. Lastly, to account for spillover effects, we conduct a heterogeneity test based on the initial level of concentration across 4-digit industries and find similar declines in profits margins among both highly concentrated and less concentrated industries.

While we show there are no pre-trends in key outcomes for M&A firms, it is still possible that coinciding shocks could bias our estimates. For example, acquiring firms may face positive productivity shocks in the year of the merger, which would not be apparent in pre-trends. In this case, our estimates would be attenuated toward zero. Therefore, one may interpret our estimated effects on investment as a lower bound of the true effects. The opposite story, of coinciding negative shocks, is potentially less relevant as a firm that receives a negative shock has the option to delay the merger.

This paper contributes to several distinct literatures. First, it contributes to the literature on the effects of mergers and acquisitions. There is a long theoretical and empirical literature in industrial organization studying the impacts of M&As on consumer welfare (Dansby and Willig, 1979; Hart et al., 1990; Farrell and Shapiro, 1990; Nevo, 2000; Kaplow and Shapiro, 2007). While much prior work in this literature has focused on simulation of merger effects, there is a growing body of evidence that identifies effects in completed mergers, an approach often referred to "retrospective" merger analysis in industrial organization (Ashenfelter, Hosken and Weinberg, 2013, 2015; Dafny, Ho and Lee, 2019). Unlike much prior work on retrospective merger analysis, we take a broader approach by considering the impacts across a large number of M&A events and industries.

In terms of "retrospective" merger analysis, this paper is most closely related to papers that study the impacts of mergers on firm-level outcomes across many acquisitions, rather than a case study of a particular merger or acquisition. For example, Braguinsky et al. (2015) utilizes detailed firm-level data to study the effects of acquisitions in the Japanese cotton spinning industry on productivity. Most closely related to this work are papers in the United States that use firm-level data (in manufacturing industries) to estimate impacts on productivity, for example Maksimovic and

Phillips (2001) and Blonigen and Pierce (2016). In particular, Blonigen and Pierce (2016) consider both productivity and market power changes separately by applying the method by De Loecker and Warzynski (2012) to estimate markups. Overall, empirical findings in this literature are somewhat mixed. Braguinsky et al. (2015), Maksimovic and Phillips (2001), Healy and Ruback (1992), and Devos, Kadapakkam and Krishnamurthy (2009) document efficiency gains while Blonigen and Pierce (2016) and Cohn, Mills and Towery (2014) find little evidence of increases in productivity or operating improvements. Relative to these papers, we focus on how M&As affect corporate profits and markups, examining M&A activities across a wide range of countries in Europe. Lastly, Boucly, Sraer and Thesmar (2011) and Erel, Jang and Weisbach (2015) find that after leveraged buyouts, target firms become more profitable, grow faster, and issue more debt, using a sample of French firms between 1994 and 2004 and a sample of European firms between 2001 and 2008, respectively. While their findings contrast our overall results, our paper focuses on more recent years and with a broader set of M&A deals, which can lead to differences in results.

This paper also contributes to a recent literature on the relationship between market power and corporate outcomes. Gutiérrez and Philippon (2017) argues that declining competition in the U.S. has resulted in lower investment rates. Similarly, De Loecker, Eeckhout and Unger (2020) document a rise in market power in the U.S., which is consistent with patterns of declining competition. In this paper, we study one potential source of changing competition – changing ownership structure. While we find no evidence of increased markups after M&As, the decline in profitability we find is likely also driven by other factors, given the declines are documented in mergers that likely have negligible impacts on market power.

Finally, our results contribute to the literature in corporate finance that studies negative stock-market reactions to merger announcements. Researchers have interpreted such findings as evidence of empire building (Jensen, 1986), misaligned incentives (Morck, Shleifer and Vishny, 1988), or CEO overconfidence (Malmendier and Tate, 2005). These hypotheses of acquisition behavior imply that some M&A events may not be profit-maximizing. Our results are consistent with this interpretation, as we find declines in both profit margins and investment in fixed assets following M&As. The declines in profits among acquiring firms are consistent with the empirical evidence on the negative stock-market returns of corporate acquisitions (Betton, Eckbo and Thorburn, 2008).

The remainder of the paper is organized as follows. Section 2 describes the institutional setting. Section 3 describes our empirical strategy and data. Section 4 presents our main results. Section 5 discusses potential mechanisms and economic interpretations of our results. Section 6 concludes.

# 2 Institutional Background

The regulations regarding M&As are comparable across 10 European countries we study: Belgium, Finland, France, Germany, Italy, Netherlands, Poland, Spain, Sweden, and United Kingdom.[1] Each country has its own antitrust agency which oversees and regulates M&A activities and bidding processes that occur both within the country or across the border. At a broad level, all competition authorities enforce a comparable set of rules when reviewing the proposed M&As, and follow the guidelines set by the European Union. These countries may differ primarily in terms of which types of firms they grant exemptions on regulations. For example, in Finland, foreign target companies are not subject to the regulations. We include the details on regulations regarding M&As across these countries in Appendix A.

All of the countries in our sample have pre-merger notification rules to block potentially anticompetitive mergers or acquisitions. Typically, those rules are based on firm size: (1) domestic sales and (2) global sales. Each country has its own thresholds, but they are typically set higher than the thresholds in North America (Wollmann, 2019). Appendix A summarizes the rules regarding pre-merger notification rules. There have been several legislation changes on the antitrust regulations, especially regarding pre-merger notification rules, across these countries during our sample period. These legislative changes, however, depend on firms' global sales, which we do not observe in our data. Therefore, we do not exploit these changes for identification in this paper.

# 3 Empirical Strategy

This section describes our empirical strategy and data for estimating the impact of mergers and acquisitions on corporate outcomes.

## 3.1 Estimating M&A Effects on Main Outcomes

The effects of M&As on firms' profitability and markups are ex-ante ambiguous. A merger or acquisition may lead to an increase in profits if it generates efficiency gains through synergies between merging parties, which can boost their productivity (Braguinsky et al., 2015). By contrast, an M&A may lead to a fall in profits if the transaction was initiated by empire-building motives (Jensen, 1986) or ends up reducing firms' productivity. Understanding potential mechanisms be-

[1] We choose these 10 countries based on the total number of M&A events in each country within the European Union, as these countries give us enough variation to estimate the effects of M&As on firm outcomes. See Table 1 for the number of M&A transactions across these countries over time.

hind the impacts of M&As on firms' profitability and markups is important for policy implications.

To estimate the effects of M&As on firm-level outcomes, we implement a matched difference-in-differences design. As the first step, we match each M&A firm to a "counterfactual" non-M&A firm that is *never treated* throughout our entire sample period. To do so, we extract all M&A events in a given year and then match firms involved in these events to non-M&A firms based on observable characteristics one year prior to the M&A event. In particular, we partition firms in the same 2-digit sector and country by their total assets, operating revenue, and firm age. An M&A firm and a non-M&A firm are a match if they are in the same country, the same sector and the same decile bins of total assets, operating revenue, and age.[2] Note that we match M&A firms with control firms, separately for acquirers and for targets. The majority of M&A activities in our sample are partial acquisitions, rather than full mergers. Therefore, target firms in our sample remain as separate, independent entities after M&As, and target firms involved in full acquisitions (or mergers) are absorbed by acquirers and not observed in our data.

If multiple potential matches are found, then we use propensity score matching as a tie breaker. A propensity score matching is a conditional measure of treatment participation given a set of observable variables (Cameron and Trivedi 2005). We use quadratics in total assets, operating revenue, and firm age to estimate the propensity score, and conditioning that firms are in the same partition, the two closest in propensity score will be considered as a match. For each M&A year, we construct an unbalanced panel of observations 5 years prior to an M&A and 5 years after. This creates a panel of treated and control units for every M&A year. To aggregate across M&A years and compute an overall average impact, we stack these panels in our main estimation.

In the second step of our empirical procedure, we estimate a regression of the following form:

$$y_{it} = \sum_{k=-5}^{5} \beta_k \mathbb{1}\left(t_i = t^* + k\right) \times MA_i + \alpha_i + \alpha_{jst} + X_i\beta + \epsilon_{it} \tag{1}$$

where $y_{it}$ is the outcome of interest, $MA_i$ is an indicator for whether a firm is an M&A firm or not, $\mathbb{1}\left(t_i = t^* + k\right)$ indicates an M&A event that happened $k$ years in the past (future) relative to the period of M&A event $t^*$, $\alpha_i$ are firm fixed effects, $\alpha_{jst}$ are country-by-industry-by-year fixed effects. This implies that the effects of mergers are identified off changes over time between firms in the same 4-digit industry and country. Again, both M&A firms and their control firms are matched at $t = -1$. While the matching procedure ensures balance within a two-digit sector, the industry-by-year fixed effects are included to further control for any industry-specific shocks in a given year. Including these fixed effects therefore controls for industry-by-country specific trends. We also

[2]Our results robust to including other variables for matching, such as cash holdings or leverage ratio. Furthermore, our results are qualitatively similar when we use smaller or larger bin sizes. See Appendix C for details.

include quartics in firm age in order to control for underlying financial constraints of the firms. The standard errors are clustered at the firm level.[3] We omit the year prior to the M&A event so that each $\beta_k^{MA}$ shows the difference in the outcomes variable relative to the base year, which is one year before the M&A event. To summarize the impact of the M&A event overall, we denote $\sum_{k=0}^{5} \hat{\beta}_k$ as the average impact.

An alternative to this matched difference-in-differences design is to use all of the data and estimate an event-study design with staggered adoptions. However, a recent literature (Goodman-Bacon, 2018; Sun and Abraham, 2020; De Chaisemartin and d'Haultfoeuille, 2020; Borusyak, Jaravel and Spiess, 2021) finds that in two-way fixed effects designs with unit and time fixed effects, the difference-in-differences estimator (or dynamic difference-in-differences estimator) may not retrieve a weighted average treatment effect. Intuitively, standard regression-based implementations utilize "forbidden comparisons" between groups that got treated over a period of time and groups which had been treated earlier (Borusyak, Jaravel and Spiess, 2021). This issue can lead to estimates that are biased or even have the wrong sign. Instead, the matched difference-in-differences design is implemented separately for each event year, similar to Cengiz et al. (2019) that estimates separate event-specific treatment effects for 138 minimum wage changes. Identification here comes solely from differences in M&A firms and non-M&A firms over time, not from units coming in and out of treatment, therefore avoiding the negative weighting issue from standard regression-based implementations. Additionally, to provide evidence that our results are not biased due to the staggered event timing, we implement the imputation estimator of Borusyak, Jaravel and Spiess (2021) (see Appendix C).

The main identification assumption of our approach is that M&A firms and non-M&A firms would have followed similar trajectories in the absence of a merger or acquisition. This may be a strong assumption given that an M&A is an endogenous decision by firms. For example, M&A events are likely undertaken by productive acquiring firms that will continue to expand. Furthermore, an acquirer may target an innovative firm that introduces a new technology, which would lead to higher profits or markups. Therefore, an estimate on the impact of M&A on profitability or markups would be biased upwards if profits or markups of the acquirer or the target would have increased even in the absence of the M&A. On the other hand, it is possible that unproductive firms become targets. Even under this case, the effects of M&As on profits for acquiring firms may be still overstated because acquirers may purchase unproductive firms for their growth potential.

Another key threat to this event study design is that time-varying shocks may coincide with M&A events. For example, it is conceivable that acquiring firms face positive productivity shocks

[3] We also do a robustness check by two-way clustering our standard errors at the 4-digit NAICS and country level, and find similar results.

in the year of the merger, which can overstate the effects of M&As on profits or markups. By contrast, the other case in which negative productivity shocks coinciding with the M&A events is unlikely, because firms that receive a bad shock has an option to delay the M&A event. We include 4-digit NAICS dummies interacted with year dummies to control for any time-varying industry wide productivity shocks. Relatedly, our matched difference-in-differences design addresses a potential mean-reversion from M&A firms being larger than non-M&A firms on average.

Another potential source of bias to our main estimates are spillover effects. If M&A impacts other firms in the same product market (for example, through market power effects), then our estimates will be biased towards zero. To address potential spillover effects of M&As, we conduct a heterogeneity test based on the initial level of concentration, where we define an industry as being concentrated based on total assets of firms active in that industry. Then, we consider industries where the concentration level the year prior to a merger is above the median as initially concentrated industries. The intuition is that a given merger would likely have much smaller spillover effects in initially less concentrated markets. We find profit declines in both types of industries, suggesting that spillover effects were unlikely to be the main driver behind our results.

## 3.2 Data and Analysis Sample

This paper uses firm financial and accounting information from the Amadeus database matched with information on merger and acquisition activities from SDC Platinum database. The matched data set allows us to examine firm behaviors after they go through M&As and compare their outcomes to other firms that did not go through M&As. The data set covers from 2007 to 2019 and includes small to large firms across 10 European countries: Belgium, Finland, France, Germany, Italy, Netherlands, Poland, Spain, Sweden, and United Kingdom. We choose these countries as they give use enough variation based on the number of M&A deals in each year to conduct an event-study analysis.[4]

The firm-level data from Amadeus contain financial and accounting information for both private and publicly traded firms in Europe from 2007 to 2019.[5] They include a wide range of firm characteristics and outcome variables, which we detail in the next subsection. Importantly, they include unique identifying variables, such as firm names, addresses, phone and fax numbers, which

[4]Table A.3 in Appendix A shows the number of M&A deals in other European countries not included in our analysis. Except for Denmark, all other countries have a substantially lower number of M&A events relative to 10 European countries in our analysis during the sample period.

[5]The Amadeus database was accessed while David Arnold and Terry Moon were graduate students at Princeton University. To avoid potential survivorship bias due to high attrition in pre-2010 data, we downloaded the firm-level data for each year (2007, 2008, and 2009) from a licensed CD, instead of downloading everything from Wharton Research Data Service.

we use along with other identifying variables (i.e., postal codes) to perform fuzzy matching with the M&A data set. As a robustness check, we also estimate results only for firms that perfectly match between the Amadeus dataset and SDC platinum.

The data set from SDC Platinum allows detailed search on mergers and acquisitions. All corporate (public or private) transactions are included. This data set includes names of the parties, NAICS industry codes, value of the transaction (if disclosed), and the status of the transaction (completed, pending, etc) with some identifying information such as addresses, websites, and phone numbers.

We perform fuzzy matching between the financial data and M&A data at the firm-level. We standardize name, city, address, website, email, fax and phone number of firms. Then, we perform fuzzy matching using *matchit* command in STATA which matches two variables (names of firms here) based on similar text patterns. Other variables are used to increase both quality and the number of matches (see Appendix B for more details). Since different establishments of a firm may be active in different industries, matching based on industry codes will not be perfect and a firm might be matched with an establishment that is not active in its industry.[6] Therefore, we do not use the NAICS industry code as the unique identifying variable. The final data set contains firm financial data matched with M&A information for 10 European countries from 2007 to 2018.

Our analysis sample consists of both publicly traded (mostly large) and private (small to large) firms across 10 European countries from 2009 to 2018. To avoid potential biases that can arise from young firms that get acquired right after entering the market, we do a robustness check where we restrict our M&A sample to be present for at least 2 years before the M&A event, which restricts the first event to be in year 2009 (see Appendix C). The share of listed firms in our analysis sample is about 1 percent on average, and dropping them does not quantitatively affect our main estimates. The dominant sectors are manufacturing, construction, trade, information, and technology services, and we exclude financial and management sectors. In our main specification, we consider firms that completed at least one transaction (whether as an acquirer or target) as treated firms and firms without any completed transaction as control firms.

## 3.3 Variable Definitions

We define the key set of variables used in our empirical analysis. This includes profit margins, markups, leverage ratio, and investment in fixed assets.

The key outcome variable is profit margins, defined as total revenue minus total expenses,

[6]For example, Airbus SE is a company primarily active in "Manufacturing" sector; however, it has establishments active in "Retail" and "Management of Companies and Enterprises" sectors.

scaled by total revenue. This variable is directly observed in our data. The other main outcome is firm's markup. We follow the cost-based method by De Loecker and Warzynski (2012) to estimate markups. This approach requires fewer inputs than the demand-based approach. In particular, the markup depends on the elasticity of output with respect to variable costs as well as the variable costs share. For the elasticity of output with respect to variable costs, we use estimates from De Loecker, Eeckhout and Unger (2020) that allow for different elasticities across two-digit NAICS codes and years. Given the elasticity estimates, this allows us to estimate firm-level markups as the output elasticity multiplied by the inverse of the variable costs (wages and material costs) share: $\hat{\theta}_{st} * \frac{Sales}{Costs\ of\ goods}$. Note that this approach is also used in De Loecker and Eeckhout (2020) to estimate markups across European countries.

We also examine how the capital structure of firms changes following M&As. In particular, to assess firms' sources of financing, we look at their leverage ratio, defined as total debts over total assets. Finally, we also examine the investment rate in fixed assets: $\frac{I_t}{K_{t-1}} = \frac{K_t - K_{t-1}}{K_{t-1}} + \delta_t$, where $I_t$ is the expenditure on capital $K_t$ at time $t$ and $\delta_t$ is the depreciation rate at time $t$. We do not directly observe expenditures on capital, but we observe the book value of fixed assets and their depreciation, which we use to compute the investment rate based on the accounting convention: $K_t = (1-\delta_t)K_{t-1} + I_t$. Fixed (or long-term) assets refer to assets and properties owned by a business that are not easily converted to cash.

## 3.4 Descriptive Statistics

Panel A of Table 1 reports the match rate between SDC Platinum (M&A data) and Amadeus (firm-level financial data) across countries and years of our sample. The average match rate over period 2007-2018 is around 62 percent, with the perfect (unique) match rate of roughly 81 percent on average during our sample period across 10 European countries. Panel B of Table 1 reports the total number of M&A deals across 10 countries and for 2007-2018 period. In our sample, United Kingdom has been the most active M&A market.

Table 2 reports the average and standard deviation of important variables in our matched sample. On average, M&A firms are a bit larger, in terms of operating revenue, than non-M&A firms. However, in terms of key outcomes, such as profit margins, markups, leverage ratio, and investment rate in fixed assets, M&A firms and their matched control firms are comparable in sizes. Importantly, M&A firms and non-M&A firms show parallel trends in these outcomes prior to the event.

Table 3 reports the summary statistics on M&A activities across countries and years among our sample of acquirers. Overall, the majority of M&A deals was within non-tradable sectors, within

the same industries (horizontal M&As), domestic, and involved in the acquisition of assets. On average, an acquiring firm was involved in 1.3 deals per year during our sample period. Finally, the average value of a transaction in our sample is 140 million US dollars. Note that the average ownership and value of transactions were estimated using a much smaller subset of M&A firms where we can observe these variables.

# 4 Results

This section shows results from the estimation of the difference-in-differences model in Section 3, and presents additional tests supporting the interpretations of the results.

## 4.1 The Effects of M&A on Profit Margins and Markups

Figure 1 plots $\beta_k^{MA}$ from estimating equation (1) with profit margins and markups as the outcomes using our matched sample. For both acquiring and target firms, we observe parallel trends in these outcomes relative to their control groups before the event. While markups remain unchanged, profit margins decreased significantly after an M&A relative to non-M&A firms.

Table 4 presents the difference-in-differences estimates on profit margins and markups, separately by acquiring and target firms. Column (1) shows that both acquirers' and targets' profit margins decreased by roughly 1 percentage point (15 percent decline) on average relative to non-M&A firms. Column (2) shows that both acquiring firms' and target firms' markups remained unchanged on average after M&A.

## 4.2 The Effects of M&A on Leverage and Investment

Figure 2 plots estimates of $\beta_k^{MA}$ from equation (1) for leverage ratio and investment rate in fixed assets as the outcomes using our matched sample. Panel A shows that acquiring firms' leverage ratio follows a similar pattern as leverage of the non-M&A firms before the M&A event, and we see a sharp increase in leverage after the event. While target firms' leverage ratio does not appear to satisfy parallel trends with their control firms before the M&A event, we do not see much changes in leverage on average after the event. Panel B shows that both acquirers and targets show parallel trends in investment rate relative to their control groups before the M&A event. While target firms do not show much change in investment rate after the event, we see a sharp spike in investment on the year of the acquisition for acquirers, but an overall decline in investment on average in the

subsequent years. This is consistent with the idea that there is a mechanical shift in fixed assets through acquisition on the first year, but acquirers subsequently cut investment in overall fixed assets over time.

Column (3) of Table 4 presents the difference-in-differences shows that acquiring firms' leverage ratio increases by 2.1 percentage points on average, relative to non-M&A firms, whereas target firms' leverage does not change much on average after the event. Column (4) shows that acquirers' investment rate in long-term assets decreased by 7 percentage points on average relative to non-M&A firms, whereas targets' investment in fixed assets does not change much.

Taken together, the combined results show that acquiring firms take more debts and cut back on investment in long-term assets in order to finance their acquisitions, and both acquirers' and targets' profit margins decreased significantly after the event.

### 4.3 Internal Validity

We conduct several robustness checks to strengthen the internal validity of our results. First, we repeat the main analysis with different levels of winsorizing our outcome variables, by imposing 2-year lags, and by different ways of clustering our standard errors, and find qualitatively similar results to our main findings. Second, we repeat the analysis by focusing on the perfectly matched sample and find that the results are qualitatively similar. Third, we implement the imputation estimator by Borusyak, Jaravel and Spiess (2021), and find qualitatively similar results. Finally, we include additional variables, such as firms' cash holdings or leverage, and use different bin sizes, such as quintiles or ventiles, when finding a matched pair, and find qualitatively similar results. Results from these robustness tests are reported in Appendix C.

## 5 Market Power Channel and Economic Interpretations

In this section, we discuss and empirically test whether profitability and markup responses following an M&A event are consistent with a rise in market power. Understanding potential mechanisms behind these responses is important for policymakers designing an effective antitrust system. The main channel in which M&As can induce higher profits or markups is through the product market power: firms that gain market power after M&As may have incentives to decrease investment in order to suppress output and to increase prices, which will result in higher markups and profit margins.

We find that the both acquiring and target firms experienced a decline in profit margins, which

is inconsistent with these firms gaining market power after M&As (De Loecker, Eeckhout and Unger, 2020). Therefore, the results on markups and profit margins indicate that our results are unlikely driven by the market power channel. To further corroborate this conclusion, we also conduct heterogeneity analyses by sectors and industries to test the market power channel.

## 5.1 Heterogeneity by Tradable vs. Non-Tradable Sectors

If firms gain more market power after M&As, we should observe that a decrease in profit margins is concentrated among tradable sectors relative to non-tradable sectors. The intuition is that an M&A would have a larger impact on firms' market power if they do not face competition outside their geographical (i.e., international) markets. We define firms as active in tradable good sectors if they fall under Agriculture, Forestry, Fishing and Hunting, Mining, Quarrying, and Oil and Gas Extraction, and Manufacturing. Firms active in other sectors (i.e., Construction, Retail, Real Estate, Services, etc) are defined as falling under non-tradable sectors (Berger, Herkenhoff and Mongey, 2021; Delgado, Bryden and Zyontz, 2014).

Figure 3 shows the results separately for tradable and for non-tradable sectors. Panels A and B show that the effects of M&As on profit margins and markups for acquiring firms are similar for both tradable sectors and non-tradable sectors. Panels C shows that the effects of M&As on profit margins for target firms are stronger for tradable sectors, and Panel D shows that target firms in non-tradable sectors show a slight increase in markups. While these results for target firms are partly consistent with the market power channel, we see a decline in profit margins for both tradable and non-tradable sectors, implying that M&As unlikely lead target firms to gain more market power.

Furthermore, we estimate the effects of M&As on profit margins and markups separately for each sector to check where the effects are concentrated. Figure 4 presents the results separately across 8 major sectors, and shows results consistent with Figure 3. While the results for target firms seem consistent with the market power channel, these results could be purely driven by the sectoral heterogeneity. Therefore, we supplement this analysis by examining the industry-level heterogeneity in the next subsection.

## 5.2 Heterogeneity by Between vs. Within Industries

Similar to the heterogeneity analysis in the previous subsection, if firms gain more market power after M&As, we may observe that a decrease in profit margins is concentrated among the between-industry M&As relative to within-industry M&As. The intuition is that an M&A would have a

larger impact on firms' market power if they acquire another firm within the same industry (i.e., horizontal mergers). We divide our sample of all M&A firms based on the industries of the parties involved in a transaction. A merger is a within-industry merger if the industries (4-digit NAICS) of both parties are identical and it is between-industry merger if the industries are different. For firms with one transaction, we define a firm as "within" if it participated in a within-industry merger and as "between" if it participated in a between-industry merger. For firms with more than one transaction, we will consider the majority of transactions to determine the within and between indicators.

Figure 5 shows the results separately for within- and between-industry M&As. Panels A and B show that the results on profit margins and markups for acquirers are similar for both within- and between-industry M&As. Panel C shows that the decline in profit margins for targets is concentrated for between-industry M&As, and Panel D shows that targets involved in within-industry M&As show a moderate increase in markups after the event. While these results for target firms seem consistent with the market power channel, we conclude that M&As do not appear to contribute to a rise in market power for target firms, given that their profit margins still do not increase after M&As.

## 5.3 Heterogeneity by Initial level of Concentration

We supplement our analysis in the previous subsection by doing a heterogeneity test based on the initial level of concentration. Here, we define an industry as being concentrated based on total assets of firms active in that industry. Specifically, we compute the HHI using total assets for all industries.[7] Then, we consider industries where the concentration level in the year prior to a merger is above the median as initially concentrated industries. We focus on industries that have within-industry mergers. The market power story is more pronounced where two firms merge in a specific industry that is already concentrated.

Figure 6 shows the results separately for above-median concentration and for below-median concentration industry M&As. Panels A and B show that the effects of M&As on profit margins and markups for acquirers are similar for both above-median and below-median concentration industries. Panel C shows that the decline in profit margins for targets is stronger for above-median concentration industries, which is inconsistent with the market power channel. Panel D shows that the effects of M&As on markups for targets are similar for both above-median and below-median concentration industries.

[7] $HHI_{cy} = \Sigma s_{icy}^2$ where $s_{icy}$ is the share of total assets of firm $i$ active in industry $c$ and year $y$.

### 5.4 Heterogeneity by Domestic vs. Cross-border M&As

In our pooled sample across 10 European countries, cross-border M&As account for almost a quarter of total M&A deals. We test whether the effects of M&As on investment are different depending on whether a M&A deal was international rather than domestic. We define a deal as domestic if both target and acquiring firms are within the same country, and define the deal as cross-border if the parties are from different countries. Figure 7 shows that the effects of M&A on profit margins and markups are not statistically different between domestic and cross-border M&As.

Our main specification estimates the effects of M&As on the main outcomes within a particular industry in a given country by a specific year. Therefore, our results are estimated net of any industry-by-country-by-year specific fixed effects. However, to get a sense of on which countries the effects are concentrated, we also run the same specification across each of these countries, controlling for industry-by-year fixed effects.

Figure 8 shows that the effects of M&As on profit margins are concentrated among the following six countries: Finland, France, Sweden, Italy, Netherlands, and Poland. According to the study by Hylton and Deng (2007), these countries have high antitrust scope indices, which was a metric also used by Besley, Nicola and Limodio (2021) to examine how antitrust policies affect profitability in non-tradable sectors across 90 countries. Given that these countries do not have lower antitrust indices relative to other EU countries on average, it is unlikely that changes in profit margins or markups are driven by the market power channel, consistent with our previous results. Potential reasons for the country-level heterogeneity could be institutional differences or differences in firm characteristics that could generate heterogeneous investment responses to M&As. Understanding these sources of differences across countries would be an interesting avenue for future research.

## 6 Conclusion

In this paper, we study how corporate M&As affects firms' profitability and markups in the medium-run. We compare the outcomes of firms that went through M&As with a matched sample of non-M&A firms before and after the event. Using financial data merged with M&A data at the firm-level across 10 European countries from 2009 to 2018, we exploit a large number of M&A activities based on a pooled sample of firms across these countries, given that they all share a comparable set of antitrust regulations and are governed by the European Union. To address potential biases in our estimates due to the endogeneity of M&A decisions, we argue that our estimates likely provide lower bounds on the effects of M&As on firm's investment given their sign and the

type of transactions.

Our results show economically and statistically significant drops in profit margins for both acquiring and target firms, while their markups remain unchanged. Furthermore, acquiring firms experience a significant increase in leverage ratio and reduce investment rate in long-term assets. Additional heterogeneity analyses based on sectors and industries suggest that the changes in profitability and markups are unlikely to be driven by the market power channel; instead, it appears that acquiring firms decrease long-term assets and take more debts to finance their acquisitions.

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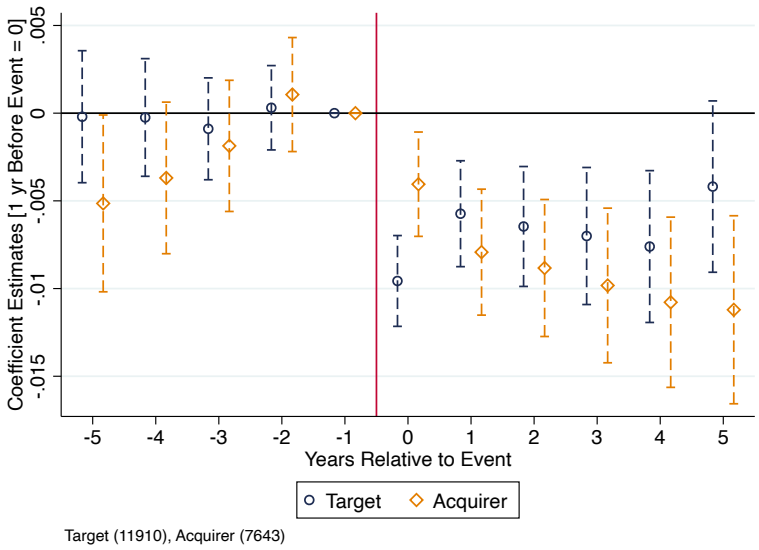
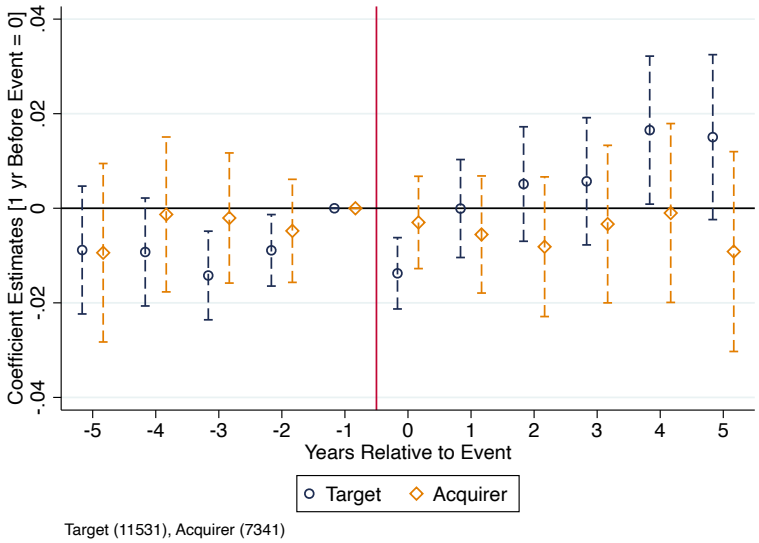
Figure 1: Effects of M&As on Profit Margins and Markups

(A) Profit Margins



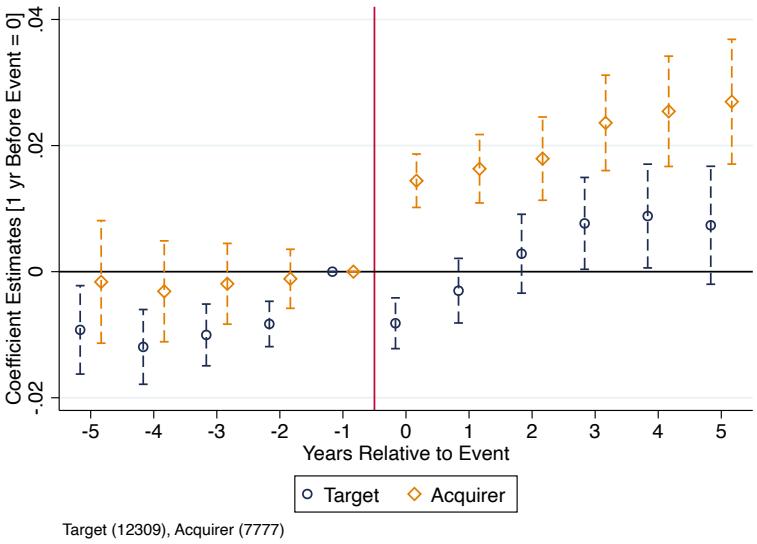

(B) Markups



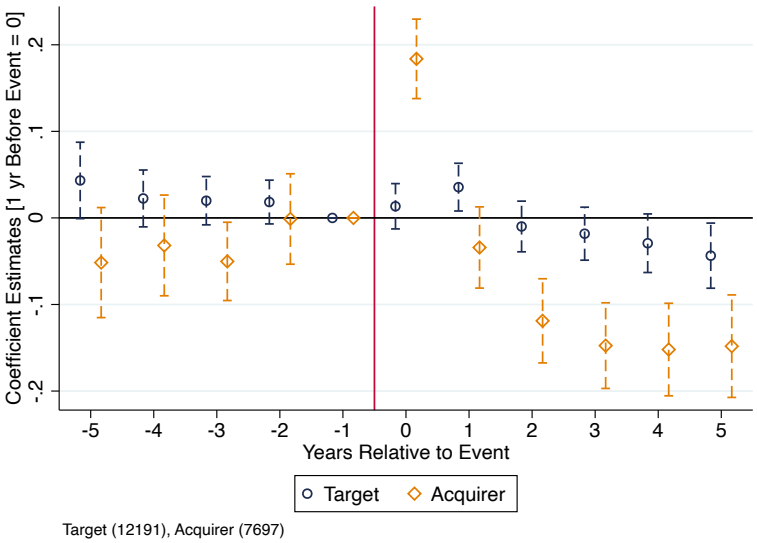

*Notes*: These figures show event-study coefficient estimates for firms' profit margins and markups. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these coefficient estimates. The solid vertical line indicates the event year. The orange dots correspond to event study estimates for acquiring firms and the navy blue dots indicate the estimates for target firms. The analysis uses a matched sample across 10 European countries from 2007 to 2018.

Figure 2: Effects of M&As on Leverage Ratio and Investment in Fixed Assets

(A) Leverage Ratio



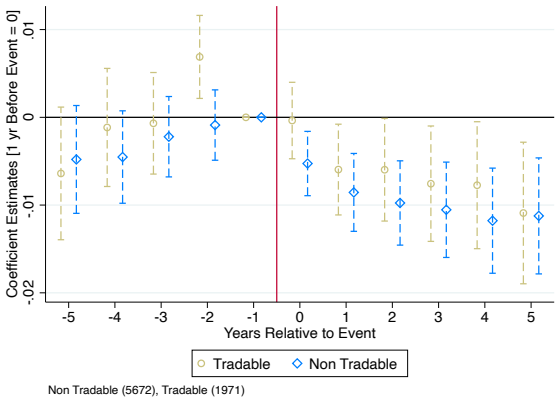

(B) Investment Rate




*Notes*: These figures show event-study coefficient estimates for leverage ratio and investment rate in fixed assets. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these coefficient estimates. The solid vertical line indicates the event year. The orange dots correspond to event study estimates for acquiring firms and the navy blue dots indicate the estimates for target firms. The analysis uses a matched sample across 10 European countries from 2007 to 2018.

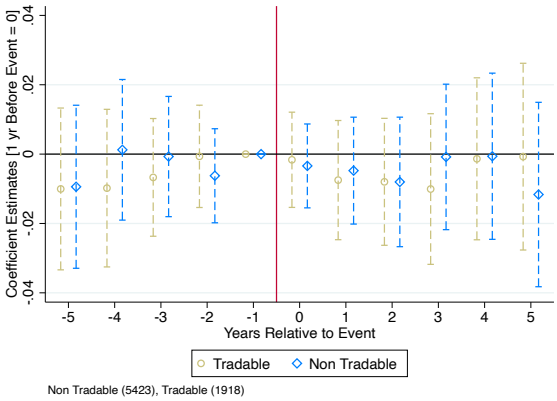
Figure 3: Effects of M&As on Profit Margins and Markups (Tradable vs. Non-tradable Sectors)

(A) Profit Margins (Acquirers)



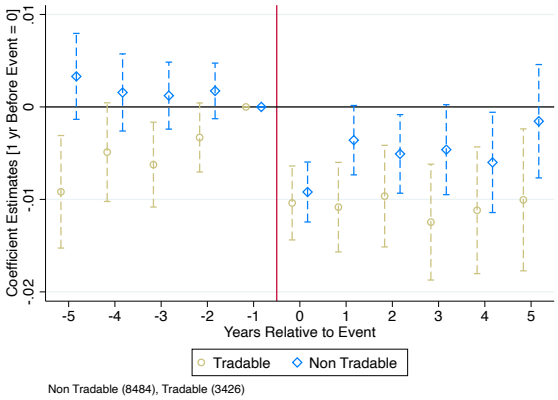

Non Tradable (5672), Tradable (1971)

(B) Markups (Acquirers)



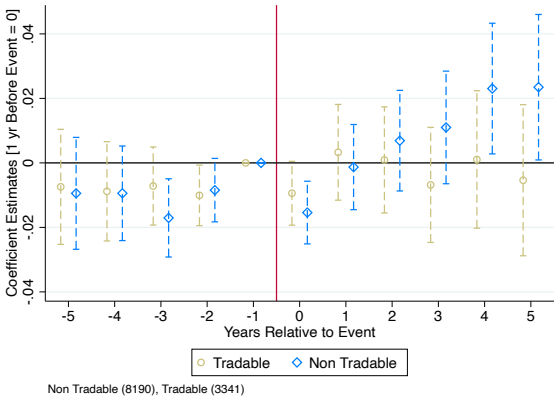

Non Tradable (5423), Tradable (1918)

(C) Profit Margins (Targets)




Non Tradable (8484), Tradable (3426)

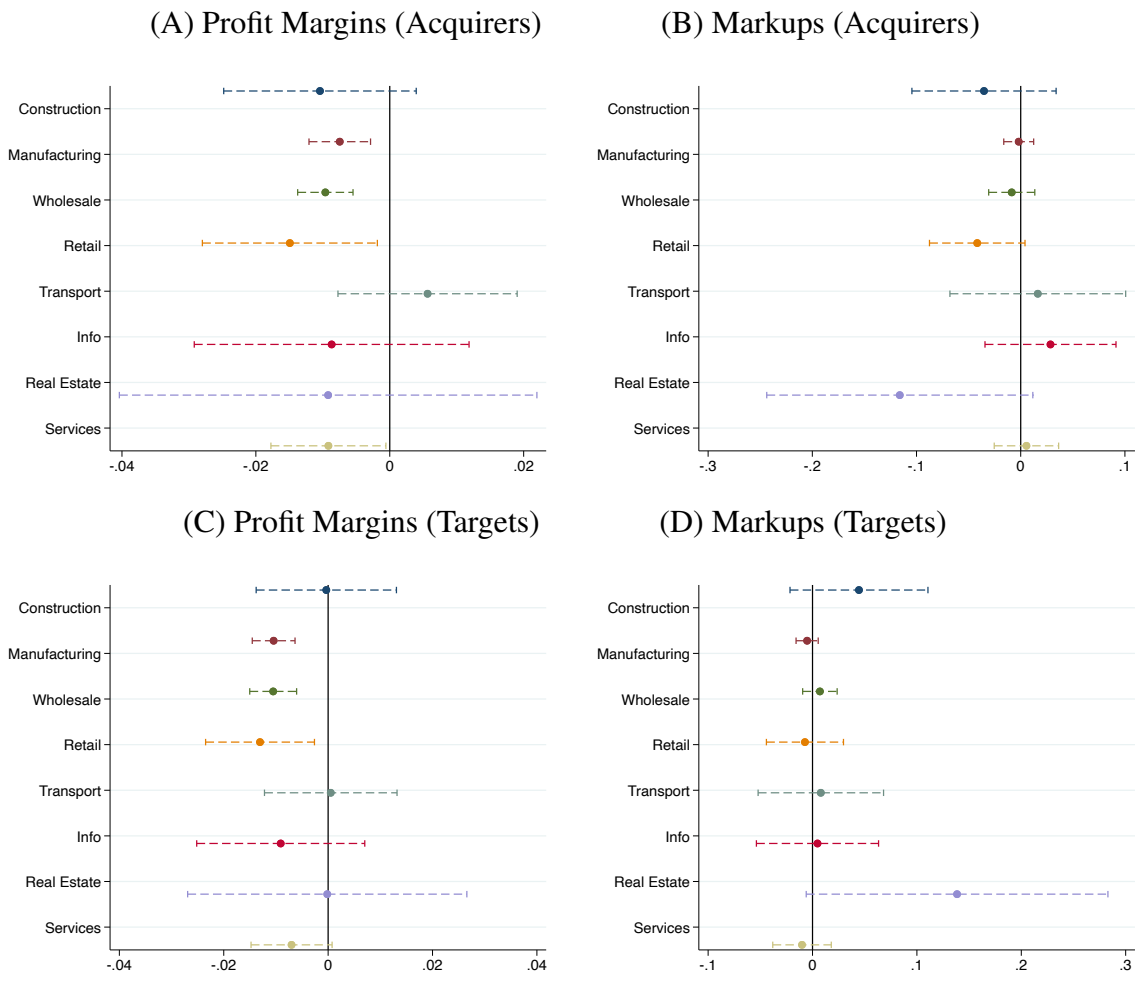
(D) Markups (Targets)




Non Tradable (8190), Tradable (3341)

*Notes*: These figures show event-study coefficient estimates for firms' profit margins and markups, separately for firms in non-tradable sectors and for firms in tradable sectors. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these coefficient estimates. The solid vertical line indicates the event year. The blue dots correspond to the event study estimates for firms active in non-tradable goods sectors and the khaki dots indicate the estimates for firms involved in tradable goods sectors. The analysis uses a matched sample across 10 European countries from 2007 to 2018.

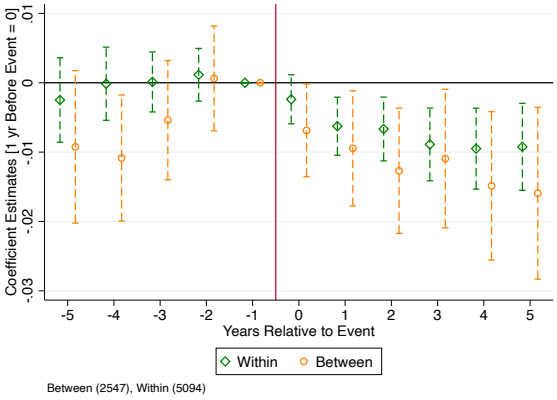
Figure 4: Effects of M&As on Profit Margins and Markups (Across Sectors)




*Notes*: These figures show average difference-in-differences estimates on firms' profit margins and markups across each sector. The dashed lines indicate 95% confidence intervals for these coefficient estimates. The analysis uses a matched sample across 10 European countries from 2007 to 2018.

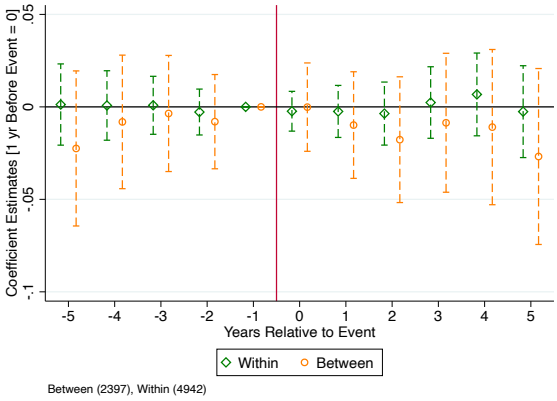
Figure 5: Effects of M&As on Profit Margins and Markups (Between vs. Within Industries)

(A) Profit Margins (Acquirers)



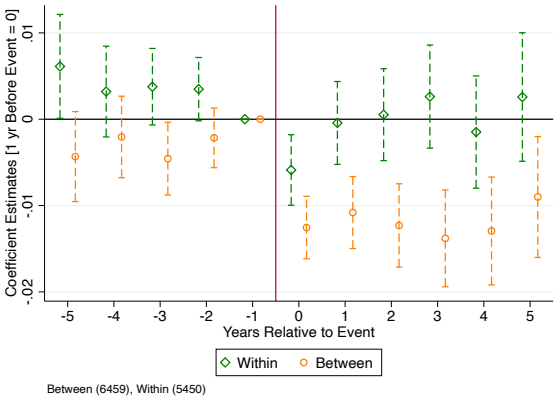

Between (2547), Within (5094)

(B) Markups (Acquirers)



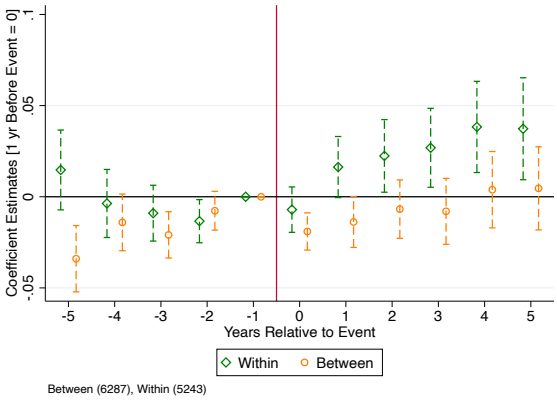

Between (2397), Within (4942)

(C) Profit Margins (Targets)




Between (6459), Within (5450)

(D) Markups (Targets)

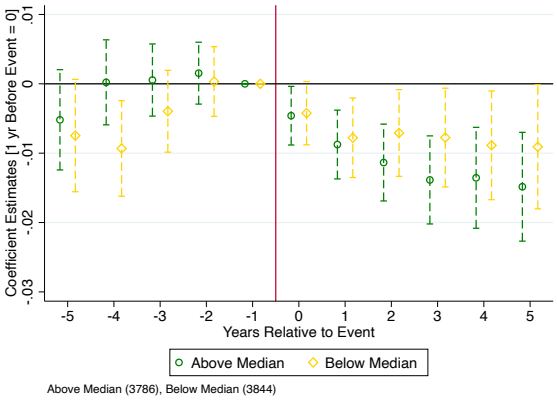



Between (6287), Within (5243)

*Notes*: These figures show event-study coefficient estimates for firms' profit margins and markups for firms in the same 4-digit industries and for firms in different 4-digit industries. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these coefficient estimates. The solid vertical line indicates the event year. The green dots correspond to event study estimates for firms in the same 4-digit industries ("within") and the orange dots indicate the estimates for firms in different 4-digit industries ("between"). The analysis uses a matched sample across 10 European countries from 2007 to 2018.

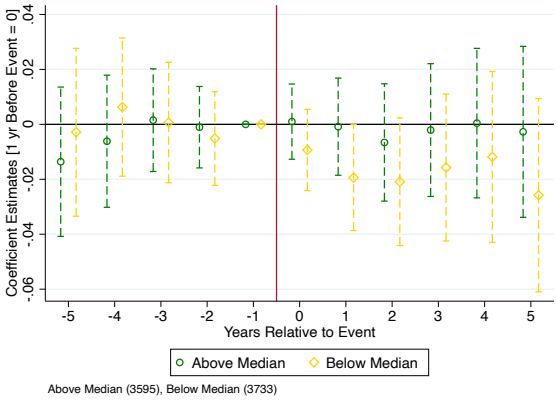
Figure 6: Effects of M&As on Profit Margins & Markups (Above vs. Below median concentration)

(A) Profit Margins (Acquirers)



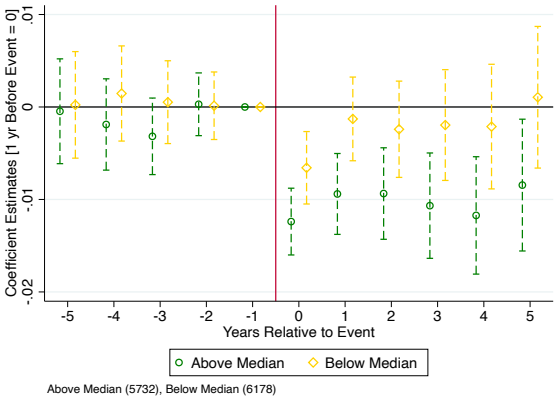

Above Median (3786), Below Median (3844)

(B) Markups (Acquirers)



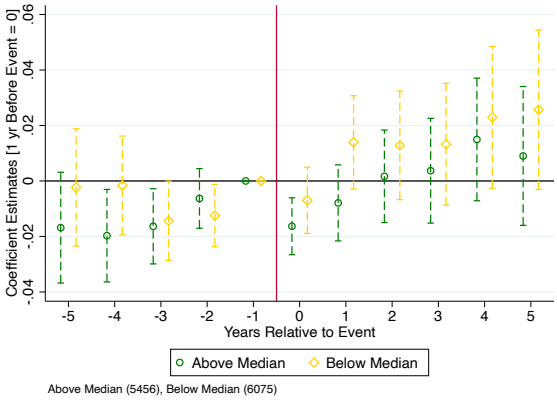

Above Median (3595), Below Median (3733)

(C) Profit Margins (Targets)




Above Median (5732), Below Median (6178)

(D) Markups (Targets)

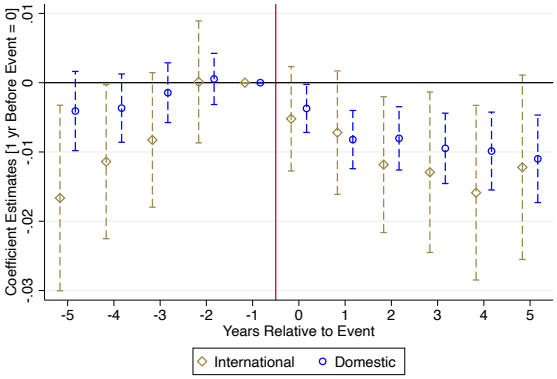



Above Median (5456), Below Median (6075)

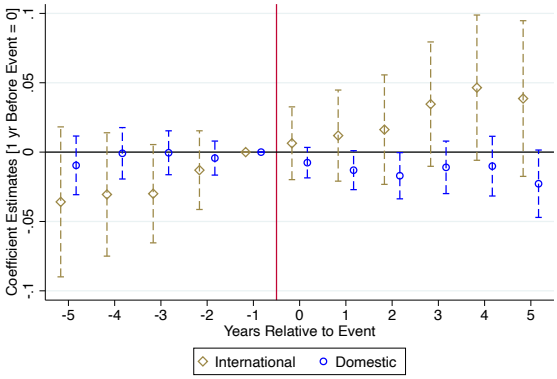
*Notes*: These figures show event-study coefficient estimates for firms' profit margins and markups, separately for firms operating in concentrated industries and for firms operating in less concentrated industries. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these coefficient estimates. The solid vertical line indicates the event year. The green dots correspond to the event study estimates for firms active in concentrated industries (above-median HHI) and the yellow dots correspond to the event study estimates for firms active in less concentrated industries (below-median HHI). The analysis uses a matched sample across 10 European countries from 2007 to 2018.

Figure 7: Effects of M&As on Profit Margins and Markups (Cross-border vs. Domestic M&As)

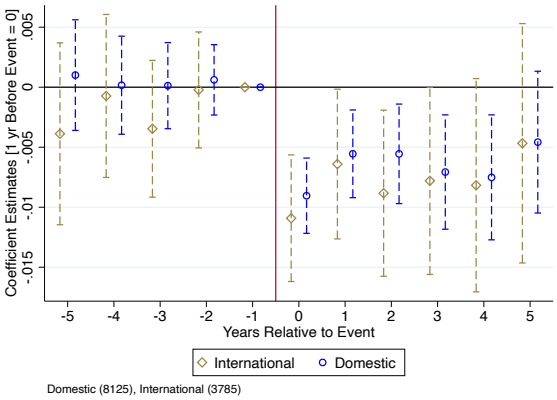
(A) Profit Margins (Acquirers)



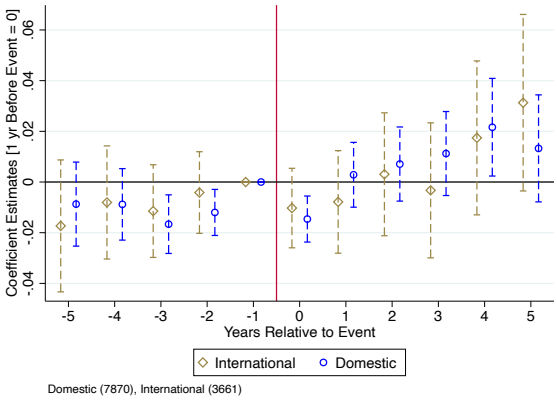

(B) Markups (Acquirers)




(C) Profit Margins (Targets)

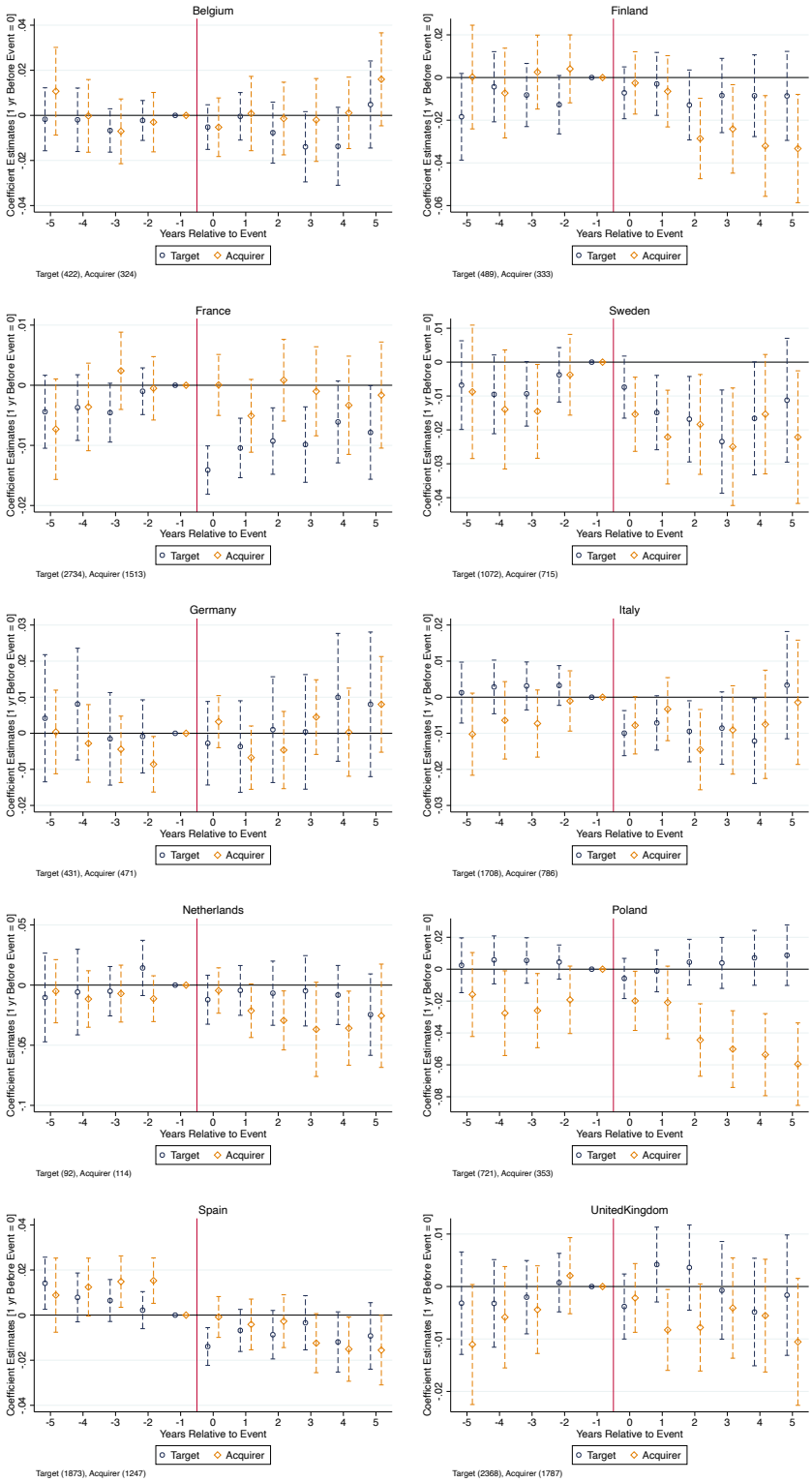



(D) Markups (Targets)




*Notes*: These figures show event-study coefficient estimates for firms' profit margins and markups, separately for firms involved in domestic M&A deals and for firms involved in cross-border deals. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these coefficient estimates. The solid vertical line indicates the event year. The blue dots correspond to the event study estimates for firms involved in domestic deals and the grey dots correspond to firms involved in cross-border deals. The analysis uses a matched sample across 10 European countries from 2007 to 2018.

Figure 8: Effects of M&As on Profit Margins (Across Countries)




*Notes*: These figures show event-study coefficient estimates for firms' profit margins, separately for each country. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these coefficient estimates. The solid vertical line indicates the event year. The orange dots correspond to event study estimates for acquiring firms and the navy blue dots indicate the estimates for target firms.

Table 1: M&A Deals Across Countries (2007 - 2018)

Panel A: Fuzzy Match Rate (Perfect Match Rate)

| | (1) Belgium | | (2) Finland | | (3) France | | (4) Germany | | (5) Italy | | (6) Netherlands | | (7) Poland | | (8) Spain | | (9) Sweden | | (10) UK | | (11) Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | 74 | (75) | 69 | (84) | 72 | (77) | 70 | (85) | 65 | (71) | 69 | (80) | 68 | (83) | 69 | (75) | 64 | (78) | 75 | (89) | 71 | (83) |
| 2008 | 76 | (76) | 71 | (84) | 72 | (75) | 76 | (85) | 65 | (73) | 65 | (76) | 68 | (80) | 70 | (58) | 65 | (75) | 76 | (89) | 72 | (79) |
| 2009 | 75 | (77) | 74 | (86) | 71 | (75) | 75 | (87) | 70 | (65) | 66 | (79) | 73 | (89) | 69 | (81) | 63 | (77) | 75 | (91) | 72 | (82) |
| 2010 | 53 | (84) | 58 | (88) | 48 | (82) | 52 | (93) | 40 | (37) | 41 | (77) | 66 | (91) | 36 | (81) | 50 | (82) | 59 | (93) | 51 | (86) |
| 2011 | 51 | (83) | 59 | (93) | 46 | (81) | 54 | (93) | 42 | (37) | 41 | (78) | 65 | (93) | 38 | (81) | 52 | (87) | 62 | (93) | 52 | (86) |
| 2012 | 52 | (81) | 59 | (86) | 48 | (81) | 57 | (92) | 44 | (40) | 44 | (73) | 64 | (90) | 43 | (77) | 51 | (83) | 62 | (92) | 54 | (85) |
| 2013 | 54 | (81) | 58 | (85) | 48 | (81) | 58 | (91) | 49 | (39) | 46 | (70) | 60 | (90) | 49 | (74) | 53 | (82) | 67 | (93) | 56 | (84) |
| 2014 | 60 | (83) | 63 | (84) | 48 | (79) | 66 | (88) | 49 | (39) | 51 | (74) | 63 | (87) | 51 | (72) | 59 | (83) | 69 | (92) | 59 | (83) |
| 2015 | 56 | (79) | 62 | (86) | 45 | (77) | 68 | (89) | 49 | (39) | 51 | (69) | 62 | (86) | 54 | (71) | 61 | (79) | 72 | (91) | 59 | (81) |
| 2016 | 59 | (68) | 68 | (85) | 48 | (73) | 70 | (89) | 52 | (42) | 57 | (68) | 62 | (85) | 56 | (71) | 67 | (75) | 74 | (91) | 62 | (79) |
| 2017 | 68 | (77) | 72 | (83) | 54 | (77) | 74 | (91) | 56 | (41) | 60 | (72) | 67 | (84) | 59 | (70) | 69 | (73) | 72 | (86) | 65 | (78) |
| 2018 | 69 | (78) | 76 | (83) | 59 | (76) | 73 | (88) | 63 | (42) | 63 | (75) | 69 | (85) | 61 | (66) | 73 | (75) | 65 | (72) | 66 | (74) |
| Average | 63 | (78) | 66 | (85) | 54 | (77) | 66 | (89) | 55 | (50) | 55 | (75) | 65 | (87) | 55 | (72) | 61 | (79) | 69 | (89) | 62 | (81) |

Panel B: Total Number of M&A Deals

| | (1) Belgium | (2) Finland | (3) France | (4) Germany | (5) Italy | (6) Netherlands | (7) Poland | (8) Spain | (9) Sweden | (10) UK | (11) Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | 443 | 426 | 2051 | 2368 | 970 | 1000 | 345 | 1201 | 1241 | 4400 | 15439 |
| 2008 | 390 | 452 | 1748 | 2020 | 976 | 1037 | 386 | 1437 | 980 | 3617 | 13891 |
| 2009 | 278 | 270 | 1489 | 1638 | 743 | 767 | 289 | 905 | 746 | 2566 | 10330 |
| 2010 | 302 | 324 | 1755 | 1612 | 730 | 804 | 378 | 1033 | 980 | 2986 | 11754 |
| 2011 | 318 | 333 | 1988 | 1893 | 671 | 863 | 294 | 1060 | 993 | 3084 | 12356 |
| 2012 | 284 | 253 | 1931 | 1733 | 545 | 763 | 224 | 898 | 881 | 3019 | 11356 |
| 2013 | 262 | 247 | 1830 | 1641 | 553 | 684 | 272 | 793 | 779 | 2737 | 10551 |
| 2014 | 316 | 266 | 2497 | 1855 | 657 | 737 | 447 | 1014 | 695 | 3188 | 12260 |
| 2015 | 405 | 275 | 3123 | 1843 | 900 | 833 | 691 | 1072 | 756 | 3408 | 13926 |
| 2016 | 413 | 321 | 3083 | 1957 | 1054 | 978 | 551 | 1034 | 840 | 3279 | 14120 |
| 2017 | 443 | 302 | 2556 | 1902 | 1174 | 926 | 402 | 1138 | 900 | 3958 | 14267 |
| 2018 | 430 | 313 | 2287 | 1796 | 1187 | 928 | 411 | 1253 | 934 | 4250 | 14320 |
| Total | 4284 | 3782 | 26338 | 22258 | 10160 | 10320 | 4690 | 12838 | 10725 | 40492 | 154570 |

*Notes*: Panel A reports the match rate between SDC Platinum (M&A data) and Amadeus (firm-level financial data). In the parentheses, we report the share of perfectly matched observations. A match is perfect if two observations match on at least one unique identifying variables (i.e., phone number, website, email, and ticker symbol). Panel B reports the total number of deals (matched and unmatched) across years and countries in our sample.

Table 2: Summary Statistics (Matched Sample)

| | (1) Revenue (mil) | (2) ProfMargin | (3) Markup | (4) Leverage | (5) Fixed (%) |
|---|---|---|---|---|---|
| Acquirer | 114.621 | 0.056 | 2.966 | 0.615 | 0.416 |
| | (263.256) | (0.095) | (4.852) | (0.225) | (0.458) |
| Matched Control | 71.894 | 0.060 | 3.626 | 0.599 | 0.294 |
| | (150.348) | (0.088) | (8.517) | (0.244) | (0.389) |
| Target | 47.147 | 0.045 | 2.631 | 0.623 | 0.410 |
| | (143.085) | (0.100) | (4.147) | (0.227) | (0.419) |
| Matched Control | 36.446 | 0.055 | 3.176 | 0.601 | 0.290 |
| | (95.341) | (0.084) | (6.344) | (0.245) | (0.332) |

*Notes*: Sample years include 2007 – 2018. These statistics are computed one year prior to an M&A event. Column (1) reports operating revenue in million US dollars. Column (2) reports profit margins, defined as total revenue minus total expenses, scaled by total revenue. Column (3) shows markups, defined in Section 3. Column (4) shows leverage ratio, defined as total debts scaled by total assets. Column (5) reports investment rates in fixed (long-term) assets. "Matched Control" is the group of matched non-M&A firms.

Table 3: Summary Statistics on M&A Activities Across Countries

| | (1) Per Year | (2) # Deals | (3) Non-Tradable (%) | (4) Within Indusry (%) | (5) Domestic (%) | (6) Merger (%) | (7) Asset Sought (%) | (8) Share Owned | (9) Value |
|---|---|---|---|---|---|---|---|---|---|
| Belgium | 35 | 1.3 | .75 | .63 | .52 | .18 | .65 | .95 | 165 |
| | (10) | (.16) | (.089) | (.092) | (.094) | (.058) | (.061) | (.029) | (335) |
| Finland | 37 | 1.4 | .75 | .64 | .78 | .27 | .53 | .92 | 41 |
| | (16) | (.22) | (.074) | (.09) | (.08) | (.1) | (.1) | (.033) | (42) |
| France | 148 | 1.4 | .81 | .63 | .84 | .12 | .6 | .92 | 179 |
| | (58) | (.17) | (.072) | (.067) | (.082) | (.049) | (.2) | (.077) | (144) |
| Germany | 54 | 1.4 | .65 | .68 | .71 | .2 | .59 | .95 | 269 |
| | (15) | (.17) | (.064) | (.11) | (.083) | (.079) | (.073) | (.022) | (338) |
| Italy | 103 | 1.3 | .51 | .7 | .78 | .2 | .35 | .86 | 87 |
| | (52) | (.14) | (.2) | (.13) | (.11) | (.084) | (.14) | (.032) | (79) |
| Netherlands | 11 | 1.3 | .7 | .69 | .5 | .21 | .54 | .85 | 240 |
| | (6) | (.27) | (.26) | (.21) | (.27) | (.16) | (.2) | (.27) | (390) |
| Poland | 34 | 1.2 | .66 | .56 | .88 | .23 | .27 | .79 | 34 |
| | (12) | (.2) | (.23) | (.092) | (.076) | (.12) | (.11) | (.068) | (50) |
| Spain | 135 | 1.4 | .73 | .66 | .84 | .18 | .55 | .9 | 164 |
| | (53) | (.13) | (.049) | (.072) | (.043) | (.038) | (.089) | (.037) | (226) |
| Sweden | 76 | 1.4 | .8 | .64 | .79 | .2 | .64 | .93 | 35 |
| | (26) | (.15) | (.092) | (.081) | (.069) | (.063) | (.086) | (.031) | (24) |
| UnitedKingdom | 178 | 1.5 | .8 | .67 | .75 | .19 | .6 | .88 | 176 |
| | (61) | (.36) | (.076) | (.12) | (.09) | (.072) | (.19) | (.26) | (186) |
| Total | 81 | 1.3 | .72 | .65 | .74 | .2 | .53 | .89 | 140 |
| | (66) | (.21) | (.16) | (.12) | (.17) | (.093) | (.18) | (.13) | (228) |

*Notes*: This table displays summary statistics of M&A deals across countries and among acquirers in our matched sample. Column (1) reports the average number of M&A deals. Column (2) reports the average number of deals that an acquiring firm is involved in. Column (3) reports the share of M&A deals in non-tradable goods sectors. Column (4) reports the share of deals that were within the same 4-digit industries. Column (5) reports the share of domestic deals. Column (6) reports the share of deals that were mergers between two parties, rather than acquisitions of assets. Column (7) reports the share of deals that was involved in the acquisition of assets (as opposed to the acquisition of stocks). Column (8) reports the average share owned by the acquiring firm post M&A (when the deal was the acquisition of stocks). Column (9) reports the average value of transactions in million US dollars.

Table 4: Effects of M&As on Profit Margin, Markup, Leverage, and Investment Rate

| | (1) ProfitMargin | (2) Markup | (3) Leverage | (4) Fixed |
|---|---|---|---|---|
| Acquirer | -0.009*** | -0.005 | 0.021*** | -0.070*** |
| | (0.002) | (0.007) | (0.003) | (0.023) |
| R squared | 0.636 | 0.956 | 0.804 | 0.627 |
| Firm-Year | 102807 | 89531 | 116764 | 107541 |
| Target | -0.007*** | 0.005 | 0.003 | -0.009 |
| | (0.002) | (0.006) | (0.003) | (0.013) |
| R squared | 0.615 | 0.954 | 0.771 | 0.577 |
| Firm-Year | 161317 | 142838 | 187223 | 171328 |

*Notes*: This table reports the difference-in-differences estimates for the effects of M&A on firm outcomes, separately for acquiring and target firms. The dependent variables in column (1) and (2) are profit margins and log(markup). The dependent variables in column (3) and (4) are the leverage ratio and investment rate in fixed assets. The standard errors are clustered at the firm level.

Table 5: Effects of M&As on Main Outcomes (Tradable vs. Non-tradable)

Panel A: Acquirers

| | (1) Profit Margin | (2) Markup |
|---|---|---|
| Post × Treated | -0.010*** | -0.005 |
| | (0.002) | (0.009) |
| Post × Treated × Tradable | 0.003 | 0.000 |
| | (0.003) | (0.012) |
| R squared | 0.636 | 0.956 |
| Firm-Year | 102807 | 89531 |

Panel B: Targets

| | (1) Profit Margin | (2) Markup |
|---|---|---|
| Post × Treated | -0.005*** | 0.008 |
| | (0.002) | (0.007) |
| Post × Treated × Tradable | -0.006* | -0.011 |
| | (0.003) | (0.010) |
| R squared | 0.615 | 0.954 |
| Firm-Year | 161317 | 142838 |

*Notes*: This table reports the difference-in-differences estimates for the effects of M&A on profit margins and markups for firms in non-tradable goods sectors, and triple-difference estimates for firms in tradable goods sectors. Panel A shows the estimates for acquiring firms, and Panel B shows the estimates for target firms. The standard errors are clustered at the firm level.

Table 6: Effects of M&As on Main Outcomes (Between vs. Within Industries)

Panel A: Acquirers

| | (1) Profit Margin | (2) Markup |
|---|---|---|
| Post × Treated | -0.008*** | -0.003 |
| | (0.002) | (0.008) |
| Post × Treated × Between | -0.002 | -0.008 |
| | (0.004) | (0.013) |
| R squared | 0.636 | 0.956 |
| Firm-Year | 102807 | 89531 |

Panel B: Targets

| | (1) Profit Margin | (2) Markup |
|---|---|---|
| Post × Treated | -0.000 | 0.019** |
| | (0.002) | (0.008) |
| Post × Treated × Between | -0.012*** | -0.025*** |
| | (0.003) | (0.009) |
| R squared | 0.615 | 0.954 |
| Firm-Year | 161317 | 142838 |

*Notes*: This table reports the difference-in-differences estimates for the effects of M&A on profit margins and markups for firms active in the same 4-digit industries ("within"), and triple-difference estimates for firms active in different 4-digit industries ("between"). Panel A shows the estimates for acquiring firms, and Panel B shows the estimates for target firms. The standard errors are clustered at the firm level.

# For Online Publication

This appendix supplements our paper "Corporate Acquisitions and Investment: Evidence from Europe" with the following sections:

- Section A provides additional institutional details.
- Section B provides details of data cleaning and fuzzy matching.
- Section C shows results from robustness tests.

# A Institutional Details

In Appendix A, we provide additional institutional details on M&A regulations for 10 European countries in our main analysis sample.

In column "Joint" of Table A.1, ✓suggests it is a joint threshold. If the column is empty, then it means if one threshold is satisfied, then the firm has to file a pre-merger notification.

In column "Regulation" of Table A.2, the first agency is in charge of takeover bid process, and the second agency is responsible for merger control. For "Exceptions" in Germany, the Takeover Act is applicable to foreign companies whose voting shares are exclusively listed in Germany at the organized market. For "Exceptions" in Italy, small and medium firms are subject to some special rules. Takeover Directives do not apply to some public offers in EU. The concentration that has a community dimension in EU Merger Regulation is defined with turnovers.

Table A.1: Threshold changes

| Country | Time | Thresholds | Value | Joint |
|---|---|---|---|---|
| Belgium | 2009-2018 | domestic combined turnover | EUR 100 million | ✓ |
| | | domestic individual turnover of at least two of the undertakings concerned | EUR 40 million | ✓ |
| Finland | 2009-2018 | global combined turnover | EUR 350 million | ✓ |
| | | domestic individual turnover of at least two of the undertakings concerned | EUR 20 million | ✓ |
| France | 2009-2018 | global combined turnover | EUR 150 million | ✓ |
| | | domestic individual turnover of at least two of the undertakings concerned | EUR 50 million | ✓ |
| Germany | 2009-2017 | global combined turnover | EUR 500 million | ✓ |
| | | domestic turnover of at least one participating | EUR 25 million | ✓ |
| | | domestic individual turnover of at least one further participating undertaking | EUR 5 million | ✓ |
| | 2017-2018 | global combined turnover | EUR 500 million | ✓ |
| | | domestic turnover of at least one participating | EUR 25 million | ✓ |
| | | domestic individual turnover of at least one further participating undertaking | EUR 5 million | ✓ |
| | | transaction value | EUR 400 million | |
| Italy | 2009 | domestic combined turnover | EUR 461 million | |
| | | domestic individual turnover of targets | EUR 46 million | |
| | 2009-2012 | domestic combined turnover | EUR 474 million | |
| | | domestic individual turnover of targets | EUR 47 million | |
| | 2013-2017 | domestic combined turnover | EUR 499 million | ✓ |
| | | domestic individual turnover of targets | EUR 50 million | ✓ |
| | 2018 | domestic combined turnover | EUR 498 million | ✓ |
| | | domestic individual turnover of at least two of the undertakings concerned | EUR 30 million | ✓ |

Table A.1 (continued): Threshold changes

| Country | Time | Thresholds | Value | Joint |
|---|---|---|---|---|
| Netherlands | 2009-2018 | global combined turnover | health care: EUR 55 million | ✓ |
| | | | pension funds: EUR 500 million | ✓ |
| | | domestic individual turnover of at least two concerned undertakings | health care: EUR 10 million | ✓ |
| | | | pension funds: EUR 100 million | ✓ |
| | 2009-2014 | global combined turnover | EUR 113.45 million | ✓ |
| | | domestic individual turnover of at least two concerned companies | EUR 30 million | ✓ |
| | 2015-2018 | global combined turnover | EUR 150 million | ✓ |
| | | domestic individual turnover of at least two concerned companies | EUR 30 million | ✓ |
| Poland | 2009-2014 | global combined turnover | EUR 1 billion | ✓ |
| | | domestic combined turnover | EUR 50 million | ✓ |
| | 2015-2018 | global combined turnover | EUR 1 billion | ✓ |
| | | domestic combined turnover | EUR 50 million | ✓ |
| | | domestic individual turnover | EUR 10 million | ✓ |
| Spain | 2009-2018 | domestic combined turnover | EUR 240 million | ✓ |
| | | domestic individual turnover of at least two of the undertakings concerned | EUR 60 million | ✓ |
| | 2009-2010 | domestic market share acquired or increased | 30% | |
| | 2011-2018 | domestic market share acquired or increased | 50% | ✓ |
| | | domestic individual turnover of targets | EUR 10 million | ✓ |
| Sweden | 2008 | domestic combined turnover | SEK 4 billion | ✓ |
| | | domestic individual turnover of at least two of the parties concerned | SEK 100 million | ✓ |
| | 2009-2018 | domestic combined turnover | SEK 1 billion | ✓ |
| | | domestic individual turnover of at least two of the parties concerned | SEK 200 million | ✓ |
| United Kingdom | 2009-2018 | domestic individual turnover of targets | GBP 70 million | |
| | | domestic market share acquired or increased | 25% | |

Table A.2: Summary of Regulations

| Countries | Regulation | Who is applied to | Exceptions | Timeline |
|---|---|---|---|---|
| Belgium | *agencies:* FSMA, Belgian Competition Authority | voluntary or mandatory public takeovers bids if securities are in Belgium, primary market is in Belgium, or registered office is in Belgium and stocks are traded on Belgian stock exchange.<br>any public squeeze-out bid. | registered office and primary market of target outside Belgium | without pre-merger notification: 4 to 16 weeks.<br>with permerger notification: 6 to 36 weeks |
| Finland | *agencies:* Financial Supervisory Authority,<br>FCCA | public takeovers.<br>firms listed on Nasdaq Helsinki. | foreign target firms | without pre-merger notification: 20 to 24 weeks.<br>with pre-merger notification: 24 to 48 weeks |
| France | *agencies:* Autorité des Marchés Financiers,<br>Autorité de la Concurrence | irrespective of targets corporate form.<br>Foreign buyers of certain sectors (energy, water, defense etc.) are subject to approval by the Minister of Economy.<br>Banking, insurance, etc. are subject to approval regardless of buyers nationality. | Listed companies have slightly different rules regarding corporate governance. | without pre-merger notification: 12 to 16 weeks.<br>with pre-merger notification: 16 to 32 weeks |

Table A.2 (continued): Summary of Regulations

| Countries | Regulation | Who is applied to | Exceptions | Timeline |
|---|---|---|---|---|
| Germany | *regulation:* Takeover Act. *agencies:* Federal Financial Supervisory Authority, Federal Cartel Office | only applies entirely to German- registered German-traded firms. | Only part of Takeover Act is applicable if a company is registered outside Germany or is traded only outside Germany. | without pre-merger notification: 1 to 16 weeks. with pre-merger notification: 5 to 36 weeks |
| Italy | *regulation:* Italian Civil Code, Italian Financial Act (TUF). *agencies:* National Commission for Companies and the Stock Exchange, Italian Competition Authority | joint-stock companies traded on Italian markets. Both public and private transactions subject to Italian Civil Code. The TUF applies to listed companies. | Small/medium enterprises have special rules. | without pre-merger notification: 4 to 10 weeks. with pre-merger notification: 6 to 24 weeks |
| Netherlands | *agencies:* Authority for the Financial Markets, Authority for Consumers and Markets | target admitted to trading on Netherlands regulated market. | N/A | without pre-merger notification: 10 to 24 weeks. with pre-merger notification: 14 to 41 weeks |
| Poland | *agencies:* Polish Financial Supervision Authority, Office of Competition and Consumer Protection | Target is public company registered in Poland with shares in a Polish regulated market. | non-Polish companies not traded in Poland | without pre-merger notification: 24 to 48 weeks. with pre-merger notification: 28 to 68 weeks |

Table A.2 (continued): Summary of Regulations

| Countries | Regulation | Who is applied to | Exceptions | Timeline |
|---|---|---|---|---|
| Spain | *agencies:* Securities Exchange Commission, Competition Authority | N/A | N/A | without pre-merger notification: 6 to 12 weeks. with pre-merger notification: 10 to 32 weeks |
| Sweden | *agencies:* Swedish Financial Authority, Swedish Competition Authority | targets whose shares are admitted to a regulated or alternative market in Sweden. | No special rules for foreign buyers except some restrictions in energy, nuclear, and defense sectors. | without pre-merger notification: 4 to 14 weeks. with pre-merger notification: 6 to 36 weeks |
| United Kingdom | *agencies:* Takeover Panel, Competitions and Markets Authority | public companies registered in the UK whose shares are traded on UK markets. | Foreign buyers restricted in aviation | without pre-merger notification: 4 to 16 weeks. with pre-merger notification: 4 to 184 weeks |
| EU | *regulation:* Takeover Directive 2004/25/EC, Council Regulation (EC) No 139/2004 (the EU Merger Regulation) *agencies:* European Commission | Takeover Directive: (1)public offers not made by the target company itself; (2)objective of control; (3)not issued by EU member states' central banks. EU Merger Regulation: all concentrations with a Community dimension | Takeover Directive: (1)made by the target company itself; (2)do not have as their objective the acquisition of control; (3)by EU member states' central banks. | without pre-merger notification: 2 to 10 weeks. with pre-merger notification: 7 to 35 weeks. |

Table A.3: M&A Deals Across Other European Countries (2007 - 2018)

| | (1) 2007 | (2) 2008 | (3) 2009 | (4) 2010 | (5) 2011 | (6) 2012 | (7) 2013 | (8) 2014 | (9) 2015 | (10) 2016 | (11) 2017 | (12) 2018 | (13) Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Austria | 222 | 184 | 152 | 174 | 184 | 137 | 139 | 136 | 161 | 147 | 118 | 114 | 1868 |
| Bulgaria | 84 | 112 | 63 | 30 | 49 | 44 | 42 | 45 | 33 | 42 | 44 | 37 | 625 |
| Croatia | 34 | 26 | 18 | 39 | 46 | 31 | 29 | 23 | 29 | 53 | 49 | 42 | 419 |
| Cyprus | 40 | 72 | 63 | 67 | 70 | 70 | 22 | 48 | 27 | 54 | 60 | 39 | 632 |
| CzechRepublic | 160 | 155 | 95 | 172 | 167 | 145 | 130 | 107 | 158 | 202 | 131 | 150 | 1772 |
| Denmark | 379 | 321 | 302 | 319 | 287 | 278 | 303 | 245 | 257 | 316 | 287 | 245 | 3539 |
| Estonia | 43 | 57 | 33 | 31 | 31 | 35 | 33 | 42 | 50 | 78 | 52 | 62 | 547 |
| Greece | 98 | 79 | 93 | 96 | 87 | 58 | 55 | 55 | 27 | 36 | 73 | 56 | 813 |
| Hungary | 93 | 78 | 41 | 72 | 38 | 49 | 57 | 48 | 57 | 87 | 123 | 88 | 831 |
| Ireland | 189 | 166 | 146 | 115 | 111 | 132 | 122 | 175 | 187 | 165 | 190 | 217 | 1915 |
| Latvia | 36 | 28 | 18 | 30 | 39 | 29 | 34 | 34 | 40 | 42 | 46 | 37 | 413 |
| Lithuania | 69 | 49 | 35 | 42 | 52 | 32 | 41 | 65 | 56 | 57 | 39 | 55 | 592 |
| Luxembourg | 45 | 34 | 39 | 45 | 52 | 32 | 40 | 55 | 80 | 85 | 83 | 58 | 648 |
| Malta | 8 | 4 | 10 | 2 | 11 | 5 | 8 | 10 | 14 | 21 | 26 | 18 | 137 |
| Portugal | 169 | 201 | 92 | 124 | 72 | 73 | 76 | 69 | 121 | 128 | 156 | 166 | 1447 |
| Romania | 112 | 111 | 55 | 58 | 60 | 69 | 68 | 69 | 54 | 95 | 116 | 94 | 961 |
| Slovakia | 27 | 33 | 13 | 11 | 13 | 20 | 16 | 32 | 24 | 28 | 21 | 39 | 277 |
| Slovenia | 27 | 23 | 6 | 4 | 7 | 20 | 20 | 23 | 46 | 45 | 30 | 35 | 286 |
| Total | 1835 | 1733 | 1274 | 1431 | 1376 | 1259 | 1235 | 1281 | 1421 | 1681 | 1644 | 1552 | 17722 |

*Notes*: This table reports the total number of deals (matched and unmatched) across years and countries that are part of the European Union, but not included in our analysis sample.

# B Fuzzy Matching

In this appendix, we explain the steps to merge M&A firms from SDC Platinum database with firms from the Amadeus database.

## B.1 SDC Platinum Data

First, we drop transactions with missing dates of submission from the SDC data set. Second, SDC Platinum lists a target firm and an acquiring firm for each transaction. However, the names of the parties are not always disclosed. For example, an investor group acquired "Albingia SA" in 2018 but the names of acquiring parties are not disclosed or "Animagi Oy" acquired a set of companies whose names are not disclosed. We label these undisclosed parties as *unmatchable* and do not include them in our fuzzy matching. Roughly 7% of M&A parties are labeled *unmatchable* and dropped.

Moreover, a firm may have participated in multiple transactions during the period of our study. However, information such as phone number, website, and postal code might not be reported for all of the transactions. The SDC Platinum does not have a unique identifier for firms, hence, we use firms' original (non-standardized) names to recover these unique identifying variables (UIVs). We explain below how UIVs are used in our fuzzy matching.

To perform fuzzy matching, we standardize names of the firms. This task is particularly difficult since names are in various languages such as English, French, German, Italian and Finnish. First, we remove punctuation such comma, colon, dot, and ampersand from firms' names. For example, "A. & J. VOEGEL" will turn into "A J VOEGEL" and common words such "AND", "THE", "OF" (in various languages). Second, we identify common phrases. For example, the German phrase "Gesellschaft mit beschränkter Haftung" or "GmbH" and the Swedish phrase "Aktiebolag" or "AB" are equivalent to "Ltd." used in the U.K. or "Inc." in the U.S. Third, we harmonize these common phrases. For exmaple, "Gesellschaft MBH", "Ges MBH" and "Gesell MBH" are all various formats of "Gesellschaft mit beschränkter Haftung", all of which we replace with the phrase "GMBH". As another example, "PHARMACOLOGIQUES", "PHARMACIES", "FARMACEUTICO" are all various formats "PHARMACEUTICALS", all of which we replace with the phrase "PHARM". Fourth, we remove phrases that represent the legal status of a firm but are not specific to the firm such as "PLC", "LTD", "INC" (in various languages). Fifth, we identify and harmonize phrases related to the country of the firm e.g. "ITALIENNE", "ITALIE", and "ITALIANO" are all related to Italy, and we replace them with the phrase "IT".

## B.2 Amadeus Data

The Amadeus database contains financial and accounting information for both private and publicly traded firms in Europe from 2007 to 2018. We drop firms with missing values for tangible, intangible and total fixed assets. We drop firms with missing names and standardize the names of firms, as described above.

## B.3 Fuzzy Matching

We perform fuzzy matching between SDC Platinum and Amadeus data using the STATA command *matchit*.[8] We tokenize standardized names by splitting on spaces. For instance, in "SEVEN NETWORKS" there are two tokens: SEVEN and NETWORKS. These match perfectly with "SEVEN NETWORKS" and "NETWORKS SEVEN" (score = 1), imperfectly with "NETWORK SEVEN" or "SEV NETWORKS" (score = 0.5) but does not match with "SEVE NET" (score = 0). The score is calculated by dividing number of matched tokens by the total number of tokens. We keep all the matches with a score equal to or above 0.5.

We use unique identifying variables (UIV) such as phone number, email, website, postal code, ticker symbol if available to identify perfect matches. This helps us to improve both quality and quantity of identified matches. We define four classes of quality in our matched data with class 1 having the highest quality: (1) Identical standardized names and at least one matching UIV (2) Imperfect fuzzy-matched names with at least one matching UIV (3) Identical standardized names with no conflicting UIVs but same industry codes, and (4) Identical standardized names with conflicting UIVs. At this point, a firm might have multiple matches. We keep matches with the highest quality. If a firm has two or more matches of the same quality, we choose one randomly.

[8] See the STATA documentation for details.

# C Robustness

In this Appendix, we provide a set of robustness tests for the main results in Section 4.

## C.1 Using Different Levels of Winsorization, Lags, and Clustering

We repeat the main analysis using the same specification as in equation (1), winsorizing (bottom- and top-coding) the main outcome variable at the 1% and 99% levels, instead of at the 5% and 95% levels. Figure C.1 shows that the results are qualitatively similar to the ones in which we winsorize the main outcomes at 5% and 95% levels.

Furthermore, to avoid potential biases that can arise from young firms that get acquired right after entering the market, we do a robustness check where we restrict our M&A sample to be present for at least 2 years before the M&A event. Figure C.2 shows that the results from the specification where we impose 2 year of lag, and that they are qualitatively similar to our main results.

Finally, we use two-way clustering at the industry-by-country level. Figure C.3 shows that the results are similar to the ones where we cluster our standard errors at the firm-level.

## C.2 Perfectly Matched Sample

We repeat the main analysis using the same specification as in equation (1) using the perfectly matched sample. Figure C.4 shows the results with the perfectly matched sample, which are qualitatively similar to the ones where we include the fuzzy matched sample. Note that within the matched sample we use for our main analysis, 81% of them are the perfectly matched sample and 19% of them are the fuzzy-matched sample.

## C.3 Imputation Estimator of Borusyak, Jaravel and Spiess (2021)

A recent literature (Goodman-Bacon, 2018; Sun and Abraham, 2020; De Chaisemartin and d'Haultfoeuille, 2020; Borusyak, Jaravel and Spiess, 2021) finds that in two-way fixed effects designs with unit and time fixed effects, the difference-in-differences estimator (or dynamic difference-in-differences estimator) may not retrieve a weighted average treatment effect. The key issue in these designs is that the standard implementation by OLS uses variation in which already treated units are used as a comparison group for not-yet treated groups, a comparison Borusyak, Jaravel and Spiess (2021) calls a "forbidden comparison". This can lead to important biases when treatment effects are not

constant across groups or over time. This issue motivates our primary strategy that utilized a match difference-in-differences strategy separately for each M&A cohort.

Another approach is to use the the estimator of Borusyak, Jaravel and Spiess (2021). To illustrate the approach, consider a simplified Equation (1):

$$y_{it} = \beta \cdot MA_{it} + \alpha_i + \alpha_t + \epsilon_{it} \tag{2}$$

where $MA_{it}$ is equal to one of the firm has gone through a merger. The imputation estimator proceeds by estimating the unit and period fixed effects, $\alpha_i$ and $\alpha_t$, using only never-treated or not-yet-treated observations. We impute the value for $y_{it}$ for a firm that has gone through a merger at time $t$ as $\hat{y}_{it}(0) = \hat{\alpha}_i + \hat{\alpha}(t)$. In other words, this is the predicted value of $y$ for this firm at time $t$ had the firm not gone through the merger based on the firm's fixed effect and the period fixed effect. The treatment effect at time $t$ is therefore given by the difference between the actual value of $y$ and the imputed value $\hat{\tau}_{it} = y_{it} - \hat{y}_{it}(0)$. To yield an overall estimate, we take a simple average of $\hat{t}_{it}$ across all treated units (i.e. estimate the ATT).

Figure C.5 implements the imputation estimator for our main outcomes. In all cases, we find similar results to the main specifications in the paper that uses the matched difference-in-differences that matches separately for each cohort of M&A events. These results confirm that the main estimates are not biased by identification issues in standard event-study design implementations with staggered treatment timing.

## C.4 Adding Other Variables for Matching

We repeat the main analysis using the same specification as in equation (1), but adding more variables when finding matched control firms. Panels A and B of Figure C.6 show the results derived from adding cash holdings as another variable for matching, and Panels C and D of Figure C.7 show the results derived from adding leverage ratio as another variable for matching. These figures show results that are qualitatively similar to the ones where we use just firm age, total assets, and total revenue when finding matched control firms. Therefore, our results are robust to using additional capital structure variables when finding a matched pair.

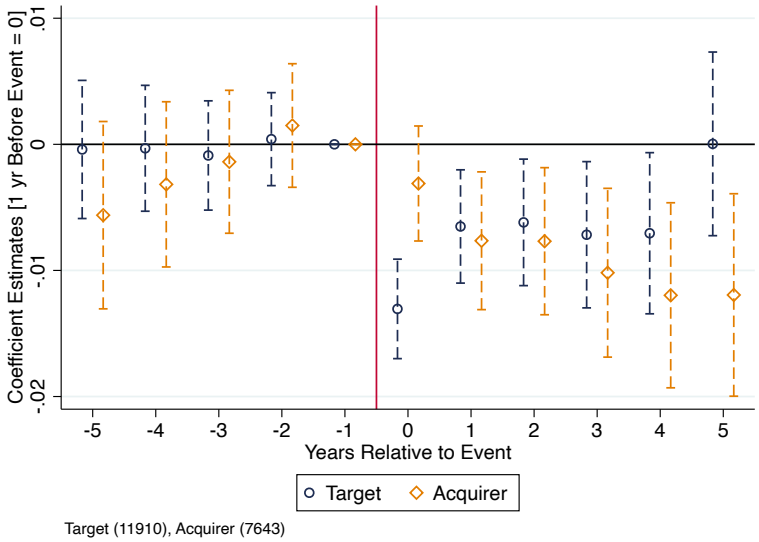
## C.5 Using Different Bin Sizes for Matching

We repeat the main analysis using the same specification as in equation (1), but different bin sizes when finding matched control firms. Panels A and B of Figure C.7 show the results derived from

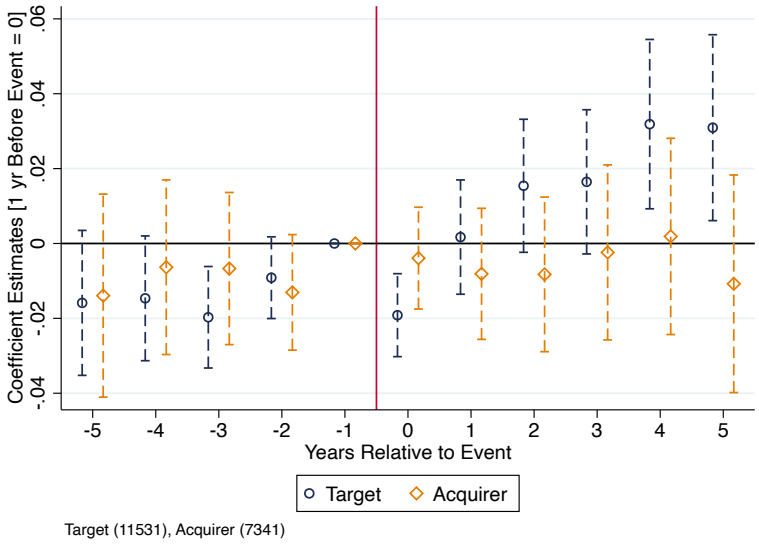
using quintile bins, and Panels C and D of Figure C.7 show the results derived from using ventile bins. These figures show results that are qualitatively similar to the ones where we decile bins when finding matched control firms. Therefore, our results are robust to using different bin sizes when finding a matched pair.

Figure C.1: Effects of M&As on Investment (1%, 99% Winsor)

(A) Profit Margins



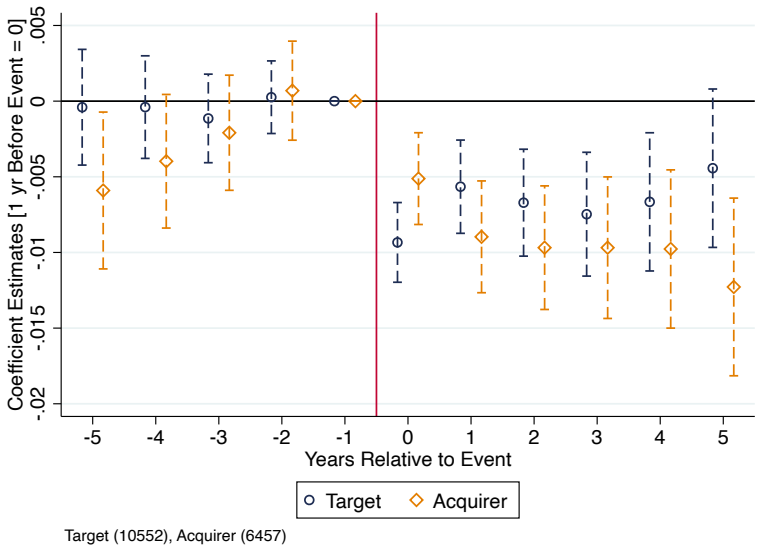

(B) Markups



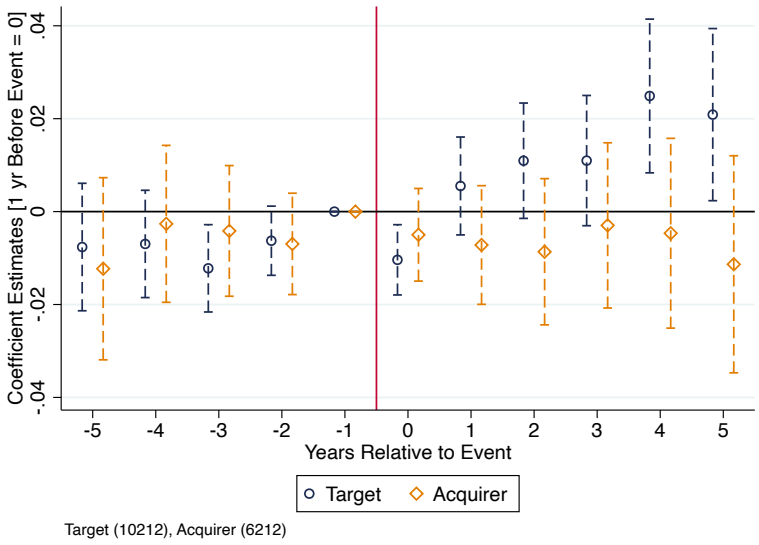

*Notes*: These figures show the event-study coefficient estimates for firms' profit margins and markups. The main outcomes are winsorized at 1% and 99%. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these estimates. The solid vertical line indicates the event year. The orange dots correspond to the event study estimates for the acquiring firms and the navy blue dots indicate the estimates for the target firms. The analysis uses a matched sample across 10 European countries from 2007 to 2018.

Figure C.2: Effects of M&As on Investment (Imposing 2 Year Lag)

(A) Profit Margins



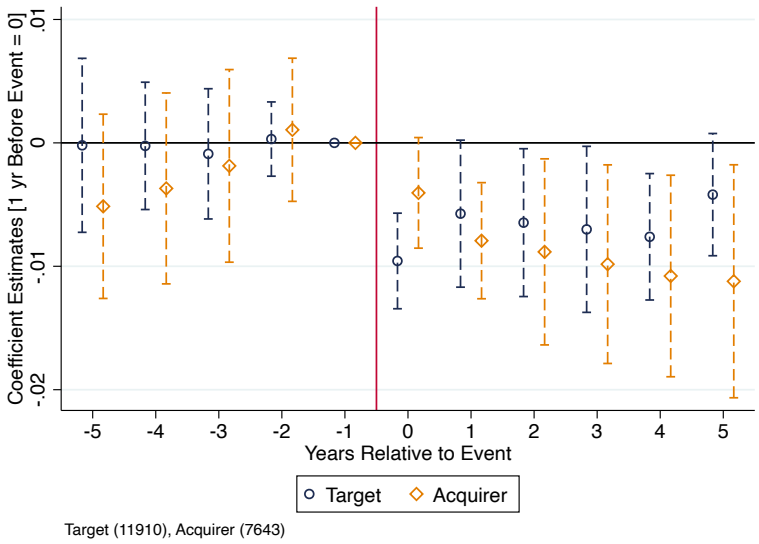

(B) Markups



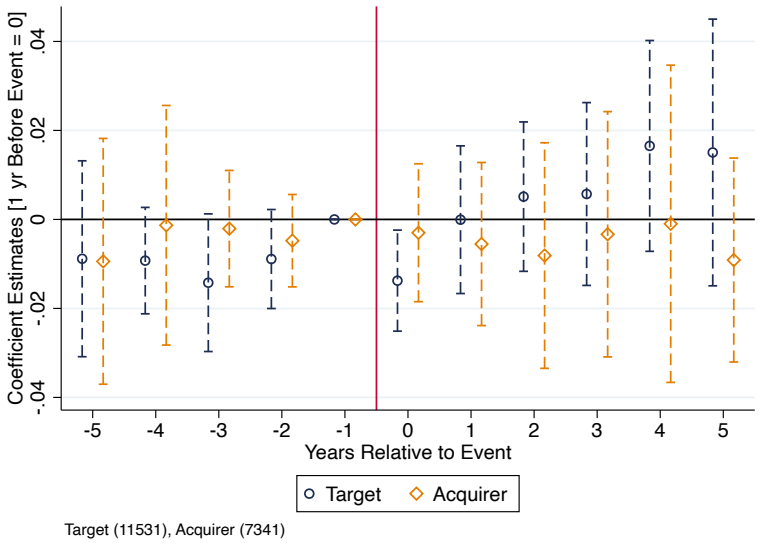

*Notes*: These figures show the event-study coefficient estimates for firms' profit margins and markups. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these estimates. The solid vertical line indicates the event year. The orange dots correspond to the event study estimates for the acquiring firms and the navy blue dots indicate the estimates for the target firms. The analysis uses a matched sample across 10 European countries from 2007 to 2018.

Figure C.3: Effects of M&As on Investment (Industry-by-Country level Clustering)

(A) Profit Margins



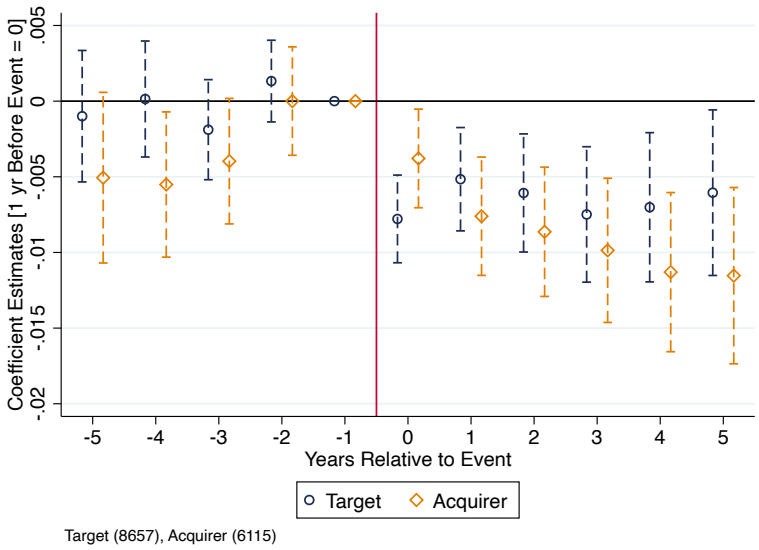

(B) Markups



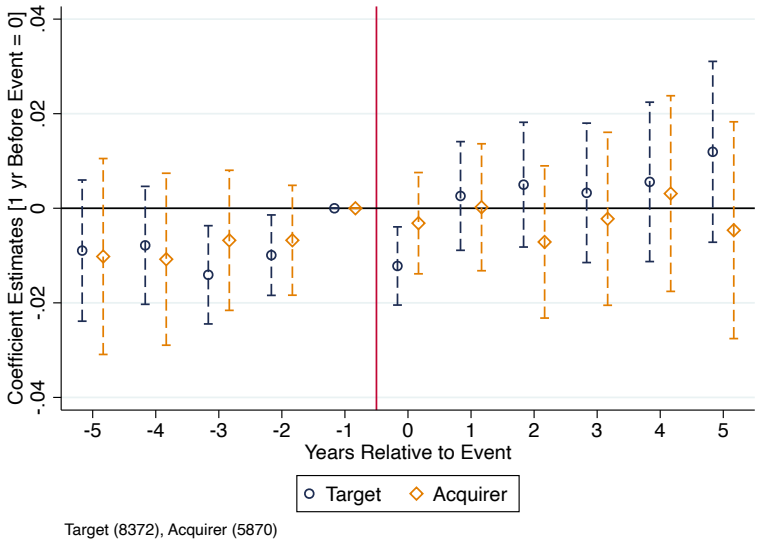

*Notes*: These figures show the event-study coefficient estimates for firms' profit margins and markups. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these estimates. The solid vertical line indicates the event year. The orange dots correspond to the event study estimates for the acquiring firms and the navy blue dots indicate the estimates for the target firms. The analysis uses a matched sample across 10 European countries from 2007 to 2018.

Figure C.4: Effects of M&As on Investment (Perfectly Matched Sample)

(A) Profit Margins



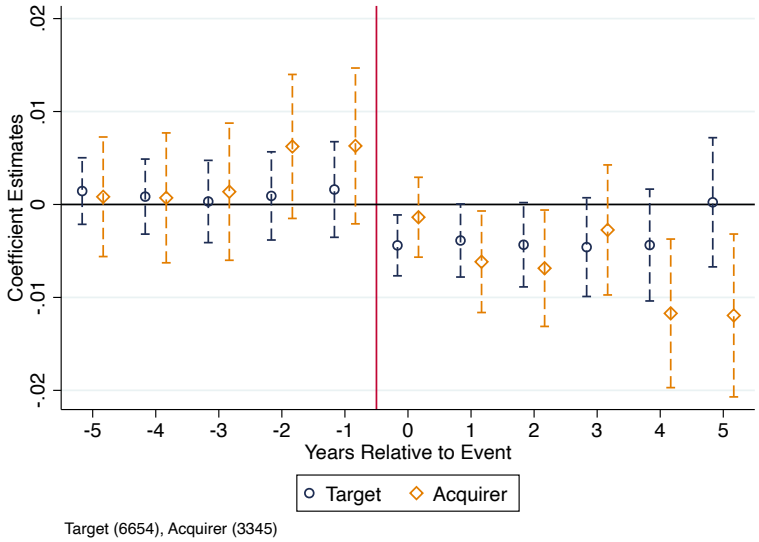

(B) Markups



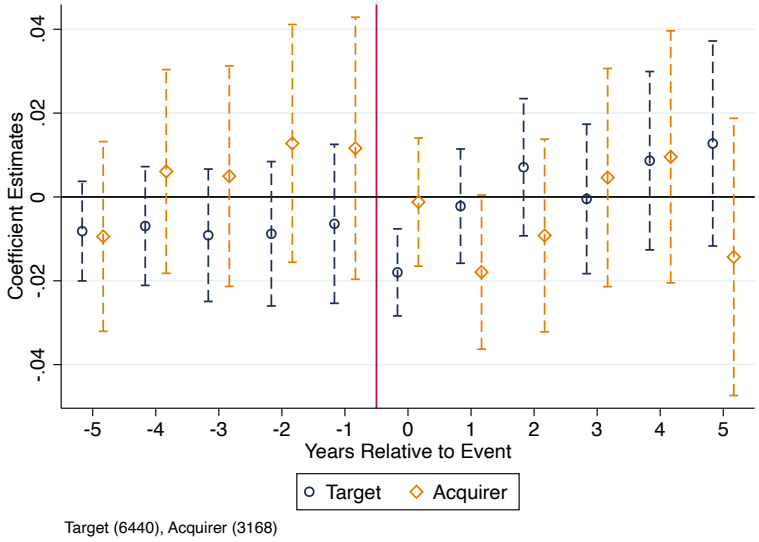

*Notes*: These figures show the event-study coefficient estimates for firms' profit margins and markups for the perfectly matched sample. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these estimates. The solid vertical line indicates the event year. The orange dots correspond to the event study estimates for the acquiring firms and the navy blue dots indicate the estimates for the target firms. The analysis uses a matched sample across 10 European countries from 2007 to 2018.

Figure C.5: Effects of M&As on Investment following Borusyak, Jaravel and Spiess (2021)

(A) Profit Margins



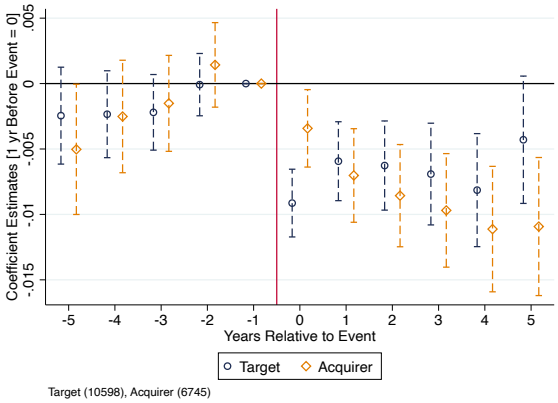

(B) Markups



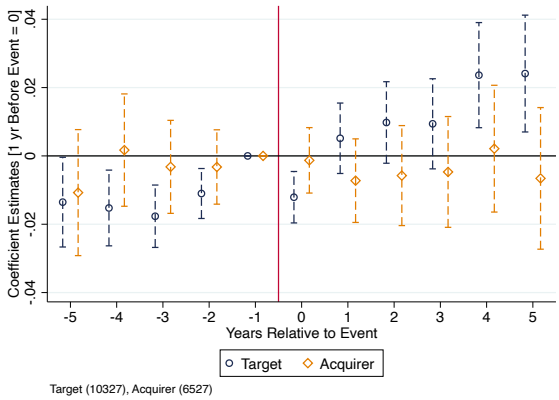

*Notes*: These figures show the event-study coefficient estimates for firms' profit margins and markups. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these estimates. The solid vertical line indicates the event year. The orange dots correspond to the event study estimates for the acquiring firms and the navy blue dots indicate the estimates for the target firms. The analysis uses a matched sample across 10 European countries from 2007 to 2018. Unlike the main estimates that estimate the coefficients by traditional OLS, these results estimate the coefficients by applying the estimator detailed in Borusyak, Jaravel and Spiess (2021).

Figure C.6: Effects of M&As on Profit Margins and Markups (More Variables for Matching)

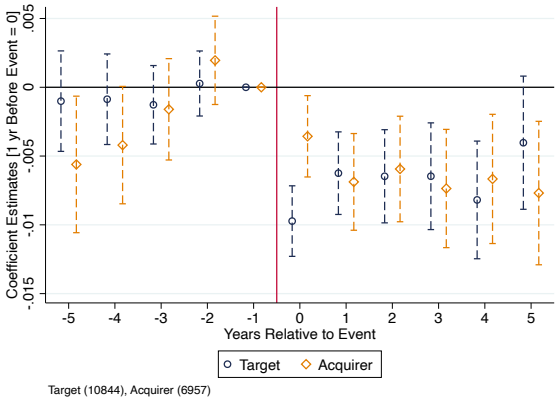
(A) Profit Margins (Cash)



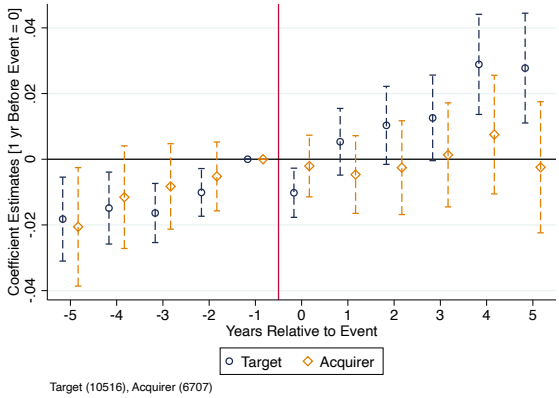

(B) Markups (Cash)




(C) Profit Margins (Leverage)



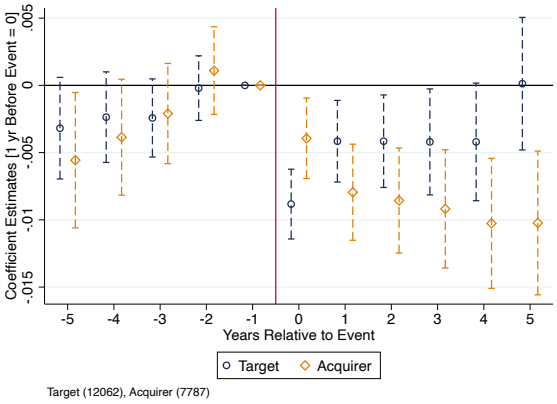

(D) Markups (Leverage)




*Notes*: These figures show the event-study coefficient estimates for firms' profit margins and markups. Panels A and B use firms' cash holdings as an additional variable for finding a matched pair. Panels C and D use firms' leverage as an additional variable for finding a matched pair. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these estimates. The solid vertical line indicates the event year. The orange dots correspond to the event study estimates for the acquiring firms and the navy blue dots indicate the estimates for the target firms. The analysis uses a matched sample across 10 European countries from 2007 to 2018.

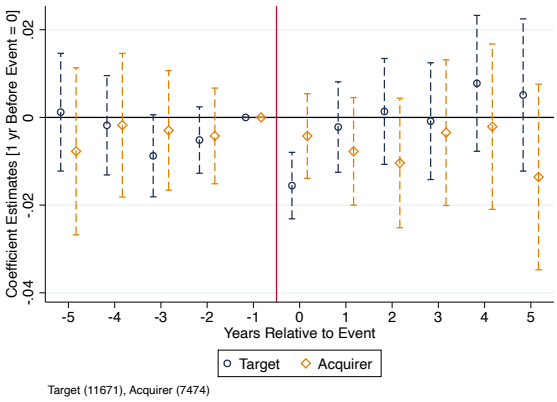
Figure C.7: Effects of M&As on Profit Margins and Markups (Different Bin Sizes)

(A) Profit Margins (Quintile)



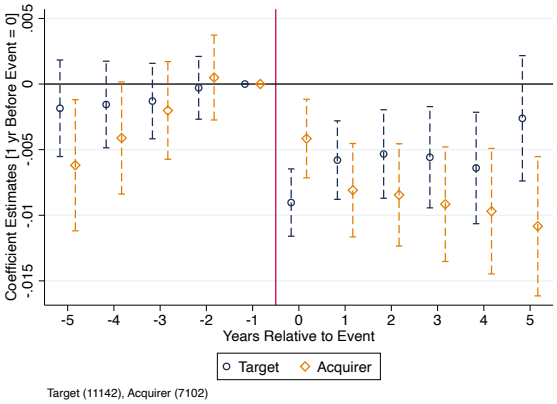

Target (12062), Acquirer (7787)

(B) Markups (Quintile)



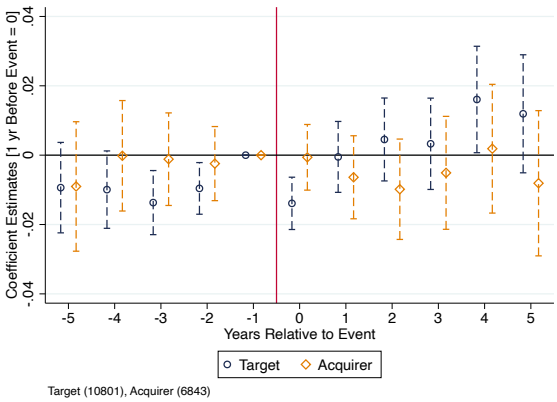

Target (11671), Acquirer (7474)

(C) Profit Margins (Ventile)




Target (11142), Acquirer (7102)

(D) Markups (Ventile)




Target (10801), Acquirer (6843)

*Notes*: These figures show the event-study coefficient estimates for firms' profit margins and markups. Panels A and B use quintile bins when finding a matched pair. Panels C and D use ventile bins when finding a matched pair. The numbers inside the brackets on the bottom left indicate the unique number of firms. The dashed lines indicate 95% confidence intervals for these estimates. The solid vertical line indicates the event year. The orange dots correspond to the event study estimates for the acquiring firms and the navy blue dots indicate the estimates for the target firms. The analysis uses a matched sample across 10 European countries from 2007 to 2018.