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Drivers of Mergers and Acquisitions in the Telecommunication Industry: The Differences between Blockbuster and Small M&As

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ABSTRACT

Although many major, blockbuster mergers and acquisitions (M&As) in the telecommunications industry have attracted much attention from both the popular press and the media economic research community, small M&A deals in fact constitute the vast majority of business expansion activities in the telecommunications industry. Utilizing the data obtained from the Zephry database for over 2500 M&A cases involving U.S telecommunications companies, this study compares small and large blockbuster M&As in several aspects and analyzes whether several factors that have been shown to influence valuation of large M&As tend to affect small M&As to the same extent. According to the regression analysis, those factors, including financial market dynamics, M&A activity momentum, types of business expansion, and the involvement of foreign companies, influence the valuation of both small and large M&As. However, the direction and magnitude of the influences are quite different among small M&As.

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Introduction

The past two decades have witnessed a wave of mergers and acquisitions (M&As) in the telecommunications industry. Mega-mergers such as the AT&T-Time Warner, T-Mobile-Sprint, and AT&T-DirecTV and the failed Comcast-Time Warner deals have caught much attention from both the popular press and scholarly research (Geiger & Schiereck, 2014; Majumdar, Moussawi, & Yaylacicegi, 2020; Okoeguale & Loveland, 2017). Yet, as the data we compiled for this analysis show, these mega-mergers constitute only 7% of the M&A deals in the telecommunications industry in the last twenty years. "Small" mergers and acquisitions (defined as deals worth less than € 1 billion in this study), though not game changers individually, are the vast majority of the telecommunication M&As and cumulatively have a profound impact on

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the industry. However, not much research has been done on these "small" M&A cases in the telecommunications industry. This study seeks to fill this gap.

The drivers of M&A activities have long been the focus in M&A scholarship, and many studies have explored various factors that could affect the valuation of M&As, such as financial market changes, M&A activity momentum, types of business expansion, and the involvement of foreign companies (Gugler, Mueller, & Weichselbaumer, 2012; Mesarić, Segetlija, & Dujak, 2015; Shleifer & Vishny, 2003; Signori & Vismara, 2018; Yildiz, 2016). However, most of the findings are based on the analysis of the headline, billion-dollar mega deals. It is unclear whether those factors also affect small M&As and if they do, whether the influence tends to be the same. This study answers this question by an empirical analysis of over 2500 M&A cases in the telecommunications industry from 2000 to 2019.

The structure of the rest of this paper is as follows. In the next section, literature on the factors that drive M&A activities and influence the valuation of the M&As is reviewed. The methods and data used in this study are introduced in the third section, followed by the results of the empirical analyses. The last section summarizes the main findings and provides the interpretations of the findings and the implications of the study.

Driving factors of M&A activities

Fundamentally, the valuation of a M&A deal depends on the value of the target company and the estimated synergy that can be created by the M&A (Corporate Finance Institute [CFI], 2015). Therefore, the best M&A valuation analysis approach would require evaluating the value of the target company and assessing the potential synergy the M&A could bring to the acquirer. Nevertheless, this study utilizes a large data set and analyzes more than 2500 M&A cases, a thorough analysis of each company, and each case is impractical. Thus, in this study, apart from the base locations of the involved companies and the 3-digit SIC 48 codes of the target and acquiring companies, which are used to determine the type of business expansion, we focused on non-firm-specific, external factors that have been recognized and analyzed in previous studies as potential influencers for M&A deal valuation. This section provides an overview of the literature, which discusses the influences of those external factors.

Financial market

The link between financial market dynamics and M&A activities have been well documented. Multiple studies have found that surges in M&A activities tend to follow stock market booms (Gugler et al., 2012; Mauboussin, 2010).

There are several possible underlying mechanisms for this positive relationship. One very straightforward explanation is provided by Malik (2003). A bull market provides, at least for some companies, the necessary funds to engage in M&A activities, and therefore, increase M&A values. Different from Malik's perspective, Jovanovic and Rousseau (2002) approached this issue from a technological innovation angle and argued that major stock market boom is often caused by major technological innovation, which also tends to increase profitability of business expansion. Thus, companies are more likely to expand during stock market boom or shortly after the boom. Another camp of scholars focuses on the incentives and behaviors of business managers. According to Shleifer and Vishny (2003), the surge in M&A activities and valuation during stock market boom is mainly driven by the efforts of the managers of overvalued target companies to cash out quickly. Rhodes-Kropf and Viswanathan (2004) emphasized the role of the managers of acquiring companies. They proposed that the surge in M&A activities and valuation is by and large caused by the overoptimism of the buyers who are influenced by the bull stock market in their valuation of the synergies that can be created by M&As.

Besides stock market performance, monetary policies, in particular, the federal fund rate is also found to influence M&As. For example, Choi and Jeon (2011) examined the relationship between federal monetary policies and M&A volumes and values for the period from 1980 to 2004. They found that federal funds rates are an influential factor, although the direction of the effects changed dependent on the length of time lags applied. Harford (2005) explained the importance of federal funds rate as a driver of M&As by pointing out that lower federal funds rate means less financing restraints for businesses, which is a key prerequisite for M&As to surge. This argument has been validated since numerous studies have established the negative relationship between federal funds rate and cost of business loans (Adra, Barbopoulos, & Saunders, 2020; Boateng, Hua, Uddin, & Du, 2014).

M&A activity momentum

The examination of the dynamics between the financial market and M&A activities also reveals that merger and acquisition activities often take place in waves, i.e., the volume and value of M&As rise and fall in cycles (Gugler et al., 2012). The existence of M&A waves, or cycles, has long been recognized and analyzed by M&A scholars. On the one hand, as the large-sample study conducted by Mitchell and Mulherin (1996) found, merger activities are often related to the recent industry shocks, including major technological shifts and changes in the market structure. Therefore, an increase in M&As in a short period of time could reflect the more fundamental changes in the technology or industry structure, which tend to give rise to even more M&As.

The stud by Mesarić et al. (2015) illustrated this point by detailed discussion of several cases showing how major M&A activities caused by technological changes influenced the basic landscape of the supply chain of the entire industry, which further led to more merger and acquisitions. Harford (2005) also noticed that M&As often happened as a cluster of activities with deals following each other in the same industries within a relative short period of time.

Another way to understand the influence of M&A momentum is that companies, which had M&A experience in the past, are more likely to have subsequent M&A activities. In their influential work, *Strategic momentum: The Effects of repetitive, positional, and contextual momentum*, Amburgey and Miner (1992) found that companieswhich had M&A experience in the past, whether it be a successful one, were more likely to engage in M&A activities in the future. The empirical study by Collins, Holcomb, Certo, Hitt, and Lester (2009) shows that the strong effect of M&A momentum is present even in cross-border M&A transactions, which many businesses tend to avoid as an expansion strategy. Given the cyclic characteristic of M&As, it can be expected that the values of current M&A deals are influenced by the volume and values of M&As in the recent past due to the momentum effect.

Type of business expansion

All M&A decisions are made with the consideration of the synergies that can be created, and M&Aswhich are estimated to generate more synergies, tend to have higher valuation (CFI, 2015). Although the magnitude of synergies is difficult to quantify, numerous studies have suggested that M&A deals involving companies in the same or related sectors tend to generate more synergies thanks to "economies of sameness" (Puranam & Srikanth, 2007, p. 821; Signori & Vismara, 2018, p. 142). Goldman, Gotts, and Piaskoski (2003) pointed out that by remaining in the same or related business areas, acquiring firms are exposed to less business risk. Rhodes-Kropf and Robinson (2008) attributed the greater synergies from the merges of companies with the same or similar products to scope advantage and economies of scale since the acquiring company can smoothly incorporate the products of the acquired company into its own product portfolio using the existing infrastructure and operation experience. Based on previous studies, it is reasonable to expect that horizontal integrations are often the most popular type of business expansion. This is observed by Hoberg and Phillips (2010) that more than 50% of M&A deals involved companieswhich have the same or related product lines. In accordance with the general M&A trend, Pfeffer and Salancik (2003) found that horizontal integrations where one firm mergers with or acquires others in the same or related business sector are the most common type of business expansion in the telecommunications industry.

Given that horizontal integrations are more likely to generate greater synergy between the acquirer and target companies, which could be further converted to increased revenues and cash flows for the buying company, it is likely that horizontal M&As tend to have higher valuation compared to other types of expansion.

The involvement of foreign companies

The synergy that can be generated in M&As is dependent on the level of post-acquisition integration between the acquiring and target companies. If severe difficulties in post-acquisition integration are expected, company management is likely to be cautious about engaging in M&A activities, and the valuation of the potential transaction could be negatively influenced (Ghosh Ray & Ghosh Ray, 2014). One of the most discussed factors that cause failed post-acquisition integration is the cultural barriers in cross-border M&As. The study by Zhou, Xie, and Wang (2016) examined over 3483 cross-border M&As involving BRIC countries (Brazil, Russia, India and China) and found that 32.5% of the announced deals between BRIC countries and UK or the U.S. failed to complete, while the failure rates of domestic deals in the U.K and in the U.S. are only 18.7% and 24.9%, respectively.

Cross-border M&As impose several challenges on the involved companies. First, information asymmetry is often a more severe issue in cross-border M&As, which leads to greater complexity and difficulty in conducting target company valuation and due diligence (Hyde & Paterson, 2001). Second, the differences in business operation, tax and financial regulation and laws often make M&A transactions extremely challenging, particularly when the planned M&As involve cross-border transfer of a large amount of funds (Gomes, Angwin, Weber, & Yedidia-Tarba, 2013). Third, cultural differences often lead to a low level of trust between acquirers and acquirees, which is found to be a prominent issue in both the pre-deal and post-acquisition integration phases of cross-border M&As (Yildiz, 2016). Given the difficulty and complexity involved in cross-border M&As, although there are not many empirical studies examining the relationship between foreign company involvement and M&A deal values, it can be inferred from the literature that, other things being equal, the involvement of foreign companies in M&As is associated with lower values of M&As.

Method

Data and variables

Data for the merger and acquisition deals which involve U.S companies, were accessed from the Zephyr database (https://zephyr.bvdinfo.com/), produced by Bureau van Dijk, a leading publisher of business information. The database

provides information for more than 1.1 million M&A cases and IPO activities worldwide and is widely used as the data source in merger and acquisition studies (Bollaert & Delanghe, 2015).

Using the advanced search function of the database, we identified all the acquisition, merger, join-venture, and divestiture ("demerger" in the database) cases, which involve at least one U.S. company from 01/01/2000 to 12/31/2019. Since the focus of the study is the M&A activity in the telecommunications industry, only the deals in which at least one involved company is under the NAICS SIC 48 Code (481: Telephone Communications, 482: Telegraph and Other Message Communications, 483: Radio and Television Broadcasting Stations, 484: Cable and Other Pay Television Services, 489: Communications Services, and Not Elsewhere Classified) were selected. In total, 2584 cases met the selection criteria.

Information obtained from the database

For each case, the following information reported in the database was collected:

- *The completion date of the case*: The dates on which the deals were competed are reported in the case summary. The dates were coded into the quarter/year format (*Quarter* = 1 for cases from January 1 to March 31, = 2 for cases from April 1 to June 30, = 3 for cases from July 1 to September 31, and = 4 for cases from October 1 to December 31).
- *Deal value*: Deal values are also reported in the case summary. Since the database publisher is a Belgium-based company, all the values are reported in Euros. Based on the reported deal values, a dummy variable, *small* is created, where *small* = 0 if the deal value is equal to or higher than €1 billion[1] and = 1 if the deal value is lower than €1 billion. Of the 2584 cases, 2396 (92.7%) have valuations lower than €1 billion. The average valuation of the deals is € 693 million. The large standard deviation, €5.6 billion, indicates that there exists considerable variation in the deal values.
- *Business sectors of the acquiring and target companies*: In the 2569 cases where the 3-digit SIC codes of the acquiring companies are reported and the 2583 cases where the 3-digit SIC codes of the target companies are reported, companies under SIC 48 Communications Services, not Elsewhere Specified are the most common type (30.9% of the acquiring companies and 35.1% of the target companies). Companies not under the SIC 48 code were coded as non-telecommunications businesses (*NONTELE*).
- *Type of deals*: The type of the deal is specified in 2582 cases: 2531 (98%) of the cases are categorized as acquisitions (*ACQ*), where one company becomes the owner (or shareholder) of another company. Forty-six

cases (1.8%) are joint ventures (*JVEN*), where a new entity is jointly created by two companies. Four cases (0.2%) are divestiture ("demergers" in the database), where a company is segregated into one or more components. One merger case is reported.

- *Financing method*: The method with which the deal was financed is specified in 1875 cases. Cash is the most common financing method, used in 846 cases (45.1%), followed by Hybrid (N = 673, 35.9%), where several asset classes were used to finance the deal. Stock financing was used in 289 cases (15.3%). Debt (N = 21, 1.1%) and bonds (N = 9, 0.5%) were used in a small number of cases. Thirty-seven cases (1.9%) are listed "other, not specified" as the financing method.

Factors influencing M&A deal valuation

The main purpose of the study is to examine if the factors found to be associated with the valuation of large M&As influence small M&As to the same extent. Based on the review of previous studies on this topic, the following model was built and estimated:

$$\begin{aligned} Ln(dealvalue) = {} & \beta_1 numcase\_4q + \beta_2 avgvalue\_4q + \beta_3 spindex \\ & + \beta_4 spindex\_2q + \beta_5 spindex\_4q + \beta_6 fedfunds \\ & + \beta_7 fedfunds\_2q + \beta_8 fedfunds\_4q + \beta_9 c \\ & - diversification + \beta_{10} horizontal + \beta_{11} vertical \\ & + \beta_{12} acq\_international + \beta_{13} tar\_international \\ & + \beta_{14} year + constant + \mu. \end{aligned}$$

Note that the natural log of deal values is used as the dependent variable to mitigate the influence of some M&A cases with extremely high values. Also, a time trend variable, *year*, is included to control for the general trend change in M&A values over the years. The variables used in the model are either constructed using the information reported in the database or based on data collected from other sources.

- *Financial market performance*: To capture the influence of financial market changes on M&A deal values, two groups of variables, the Standard & Poor's 500 Index (*SPIndex*) and the Federal Funds Rate (*Fedfunds*), are used. Given that the negotiation process of many M&As can last for months or even over a year, time lags were applied to the variables (2- and 4-quarter lags) in addition to the value on the completion date of the deal.

- *M&A momentum*: As previous studies have suggested, M&A activities tend to have cyclical rises and falls, and a surge in M&A activities in a short period of time often leads to more M&As subsequently (Mesarić et al., 2015). To capture the influence of M&A momentum, the total number of M&As (*numcase_4q*) and the average value of M&As (*avgvalue_4q*) in the preceding year of a deal were used in our analysis.
- *Type of business expansion*: Based on the 3-digit SIC codes of the acquiring and target companies reported in the database, each case is categorized into one of the 4 types of expansion. First, if the acquiring and target companies have the same 3-digit SIC code, then the case was classified as horizontal integration (*horizontal*). Second, if the acquiring and target companies have different 3-digit codes but both are under the SIC 48 code, the case was classified as vertical integration (*vertical*). Admittedly, such classification might lead to some inaccuracy, since the strict definition of vertical integration is when a company merges with or acquires another in a different stage of the production chain of the same product or service (Lin, Parlaktürk, & Swaminathan, 2014). However, given the fast changes and convergence of technologies and services in the telecommunications industry, the relationships and boundaries between different sectors become very complicated and blurry. As a result, determining whether a case is vertical integration based on this strict definition would require considerable subjective judgment. Thus, to enable rigorous statistical tests, a loose definition of vertical integrations is used. Third, if at least one company involved is not under the SIC 48 code, the deal would be classified as conglomeration diversification (*conglomeration*), i.e., companies operating in unrelated businesses merging their activities. Fourth, if multiple companies under different 3-digit SIC 48 codes are involved, with some being in the same sector and others not, the case was classified as concentric diversification (*c-diversification*). Among the 2574 cases with types of expansion identified, 1039 cases (40.4%) are horizontal integration, followed by concentric diversification (N = 622, 24.2%), conglomeration (N = 504, 19.6%) and vertical integration (N = 409, 15.9%). The dummy variable, *conglomeration* is used as the reference group and therefore, not included in the model.

- *Involvement of foreign companies*: Using the reported base locations of the acquiring and target companies in the database, we constructed the following dummy variables for each case. *Acq _ international* (=1 if the acquiring company is not a U.S-based entity, = 0 otherwise) and *tar_ international* (=1 if the target company is not a U.S -based entity, = 0 otherwise). The base locations of the acquiring companies are reported in

2568 cases and those of the target companies in 2575 cases. U.S -based companies are the most common types of acquirers (N = 2300, 89.6%) and acquirees (N = 2182, 84.7%).

Empirical strategy

Three sets of analyses are conducted. First, we checked the general trends in telecommunications M&A deals over the 20 years for which data were collected. Second, a series of comparisons were made between small deals (below € 1 billion) and large deals (equal to or above € 1 billion) in terms of deal types, financing methods, types of expansion and international firm involvement. Finally, a series of regression analyses were conducted to test whether the factors associated with deal valuation of large M&A cases tend to influence the valuation of small M&As differently.

Results

Cases overview

The number of cases per year (small and large M&As combined) and the percentage of small M&As in each year are shown in Figure 1. The number of M&A cases has declined by 77% from 206 in 2000 to only 47 in 2019; the decline, however, is not uniform with some years, notably from 2003 to 2006 and from 2011 to 2014, recording an increase in the generally downward trend.

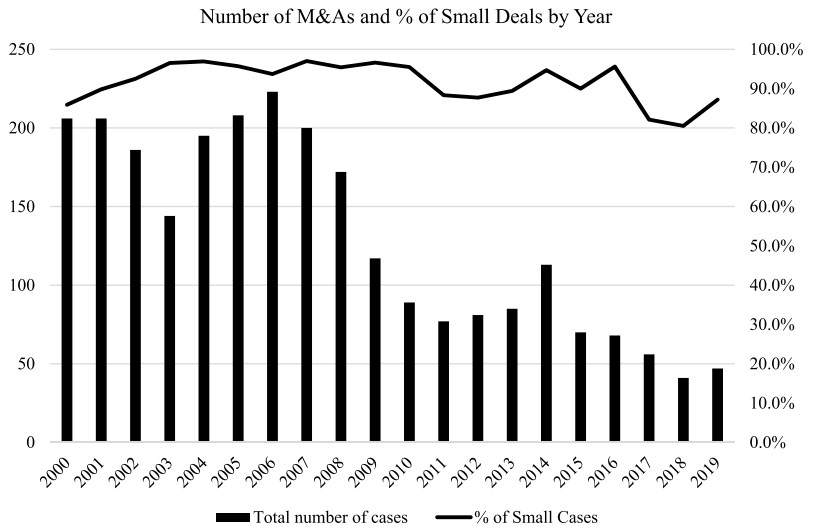

Figure 1. Number of M&A cases and % of small M&As by year.

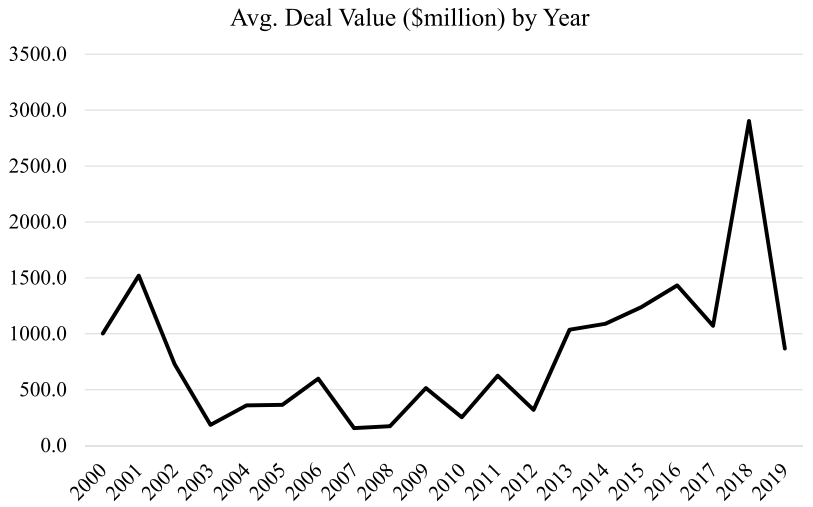

Figure 2. Average deal value (€ million) by year.

Among the 2584 cases, 2396 (92.7%) are deals valued below €1 billion and therefore categorized as small M&As. Small M&As were also the majority of cases in each of the examined years, constituting over 80% of deals in all the years. The fact that small M&As constituted most of the merger and acquisition cases in the telecommunications industry validates our focus on such deals.

Figure 2 shows the average deal value per year. The values of the deals range from €7,700 to € 191 billion with an average of €693.9 million. There is a great variation in the deal values, indicated by the large standard deviation of € 5.6 billion. Specifically, the average valuation of small M&As is €90.7 million (SD = $165.3 million), and the average valuation of large M&As is €8.3 billion (SD = €19.4 billion). Based on the graph, there was a dramatic increase in the average deal in 2001, 2013 and 2018 and noticeable decrease in 2002 and 2019. Nevertheless, the one-way ANOVA test suggests that those differences in the average deal value across the years are not statistically significant, $F(19, 2564) = 1.12$, $p > .1$.

Comparisons between small and large M&As

We compared large M&As and small M&As in terms of deal types, financing methods, types of expansion and international firm involvement. The comparison reveals noticeable differences between small and large M&A deals in financing methods and the types of business expansions.

First, the commonly used types of financing methods are different. As Table 1 shows, hybrid financial methods were used in about half of the large M&As, whereas cash was the most common method of financing for deals below

Table 1. Number of M&As by financial methods.

	BONDS	CASH	DEBT	HYBRID	SHARE	OTHER
Large	0	38 (20.2%)	7 (3.7%)	91 (48.4%)	26 (13.8%)	2 (1.1%)
Small	9 (0.4%)	808 (33.7%	14 (0.6%)	582 (24.3%)	263 (11.0%)	35 (1.5%)

Number of small and large cases using each type of financing method are reported. % of the cases using each method among small or large M&As are reported in parentheses.

€1 billion. This can be expected since acquirers may need to tap a greater variety of sources of financing as the deal valuation increases; small mergers on the other hand, might be able to rely exclusively on the acquirer's free cash flow.

Second, while horizontal integration is the most common type of business expansion for both small (40.4%) and large (37.8%) M&As, a much higher proportion of large M&A deals are vertical integration (30.9%) compared to that in small M&As (14.6%). Concentric diversification is more common among small M&As (24.7%) than in large M&As (16%). The fact that deals with valuation above €1 billion are more likely to be vertical integration could reflect the tendency of large businesses to improve supply chain management and maintain dominant positions in the industry. In contrast, concentric diversification is a much more appealing strategy for small businesses, which in most cases, are the companies involved in small M&As, as it allows them to reach larger customer base and extends their network using the infrastructure and resources they already have.

OLS regression analysis

This section reports the results of the regression analysis. Two variables, i.e., the SP500 index (VIF = 13.68) and the Federal Funds rate (VIF = 15.17) on the completion date of the deal, were excluded in the analysis because of high multicollinearity.

To test for the potential difference in how the aforementioned factors influence the valuation of large and small M&A deal, an interaction term was created between *small* (=1 for cases below € 1 billion, = 0 for cases equal or above € 1 billion) and each of the independent variables and added into the model. The coefficients of the interaction terms are the focus. A significant interaction term indicates that the influence of the factor tends to be different for small M&As. To avoid severe multicollinearity, the interaction terms were included in the model group by group instead of all at once.

Financial market and deal valuation

Table 2 shows how the valuation of M&As is associated with the financial market dynamics prior to the deal. According to the result, only the stock market performance one year prior to the deal has a significant influence on deal valuation. Noticeably, the influence of this factor among larger M&As ($\beta = 0.003$, $p < .1$) is three times larger than that among small M&As ($\beta = 0.003–0.002 = 0.001$, $p < .05$).

Table 2. Financial market and M&A valuation.

Ln (deal value)	Coefficients
Spindex_2q	−0.0001
Spindex2q_small	0.001
Spindex_4q	0.003^{+}
Spindex4q_small	−0.002*
Fedfunds_2q	0.2
Fedfunds2q_small	−0.23
Fedfunds_4q	0.13
Fedfunds4q_small	−0.12
F value	F(16,1478) = 79.06, p < .01
R2	0.29

Only the interaction effects and the corresponding main effects are reported. All other independent variables and time trend are included in the model. *$p < 0.05$, $^{+}$p < 0.1.

M&A activity momentum and deal valuation

Table 3 shows the relationship between M&A activity momentum and deal valuation. The significant coefficients of the interaction terms indicate that the M&A activity momentum influences small and large deals differently.

Specifically, the values of large M&As tend to be higher if there are more M&A deals in the preceding year (β = 0.019, p < .01). However, the values of small M&As tend to be lower when there are more deals in the preceding year (β = −0.007, p < .01). The influence of the average value of M&As in the preceding year is also different. A very small but significant positive relationship is observed between average value of M&As in the preceding year and the value of large M&As (β = 0.00001, p < .01), whereas the average value of M&As in the preceding year tends to have a negative influence among small M&As (β = 0.00001–0.001 = −0.00099, p < .01).

Types of business expansion and deal valuation

Since we used dummy variables to capture the types of business expansion (e.g., *horizontal* = 1 for horizontal integration cases), the difference between small and large M&As can no longer be revealed[2] by the interaction terms between each

Table 3. M&A activity momentum and deal valuation.

Ln (deal value)	Coefficients
Numcase_4q	0.019**
Avgvalue_4q	0.00001**
$Numcase_{4q}$ * small	−0.026**
$Avgvalue_{4q}$ *small	−0.0001**
F value	F (14,1480) = 98.48, p < .01
R^2	0.29

Only the interaction effects and the corresponding main effects are reported. All other independent variables and time trend are included in the model. **$p < 0.01$.

type of business expansion and the dummy variable, *small*. Therefore, an alternative strategy is used that a model with only the main effect variables (*c-diversification, horizontal, and vertical*) was estimated twice, one for small M&As only and one for large M&As only. One disadvantage of this approach is that the magnitude of the coefficients obtained from the two estimations cannot be directly compared. However, this does not cause any issue in this study because there is no need to compare the magnitude of the coefficients. As shown in Table 4 , for large M&As, the coefficients of *diversification, horizontal* and *vertical* are all insignificant, indicating that among large M&As, deal values are not significantly different across various types of business expansion.

Table 4. Types of business expansion and M&A valuation.

ln (deal value)	Small M&As	Large M&As
Diversification	−0.29*	−0.007
Horizontal	−0.35**	0.08
Vertical	−0.74**	−0.14
F value	F(11,2196) = 6.71, p < .01	F(11,143) = 1.17, p < .1
R^2	0.04	0.08

All other independent variables and time trend are included in the model. **p < 0.01, *p < 0.5.

In contrast, the coefficients of the three variables are all significant and negative in the small M&A model. This result indicates that among small M&As, concentric diversification, horizontal integration and vertical integration cases tend to have lower values compared to conglomeration deals.

Foreign company involvement and deal valuation

Finally, we examined whether the involvement of international companies influences the valuation of small and large M&As differently. As Table 5 shows, among large M&As, a positive relationship is found between the involvement of foreign companies, either as acquirers (β = 5.16, p < .01) or targets (β = 4.5, p < .01), and the deal valuation, whereas small M&A cases that involved foreign companies, either as acquirers (β = 5.16–5.88 = −0.28, p < .01) or target companies (β = 4.5–5.02 = −0.52, p < .01) tend to have lower valuation.

Table 5. Involvement of international companies and deal valuation.

ln (deal value)	Coefficients
tar_ international	4.5**
acq_international	5.16**
tar_international * small	−5.02**
acq international* small	−5.88**
F value	F (14, 1480) = 27.82, p < .01
R^2	0.11

All other independent variables and time trend are included in the model. **p < 0.01, *p < 0.5.

Discussion and conclusion

In this study, we examined the influence of the momentum of M&A activities, financial market dynamics, types of business expansion, and the involvement of international companies on the valuation of M&As in the telecommunications industry. A major contribution of this study is that we focused on the differentiated influence of the aforementioned factors on small M&A deals with valuation below €1billion, which, though constituting 92.7% of M&A activities in the telecommunication industry from 2000 to 2019, received much less attention in both news media and scholarly research. In this section, we summarized the main findings, and since the focus of the study is to reveal and quantify the differentiated influences rather than finding the underlying mechanisms causing the differences, only tentative explanations and interpretations of the empirical findings are provided.

In line with the previous literature, our analysis shows that M&A activities in the telecommunications industry are associated with the stock market performance. Specifically, a positive relationship is found between the stock market performance one year prior to the deal and the valuation of both small and large M&As. Nevertheless, the influence of stock market is much greater among large M&As. This is not surprising, as small companies, which are in most cases, the acquirers and acquirees in small M&As, are less likely to be publicly traded and therefore, influenced by stock market fluctuation to a lesser degree. Contrary to what previous studies suggest, no relationship is found between M&A valuation and federal funds rates. Given that federal funds rates are strongly related to the cost of business loans (Adra et al., 2020), this finding can be accounted for by the fact that in both small and large M&As, loans and debts are the least common type of financing methods (3.7% in large M&As and 0.6% in small M&As).

Regarding the relationship M&A activity momentum and M&A values, our analysis reveals sharp difference in how the number of M&A deals and the average M&A values influence small and large M&As. For large M&As, the deal values are positively associated with both measurements of M&A activity momentum, whereas the values of small M&As tend to be lower if there is greater M&A momentum in the preceding year. This is an intriguing finding that is worth further exploration. Since the argument for the influence of M&A momentum is based on the existence of M&A cycles, i.e., numerous M&As tend to happen at the same period of time as waves (Gugler et al., 2012), the differentiated influence of M&A momentum among small and large M&As might reveal that small M&As follow a wave or cycle of unique structures. One possibility is that the cycle of small M&As is much shorter. As a result, large M&As, which follow a longer cycle, are still within the influence of the M&A momentum starting from one year ago, whereas a different M&A cycle that generates the momentum influencing small M&As is not properly captured by

the one-year time gap we applied to the momentum variables. Admittedly, this is a tentative explanation that needs to be confirmed by more studies. Nevertheless, our finding clearly indicates that M&A momentum has a a different influence on small M&As, and the uniqueness of small M&As should be further studied.

The relationship found in our analysis between types of business expansion and M&A values is also different from what prior studies suggest. Our analysis indicates that among large M&As, there is no significant difference in deal valuation across different types of expansion. This is relatively easy to understand. Generally, large M&A activities are initiated by major companies in the telecommunications industry (and also other industries). Therefore, regardless of what type of expansion they are undertaking, most of the deals tend to be blockbuster, high-profile cases with high valuation. However, the analysis also reveals that among small M&As, conglomeration deals tend to have the highest valuation compared to other types of expansion, and this finding seems to defy the proposition made in the studies we reviewed that an expansion in the same sector or into a highly related sector involves less risk generates more synergies and therefore should have higher values (Hoberg & Phillips, 2010; Rhodes-Kropf & Robinson, 2008). We believe that it is at least partially caused by how we constructed the sample of this study. Note that only the completed deals were included in the analysis. Given the complexity and risks associated with conglomeration diversification, it is reasonable to expect that only the very successful small companies, which are usually the target or acquiring companies in small conglomeration cases, would choose this expansion strategy. Moreover, if a small company decides to engage in this type of expansion at all, it is a signal that the potential gain must be deemed to outweigh the risk. Since only the very successful small companies, which found a conglomeration expansion to be very profitable, would be likely to engage in this type of expansion at all, it is not surprising that among small M&As, the completed conglomeration deals have significantly higher values.

Finally, we investigated the influence of foreign companies' involvement. While the involvement of foreign companies, as acquirers or targets, increased deal values for large mergers, it lowered deal valuation for small mergers. Considering the cultural barriers, different regulatory environment and information asymmetry issues, cross-border M&As are risky for all firms, but especially for the smaller ones (Tao, Liu, Gao, & Xia, 2017). The differentiated effects may reflect the differences between small and large companies in their risk-management and strategy execution capabilities.

The significant differences between large and small merger activities identified in this study justify our focus on the often-overlooked small M&As in the telecommunications industry. Although each individual small M&A may not generate much impact, from a long-term perspective, small M&A cases are

important for their cumulative impact on the whole industry. Therefore, future studies on M&A activities in the telecommunications industry would benefit by distinguishing small M&As from the major, blockbuster deals.

As one of the first studies focusing on small M&As in the telecommunications industry, this study can be improved in several aspects. First, apart from the base locations and the 3-digit SIC code, no more detailed information about the involved companies is available in the Zephyr database. Future studies can benefit from focusing on a smaller number of small M&As so that more detailed information about the involved companies can be obtained. Second, since the purpose of this study is to find whether the factors influencing valuation of large M&As tend to influence small M&As to the same extent, a model with the same set of variables is estimated. However, it is possible that small M&As are influenced by a unique set of factors, which are not widely recognized in the current literature. More exploratory studies should be performed to identify those factors. Third, although the NAICS SIC 48 code includes most companies in the telecommunications industry, many companies under other SIC codes have entered the industry by providing telecommunications services. As a result, the scope of telecommunications companies may need to be revisited, and future studies can benefit from the inclusion of a more expansive sample of M&A deals.

Notes

1. We are using Euro as the currency here since it is the default setting in the Zephyr database, which is not modifiable when we access it, although our research foci are on U.S. companies.
2. For example, a model with *diversification, horizontal*, and *vertical* as the main effect variables and *diversification*small, horizontal*small, vertical*small* and *conglomeration*small* as the interaction effect variables in effect makes large conglomeration deals the reference group. Then, it can be expected that the coefficients of all the interaction terms are negative because the interaction terms in this model specification can only indicate whether small concentric diversification deals, small horizontal integration deals, small vertical integration deals, and small conglomeration deals tend to have different values compared to large conglomeration deals.

Disclosure statement

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