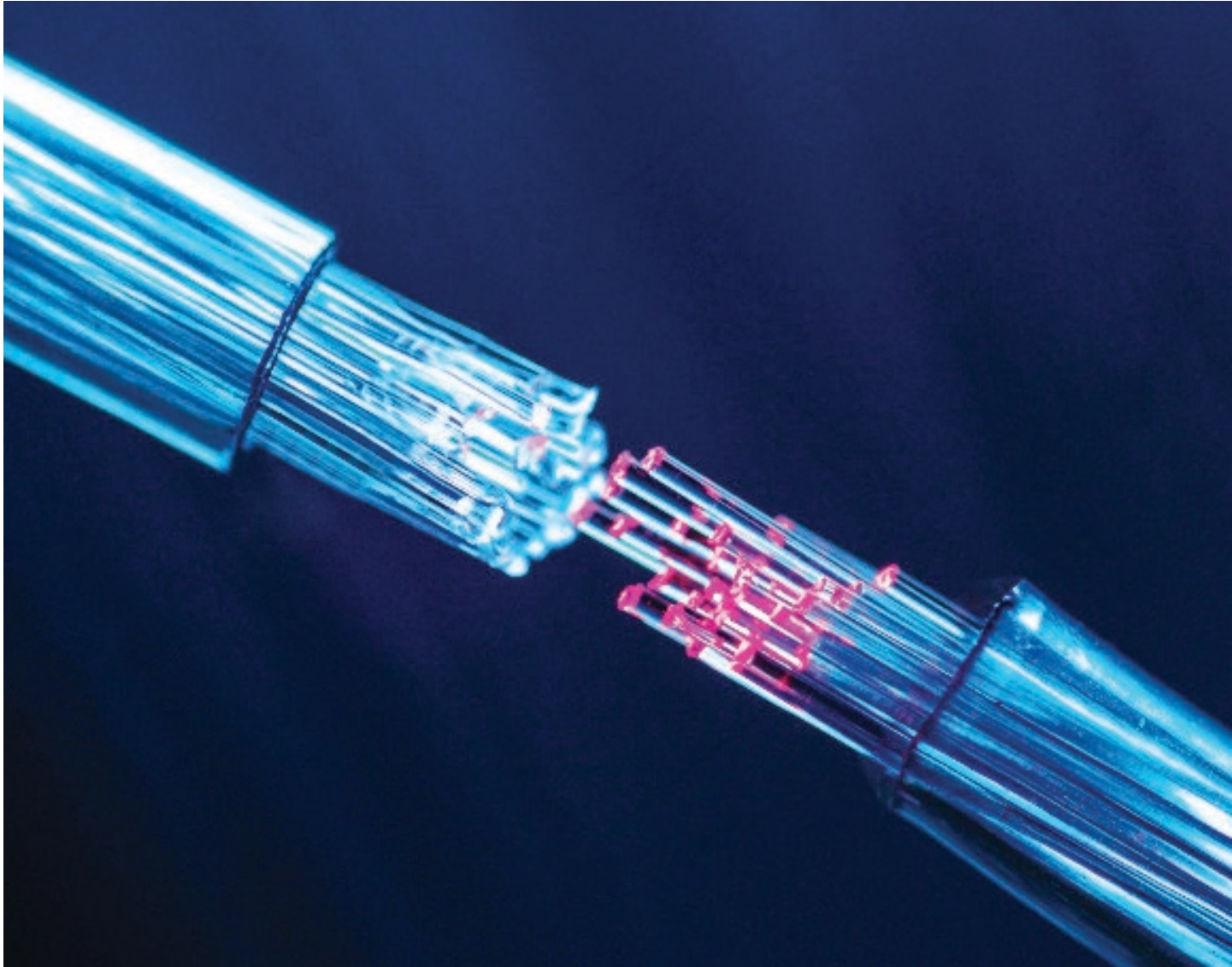


CERTUS
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To merge or not to merge?

Lessons from recent telecom mergers

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EXECUTIVE SUMMARY

- A potential merger of *Lattelecom* and *Latvijas Mobilais Telefons* has been under discussion for several years. While supporters emphasize prospective gains from economies of scale and new product development, opponents are concerned about abuse of market power and increased costs. This study overviews the major effects of the merger and sketches ways to measure them.
- We take three complementary approaches to assess the effects of the merger:
 - A review of previous studies that assess the causal impact of mergers on telecom firm performance;
 - Analysis of stock market responses to the recent telecom merger announcements in developed countries between 2010–2016;
 - A study of competition authority responses to the proposed telecom mergers.
- The three key reasons for cable and mobile telecom firms to merge are:
 - Reduction of costs,
 - Superior market power,
 - Benefits from functional competence (different knowledge and skills) synergy.Any increase in market power is likely to be neutralized by national and/or European competition authorities.
- The economic consensus is that efficiency benefits from mergers are weak. Recent studies, that take special care in detecting causal effect of a merger on firm performance, fail to detect cost or productivity gains among US and Western European telecom firms.
- One of the most important merger benefits from the functional competence point of view is an ability to provide quadruple-play bundling, which includes mobile and fixed broadband Internet, TV and regular telephony under one contract. Demand for quad-play is likely to get stronger over time. Meeting this demand would be socially desirable and could justify the merger. Quantitative techniques to measure a not-yet-available product demand should be applied for an in-depth willingness to pay analysis.
- Service bundling might be particularly advantageous for a cable provider. As demand for mobile connectivity increases, bundling allows cable providers to retain fixed-line customers by offering additional mobile service.
- A stock market in developed economies aggregates information and expectations of all market participants and thus stock prices reflect expected economic performances and future profits of firms. We compare stock prices before and after merger announcements to see whether a merger is expected to be successful in the short and medium run.
- We have collected telecom stock prices data to gauge 29 telecom merger cases in the EU and several other OECD countries in 2010–2016 period. Results show that stock markets, on average, are positive toward mergers. The positive difference of 0.46 percent means that mergers outperform average market dynamics. Compound percentages of 0.46 percent change per 25 days results into 7 percent per year.
- We have collected telecom stock prices data to gauge 33 telecom merger cases in the EU and several other OECD countries in 2010–2017 period. Results show inconclusive picture. In general, for around half of all cases mergers outperform average market dynamics, while for the other half they underperform. Stock markets are broadly positive toward mergers in the longer time horizon (50–100 days), while negative in the short-run (25 days). Moreover, the results are more robust for the EU mergers.
- A merger might be detrimental to the telecom market competition, especially if a new firm offers bundling products. It might increase the entrance cost to new firms, create incentives to restrict input access to competitors and encourage aggressive behavior. EU competition authorities never veto telecom mergers, but in almost half of the recent telecom merger cases they have imposed merger conditions.
- Selling part of the infrastructure to competitors is the most prevalent condition, as well as adjustments of the market agreements with other market players and granting them access to services.

INTRODUCTION

A potential merger of the Latvian fixed-line operator *Latttelecom* and the wireless *Latvijas Mobilais Telefons* (LMT) has been under discussion in Latvia for several years. Many pro and contra arguments have been put forward. Supporters of the merger point out potential gains from economies of scale and new product development, while opponents are concerned about potential abuse of market power and increased cost inefficiencies due to suboptimal firm size. No clear consensus on the economic and social desirability of the merger has been reached. The complex nature of the problem is an obvious reason for this.

The best way to resolve the debate is a comprehensive market analysis. State competition authorities, which are typically in charge of safeguarding healthy competition, routinely check mergers among large firms. However, such checks often require substantial resources. Recently, for example, the UK Competition and Market Authority (2016) undertook a broad study of a telecom merger between BT Group and EE Limited. The merger was given a green light in January 2016 as the analysis showed no threat to competition. The study included analysis of the telecom products, market players, current regulations, trends in the industry, the merger itself and the counterfactual situation if the two firms would continue to operate in the current market. The inquiry was performed on each of the relevant markets, i.e., retail mobile and fixed broadband, wholesale mobile, etc. Many market players provided not only their opinions about the merger, but also relevant internal business documentation. The entire investigation took around one year to complete.

While such extensive analysis is beyond the scope of this study, it is worthwhile to discuss the major effects of the merger, and to sketch potential ways to measure them. We take three complementary approaches to assess the effects of the merger:

- Firstly, we review studies of the economic impact of telecom mergers which look at both company-specific and wider socio-economic effects.
- Secondly, we perform a stock market response analysis of the most recent telecom mergers in the EU and

some non-EU OECD countries over the 2010-2016 period. We compare the stock prices during the time period right before and after the public merger announcement. Moreover, we check the performance of the general stock market indices and compare it with that of the telecom firms.

- Thirdly, we also overview competition authority's responses to the proposed merger agreements.

The main advantage of the literature review is its broad scope – researchers typically look at many aspects of mergers, including changes in firm profits, competition structure, and social welfare. The drawback is the limited number of relevant studies in the telecom industry. The key difficulty in a merger analysis is identification of the causal effect of the merger. It is important to set the causal effect aside from the changes which are due to other factors which are not related to the merger, for example, general growth of the economy or technological progress. This is usually done by employing various econometric techniques and large statistical datasets.¹ Failure to account for other factors that could potentially affect firm performance might yield the wrong conclusions. In our literature review we select studies that attempt to gauge exactly the causal effect of the merger, and do not merely describe before/after merger statistics.

The second approach analyses stock market responses. Probably one of the most straightforward ways to examine the economic effect of a merger on firms is to observe their historical stock fluctuations before and after merger announcements. Economists often assume that a stock market in developed economies aggregates information and expectations of all market participants and thus stock prices reflect expected economic performances and future profits of firms. Comparison of stock prices over time should yield evidences on whether merger is expected to be successful or not, both in the short and medium run. To account for the other potential economic effects we compare changes in stock prices of merged firms with various counterfactuals, such as country economic indices and non-merged firms.

¹ One way to identify causal effect of a certain event on subsequent firm performance is to find relevant counterfactual group with which to compare performance of the firm. Examples of such techniques are difference-in-differences and quasi-experimental approaches.

The third analysis focuses on the competition authority response to merger announcements. Mergers among large firms are often seen as a threat to competition thus authorities frequently impose preventive measures to make sure no market players (competitors and customers) are disadvantaged. We overview such measures or conditions to see what the main trends are on examples of the recent telecom mergers.

The aim of this study is to present lessons learnt from previous telecom mergers, and overview the responses of the stock markets as well as the competition authorities. The next subsection focuses on the main effects that telecom firms might reap from a merger. At first, we consider previous telecom merger studies, and then we turn to stock market responses. Further section looks at the competition authority's point of view on mergers.

Review of the literature on telecom mergers

The key reasons for cable and mobile telecom firms to merge are (Rieck and Doan, 2009):

- Efficiency gain due to economies of scale.
- Superior market power. This effect, in principle, should not be realized as competition authority would want to neutralize it completely.
- Benefits from different knowledge, skills and abilities that each company possesses. This effect might be particularly relevant for the development of the telecom market in Latvia as the new company would be able to offer currently unavailable service (quadruple bundling).

Efficiency gain

In theory, cost saving advantages, with the subsequent increase of firm profitability and shareholder value might arise due to the increasing economies of scale. That is, firm size positively affects firm's productivity and its overall performance. One of the main reasons why increasing scale economies might persist is due to the large fixed cost of equipment and materials and cost of research and development of new services and products. Alternative reasons for scale economies are due to the bulk purchasing of inputs, staff specialization, favorable financial terms and lower marketing costs (Bovaird, 2004). The economic literature suggests that the majority of manufacturing firms have firm-level increasing returns to scale. Findings for the service industries also support increasing scale economies. However, the extent of such economies varies considerably across countries and industries.

Firm merger is a quick way to achieve a larger scale of activities as compared to a gradual internal growth of a firm. However, the effects of such a rapid boost in the firm scale are ambiguous. Harvard professor Frederic M. Scherer in his keynote address at the 2006 International Industrial Organization Conference reported that evidence across many industries of substantial efficiency

benefits from mergers is weak (Scherer, 2006, p. 341). Quantitative studies of, among other, the US bank industry (Halkos and Tzeremes, 2013) and IT sector (Tanriverdi and Uysal, 2015), show negative effects of mergers on firm performance.

Recent evidence from the telecom industry on the effects of mergers is also weak. Table 1 overviews the papers considered. Majumdar et al. (2012) collected yearly operational data, such as operator expenses and total operating revenues, of all local US telecom firms that merged in the time period 1988-2001. The authors used sophisticated multivariate regression analysis to explain variations in cash flow over assets ratio (total operating revenues over total assets), which is a standard measure of merger synergy, with the set of control variables. The authors also accounted for the number of competitors in the market, for average wage levels, a set of relevant telecom regulations, the urbanization level of the market, share of business customers, debt size and advertisement expenditures of a firm. The results show that the merger caused negative dynamics of the cash flow over assets ratio which indicates that firms were not able to realize synergy via asset reconfiguration after the merger.

Relevant studies on firm efficiency after telecom mergers.

Table 1.

Authors	Country	Dependent variable	Data	Methods	Major finding
Majumdar et al. (2012)	USA	Ratio of total operating revenues to total assets	Yearly data of all US local telecom firms, 1988-2001	Dynamic panel-data model Arellano-Bond (i.e., lagged variables as instruments)	"decline in performance following mergers, and expected post-merger synergies were a mirage irrespective of the firm size"
Sung and Gort (2006)	USA	(a) Total Factor Productivity, total costs; (b) Stock prices	Yearly data of 38 US local telecom firms, 1991-2000	(a) Regression analysis, comparison of merged vs. non-merged firms; (b) medium-run stock market response	No productivity or cost benefits and no abnormal shareholder returns
Rieck and Doang (2009)	USA and Western Europe	Stock prices	88 telecom mergers, 1998-2006	Short-run stock market response	Positive effect on stock prices for cross-border mergers, no statistically significant effect otherwise
Trillas (2002)	Western Europe	Stock prices	12 telecom mergers, 1999-2000	Stock market response	No abnormal shareholder returns

A similar result is due to Sung and Gort (2006) who compared US merged telecom firms that merged in 1991-2000 with the control group of similar non-merged telecom firm group. The comparison is made on measures of total factor productivity, shifts in the cost functions and stock market returns. Using difference-in-differences regression analysis, the authors find no significant change in returns to scale between merged and non-merged companies when controls for other variables are introduced. One of potential explanation is high labor costs (in particular, monitoring costs) in merged firms as compared to the non-merged ones after the merger. The same authors also looked at stock market response to the merger announcements. The base period for the analysis is 60 days before merger announcement. Capital gains for the acquiring companies appeared to be positive only in a period of a few months, while later on it was indistinguishable from that of non-mergers.

A study by Rieck and Doang (2009) on shareholder wealth effects of mergers and acquisitions in the telecom industry, which is based on US mergers over time period 1998-2006, makes a somewhat more optimistic conclusion. The paper assesses the reaction of stock market on a merger announcement. It applies an event study approach in which a merger announcement

is an event which affects stock prices. It uses information on stock price changes during a short time window of 2 days right before and after the announcement of 88 US telecom mergers between 1998 and 2006. The authors compare expected returns (calculated as the ones over the time period from 120 to 12 days before the merger announcement) with the actual ones during the relevant time window. The results show a positive effect for cross-border mergers, while it is non-significant for domestic ones.

A paper by Trillas (2002) also employs event-study methodology to see the returns due to the acquisitions of the 12 largest telecom companies in Europe in 1999 and 2000. The results again are not too positive, with large variation of outcomes across firms. The author mentions a lack of coordination, desire for empire-building by the management, political reasons, and flawed mechanisms of corporate governments (especially in the state controlled firms) as the factors behind such results. Overall, the literature suggests that the economies of scale argument might not be strong in practice, despite the fact that telecom is a capital-intensive industry. Thus, for the firms to accept the merger, other considerations should bring profit. Moreover, loss of efficiency, if such occurs, should be compensated by this profit.

Bundling

One of the most important merger benefits from the functional competence point of view is an ability to provide a seamless connectivity service to customers, i.e., service bundling. In the telecom industry, bundling is an evolutionary process since services are developed one after another (Uner et al., 2015). At first dual-play with the fixed voice and Internet, then triple-play with the TV services in addition. The widely used term quadruple-play bundling means provision of mobile and fixed broadband Internet, TV and regular telephony. Currently no company in Latvia provides such a service.²

The relevant question is the extent of the demand for such quadruple-play bundling. The estimate of the demand would also inform stakeholders about the extent of the potential efficiency loss that merged firms can tolerate. A demand study can estimate the potential market for the quad-play bundling and its strength in Latvia. However, the current consensus in the global telecom industry is that such demand might get stronger over time.

One of the widely used ways to quantitatively gauge demand for a not-yet-available product is to conduct a stated choice experiment, also known as conjoint analysis.³ In this way Klein and Jakopin (2014) studied demand for telecom service bundling in Germany. The results support the recent product bundling strategies, as customers are willing to pay an additional amount for the bundle. Grzybowski and Liang (2015) analyzed data from a European city in which the quad-play option is available. The findings suggest that for quadruple play subscribers mobile data is complementary to fixed broadband access. Consumers appear to use Internet access via mobile data to sample online content but complete their online activity at home. Thus, fixed broadband services are of additional value to mobile data services. Overall, bundling appears to be a relatively novel element in the mergers of the telecom firms that can generate additional revenues for both cable and mobile firms.

Bundling allows firms to gain a competitive advantage, as it allocates fixed costs across a range of services, and strengthens the retention of customers and attracts new subscribers due to the convenience of

unified billing and new possibilities for innovation and discounts for consumers and business (OECD, 2015). One survey study in the USA shows that the convenience of a single bill appears to be a powerful incentive that generates switching intentions comparable to free upgrades and discount incentives (Andrews et al., 2010). It also might reduce marketing costs, as several products are advertised within the same package, and stimulate price discrimination.

Service bundling might be particularly advantageous for a cable provider, as it prevents fixed to mobile migration of customers (Grzybowski, 2014). As demand for mobile connectivity increases, the bundling allows cable providers to retain customers for the fixed-line by offering additional mobile service. Without such bundling, customers are more likely to switch to mobile services. A recent econometric study on voice access, which was based on a survey of 160,000 households in 27 EU countries between 2005–2011, showed that without mobile telephony, fixed-line penetration in the EU would have been 14 percent higher at the end of 2011 (Grzybowski and Verboven, 2016). This result is even stronger for the Central and Eastern European states.

Fixed to mobile convergence implies that mobile telecom operators might currently be less inclined to merge, as the demand for mobile access to the Internet is strong. Current costs and service quality imply that customers seek to secure a mobile connection whether with bundling or without. However, possible quad-play offer on the Latvian market might substantially disadvantage mobile-only and cable-only telecom firms. This is under the condition that willingness-to-pay for quad-play is larger than that to pay for separate cable and mobile services. If that is the case, one would expect a merger wave of cable and small fixed network firms with independent mobile operators (Vogelsgang, 2010). In the Latvian context a case in point might be, for example, a merger of *Baltcom*, a large cable Internet provider, and *Tele2*, a mobile operator. On 4 November 2015 *Tele2* and *Kazakhtelecom*, a major fixed and mobile line operator in Kazakhstan, made a merger announcement (TELE2, 2015).

² Content provision is not part of quadruple-play bundling.

³ The key idea of stated choice experiment is to present to potential customers two hypothetical product choices. These clearly described, in terms of relevant product characteristics, choices might differ only in a few parameters, such as price and quality. A researcher might induce willingness to pay for a product characteristic by repeatedly confronting the customers with slightly altered choices.

Stock market response

We compare selected telecom firms' stock performance over 25 days (and also 4, 50 and 100 days in a sensitivity check) before and after a merger announcement. In particular, we calculate average (over time) prices of the stocks for the firms that announce a merger and check the average price changes over time. We also calculate aggregate market index fluctuations in the countries of firms' origin to see whether firm stocks outperform general market trends. There are also a few cases of non-mergers, when merger announcements later did not

Data

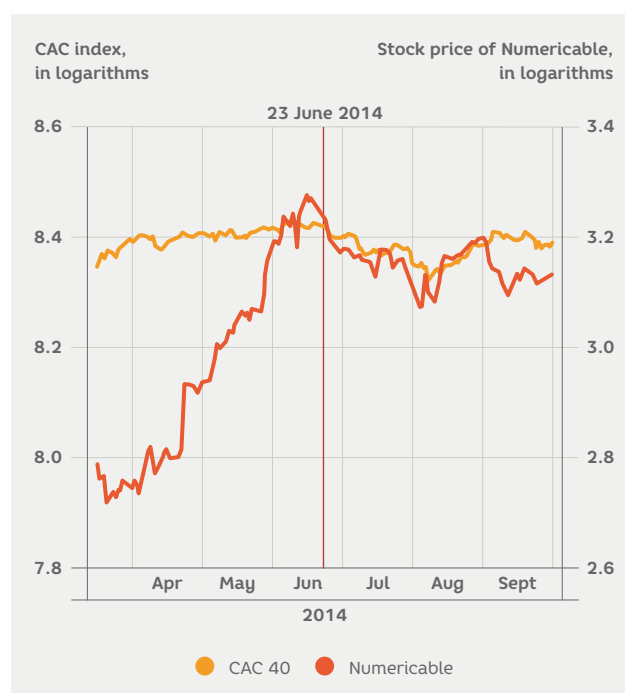
For the purpose of this empirical investigation we have selected announcements of mergers and acquisitions which took place in telecom industry over the past 7.5 years, from 2010 till the first half of 2017. We pick a relatively short time period because rapidly changing technological environment of the telecom industry renders earlier mergers less relevant for the analysis of the current industry conditions. To further enhance relevance of the study, we have selected firms which are similar to *LMT* and *Lattelecom* in terms of the core business activities they perform. That is, we picked firms that provide and sell communication services such as broadband, mobile and fixed-line services. Thus, we do not consider firms that are involved mainly in production of electronic equipment, computer programming or focus solely on TV broadcasting and content creation.

The main source of information about the merger cases is a dataset from the European Commission.⁵ The Commission examines all large mergers in the EU for the potential breach of antitrust regulation. Approximately 300 mergers are considered each year across different industries. Over the time period 2010 – 2017 there are 70 cases in a broadly defined telecommunication industry, in which firms' core activities might also lay outside communication services. Given that the telecommunication industry accounts for about 3 percent of EU GDP, telecom share in all merger cases is approximately proportional to its GDP share. So, telecom industry is not more likely to experience mergers as compared to other industries. In our dataset there are 23 EU large telecom cases which are in line with the focus of our analysis. Thus, we have a full EU sample of large telecom mergers.

turn into the actual mergers, as competition authorities opposed them, usually by imposing very restrictive merger conditions. One can use performance of the general indices and prices of the non-merger firms as a control group with which to compare the dynamics of the mergers stock prices.⁴ Positive difference in prices between merged firm and general trend indicates that the market players see the merger as a successful strategy for the firm. In turn, a negative difference suggests that the market does not expect firms to profit from the merger.

Stock price performance of *Numericable* and CAC 40 index 100 days before and after a merger announcement on 23 June 2014, in logarithms.

Figure 1.



In the OECD, which consists of 22 EU and 13 non-EU countries, the typical number of telecom operators is either 3 (in 16 countries) or 4 (in 13 countries), with only Canada, Chile, Israel, Poland and USA having more than 4 operators.⁶

⁴ Effectively, we apply difference-in-differences estimations technique, in which we compare differences in stock performance over time of merged firms and general market trends and the non-merged firms.

⁵ The list of merger cases considered by the European Commission: <http://ec.europa.eu/competition/elojade/iseif/index.cfm>

⁶ Wireless Market Structures and Network Sharing. OECD, 2015. Latvia was invited to become the 35th OECD member state in May 2016.

We have included 10 recent telecom mergers from the non-EU OECD countries (US, Australia and Norway) in which the stock exchanges are developed enough to rely on their reactions for the analysis. In total there are 33 merger cases in our dataset. If not exhaustive, it covers large portion of the recent telecom mergers. All of the telecom firms in our sample provide both mobile and cable services.⁷

We make use of publicly available historical stock prices data.⁸ Figure 1 illustrates an example of the data we operate with – time series of firm stock prices and

Results

Table 2 shows companies and their stock price changes in percentages over a certain number of days before and after a merger announcement. We calculate the average stock and index prices for 4, 25, 50 and 100 days before and after that date. For each of the merger announcements we identify a time window before and after the announcement. Then we calculate average stock prices for the leading firm (an acquirer) involved in a merger during the two intervals. We compare the

general market indices. We show stock prices of the French telecom firm *Numericable* which announced a merger with the *SFR* on 23 June 2014, and *CAC 40* French general market index. The scales are in logarithms to ease comparison of the two time series, as in logarithmic scale the two identical percent changes are represented by the same vertical distance on the scale, regardless of the asset price. Figure 1 shows that *CAC 40* is relatively stable over time in comparison to the stock prices in percentage terms. In the analysis we compare the price changes over time in percentages.

performance of the stocks with the general market indices of the countries from which an acquirer is from. The longer term comparison might be less informative, as the probability of other factors affecting both firm and general market performances becomes high. Our preferred specification is 25 days, but to check stability of the results, we also calculated outcomes for other time periods.

⁷ We have chosen not to include any telecom mergers from non-EU Eastern European countries, e.g., Russia and Ukraine, as the stock market is not sufficiently developed there. It does not reflect market expectations in the same way it does in the Western Europe and North America.

⁸ Historical stock market data are from yahoo.finance publicly-available services.

Telecom mergers over the time period 2010 – 2017 and performance of stock prices and general market indices before and after merger announcements

Table 3.

#	Merger (the first firm is an acquirer)	Country of a merger	Date of announcement	Stock prices change over a given number of days before and after announcement, in percentages				Acquirer's country	Country's index	Index change over a given number of days before and after announcement, in percentages			
				4 days	25 days	50 days	100 days			4 days	25 days	50 days	100 days
1	TeliaSonera and TELE2	Norway	7 July 2014	0.67	4.04	3.37	4.95	Sweden	OMX Stockholm 30	-1.40	-0.05	-1.14	0.95
2	Orange and Jazztel	Spain	16 September 2014	-0.05	-2.68	-3.67	0.83	France	CAC 40	0.49	-1.30	-2.06	-3.07
3	BT and EE	UK	15 December 2014	-0.21	-0.26	5.31	11.55	UK	FTSE AIM UK 50	-1.46	-2.79	-0.51	2.07
4*	AT&T and T-Mobile	USA	11 March 2011	-0.19	2.13	5.59	5.06	USA	S&P 500	-0.97	-1.44	0.33	2.67
5	Verizon and Vodafone	USA	2 September 2013	-1.20	-1.40	-3.94	-1.93	USA	S&P 500	0.36	1.48	0.78	4.91
6	Telefonica Deutschland and E-plus	Germany	23 July 2013	-2.85	-3.57	-4.98	-3.83	Germany	DAX	-0.09	2.83	2.63	5.19
7	Vodafone and Kabel Deutschland	UK	24 June 2013	1.68	-0.27	0.20	5.41	UK	FTSE AIM UK 50	-0.56	-0.37	-0.91	0.60
8**	Hutchison 3G and O2	UK	24 March 2015	-2.27	-1.81	-1.24	-0.02	Hong Kong	HIS	-0.17	7.04	10.18	12.23
9	AT&T and DirecTV	USA	18 May 2014	-0.85	-10.57	-11.27	-0.89	USA	S&P 500	-0.02	1.86	3.37	4.75
10	Telenor, Globus, Germanos	Greece	15 April 2013	1.21	1.13	1.44	-1.97	Norway	OMX Oslo 20 PI	0.67	-0.22	1.17	1.82
11	Vodafone and Belcompany	Netherlands	22 March 2011	-1.13	0.57	-0.45	-0.81	UK	FTSE AIM UK 50	0.94	1.39	0.51	-0.67
12	Hutchison 3G and Orange	Austria	3 February 2012	3.90	6.79	8.95	12.03	Hong Kong	HIS	1.65	6.34	10.09	9.80
13*	Telstra and Adam Internet	Australia	25 October 2012	0.74	4.35	8.45	12.09	Australia	S&P/ASX 200	-0.6	-0.55	0.84	5.33
14	TPG and inet	Australia	13 March 2015	13.52	19.43	25.67	29.02	Australia	S&P/ASX 200	0.17	-0.02	1.96	3.61
15	Vodafone and CWW	UK	29 May 2012	-0.47	-0.04	0.78	3.65	UK	FTSE AIM UK 50	-0.23	-0.31	-1.44	-1.89
16	Telefonica, Vodafone, EE	UK	6 March 2012	-0.12	2.99	4.50	-0.07	Spain	IBEX 35	-2.20	-3.66	-8.40	-14.81
17	Vodafone and ONO	Spain	17 March 2014	0.90	-7.62	3.45	-9.39	UK	FTSE AIM UK 50	0.43	-2.13	-0.62	0.85
18	Liberty Global and Ziggo	Netherlands	14 March 2014	-0.17	-36.86	-44.29	-47.02	UK	FTSE AIM UK 50	-1.46	-2.45	-0.75	0.82
19	Liberty Global and Virgin Media	UK	6 February 2013	-2.63	-2.82	5.96	16.42	UK	FTSE AIM UK 50	-0.37	1.59	4.49	7.37
20*	TeliaSonera and Telenor	Denmark	27 February 2015	1.00	1.57	2.20	0.922	Sweden	OMX Stockholm 30	0.25	2.53	6.78	9.49
21	Deutsche Telekom and GTS	Germany	11 March 2014	-0.28	-4.25	-4.00	-0.34	Germany	DAX	-1.37	-2.30	-1.06	1.68
22	Altice and PT Portugal	Portugal	5 March 2015	1.86	18.42	31.05	53.91	Portugal	FTSE Portugal 20 ETF	-22.65	-23.08	-4.43	2.46
23	Liberty Global and Base	Belgium	17 August 2015	0.50	-11.26	-11.02	-13.89	UK	FTSE AIM UK 50	-0.79	-6.53	-7.60	-7.78
24	Numericable and SFR	France	23 June 2014	-2.80	-4.93	2.48	18.06	France	CAC 40	-0.86	-2.66	-3.33	-2.10
25	AT&T and Nextwave	USA	2 June 2014	0.49	3.65	4.26	6.07	USA	S&P 500	-0.81	3.15	4.80	5.93
26	Equinix and Telecitygroup	USA	29 May 2015	1.30	-0.65	2.07	10.00	USA	S&P 500	-0.17	-0.50	-0.57	-1.09
27	Telefonica and DTS	Spain	8 May 2014	-0.49	-0.01	-0.58	2.54	Spain	IBEX 35	0.54	1.86	4.54	5.30
28	Vodafone and Vodafone Omnitel	Netherlands	30 September 2013	1.48	1.03	10.15	16.22	UK	FTSE AIM UK 50	-1.09	-0.91	1.27	1.84
29	Hutchison 3G and Telefonica	Ireland	1 October 2013	-1.62	-0.84	-2.04	-18.35	Hong Kong	HIS	0.44	0.11	2.20	5.90
30	Vimpelcom and Hutchinson 3G	Italy	6 August 2015	-2.63	-3.42	-6.23	-19.81	Netherlands	AEX	0.04	-6.14	-7.79	-8.01
31	CenturyLink and Level 3	USA	31 October 2016	-15.68	-12.31	-11.94	-13.53	USA	S&P 500	-1.54	0.47	2.07	3.23
32	Telia and Phonero	Norway	7 November 2016	-0.99	-7.32	-7.13	-6.65	Sweden	OMX Stockholm 30	1.89	1.39	3.53	6.20
33	United Internet and Drillisch AG	Germany	12 May 2017	11.72	15.02	17.45	23.04	Germany	DAX	0.46	1.87	3.27	3.62

Notes: *: cancelled or vetoed mergers, **: ongoing merger.

Stock price change before and after the merger announcement, in percentages.

Table 3.

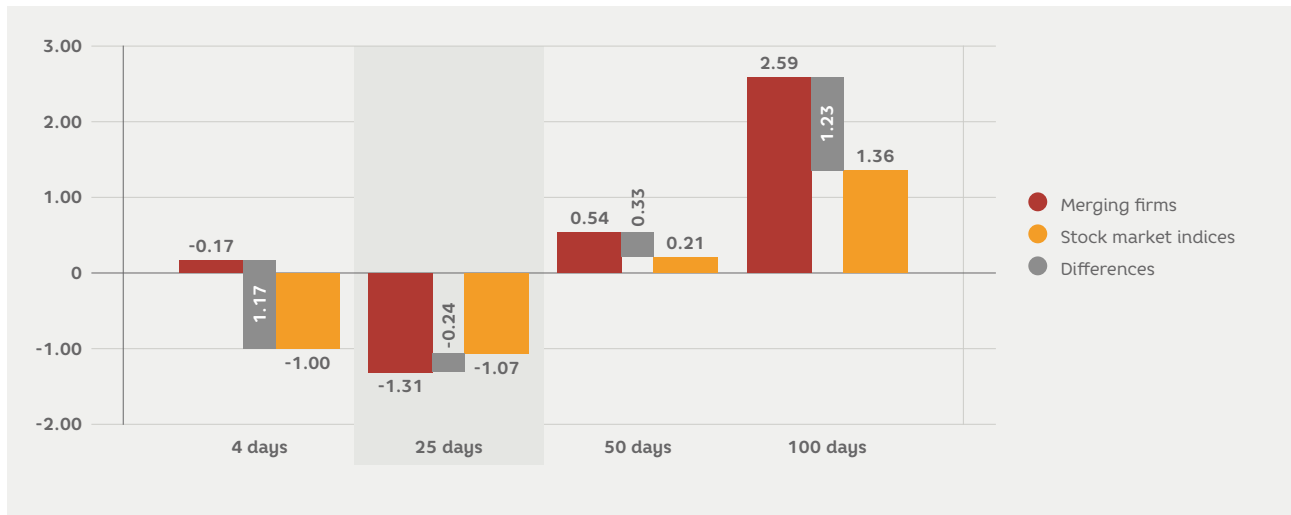


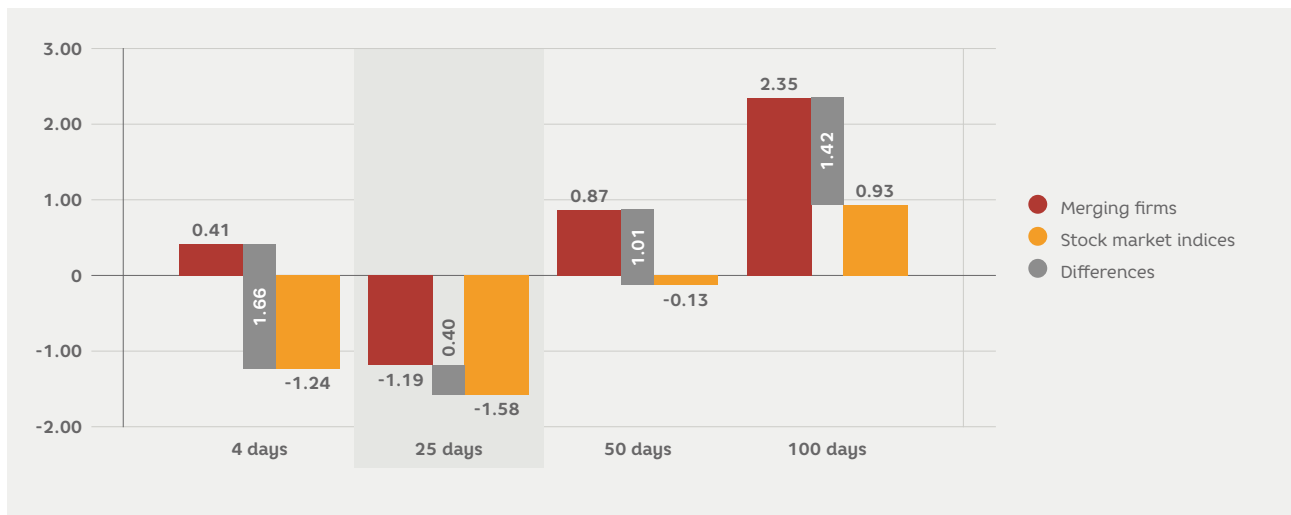
Table 3 shows inconclusive picture, as the effect of a merger differs over time. For the 25 days period an average stock price percentage change for the telecom firms that are involved in a merger turned out to be -1.31 percent while it is -1.07 percent for the stock market. Such discrepancy indicates that, on average, markets are negative towards the mergers, as negative difference of 0.24 percent means that mergers perform worse than average market dynamics. However, for shorter and longer time periods the results are reverse.

Moreover, the results are not robust to inclusion or omission of certain influential observations. For example, omission of merger of Altice and PT Portugal makes the 25 days estimate positive. We refrain from estimating statistical significance due to the small sample size.

On average, around half of the merger cases perform better than the market – for 25 days period these are 18 out of 33 cases, while it is 16 of 33 cases for the longer periods. This means, of course, that the other half performs worse than the market.

Stock price change before and after the EU merger announcement, in percentages.

Table 4.



Interestingly, the raw data show that the merger firms performed, on average, well before the announcement as compared to the market index. This suggests that growing companies initiate a merger as a tool to further boost their performance, rather than lagging companies trying to fix bad performance.

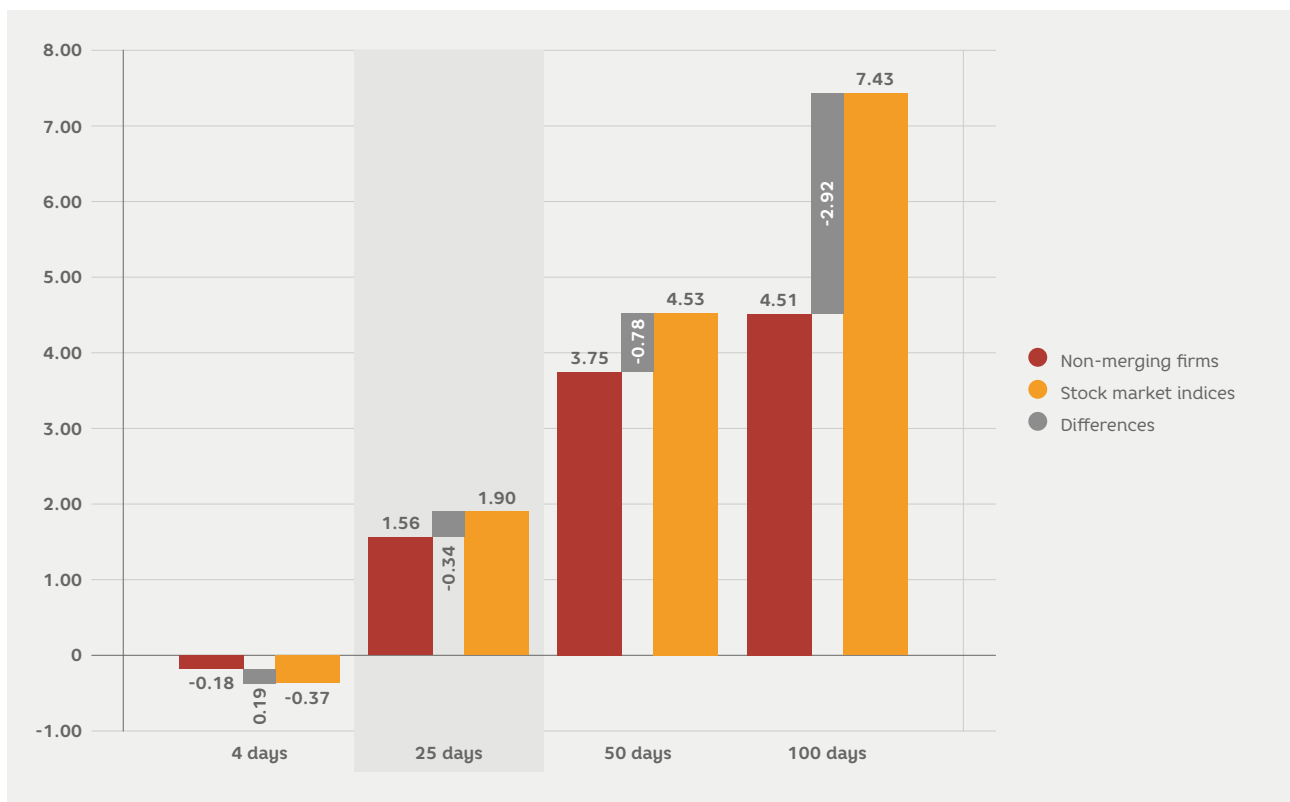
We have done some further sensitivity check to see whether the results remain the same if the firm sample is bound to EU cases only. For example, Table 4 shows the results for EU mergers only. The outcomes become

positive: for the 25 day period the return to merger announcement is positive, while for other time intervals it remains positive, but slightly less strong.

We check also the non-merger cases, although the number of such cases is small, so one should take this result with some cautiousness. The results suggest that non-mergers perform well right after the announcement, but after already 25 days the return turns to be negative and it remains so for 50 and 100 days.

Stock price change before and after the merger announcement, which later were cancelled, in percentages.

Table 4.



Overall, the stock market response analysis tends to show a somewhat positive effect of a telecom merger on firms' stock prices. However, this result is not robust to inclusion or omission of certain influential observations,

and to changes in the time period of analysis. Thus, one cannot conclude that there is strong evidence that mergers lead to better stock market performance for publicly listed telecom companies.

Competition authorities

For the purpose of competition assessment one has to identify, at first, the relevant markets that the merger might affect. While it is a task of the competition authority to determine the relevant market, usually by the means of a SSNIP test (Small but Significant and

Non-transitory Increase in Price), probably in the case of *LMT* and *Lattelecom* it will include TV, retail and wholesale mobile services, mobile backhaul, and retail and wholesale cable broadband. Then the remedies or merger conditions should be proposed that can restore competition.

Merger effects on competition

The bundling of different products creates interdependency and might affect competition across previously separated markets. Research shows that customers already perceive cable and mobile broadband as close substitutes (Srinuan et al., 2012). Thus, possible bundling of TV and mobile services might bring several challenges.

1. A merger of large telecom firms can increase the entrance costs to a new stand-alone firm (OECD, 2015). If typical service subscription includes three or four services in a single bundle, this might make an entrance to a particular market (for example, mobile broadband) prohibitively expensive for a new stand-alone firm.
2. Bundling products with different degrees of competition might encourage aggressive behavior as a newly merged firm will be able to cross-finance different services. That is, if firms face strong competition on one market, but on another there is a clear market leader with market power, then by bundling two products together, the leader might offer a substantial discount for both products. This would drive out the competitors from the competitive market and thus limit current competition.
3. Restrictive access to the inputs of bundled goods (e.g., TV or cable) by a dominating firm might create competition distortion in other markets (e.g., mobile), as service providers would not be able to make a similar bundled offer (BEREC, 2010). Such restrictions are more likely to occur at the wholesale markets.

Competition authorities should assess whether anti-competitive behavior is likely to occur by comparing a potential merger with the counterfactual market situation, in which the two firms remain independent. Telecom mergers from abroad might provide some tentative suggestions on whether such merger is likely to cause lessening of competition or not. The key

concern is to determine to what extent an incentive structure of the two firms' changes due to the merger.

Currently, *LMT* and *Lattelecom* focus on different segments of the telecom market. In case it is confirmed that current competition on the stand-alone markets is sufficiently strong, then it might well be the case that the merger is not likely to affect competition on these markets directly. However, the possibility of a quadruple-play bundling creates new market interdependency and indirectly affects competition in those. The possibility to reproduce a bundled product by other firms in the market is a prerequisite of a competitive environment (BEREC, 2010). Thus, an important concern might be the firms' ability to foreclose its competitors, i.e., to deny access to its infrastructure. Such foreclosure on both wholesale and retail levels should be legally forbidden. And access to infrastructure at a reasonable price should be assured. The price might be set in accordance to the rules designed by competition authorities. A similar arrangement is proposed by the UK Competition and Markets Authorities (2016) which recently approved the merger of two telecom firms BT group and EE. Provision of an equal access right to firms' network (same availability of products and services, same timescale, terms and conditions, same reliability, among other) was important for this approval. These terms would make sure that if the market conditions are suitable, other companies could provide quadruple-play bundling.

Realization of a potential (latent) demand for quadruple-play will be welfare improving, as the new company would provide a novel service. However, an open question is whether such service could have been provided in the counterfactual case. Theoretically, there are two options – either some other mobile and cable telecom companies merge or two independent companies join forces to provide the service, while remaining independent. In the first case, most of the aspects which are covered in this report remain valid for this hypothetical case.

Creation of a strategic partnership or an alliance is another option for firms to offer quad-play bundling. Italian mobile and cable broadband operator Telecom Italia and TV service provider Sky created such a partnership in 2015. They were the first to offer quad-

Competition authority responses

Competition authorities closely monitor the markets which are dominated by just a few firms. Any substantial changes in the market structure, such as mergers and acquisitions, naturally attract authorities' attention and are typically seen as an opportunity to guide market players. There is a two-layer supervision system in place in the EU. Local authorities in each of the EU countries monitor and regulate small firms, while EU-wide competition authority, run by European Commission, supervises large, in terms of market share and total turnover, firms. Often, these firms operate in several EU countries simultaneously and thus a cross-country regulator is in a better position to assess the consequences of a potential merger.

There is a set of rules that identifies under which circumstances a particular merger should be considered by the EU authorities.⁹ The Commission typically examines mergers that involve firms with large turnovers. The first precondition is that merging firms should not have two thirds of their turnover from one and the same EU country. In addition, either of the two key thresholds should hold:

1.
 - a. A combined worldwide turnover of the newly merged firms is more than 5 000 mln EUR and
 - b. An EU-wide turnover for each of at least two of the firms is over 250 mln EUR.
2.
 - a. A combined turnover of all the merging firms is over 100 mln EUR in each of at least three EU countries and
 - b. A worldwide turnover of all the merging firms over 2 500 mln EUR and
 - c. A turnover is over 25 mln EUR for each of the merging firms in these three EU countries and
 - d. An EU-wide of each merging firms is at least 100 mln EUR.

The *Lattelecom* and *LMT* merger would be assessed by the Competition Council (the Latvian competition

play in the Italian market. However, it remains to be seen whether price, quality and coverage brought by the alliances match the characteristics of a services delivered by a merger and whether one setup is preferable over the other.

authorities). However, in exceptional cases, local and EU competition authorities might transfer the cases between themselves, either at the request of the companies or the Member States.

Conditional on matching the thresholds, there is an investigation procedure that the European Commission, as well as Latvian Competition Council, follows. After firms announce their intention to merge and notify the authorities, the commission either starts a simplified check or Phase I investigation. This is chosen if combined market share on any markets where the merging firms operate is below 15 percent or 25 percent on vertically related markets. Otherwise, a full check or Phase II investigation takes place. Both investigations might involve request of information from the merging companies and third parties to identify their views on the merger and general conditions for competition in a market.

The result of the investigations is either a merger clearance or the imposition of merger conditions (remedies). Such conditions are typically proposed by the firms, subject to authority's approval. There are several types of merger conditions which are typically proposed to remedy increasing market power due to the telecom merger. Over the past 6 years European authorities have not imposed a veto on telecom mergers, while in the USA the right of veto is used occasionally.

We overview the mergers from our dataset listed in Table 2. For each merger case we have information on the firms' name, country of origin and a date of public announcement of a merger. Almost each announcement is followed by the corresponding competition authority statement on whether the merger might be approved or an in-depth investigation is required. We collect information on such statements, i.e., the announcement dates and their content.

Three merger announcements were eventually turned down by the US authorities.

That is, merger conditions were too restrictive for the firms to continue the merger process. In general, there are very few non-mergers in the history of the Commission (less than 2 percent in total across all industries), as firms anticipate the reaction of public authorities on a merger and thus do not announce it before being ready to follow the necessary

conditions. There is one merger which the companies decided to cancel. Table 6 shows the list of telecom mergers which had to comply with some conditions imposed by public authorities. The other 17 mergers, which are almost 60 percent, got accepted without any conditions. Table 7 lists these conditions in details.

List of telecom mergers for which competition authorities issued merger conditions.

Table 6.

#	Merger	Country of merger	Date of merger announcement	Competition authorities	Date of merger conditions announcement
1	TeliaSonera and TELE2	Norway	7 July 2014	Norway	2 February 2015
2	Orange and Jazztel	Spain	16 September 2014	EU	19 May 2015
3	Telefonica Deutschland and E-plus	Germany	23 July 2013	EU	2 July 2014
4	AT&T and DirecTV	USA	18 May 2014	USA	28 July 2015
5	Vodafone and Belcompany	Netherlands	22 March 2011	Netherlands	18 July 2011
6	Hutchison 3G and Orange	Austria	3 February 2012	EU	12 December 2012
7	Liberty Global and Ziggo	Netherlands	14 March 2014	EU	10 October 2014
8	Altice and PT Portugal	Portugal	5 March 2015	EU	20 April 2015
9	Liberty Global and Base	Belgium	17 August 2015	EU	4 February 2016
10	Numericable and SFR	France	23 June 2014	France	27 October 2014
11	Telefonica and DTS	Spain	8 May 2014	Spain	28 April 2015
12	Hutchison 3G and Telefonica	Ireland	1 October 2013	EU	28 May 2014

Prevalence of merger conditions types imposed by competition authorities, in percentages from the total number of mergers (in the sample considered).

Figure 2.

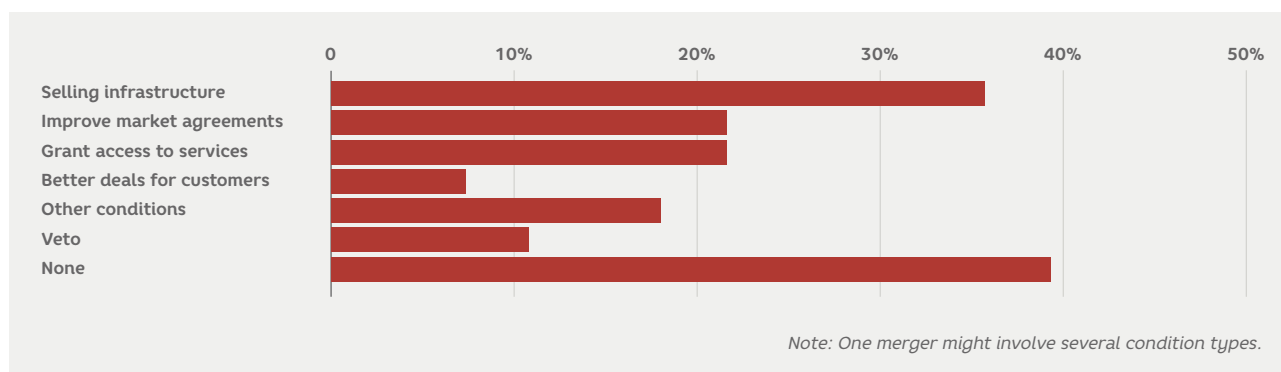


Figure 2 shows prevalence of the conditions in the sample we have considered. Selling and divestiture of the network infrastructure is the most frequent condition. It was imposed in 36 percent merger cases. For example, in a merger between TeliaSonera and TELE2 in Norway in 2015 (the companies market shares were, respectively, 23 and 19 percent), the newly merged firms agreed to sell part of the existing infrastructure and distribution network to new market entrant *ICE*. This merger of two mobile operators was initially denied by the Norwegian Competition Authority, as the regulator feared that the reduction of the number of operators from three to two would “harm the competition climate”. However, the merger conditions effectively brought *ICE*, a new mobile operator, necessary infrastructure and customer base to offer full-scale mobile services. In a similar fashion, in Spain in the same year *Orange* agreed to sell fiber-to-the-home network in 5 largest Spanish cities to its competitors to keep high competition level.

Termination, extension or improvement of an agreement with other market players is one other common remedy. *TeliaSonera* agreed to conclude a roaming and service agreement with the *ICE*. In the USA, *AT&T* has to disclose any “interconnection” agreements with other telecom providers, so that the competition authority can ensure the contracts are not unreasonable. *Telefonica Deutschland* had to

extend existing wholesale agreements with service providers after it is merged with *E-Plus*.

Sometimes firms agree to grant access to its network, services, and ensure wholesale offers on favorable conditions to the competitors. *Numericable*, for example, had to open its cable network to the competitors wishing to offer fixed broadband services.

In some cases, firms have to follow special tailor-made conditions. For example, *Numericable* agreed not to communicate any strategic commercial information to *Vivendi*, a parent company of a firm with which it was going to merge in France. That is because both companies, *Numericable* and *Vivendi*, still remain competitors in other markets. Another example is *AT&T* which pledged to build fiber network to schools and libraries, which are eligible for federally subsidized broadband rate.

Overall, European competition authorities do not decline telecom merger proposals. Rather they impose merger conditions to remedy potential increase of the market power. Selling part of the infrastructure to competitors is the most prevalent condition, adjustments of the market agreements with other market players and granting them access to services are, respectively, the second and the third most frequent conditions.

Merger conditions

Table 7.

#	Selling or divestiture of firm's infrastructure	Agreement changes with other market players	Access to firm's network and services	Customer relations	Other conditions
1	<ol style="list-style-type: none"> 1. Selling infrastructure to new market entrant <i>ICE</i>. 2. Selling of <i>Network Norway's</i> customer base (corporate), distribution network and frequencies to <i>ICE</i>. 3. Selling offer of three <i>Tele2</i> stores to <i>ICE</i>. 	<ol style="list-style-type: none"> 1. A roaming and service provider agreement with <i>ICE</i>. 	<ol style="list-style-type: none"> 1. Commitment to offer a mobile virtual operator access to Norwegian mobile operators. 		
2	<ol style="list-style-type: none"> 1. Selling of fibre-to-home network in 5 largest Spanish cities. 2. Selling access to its ADSL network on certain costs. 		<ol style="list-style-type: none"> 1. <i>Orange</i> grants access to its mobile network on favorable conditions. 		
3	<ol style="list-style-type: none"> 1. Selling 30% of network capacity to mobile virtual operator (MVO) in Germany at fixed payments. 2. Divestiture of radio wave spectrum and certain assets to mobile virtual operator(s). 	<ol style="list-style-type: none"> 1. Extend existing wholesale agreements with <i>Telefónica's</i> and <i>E-Plus'</i> partners. 	<ol style="list-style-type: none"> 1. Offer wholesale 4G services to all interested players in the future. 		<ol style="list-style-type: none"> 1. To improve its wholesale partners' ability to switch their customers from one MVO to another.
4		<ol style="list-style-type: none"> 1. Disclosure of any "interconnection" agreements so the FCC can ensure they're not unreasonable. 		<ol style="list-style-type: none"> 1. Expanding fiber-to-home network to 12.5 million customers. 2. Discount broadband for low-income consumers. 	<ol style="list-style-type: none"> 1. Build fiber network to eligible schools and libraries at subsidized rates. 2. Pledge to treat all
5					<ol style="list-style-type: none"> 1. Stop mutual selling of any mobile-phone plans with competitors.
6	<ol style="list-style-type: none"> 1. Divestiture radio spectrum and additional rights to an interested new entrant in the Austrian mobile telephony market. 		<ol style="list-style-type: none"> 1. Grant access to its network for up to 30 percent of its capacity to mobile virtual network operators in the next 10 years. 		
7	<ol style="list-style-type: none"> 1. <i>Liberty Global</i> committed to divest its <i>Film1</i> channel to a third party purchaser. 	<ol style="list-style-type: none"> 1. To allow broadcasters to offer their channels and their content via OTT services for at least 8 years. 			<ol style="list-style-type: none"> 1. Maintain adequate interconnection capacity through at least three uncongested routes.
8	<ol style="list-style-type: none"> 1. Selling of Portuguese subsidiaries <i>Cabovisão</i> and <i>ONI</i>. 				
9	<ol style="list-style-type: none"> 1. Selling share in <i>Mobile Vikings</i>, a mobile virtual network operator that uses <i>BASE's</i> network, to Belgian broadcaster <i>Medialaan</i>. 2. Transfer part of <i>BASE's</i> customer base to <i>Medialaan</i>. 				
10	<ol style="list-style-type: none"> 1. Selling of the copper network of business operator subsidiary <i>Completel</i>. 2. Selling the <i>Outremer Telecom's</i> mobile businesses in the islands Reunion and Mayotte. 	<ol style="list-style-type: none"> 1. <i>Numericable</i> will have to respect <i>SFR's</i> fibre sharing agreement with <i>Bouygues Telecom</i> and cannot block <i>Orange</i> from deploying its fibre in areas reserved for <i>SFR</i> under an earlier deal. 	<ol style="list-style-type: none"> 1. Offer a bitstream access to and give business operators wholesales access to local fibre loop. 2. <i>Numericable</i> will open its cable network to <i>Orange</i>, <i>Bouygues Telecom</i>, <i>Free</i> and MVNOs wishing to offer fixed broadband services. 		<ol style="list-style-type: none"> 1. Not communicate any strategic commercial information to <i>Vivendi</i> in markets in which they compete.
11			<ol style="list-style-type: none"> 1. <i>Telefónica</i> will offer competitors a wholesale offer including 100 percent of all premium channels. 	<ol style="list-style-type: none"> 1. Guarantee that its lines and facilities will allow customers to use competitors' services in a regular way. 2. <i>Telefónica</i> commits itself not to impede customers from switching to one of its competitors. 	
12	<ol style="list-style-type: none"> 1. Selling up to 30 percent of the merged company's network capacity to two mobile virtual operators at fixed payments transfer. 2. Divest five blocks of spectrum in the 900 MHz, 1800 MHz and 2100 MHz bands. 	<ol style="list-style-type: none"> 1. Offer <i>Eircom</i> to continue the network sharing agreement on improved terms. 			

Notes: *: cancelled or vetoed mergers, **: ongoing merger.

Conclusions

Telecom mergers attract considerable attention both from the general public and state authorities. The industry is usually very concentrated, as there are typically 3 or 4 large service providers in a country thus a merger between two firms noticeably affects market structure. There are public concerns that a newly merged company might abuse its market power. A more optimistic view on mergers points out the potential synergy effects, such as stronger scale economies. In this study we overviewed potential merger effects and performed empirical exercises.

The economic literature fails to detect efficiency gains in newly merged telecom enterprises. Telecom mergers cause neither cost decreases, nor productivity increases, and thus are unlikely to be socially beneficial if judged solely on the ground of efficiency gains. However, recent research in the industry indicates that there is potential demand for quadruple-play bundling telecom products (cable and mobile broadband, TV, and regular telephony). Realization of this demand would be socially desirable, and it might justify the merger. A demand study is warranted.

Stock market response analysis of recent (2010–2017) telecom mergers in the EU and some non-EU OECD countries does not show conclusive evidences of the positive market response to the telecom mergers.

While, on average, reaction of the stock markets on the telecom merger announcements tend to be positive, the results are sensitive to inclusion or omission of certain observations.

In more than half of the recent (2010–2016) telecom merger cases, competition authorities in Europe cleared the deals without imposing any conditions. In 40 percent of the cases such conditions were issued. Selling some part of the infrastructure to competitors is the most prevalent condition – it was applied in 36 percent of cases. Adjustments of the market agreements with other market participants and granting them access to services are, respectively, the second and the third most frequent conditions – both were applied in 21 percent of cases.

Overall, merger does not seem to be a question of life or death for telecom firms. Merger has its pros, such as new product development and short-run and medium-run positive effect on stock prices, and cons, as firm efficiency might suffer. European competition authorities never outright oppose telecom mergers, but they ensure that firms do not abuse market power. This is achieved with a set of constraints on firm market strategies (e.g., selling infrastructure, fixed agreements with other market participants). A comprehensive market analysis will identify whether the pros outweigh the cons in the case of an *LMT* and *Lattelecom* merger.

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