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Delineating market boundaries in the Russian mass notification market: An application of critical loss analysis☆

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Abstract

Telecom companies are a frequent target of antitrust investigations in Russia. In an industry where services tend to become more and more complex and companies actively invest in diversifying their businesses, the antitrust authority in most of its telecom cases has chosen to define markets narrowly, which increases antitrust risks for the companies. This paper uses poll data on mass SMS notifications — a market in recently investigated by the FAS Russia — to demonstrate, using critical loss analysis, that the market should be defined in broader terms. In particular, the main empirical finding is that the relevant product market boundaries should cover not only SMS, but also e-mail, messengers and push and voice notifications.

Keywords: critical loss analysis, market definition, SMS-notifications, SSNIP test, telecommunications.
JEL classification: L40, L41.

1. Introduction

One of the most important questions of market analysis for antitrust law enforcement is the definition of product market boundaries. If product market boundaries are defined too narrowly, this creates an erroneous impression that companies possess excessive market power and this may result in the condemna-

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tion of competitive conduct; on the contrary, if product market boundaries are defined too broadly, this creates an erroneous impression that companies do not possess significant market power, which results in ignoring potential negative consequences of market power for the relevant market. Both types of errors can have a profound negative impact on the maintenance of healthy market competition (Shastitko, 2011d; Joskow, 2002).

Antitrust cases against Russian telecommunication companies that took place in 2018-2019 illustrate the existing problem concerning the definition of product market boundaries for the correct application of antitrust law. In industries that are rapidly changing with the spread of new technologies, diversifying their businesses and branching out to new spheres in order to build an entire eco-system of digital services with a unified consumer experience,[1] the concept of what constitutes separate or substitutable services from the point of view of a consumer is evolving. This brings up the issue of whether regulators have a sufficient understanding of new technologies and business models and whether regulation can keep up with the pace of changes (Fenwick et al., 2017). While in some jurisdictions the current stance is that the existing instruments are supple enough to apply to new technologies (Newman, 2019), others have chosen to update their legislation to better deal with digital markets (Koenig, 2017). But it's not just the legislation that matters, but its implementation, and the latter factor can differ substantially between jurisdictions. Even if we consider only the BRICS countries, we see major differences in policy: while some countries adopt a comparatively prudent approach to regulation in digital industries, the Russian authorities are more actively intervening, even playing a significant role in digital *industrial* policy (Ivanov et al., 2019).

In 2018–2019 the Federal Antimonopoly Service of the Russian Federation (abbreviated below to FAS Russia) investigated cases against "the big four" telecommunication companies (MTS, Vympelcom, Megafon and Tele2) accusing them of violating Part 1, Art. 10 of the Federal Law on Protection of Competition No. 135-FZ of July, 26 2006. The companies were accused of creating discriminating conditions on the SMS mass notification[2] market in the Russian Federation, charging banks under government ownership significantly lower prices than private banks, as well as charging monopolistically increased prices for the service.[3]

This case illustrates the application of collective dominance in Russian antitrust enforcement: specifically, applying the concept of collective dominance in investigations of abuse of dominance cases, where each of the firms involved cannot be considered dominant in isolation but can be found to have abused its "collectively dominant" position. The use of collective dominance is controversial: the concept has no place in North American antitrust enforcement and has only rarely been used by the European Commission, but this is an issue that is

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[1] http://futurebanking.ru/post/3830

[2] In our paper we use "notification" to signify all types of messages a customer can receive from a bank: service messages, security information, and advertising. Arguably, the type of message can influence the readiness of both the companies and the recipients to switch to other notification channels, but our choice of a unified approach is consistent with the approach applied in the antitrust cases. See also Section 2 on the willingness of recipients to switch from SMS to alternative methods of notification.

[3] The decision texts (in Russian) can be found at: https://br.fas.gov.ru/cases/1a937e0d-12a2-4714-ab16-5b740c66a143/; https://br.fas.gov.ru/cases/43ea6530-e7e1-487b-99cf-c062928cb685/; https://br.fas.gov.ru/cases/c9984dac-1529-4b45-9028-5a3bbcf486b6/; https://br.fas.gov.ru/cases/a772874f-9aa5-490b-9bc2-7cb0d9f49270/

outside the scope of this article.[4] Yet it's important to note that the FAS Russia was able to establish the collective dominance of "the big four" telecom companies by defining the relevant product market narrowly, as SMS mass notifications via mobile radiotelephone networks. As evidenced by the text of the FAS's case decision, this narrow approach was backed by a consumer survey,[5] according to which 82% percent of bank clients found SMS to be the most convenient type of notification, while 78% weren't ready to *fully* switch away from SMS notifications in favor of other notification channels.[6] This approach not only ignores the possibility of partial substitution and bases itself on value judgement (what about the 22% of clients that appear to be ready to fully switch?), but also contradicts the standard approach to market definition based on demand-side substitution: the subject of the case was the conduct of mobile operators as suppliers of the service of SMS mass notification, with the banks and other companies acting as buyers. This is also why SMS as a form of communication between people is not considered in our analysis, as the market participants on the demand and supply sides would be different.

Thus, the fundamental question, the answer to which influences the answers to related questions concerning the list of market participants, their market shares, the corresponding concentration level, barriers to entry, the intensity of competition existing in the market and the dominance of certain companies in it, is whether an *independent* relevant market exists within the product boundaries of mass SMS notifications.

Although, at first, the subject of the case might seem of little interest to experts apart from industry specialists and antitrust practitioners, in fact it has much wider implications. Firstly, the aggregate of the four cases on SMS mass notification were named one of the top-7 antitrust cases of 2019 by the influential Russian legal portal Pravo.Ru,[7] out of 3029 cases decided by FAS Russia in that year[8]. Secondly, telecoms as a sector plays an increasing role in digitalization and innovation — both important policy goals, especially in light of the ongoing National Program "Digital economy".[9] Yet recently they have borne the brunt of new restrictive measures aimed at increasing security (the "Yarovaya package" of legislation), the cost of which, by some estimations, could range between 0.5 to tens of billions of rubles for each of the major telecom companies.[10] At the same time, telecom companies in Russia remain under traditional close scrutiny by the competition authority that monitors and investigates any attempts to increase prices both for the population and commercial clients. The cases in question came shortly after other high-profile cases dealing with national and intra-network roaming that eventually brought about the sectoral abolishment of both types of roaming charges.[11] In a sense, antitrust seems to be used as complementary to industrial policy, ensuring that the cost increases of regulation are mostly inter-

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[4] For more on the use of the collective dominance concept in Russia see (Shastitko, 2011a, 2011b, 2011c).

[5] The survey was conducted by "Levada-Center" and presented by one of the plaintiffs in the case.

[6] https://br.fas.gov.ru/ca/upravlenie-regulirovaniya-svyazi-i-informatsionnyh-tehnologiy/8a65d7b2-b645-4323-8788-6709551ad1cb/

[7] https://pravo.ru/story/217238/

[8] https://fas.gov.ru/documents/686527

[9] http://government.ru/info/35568/

[10] https://tass.com/politics/1011585

[11] https://en.fas.gov.ru/press-center/news/detail.html?id=54098

nalized and not passed on to consumers — a somewhat unconventional approach to competition policy.

In terms of the junction between industrial policy and competition policy another aspect highlighted by the case is the impact of digitalization on industry and market boundaries (Atluri et al., 2017; PwC, 2019): they become blurred as digital companies branch out and start competing with more traditional businesses. Assessing this competition becomes increasingly important not just in antitrust cases, but also for developing pro-competitive industrial policy. Yet in the Russian telecommunications sector there is currently a shortage of work dedicated to any kind of empirical assessment of market boundaries (although issues of market boundaries in telecoms have been theoretically explored in Pavlova, Meleshkina, 2018; Shastitko, Pavlova, 2019).

The present article develops research with first results presented in (Pavlova, Shastitko, 2019). It is an attempt to determine the boundaries of the mass notification market in terms of the comparative characteristics of notification types, taking into consideration their evolution under the influence of technological progress and the possible simultaneous use of different notification methods. The framework for market analysis in Russia is regulated by FAS Order No. 220 on Approval of the Procedure for Analyzing the State of Competition on a Product Market of April 28, 2010 (Order No. 220), and even though the goal of this article is not to follow the whole structure of Order No. 220 to the letter, the main methods and findings are in accordance with its legal requirements.[12]

Our approach to market definition is based on critical loss analysis, which, in turn, is performed using data acquired with a hypothetical monopolist test. The test infers the consumers' reaction to a small but significant non-transitory increase in price (SSNIP) on a product or group of products that are preliminary defined as the candidate market. The scale of the SSNIP is a debated topic, but in Russia the SSNIP is fixed at the level of 5–10% (Order No. 220, paragraph 3.9).[13] If not enough consumers switch to substitute products to make such a price increase unprofitable, then the candidate market definition holds; but if enough consumers switch, then the originally defined market boundaries need to be expanded.

Critical loss analysis has been widely used by antitrust authorities and courts in different countries. It has also been criticized by economists for a lack of theoretical rigor and the oversimplification of the empirical processes that determine market definition. One of the most frequent points of criticism is that for markets where the margin is already high, the critical loss is small, as the hypothetical

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[12] It must be noted that our analysis focuses on the product dimensions of the market whereas its geographic dimensions are automatically identified as the boundaries of the Russian Federation, which coincides with the report published by analytical agency TMT Consulting (TMT Consulting, 2019). Moreover, the investigation conducted by FAS Russia in this case showed that the product market boundaries are not divided according to the groups of consumers, represented by different types of organizations served by mass notification systems, such as banks, transport/tourist/insurance companies, etc. Notwithstanding the possible different ways these groups of companies may use mass notifications, the investigation showed that such differences do not justify the identification of separate product markets depending on consumer type, even though such a possibility is stipulated by Art. 3.3 of Order No. 220. Thus, the present paper does not argue that different groups of customers form (or do not form) different product markets, nor that the geographic dimensions of the market coincide (or do not coincide) with those of the Russian Federation. A unified product market within the boundaries of the Russian Federation is considered a prerequisite for the present analysis.

[13] This is similar to the European case (EC, 1997), while in the U.S. the size of the SSNIP is usually 5% (U.S. DoJ & FTC, 2010), but can vary depending on the market in question.

monopolist then has a lot of profit to lose even from a small loss of output. It is then easy to erroneously conclude that with critical loss being small, the actual loss would be higher, and therefore the market boundaries need to be expanded, when, in fact, the existing high margins indicate that the firms in the candidate market already have the ability to profitably raise prices. The answer to this discrepancy is that with high margins critical loss might be small, but the actual loss would very likely be even smaller, so the candidate market would not need to expand. In this vein, Katz and Shapiro (2003) and O'Brien and Wickelgren (2003) demonstrate how critical and actual loss are theoretically linked, which enables them to provide a way to check the critical loss condition without needing to directly estimate the actual loss. The approach is expanded by Farrell and Shapiro (2008), Daljord et al. (2008, 2014), Moresi et al. (2008, 2019), Langenfeld and Li (2014), and others, arguing on the correct formulae to use as well as expanding the approach to fit a larger scope of situations (multiproduct hypothetical monopolists, etc.). Their works lend theoretical substance to critical loss analysis, but along with restrictions on the use of their formulae that come from the implemented assumptions. As pointed out by Coate and Simons (2009), these restrictions are significant and risk turning market analysis away from empirical evidence and towards deductive logic — and, perhaps, even more importantly, these approaches are in turn likely to lead to excessively narrow market definition even when margins are low-to-moderate. In our analysis, we try to address this discussion by estimating critical loss with different assumptions about the level of profit margins, checking that the conclusion remains the same.

It is important to take into account the following considerations in relation to the application of the hypothetical monopolist test and critical loss analysis in the Russian antitrust enforcement context:

- the legal reality (Order No. 220, paragraph 3.10) is that the hypothetical monopolist test is the priority method of market definition in Russian competition policy: if other methods (such as direct assessment of demand elasticities) are used, they need to either be done additionally to the hypothetical monopolist test, or an explanation must be provided why the hypothetical monopolist test could not be used in a given situation. Thus, using critical loss analysis allows us to operationalize the priority method of market definition;
- as Katsoulacos et al. (2020) demonstrate, by empirically analyzing a large set of antitrust decisions made in 2008–2015, the Russian competition authority tends to apply low legal standards, and consequently economic analysis (especially the application of sophisticated techniques as would be required in the evaluation of demand elasticities) plays a very modest role in its investigations;
- as described in Order No. 220, paragraph 3.9, the hypothetical monopolist test must be based on survey data, where consumers answer how they would react to a SSNIP. Survey data has its drawbacks, but continues to be used for purposes of market definition (Harkrider, 2004; Farrel, Shapiro, 2008). We keep to this approach relying on estimates of the diversion ratios that are revealed by survey data. Specifically, the empirical basis for the present paper is informed by the data of two recent surveys: an opinion poll among companies placing orders for mass SMS notification (VCIOM, 2019) and an opinion poll among recipients of mass SMS notification (TMT Consulting, 2019), accompanied by

other market data. These two polls provide a rare opportunity to analyze mass SMS notification on the relevant market from both sides and hence facilitate the definition of market boundaries.

Despite the hypothetical monopolist test being a priority method in Russian antitrust, and critical loss analysis being well-known from the literature and foreign practice, we are not aware of any attempts in the literature to consistently apply critical loss analysis to assess market boundaries in Russia. We demonstrate how survey data can be used to delineate a market with complicated relations of substitution between products and partial buyer switching.

Our main findings are that in Russia, an independent market within the product boundaries of mass SMS notifications does not exist; moreover, the relevant market boundaries for mass notification methods should include e-mails, messengers, calls and push-notifications. We understand that in a differentiated product market, as the one examined here, by broadening the market (by adding additional product varieties), the position of dominance of a firm may not be affected if the same firm has very significant market shares in all the varieties. But in the present case "the big four" Russian telecommunications companies, accused of abusing their collective dominance in the mass SMS notification market, do not hold correspondingly high market shares in segments with other methods of notification. Thus the choice—and the supporting arguments—between a narrow or a broad market definition for mass SMS notifications became a crucial point in this antitrust case.

Section 2 outlines the main methods of mass notification that are currently used in Russia and explains the criteria for substituting between them by the customers—i.e. the companies ordering services of mass notification from providers. Section 3 uses critical loss analysis to show that a narrow market definition is inappropriate in this case. Section 4 attempts to assess the exact market boundaries of the broader market using poll data from the surveys mentioned above and utilizing a variation of the hypothetical monopolist test that seems most suitable for this case. Section 5 contains a discussion of the results in the context of the modern Russian antitrust policy.

2. Types and methods of mass-notifying end consumers: comparative characteristics

In accordance with Art. 3.2 of Order No. 220, the boundaries of a product market shall be defined by customers' (either legal or natural persons) opinions about the substitutability of goods in one product group.

In practice, mass notification methods—through which advertisement, information, service, transaction, etc. messages can be sent to end consumers—are highly variable. In accordance with the report of TMT Consulting (2019, p. 5), in Russia the most common mass notification methods are:
- SMS;
- e-mail;
- mobile applications and messengers;
- voice notification:
  – pre-recorded phone calls;
  – calls from call-centers.

Methods of mass notification are chosen by the organizations themselves based on the following criteria (TMT Consulting, 2019, p. 7):

- accessibility: organizations are interested in broadcasting messages to as many people as possible;
- personalization: organizations are interested in sending personal messages;
- swiftness: certain messages need to be sent and received very quickly, within one minute as a rule.

Evidence shows that presently all the mass notification methods allow companies to identify the recipients and to deliver messages quickly. As for the accessibility of messages to end consumers, in accordance with the data collected by the Ministry of Digital Development, Communications and Mass Media of the Russian Federation, a 2G network and higher covers most regions of Russia.[14] The 2G network allows end consumers to receive messages through SMS, calls, e-mail, messengers and in-apps alerts (push-notifications).[15]

Based on this data, one can conclude that there is a high level of accessibility of different mass notification methods for the majority of people. Those who own a mobile phone and are able to receive SMS are almost certainly able to receive notifications through other means. But even if there is a group of mass notification recipients who can be notified exclusively through SMS (a concern pointed out by the FAS Russia in its analysis), this does not automatically indicate that the product market boundaries coincide with SMS notification — indeed the Hypothetical Monopolist Test we undertake below utilizing the data of the surveys above shows that this is not the case.

3. Substitutability of mass notification methods

In conformity with Art. 3.7 of Order No. 220 substitutability of products is assessed based on *actual substitution* already made by consumers *or their willingness to substitute one product with others*.

Evidence indicates that both conditions are applicable to mass SMS.

1. Actual substitution of mass SMS with alternative mass notification methods

Mass SMS notifications are routinely replaced by alternative mass notification methods as evidenced, firstly, by the use of other methods to deliver messages to recipients, and, secondly, by actual substitution of a certain number of messages previously sent as SMS with other types of messages.[16]

The results of an opinion poll (VCIOM, 2019) showed that companies use a whole variety of mass notification methods to send their clients advertisements, information, service, transaction, etc. messages. The most common way of com-

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[14] https://geo.minsvyaz.ru/view.php#/-1/2/3/57.122428528148745/65.10982874516468/4

[15] Moreover, according to the Ministry of Digital Development, Communications and Mass Media of the Russian Federation, in the third quarter of 2018, the number of people using mobile network and having access to the Internet with a a speed of more than 256 kbps was 123 million people. With the total population of Russia aged over 5 years old being 137.5 million people in 2018 (according to the Russian Federal State Statistics Service), this means that more than 89% of the entire Russian population had access to the Internet with a speed higher than 256 kbps.

[16] An example of actual total substitution of SMS is the official portal of the Moscow Mayor and Moscow Government www.mos.ru: notification of parents about their children's arrival at school has totally shifted from SMS to in-app push-notifications and e-mails (the information is also available on the website, see https://www.mos.ru/news/item/31123073/).

*Which method does your company use to send advertisements, service,
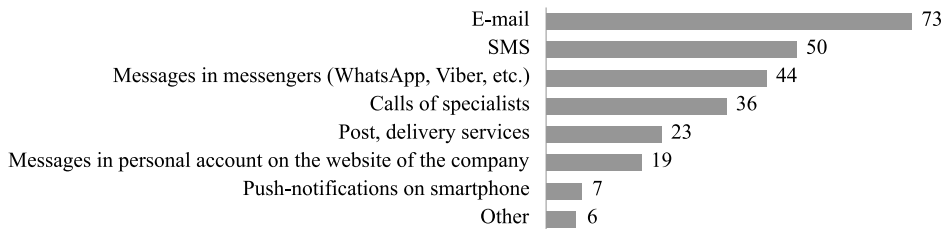information, transaction, etc. messages to the clients?*

Fig. 1. Mass notification methods preferred by companies (% of those polled).

Source: VCIOM, 2019.

municating with clients is e-mail (73%), followed by SMS (50%), calls (36%) and messages in messengers such as WhatsApp, Viber, etc. (33%) (Fig. 1).

2. Willingness of companies to abandon SMS in favor of alternative mass notification methods

The data provided above reflects only the present situation on the market of mass notification methods, which is subject to certain changes under the influence of:

• the ever-increasing amount of notifications,
• the ever-increasing access to devices supporting Internet connection with the speed necessary for data transfer, which has allowed e-mail, messengers or in-app alerts to win an advantageous position vis-à-vis other mass notification methods,
• the development of mobile apps for interacting with consumers which help companies to transmit notifications to consumers (interactive mass including push-notifications)[17].

According to VCIOM (2019), companies that use mass notification systems signal a willingness to partially replace (and, although the switch is partial, it corresponds to a considerable part of notifications) their mass SMS notifications with other types of messages under the condition of a wider distribution of smartphones with 24/7 Internet access. Furthermore, the majority of end recipients of mass notifications have also been expressing their willingness to switch from prepaid SMS sent by banks to alternative methods of notification, if they are free or less expensive (TMT Consulting, 2019).

Thus, both the companies that use mass notification systems and the end consumers receiving messages express a willingness to switch from SMS to alternative mass notification methods under certain conditions, which suggests a potential substitutability of mass notification methods. However, product market boundaries for antitrust purposes are more commonly defined by the willingness of entities to substitute a product on condition that the price for the relevant product remains increased by 5–10% over a considerable period of time while other conditions on the market and prices for other products remain the same. This willingness inspires the hypothetical monopolist test, which is indicated as the prioritized method of market boundary definition by Art. 3.8 of Order No. 200.

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[17] On the effects of digitalization on competition see Shastitko et al. (2019).

In accordance with Art. 3.9 of Order No. 220:

"The hypothetical monopolist test, which is used to define product market boundaries, shows consumers' opinion about the group of products that can be mutually substitutable. To determine this, consumers answer the following question: 'With which alternative products and in what proportions would your company substitute the product in question if its prices are increased by 5–10% and remain at that level for more than a year, while prices for all other products remain the same?'"

The consumers' answers are then aggregated to check whether two conditions are satisfied:

- after the proposed increase in price for the relevant product consumers will switch to other products,
- the sales of the relevant product will decrease in such a way that makes the price increase unprofitable for the seller(s) of the relevant product.

If both conditions are met, the alternative products that are closest in their characteristics to the originally defined product and to which the consumers are ready to switch are to be included in the group of substitutable products."

In order to implement the hypothetical monopolist test, specialists were asked to answer the following questions:

a) Imagine that prices of SMS notifications are increased by 5–10% and remain at that level for more than a year while prices for alternative mass notification methods remain the same. In your opinion, under these conditions, would your company substitute SMS notifications, totally or partially, with other mass notification methods, and if yes, then with which methods? (only representatives of companies that use mass text messaging responded to this question).

b) In your opinion, what part of SMS notifications would your company substitute with other types of mass notification messages if SMS prices were increased by 5–10%? Express the number of messages your company would send through alternative means as a percentage.[18]

Answering the first question (it was possible to choose more than one option) 52% of those polled (representatives of companies that use mass notification) responded that they would substitute SMS with notifications in messengers, 30% with e-mails, 16% with calls of specialists, 11% with push-notifications and messages in personal accounts on web-sites of the companies. Only 22% of those polled responded that they would not substitute SMS (Fig. 2).

Thus, the first condition of the hypothetical monopolist test, that determines the necessity of re-definition of the preliminary defined product market boundaries, is satisfied: an increase in price would result in product substitution.

The answers to the second question, concerning the fraction of SMS notifications that would be substituted with other mass notification types under the condition of increased SMS prices, showed that only 40% of notifications would

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[18] It is important to note that the hypothetical monopolist test is sensitive to the way the original market is defined. While product B can be a good substitute for product A, it is not guaranteed that the reverse will be true: in our example, the fact that buyers can switch from SMS notifications to e-mails does not mean that they would be willing to switch from e-mails to SMS if the price of e-mail notifications would go up by a SSNIP. Here the starting point of the analysis — SMS mass notifications — is chosen in accordance with the subject of the antitrust investigation and the opinion of the FAS Russia on the relevant product market.

*Imagine that prices of SMS are increased by 5–10% and remain so for
more than a year while prices for alternative mass notification methods remain the same.
In your opinion, under these circumstances, would your company consider substituting SMS for
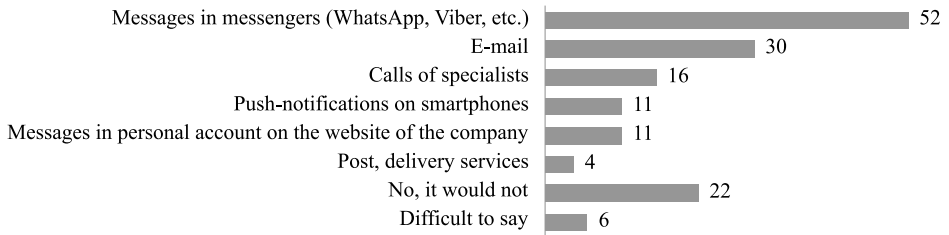an alternative mass notification method, totally or partially, and if yes, for which?*

Messages in messengers (WhatsApp, Viber, etc.) — 52
E-mail — 30
Calls of specialists — 16
Push-notifications on smartphones — 11
Messages in personal account on the website of the company — 11
Post, delivery services — 4
No, it would not — 22
Difficult to say — 6

Fig. 2. Reaction of companies using mass SMS notifications to a price increase of 5–10% for the service
(% of those polled whose companies use mass SMS notifications).

*In your opinion, what number of SMS would your company substitute with other types of
mass notification under condition of the SMS price increased by 5–10%? Express the number of
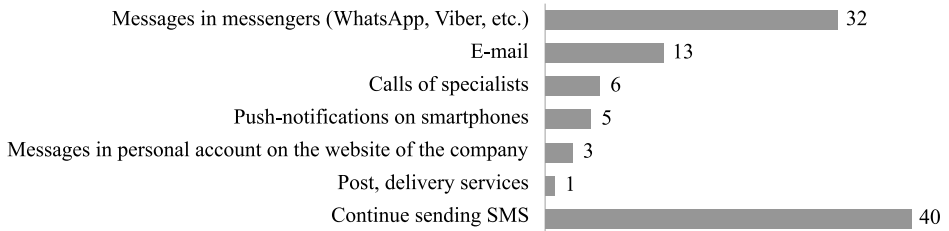messages your company would send through alternative means as a percentage.*

Messages in messengers (WhatsApp, Viber, etc.) — 32
E-mail — 13
Calls of specialists — 6
Push-notifications on smartphones — 5
Messages in personal account on the website of the company — 3
Post, delivery services — 1
Continue sending SMS — 40

Fig. 3. Reaction of companies using mass SMS notifications to price increase by 5–10% for the service
(% of SMS notifications substituted by other notification types; average of those companies
which use mass SMS notifications and gave a detailed answer).

Source: VCIOM, 2019.

be still sent via SMS. Thus, 60% of all messages would be sent through other means, among which messengers (WhatsApp, Viber, etc.) would be the preferred substitute, which corresponds with the answer to the previous question. Hence, this mass notification method would be the substitute for up to 32% of all notifications (Fig. 3).[19]

Figure 3 indicates that there will be a 60% loss in the volume of sales following a price increase. In the *critical loss analysis* (U.S. DoJ & FTC, 2010; Pavlova, 2014) that we undertake below we use this information, as well as the information about the specific substitution patterns to other services provided by Figure 3 to delineate the exact boundaries of the product market.

As previously mentioned, in critical loss analysis an estimate is obtained of the value of the maximum sales decrease for a particular product affected by a 5–10% price increase that a hypothetical monopolist can endure without turning a negative profit. If the 5–10% increase in product price results in a sales decrease greater than the critical loss amount, due to customers refusing to buy the product and substituting it with similar products, this price increase is un-

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[19] Statistics concerning the answers to this question can be found in the letter No. 39, VCIOM of April, 03 2019

profitable for a hypothetical monopolist and hence the boundaries of the product market are to be expanded until profits after the price increase are no less than before. Considering a specific candidate product, the question is whether or not the following inequality holds:

$$(p_1 - c_1)Q_1 - FC \leq (p_0 - c_0)Q_0 - FC, \tag{1}$$

where p_0, c_0, Q_0 are, respectively, the price, average variable costs and quantity of the product sold before the price increase, and p_1, c_1, Q_1 are the price, average variable costs and quantity (volume of sales) of the product sold after the price increase. FC is fixed costs. The critical loss in sales is then the largest difference between Q_0 and Q_1 for which (1) holds as an equality.

To determine the critical loss in sales (CL) assume that $c_1 = c_0 = c$. This is a usual assumption in critical loss analysis (Scheffman, 2003).[20] And, in the specific case under consideration, there is no reason to assume that average variable costs of one mass SMS would change drastically under the influence of changes in the number of SMS sent. Given this, the CL can be easily defined by expressing (1) in equality form as follows:

$$(p_0 + \Delta p - c)(Q_0 - \Delta Q) = (p_0 - c)Q_0, \tag{2}$$

where $\Delta Q = (Q_0 - Q_1)$ and $\Delta p = (p_1 - p_0)$.

Thus, defining $\dfrac{Q_0 - Q_1}{Q_0} = CL$ and solving (2) we get that:

$$CL = \frac{s}{s + m}, \tag{3}$$

where $s = \dfrac{\Delta p}{p}$ and $m = \dfrac{p_0 - c}{p_0}$.

Since the analysis is carried out within the framework of the hypothetical monopolist test, s is taken to be between 5% and 10%, that is, the price after the price increase (p_1) is 5–10% higher than the price before (p_0).[21] To start with, we note from (3) that the CL is smaller and hence the likelihood that we have a broad market is larger, the larger is m. The latter takes a maximum value of 1 when $c = 0$. Assuming then zero average variable costs we get that $CL = 4.76\%$ when $s = 0.05$ and $CL = 9.09\%$ when $s = 0.1$. Thus, with negligibly low average variable costs of one text message in the SMS mass notification system (and hence, with maximum m), if prices increased by 5% this will be profitable for a hypothetical monopolist of mass SMS only *if the price increase does not result in a loss of sales larger than 4.76%; similarly, if prices increased by 10% this will be profitable only if the corresponding loss of sales is not larger than 9.09%.* However, *the conducted opinion polls showed that a 5–10% increase in SMS*

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[20] Only average variable costs (not total costs) and their fluctuations conditioned by changes in numbers of messages sent, seen only statically, are important here (other possible changes influenced by exterior factors are not taken into account).

[21] It is also important to remember that the present analysis is performed not for a single existing company, but for the entire product market, i.e. we deal with a hypothetical monopolist that raises its price for the whole market.

prices would result in a 60% decrease in the number of SMS sent. Such a price increase would be obviously unprofitable for a hypothetical monopolist under the stated assumptions.

Let us now, more generally, not restrict the value of *c* and, as is more common, undertake the *CL* estimation using a value for *m* which typically will be less than unity. The exact amount of the gross profit margin (based on variable costs) of a separate service in telecommunication is very difficult to calculate. However, a combined profit margin, which will generally be smaller than the gross margin, can be used instead. For instance, in 2018 the combined profit margin of telecommunication company MTS, as stated in its IFRS report, amounted to 15.2%.[22] From (3), given this value for *m*, we immediately get: *with the price increased by s = 5%, the critical loss will amount to 24.75%; while with the price increased by s = 10%, the critical loss will amount to 39.68%.* Again, knowing from the opinion polls that *up to 60% of the total number of mass SMS* will be substituted by other mass notification methods, it is clear that increasing prices by 5–10% will be unprofitable even when a very low profit margin (of 15.2%) is assumed. Thus the mass SMS notification market cannot be a distinct relevant product market. And this conclusion will certainly hold for higher values of *m*.

Thus, the critical loss analysis shows that the product boundaries of the Russian product market of mass SMS notifications need to be redefined more broadly, since the 5–10% price increase, keeping prices for other products the same, would result in substitution of a certain number of SMS with other mass notification methods and would be unprofitable for a hypothetical monopolist.

4. Defining the market

According to the analysis above, the product market boundaries need to be broadened to include substitute products. In this section we examine the question of the exact market boundaries by adopting an extension to the critical loss analysis above which aims to determine whether and which products should be included in the relevant market. We utilize additional information from opinion polls (Figure 3 above) which show the buyers' reaction to an increase in prices for mass notifications through SMS, specifically, the extent to which they shift to substitute products such as messengers, e-mail, etc.

Economic theory recognizes different approaches to undertaking the HM test and critical loss analysis once additional products are included in a candidate relevant product market, in order to determine whether the expanded market boundaries do constitute a relevant market. One approach is to undertake the test by hypothesizing that there is a 5–10% price increase not for all the products in the broader market but only for the first product (but taking into account the impact of this on the profits of the hypothetical monopolist producing all products included in the broader market). Alternatively, a uniform price increase for all the products included can be considered (see for discussion Katz and Shapiro, 2003). The work of Darjord and Sorgard (2011) shows that under conditions of asymmetry within product groups (based on products' prices, profit margins, market shares) a price increase only for one product, regardless of test iteration,

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[22] http://ir.mts.ru/investors/financial-center/financial-results/default.aspx

should be considered as the correct method to define relevant boundaries of the product market. Moresi et al. (2019) mention that in the USA both types of the hypothetical monopolist test are used in implementing antitrust laws, depending on the situation in question.

Assuming two products (or services), for this variation of the test, a price increase is profitable for a hypothetical monopolist as long as the following inequality holds (assuming that average variable costs of all products are constant):

$$(p_1^1 - c^1)q_1^1 + (p_0^2 - c^2)q_1^2 > (p_0^1 - c^1)q_0^1 + (p_0^2 - c^2)q_0^2, \tag{4}$$

where superscripts 1 and 2 are products (Product 1 is the product that defined the original market boundaries, Product 2 is a substitute) and subscripts 0 and 1 indicate values "before" and "after" the 5–10% price increase, respectively.[23] Thus, the left side of the inequality shows the hypothetical monopolist's profit after the price for Product 1 is increased by 5–10% resulting in a partial substitution of a certain amount of Product 1 with Product 2; the right side shows his profit before the price increase. Only if the left side of the inequality is greater than the right one the price increase is profitable for a hypothetical monopolist.

Generally there may be more than one substitute product. For example, in our case, the opinion polls showed that with increased SMS prices at least six alternative mass notification methods will be used as substitutes[24]. Let $\Delta q^{1,i}$ denote the change in the volume of sales of product 1 due to a shift of sales to product 2, following an increase in the price of product 1 by 5%–10%. Clearly, following the increase in its price, the volume of sales of product 1 will be, assuming n substitute products:

$$q_1^1 = q_0^1 - \sum_{i=2}^{n} \Delta q^{1,i}, \tag{5}$$

while the sales of substitute product $i = 2, \ldots, n$ will be:

$$q_1^i = q_0^i + \Delta q^{1,i}. \tag{6}$$

Thus, with n substitute products, condition (4) becomes, taking into account (6):

$$(p_1^1 - c^1)q_1^1 + \sum_{i=2}^{n}(p_0^i - c^i)(q_0^i + \Delta q^{1,i}) > (p_0^1 - c^1)q_0^1 + \sum_{i=2}^{n}(p_0^i - c^i)q_0^i. \tag{7}$$

Expressing this as an equality in order to obtain the CL, and given that $q_1^1 = q_0^1(1 - CL)$ we have:

$$(p_1^1 - c^1)q_0^1(1 - CL) + \sum_{i=2}^{n}(p_0^i - c^i)(q_0^i + \Delta q^{1,i}) = (p_0^1 - c^1)q_0^1 +$$
$$+ \sum_{i=2}^{n}(p_0^i - c^i)q_0^i. \tag{8}$$

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[23] Note that the price for product 2 remains the same in contrast with the test type stipulated by Order No. 220.

[24] We assume below that one SMS is substituted with one message sent through messengers, e-mail/postal service, or made as a call. This is a simplified assumption since the length of an SMS is restricted in contrast to messages sent through other mass notification means. As a result, the ratio between messages/e-mails/calls can be other than 1 : 1.

Or, writing $\dfrac{\Delta q^{1,i}}{q_0^1} = D^{1,i}$, where $D^{1,i}$ is the diversion ratio between 1 and $i = 2, \ldots, n$:

$$(p_1^1 - c^1)q_0^1 (1 - CL) + \sum_{i=2}^{n} (p_0^i - c^i)D^{1,i}q_0^1 = (p_0^1 - c^1)q_0^1. \tag{9}$$

Thus:

$$(p_1^0 + \Delta p - c^1)(1 - CL) + \sum_{i=2}^{n} (p_0^i - c^i)D^{1,i} = (p_0^1 - c^1), \tag{10}$$

where $\Delta p = p_1^1 - p_0^1$.

Dividing by p_0^1 and given that $m^i = \dfrac{p_0^i - c^i}{p_0^i}$ and $S = \dfrac{\Delta p}{p_0^1}$:

$$(m^1 + s)(1 - CL) + \sum_{i=2}^{n} \left(\frac{p_0^i}{p_0^1}\right)(m^i D^{1,i}) = m^1. \tag{11}$$

Or:

$$CL = \frac{1}{m^1 + s} \left[s + \sum_{i=2}^{n} \left(\frac{p_0^i}{p_0^1}\right)(m^i D^{1,i}) \right]. \tag{12}$$

In (12), s is about 5–10% and generally we also know the price levels. In the present case the diversion ratios are known from the TMT Consulting (2019) survey (Figure 3). Thus we can use (12) to identify the *CL*, given some gross profit margins (*m*), for different product groups. To do this, we take $s = 10\%$: since *CL* is increasing in *s*, this allows us to define the maximum *CL* corresponding to the range of price increases and, hence, the narrowest boundaries possible for the relevant product market.

More specifically, to identify which products should be included in the market with product 1 and thus identify the market boundaries we successively add products in the market and then we calculate the *CL* from (12) following an increase in the price of product 1. The order we add products follows the order of the extent of substitutability as revealed in Figure 3. So we first add messages in messengers (Viber, WhatsApp, etc.), then we add e-mails, then calls from specialists etc. In each step we compare the *CL* to the total loss in sales for product 1 when its price increases, which is identified in Figure 3 to be 60%: if the *CL* is smaller, then the product group in this step cannot be a distinct relevant market and additional products have to be included.

The estimates obtained depend on the profit margins. Assuming, for example, that average variable costs of all the alternative ways of mass notification are negligibly small implies that $m^1 = m^i = 1$, $i = 2, \ldots, n$. Then it is easy to see from (12) that:

- if the market contains just SMS notifications and messages in messengers (Viber, WhatsApp, etc.) then given that on average their prices are 1.14 rubles for SMS and 1.04 for messages sent via messenger, and that the diversion ratio is 32%, the $CL = 35.63\%$;
- including in the market a third product, specifically e-mails, with a price per message of 0.29 rubles, and a diversion ratio of 13%, leads to a $CL = 38.64\%$;

- including a fourth product, calls of specialists, whose prices per one call vary between 0.75 and 9 rubles,[25] with a diversion ratio of 6%, leads to a $CL = 81.7\%$ (if we use the price of 9 rubles per call—this gives the maximum value of the CL and thus allows us to find the narrowest boundaries of the product market).

Taking into account that after a 5–10% price increase the actual sales decrease of SMS notifications would be 60%, the above analysis shows that *the minimal boundaries of the relevant product market include mass SMS, messengers, e-mail and calls.*

An alternative scenario would be to maintain the maximum value of $s = 10\%$ and undertake the analysis under the assumption that the gross profit margin is equal for all products and is equal to the value assumed above, i.e. 15.2%. In this case, using again (8), we can find that if the market contains just SMS notifications and messages in messengers (Viber, WhatsApp, etc.) then the $CL = 57.3\%$. While if the market also contains e-mails, $CL = 77.3\%$. Thus, in this case the relevant product market contains three products: SMS messages, messages in messengers and e-mails.

However, as already noted above, the assumption of gross profit margins of about 15% is extreme. A much more likely value would be at least 50%. In this case, if the market contains just SMS notifications and messages in messengers (Viber, WhatsApp, etc.) then the $CL = 41.0\%$. While if the market also contains e-mails, $CL = 43.76\%$. If calls by specialists are also included at a price of 9 rubles then $CL = 83.23\%$. Thus, again (after lowering m from unity, in our first scenario, to 0.5 in this scenario) we find that the minimal boundaries of the relevant product market includes four products: mass SMS, messengers, e-mail and calls.

We should underline again here that the type of the hypothetical monopolist test applied, where in each iteration a price increase only for one product is used, contrasts with an equal price increase for the whole group of products for each iteration. The test type we use can result in a definition of product market boundaries either too broad or too narrow. If the substitute products are characterized by asymmetrical sales volumes and unequal profit margins, the test type with the price increase for only one product usually shows a narrower definition of product market boundaries if the market share of product 1 is too small in comparison with the other market shares (for example, in our case, according to VCIOM, 21% of mass notifications are SMS along with 40% of e-mails) (Darjord, Sorgard, 2011; Moresi et al., 2019). Thus, taking also into account that the test was undertaken for the maximum value of 10% of price increase and the maximum call price of 9 rubles, it is reasonable to argue that a combination of SMS, e-mails, messages in messengers and calls makes up the narrowest boundaries possible of the relevant product market. In any case, all our CL calculations indicate that the product market boundaries should be defined *broader than mass SMS notifications.*

5. Discussion

The results obtained in this paper have a number of important implications in terms of current antitrust practice in Russia.

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[25] 9 rubles is an average price for a voice notification as estimated by call-centre specialists in comparison with 1 rubles for a pre-recorded voice notification (TMT Consulting, 2019, p. 9).

Critical loss analysis is not directly described in the Order No. 220 (although neither is it directly precluded by it), and consequently it is rarely used in market definition[26]—even though Order No. 220 directly prescribes to assess whether a SSNIP is profitable for the hypothetical monopolist, this part of the analysis tends to be ignored or addressed in terms of value judgements. This might not present a problem in more clear-cut cases (e.g. when in surveys, none of the consumers indicate that they would make any kind of substitution after a price increase), but when there is information of partial substitution, critical loss analysis can be a convenient and reliable method of assessing market boundaries, and hopefully with time it will become more broadly used. This is especially important in light of a recent study of evidentiary standards in Russian antitrust, which shows that the Russian competition authority does not favor the application of deeper market analysis in antitrust cases (Avdasheva et al., 2019). Additionally, earlier findings indicate that the more sophisticated the tools of market analysis used in a case, the higher the probability of the decision being annulled by the court (Katsoulacos et al., 2016). All this underlines the importance of using methods that are relatively less costly and more easily interpreted by courts—and, given that information about diversion ratios is available, critical loss analysis is arguably an example of such a method.

A broader definition of market boundaries in this case allows one to rebuke the hypothesis of collective dominance by "the big four" Russian telecom companies. But in its final decisions on the four cases (separate for each company) the FAS Russia opted for a narrow market definition[27]. In fact, the results presented in this paper, although part of the evidence made available in the antitrust case against at least one of the companies, was not given a direct assessment by the FAS Russia in its decision. The competition authority opted instead to refer to its assessment of the report by TMT Consulting, ignoring the fact that the critical loss calculations are a separate result relevant to the issue of product market definition[28]. This fact vividly illustrates that critical loss analysis is not a common tool for Russian antitrust enforcement.

The decisions of the FAS Russia are being appealed in court. The current status of the court cases indicates that opposing approaches to the cases of different companies are adopted, despite the core of the violation in question being the same in all of them: the infringement decision against MTS has so far been upheld by the courts[29], while the decision against Megafon has been overturned—the main basis being that there is no proof of a dominant position[30]. Opposing decisions can be interpreted as an indicator both of the complexity of the issues of market

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[26] In fact, the authors are not aware of any cases where such an approach was used on Russian data available in open sources.

[27] See, for example, the decision against MTS (in Russian): https://br.fas.gov.ru/ca/upravlenie-regulirovaniya-svyazi-i-informatsionnyh-tehnologiy/8a65d7b2-b645-4323-8788-6709551ad1cb/

[28] From the decision: "The source of statistical information on the basis of which the share of participants in the SMS messaging market was calculated in the MSU report is the TMT-Consulting report, 2019. The Commission notes that the TMT Consulting report was also presented as evidence. The Commission assessed the results of the study conducted by TMT Consulting, and therefore the report of the Moscow State University does not confirm the arguments about interchangeability and the absence of a dominant position in the market for the provision of services for sending short SMS messages via mobile radiotelephone networks in the Russian Federation" (https://br.fas.gov.ru/ca/upravlenie-regulirovaniya-svyazi-i-informatsionnyh-tehnologiy/8a65d7b2-b645-4323-8788-6709551ad1cb/)

[29] https://1prime.ru/News/20191127/830612085.html

[30] https://www.vedomosti.ru/technology/articles/2019/08/20/809231-megafon-viigral-po-sms-rassilkam

definition and of the peculiarities of assessing collective dominance cases in Russia that were mentioned above.

The telecom companies in these cases were accused both of discriminating between consumers *and* of charging monopolistically excessive prices. Were this to be so, we are aware that the hypothetical monopolist test could lead to an incorrect estimation of market boundaries, due to what is widely known as the "cellophane fallacy." We purposefully do not address the issue of monopolistic prices in this paper for two reasons. Firstly, because, as was mentioned, the four telecom companies were investigated as four separate instances of individual abuse of collective dominance, with no analysis of, or evidence of collusion being discussed — so we do not have evidence to suggest that the prices set by the companies are unilaterally set at excessive levels (none of the companies have individual dominance even within a narrow market) or that they are cartel prices. Secondly, a recently published article (Pavlova et al., 2019) discusses in detail the evidence on the intensity of competition between Russian telecom operators, finding it highly unlikely that, even though the industry is oligopolistic, the players charge excessive prices for their services.

6. Conclusion

The main conclusions of our analysis are the following:
- concerning the effects of digitalization: the substitutability of mass notification methods is growing, which results in the broadening of boundaries of the relevant product markets. The present analysis shows that the product market boundaries have already overgrown the limits of SMS notification, a trend which was facilitated by the ever-growing distribution of smartphones and the development of new telecommunication standards. All of this is a sign that mobile operators are engaged in intensive competition;
- concerning the methods of market definition for antitrust law enforcement: even if *some* customers do not shift to other products when the price of a product rises, it does not necessarily mean that this product makes up a separate product market. Russian antitrust practice still does not always take into account this long-established argument;
- concerning the hypothetical monopolist test as a method of market definition: the critical loss analysis is an important part of the test and can be undertaken utilizing data collected from opinion polls measuring the responsiveness of customers to price changes.

Our analysis has shown that even though there is only partial substitution between different mass notification methods, the market boundaries are broader than those assumed by FAS of Russia. None of the calculations undertaken for the critical loss analysis allowed us to conclude that the product market boundaries could be defined only as SMS notifications.

Since SMS notifications cannot be regarded as a distinct relevant product market, the boundaries of the market were consequently reassessed by means of the type of the hypothetical monopolist test that allows one to define the narrowest boundaries possible for a product market. This showed that in the Russian Federation the boundaries of the relevant product market can be defined as a combination of SMS, e-mail, messengers, push-notifications and calls.

References

Avdasheva, S., Golovanova, S., & Katsoulacos, Y. (2019). The role of judicial review in developing evidentiary standards: The example of market analysis in Russian competition law enforcement. *International Review of Law and Economics*, *58*, 101–114. https://doi.org/10.1016/j.irle. 2019.03.003

Coate, M., & Simons, J. (2009). Critical loss vs. diversion analysis: Clearing up the confusion. *CPI Antitrust Chronicle*, *DEC-09*(1).

Daljord, Ø, & Sørgard, L. (2011). Single-product versus uniform SSNIPs. *International Review of Law and Economics*, *31*(2), 142–146. https://doi.org/10.1016/j.irle.2011.04.001

Daljord, Ø., Sørgard, L., & Thomassen, Ø. (2008). The SSNIP test and market definition with the aggregate diversion ratio: A reply to Katz and Shapiro. *Journal of Competition Law and Economics*, *4*(2), 263–270. https://doi.org/10.1093/joclec/nhm032

Daljord, Ø., Sørgard, L., & Thomassen, Ø. (2014). Asymmetric price increase in critical loss analysis: A reply to Langenfeld and Li. *Journal of Competition Law & Economics*, *10*(3), 765–768. https:// doi.org/10.1093/joclec/nhu015

Deloitte (2018). *Recovery of tolerance for Internet advertising: Media consumption in Russia 2018*. Moscow: Deloitte CIS Research Center.

EC (1997). *Commission Notice on the definition of relevant market for the purposes of Community competition law*. OJ C 372, 9.12.1997, p. 5–13

Farrell, J., & Shapiro, C. (2008). Improving critical loss analysis. *The Antitrust Source*, February.

Fenwick, M., Kaal, W., & Vermeulen, E. (2017). Regulation tomorrow: What happens when technology is faster than the law? *American University Business Law Review*, *6*(3), 561–594. https://doi.org/10.2139/ssrn.2834531

Harkrider, J. (2004). *Operationalizing the hypothetical monopolist test*. FTC/DOJ Joint Workshop on Merger Enforcement, February. https://www.justice.gov/atr/operationalizing-hypothetical-monopolist-test

Ivanov, A., Karliuk, M., Perevoschikova, E., Pavlova, N., Ionkina, K., Konovtsev, A., Markova, O., Morozov, A., & Lianos, I. (2019). The macro level: Digital competition — Technology and business environment. In A. Ivanov, I. Lianos (Eds.), *Digital era competition: A BRICS view* (Chapter 1). BRICS Competition Law and Policy Center.

Joskow, P. (2002). Transaction cost economics, antitrust rules and remedies. *Journal of Law, Economics and Organization*, *18*(1), 95–116. https://doi.org/10.1093/jleo/18.1.95

Katsoulacos, Y., Avdasheva, S., & Golovanova, S. (2016). Legal standards and the role of economics in Competition Law enforcement. *European Competition Journal*, *12*(2–3), 277–297. https:// doi.org/10.1080/17441056.2016.1259089

Katsoulacos, Y., Avdasheva, S., Benetatou, K., Golovanova, S., Makri, G. (2020). *The role of economics: Testing for the extent of effects-based enforcement and its relation to the judicial review in different countries*. Unpublished manuscript, https://www.cresse.info/uploadfiles/ Empirical_analysis_of_LSs_in_different_countries_260420.pdf

Katz, M., & Shapiro, C. (2003). Critical loss: Let's tell the whole story. *Antitrust*, Spring, 49–56.

Koenig, C. (2017). Digital economy, antitrust damages, and more: The 9th Amendment to the German competition act. *European Competition and Regulatory Law Review*, *1*(3), 261–265. https://doi.org/10.21552/core/2017/3/13

Langenfeld, J., & Li, W. (2014). Asymmetric price increase in critical loss analysis: A reply to Daljord, Sørgard, and Thomassen. *Journal of Competition Law & Economics*, *10*(2), 495–503. https://doi.org/10.1093/joclec/nht045

Atluri, V., Dietz, M., & Henke, N. (2017). Competing in a world of sectors without borders. *McKinsey Quarterly*, July 12.

Moresi, S., Salop, S., & Woodbury, J. (2008). Implementing the hypothetical monopolist SSNIP test with multi-product firms. *Antitrust Source*, February. https://doi.org/10.2139/ssrn.1087536

Moresi, S., Salop, S., & Woodbury, J. (2019). *Market definition and multi-product firms in merger analysis*. In *Antitrust economics for lawyers* (Chapter 1). LexisNexis.

Newman, L. (2019) Antitrust in Digital Markets. *Vanderbilt Law Review*, *72*(5), 1497–1561.

O'Brien, D., & Wickelgren, A. (2003). A critical analysis of critical loss. *FTC Bureau of Economics Working Paper*, No. 254. http://doi.org/10.2139/ssrn.402100

Pavlova, N., & Meleshkina, A. (2018). Intranet roaming: is there a market? *Modern Competition, 12*(6), p. 5–15 (in Russian).

Pavlova, N. S. (ed.) (2014). *Economic analysis in the application of antimonopoly law: empirical assessment and paths for development*. Moscow: MAKS Press (in Russian).

Pavlova, N. S., Shastitko, A. Ye., & Ionkina, K. A. (2019) Economic framework of tariffs' determination in telecommunication services: A digital business in and "analogue" environment? *Vestnik Moskovskogo Universiteta. Seriya 6: Ekonomika, 6*, 79–98 (in Russian)

Pavlova, N. S., & Shastitko, A. E. (2019). Empirical analysis of market boundaries in telecommunications. *Voprosy Ekonomiki, 9*, 90–111 (in Russian). https://doi.org/10.32609/0042-8736-2019-9-90-111

PwC (2019). Drive or be driven: Industry convergence. *Europe Monitor*, January.

Scheffman, D. (2003). *"Critical loss" analyses*. Brussels: EU Merger Taskforce.

Shastitko, A., & Pavlova, N. (2019). Complex services: Product market definition in mobile communications. *Ekonomicneskaya Politika, 14*(4), 120–141 (in Russian). https://doi.org/10.18288/1994-5124-2019-4-120-141

Shastitko, A. Y. (2011a). *Collective dominance on the market: law and economics*. Moscow: MAKS Press (in Russian).

Shastitko, A. Y. (2011b). Collective dominance through the lens of comparative antitrust. *CPI Antitrust Chronicle, 2*(July), 1–12.

Shastitko, A. Y. (2011c). Economic and legal aspects of collective dominance. *Ekonomicheskaya Politika, 3*, p. 167–190 (in Russian).

Shastitko, A. Y. (2011d). Type I and type II errors in economic exchange with the participation of a third-party guarantor. *Journal of the New Economic Association, 10*, 125–148 (in Russian).

Shastitko, A. Y., Kurdin, A. A., Markova, O. A., Meleshkina, A. I., Morosanova, A. A., Pavlova, N. S., & Shpakova, A. A. (2019). *Competition and competition policy: At the junction between the future and the past*. Moscow: Delo (in Russian).

TMT Consulting (2019). *The analysis of the market for mass message delivery to consumers*. Moscow (in Russian).

U.S. DoJ, & FTC (2010). *Horizontal merger guidelines*. Washington, DC: U.S. Department of Justice and the Federal Trade Commission. https://www.justice.gov/atr/file/810276/download

VCIOM (2019). *The opinions of specialists working in companies that use messages to inform clients about the substitutability of different channels for informing clients*. Moscow: Russian Public Opinion Research Center (in Russian).