

The trend of price dispersion for the same goods in the e-commerce: the reasons for the emergence and preservation

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Abstract — The rapid development of e-commerce leads to a number of new problems related to the definition of e-commerce prospects and the future of traditional trade, the regulation of national and cross-border e-commerce, the evaluation of the effectiveness of e-commerce in different business areas and the impact of e-commerce on global economic processes, etc. They dictate the need to revise and refine traditional models of pricing and competitive behavior of market participants, taking into account the specific features of electronic markets both from the standpoint of theoretical modeling and in the form of empirical data analysis. The article discusses the causes of price dispersion in electronic markets, which contradicts the generally accepted opinion about their high competitiveness. The study of books prices in the largest Russian online stores, conducted by the authors, confirms the conclusion about the high dispersion of prices for homogeneous/identical goods. The analysis of empirical data and theoretical models of spatial differentiation, allows the authors to conclude that the trademark and brand are the determining factors for buyers in choosing online store and, as a consequence, determine the difference in prices for the same goods with a wide offer of different market operators. The power of influence of the online store brand on the choice seems to be stronger than in the offline business. As an additional factor affecting the growth of prices, the article highlights and presents the usability of the site and customer-oriented sales.

Keywords — e-commerce, pricing, price variance, competition models, differentiation, brand, site usability

I. INTRODUCTION

Currently, internet business covers various areas and is becoming an increasingly prominent segment of the global and Russian economy. According to experts of the Global E-commerce Playbook, the volume of online trade by 2021 will grow by 37,25% compared to 2019 and will approach \$5 trillion (Fig. 1).

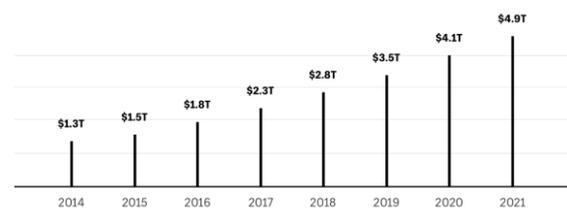


Fig. 1. Dynamics of e-commerce volumes in the world, 2014-2021, trillions \$

According to Data Insight [5], in Russia the share of e-commerce in GDP in 2018 was 2,5% (for comparison in the USA – 2,6%, in China – 4,5%). In terms of growth rates of this segment of the economy in the next 5 years Russia (44%) is almost not behind Australia, France and the United States (44,6%, 45,6% and 45,7%, respectively) (Tab. 1).

Currently, 55% of Russian consumers make online purchases at least once a month, and the average number of orders per year – 6,2 [14]. In the top three most popular categories of goods: household appliances and electronics, clothing and footwear, auto parts and accessories. High growth rates of internet trade indicators indicate that the population is changing its preferences, abandoning traditional stores in favor of online shopping [15, 16, 17].

Factors that ensure the effectiveness of e-commerce over traditional stores are considered:

- globality of electronic markets – almost complete absence of geographical and time boundaries, a wide range of products;
- reduction of operating costs, maintenance costs of office space and a large number of staff, reducing the number of intermediaries and transaction costs;
- availability of information for both buyers and sellers – it allows one to make more rational decisions when buying, and others to track the dynamics and sales volumes in different sections, to identify patterns,

improves production efficiency and quality of goods or services.

TABLE I. GLOBAL E-COMMERCE GROWTH, 2018-2023, BILLION \$

	2018	2023	Five-year growth
China	\$636.1B	\$1,086.1B	70.7%
United States	\$504.6B	\$735.4B	45.7%
France	\$49.4B	\$71.9B	45.6%
Australia	\$18.6B	\$26.9B	44.6%
Russia	\$17.2B	\$24.8B	44.2%
Canada	\$39.9B	\$55.4B	38.8%
Germany	\$70.3B	\$95.3B	35.6%
United Kingdom	\$86.5B	\$113.6B	31.3%
Japan	\$81.7B	\$103.6B	26.8%
South Korea	\$63.7B	\$80.2B	25.9%

By the data: <https://www.retail-index.com/E-commerceretail.aspx>

The combination of all these factors makes e-commerce effective and convenient for both the seller and buyers. However, the claim that e-markets are more efficient than traditional ones is increasingly being questioned.

II. RESEARCH METHODOLOGY

If we recall the theoretical assumptions of the perfect competition market (a large number of participants from both the supply and demand sides, complete information, freedom of access, identical goods, high price elasticity of demand), we can conclude that e-commerce makes markets more competitive than traditional trade [13]. This means that for online sellers, the most effective strategies are the behavior of the company in competitive markets: cost reduction, expansion of the nomenclature, increase in turnover under standard conditions of sale and average market prices [1] and, therefore, sellers find themselves in a situation of perfect competition and are forced to reduce prices to the level of marginal costs.

In theoretical models describing markets with asymmetric information (Salop S., Stiglitz J.E. [11]), it is assumed that under equilibrium conditions, sellers can assign different prices. The main reason for the variance of competitive prices, economists believe the unreality of the assumption of perfect awareness of market participants, extreme limitations and high cost of information. This applies not only to buyers who do not know the price level of other sellers and their location, but also to sellers who do not represent well not only the demand functions of their buyers, but also their own costs. Therefore, as the search costs are reduced, closer competition between sellers and better consumer awareness, the costs for the companies themselves to rent office and warehouse space are reduced, as well as the absence of various administrative and financial barriers to the organization of an online store, the price variance should decrease, that is, homogeneous goods on the internet should be sold at the same price, close to the marginal costs. But despite the fact that these conclusions look quite logical, they are not confirmed by empirical studies [6].

Back in 1999, the Americans E. Brynjolfsson and M. Smith studied the prices of books and CD-disks in internet and

traditional stores (eight stores in each group) and concluded that the variance of online prices is much higher than in traditional markets, and the difference between the minimum and maximum online prices for a sufficiently large sample of books averages about 33%. For 84% of book titles, the standard price deviation in online stores is higher than in traditional stores. Approximately the same ratio is obtained for the difference between the maximum and minimum prices [7]. In 2004 similar research conducted in Russia also confirming price dispersion [6].

To conduct an independent research of Russian online stores the authors also selected books as the most homogeneous goods. The study looked at the prices of books sold in October 2019 in the 8 largest online stores specializing in sales of books. Table 2,3 shows a sample of 8 items of different subjects and price level. These data confirm the deviations in prices of various online stores, although not as significant as in the United States.

TABLE II. ANALYSIS OF THE BOOKS PRICE DEVIATIONS IN ONLINE STORES (PART 1)

Book title	Prices in stores, RUB.							
	<i>labyrinth.ru</i>	<i>my-shop.ru</i>	<i>chitai-gorod.ru</i>	<i>books.ru</i>	<i>ozon.ru</i>	<i>moscowbooks.ru</i>	<i>book.24.ru</i>	<i>bookvoed.ru</i>
1. Akunin B. Sulazin (in Russ.)	844	692	702	825	-	690	844	844
2. Zhebrak M. On Foot in Moscow (in Russ.)	513	410	450	-	410	442	439	510
3. Unified state examination-20. Typical examination options (36) (in Russ.)	466	310	-	572	-	440	-	-
4. Samuelson P., Nordhaus V. Microeconomics, 2019 (in Russ.)	2232	1551	-	1334	1275	-	-	1601
5. Rolling George. Harry Potter and the goblet of fire (in Russ.)	-	1556	1610	1781	1729	1729	1700	1729
6. Dashkova P. Gorlov deadlock (in Russ.)	646	477	646	547	512	528	646	646
7. Dicker J. The Disappearance of Stephanie Meyer (in Russ.)	752	617	752	699	399	614	752	752
8. Kurdyumov M. Ecodaca – safe harvest (in Russ.)	294	226	250	281	223	-	227	275

**TABLE III. ANALYSIS OF THE BOOKS PRICE DEVIATIONS IN ONLINE STORES
(PART 2)**

Book title	Calculation index*:
	1. Dispersion 2. Coefficient of variation 3. Mean linear deviation
1. Akunin B. Sulazin (in Russ.)	1. 6031,57 2. 9,99% 3. 70,82%
2. Zhebrak M. On Foot in Moscow (in Russ.)	1. 1811,95 2. 9,39% 3. 33,18
3. Unified state examination-20. Typical examination options (36) (in Russ.)	1. 11601,33 2. 24,1% 3. 72
4. Samuelson P., Nordhaus V. Microeconomics, 2019 (in Russ.)	1. 144549,3 2. 23,78% 3. 254,32
5. Rolling George. Harry Potter and the Goblet of Fire (in Russ.)	1. 6216,29 2. 4,66% 3. 61,47
6. Dashkova P. Gorlov deadlock (in Russ.)	1. 5206 2. 12,42% 3. 65
7. Dicker J. The Disappearance of Stephanie Meyer (in Russ.)	1. 15293,84 2. 18,54% 3. 92,8
8. Kurdyumov M. Ecodaca – safe harvest (in Russ.)	1. 876,57 2. 11,67% 3. 25,39

* calculated by the authors using www.allcalc.ru

III. RESEARCH RESULTS

Analyzing the results, we can assume that the reason for the price variance for the same products in online stores is that for consumers they are not perfect substitutes. Therefore, it would be more correct to consider internet markets not as completely competitive, but from the standpoint of a model of monopolistic competition, involving the differentiation of goods. In this case, in relation to this research, it is more reasonable to consider the models of spatial competition (or spatial differentiation), rather than the traditional model of E. Chamberlain, where differentiation involves qualitative differences of goods and, which in the long run leads to zero economic profit for all sellers.

In models of spatial competition the basis of differentiation and, as a consequence, the basis for price deviations are subjective preferences of consumers and in these models sellers can maintain economic profits for a long period.

Several models of spatial differentiation are presented in the theoretical literature (V. Voitinsky [3], P. Sraffa [12], Hotelling [8], S. Salop [10], K. Lancaster [9]).

According to V. Voitinsky, the conditions determining the preferences of buyers are:

- a) price differences between different sellers;
- b) differences in utility of the offered goods (for existence of actually identical goods it is enough that the consumer considered them different);
- c) labor and comfort of shopping in different stores;
- d) non-economic (political, religious, ethical and other consumer beliefs) [4].

This lack of indifference, the attachment of the buyer to the individual seller P. Sraffa explained a long habit, personal acquaintance, trust in the quality of goods sold, finally proximity, which means “the willingness of the buyers, forming the clientele of the enterprise, to pay if necessary, a little more for goods purchased from a particular enterprise, and not from others” [4].

In S. Salop's model, manipulative advertising serves as a tool to increase the seller's share in the market, which, in turn, strengthens its market power and, as a consequence, allows to raise the price.

K. Lancaster proposes a model of “consumption technology” for the analysis of product differentiation, which assumes that identical goods may have their own characteristics from the subjective point of view of the consumer, qualitatively different from each other, or may have the same characteristics, but in quantitatively different combinations, which is also subjectively perceived by consumers.

IV. DISCUSSION OF RESULTS

The goods in all the considered stores are absolutely identical in quality, and the sets of services related to the choice of goods and the implementation of the purchase are very similar. Therefore, in e-commerce competition between sellers is shifting to a different plane. In addition to competing in prices and quality of service, sellers compete in advertising volume and brand strength. For theoretical models with asymmetric information, it is natural that the stores with the lowest price level have the largest market share. This is logically explained by the law of demand.

However, the practice contradicts the theory. According to the results of our research (table 2,3), Labirint.ru, the undisputed leader in the online book market in Russia (51% of sales in 2018), it has prices in almost all positions, exceeding the average level by 10-15%. The results obtained by the authors are also confirmed by the conclusions of the already mentioned E. Brynjolfsson and M. Smith that the seller who controls the largest share of the American online market of books, assigns not the lowest prices [7]. This suggests that the market position of the seller, his fame and reputation play a significant role in the selection of goods.

Due to the specificity of online sales, when buyers and sellers are separated in time and space (delivery usually occurs some time after the purchase), the importance of trust is extremely high. Since the online transaction does not involve the transfer of cash and goods, and instead the seller is given personal data and credit cards (or payment systems) are used, the buyer must be sure that his financial information will not become the property of intruders. And for ensuring confidentiality, he is willing to pay extra, which is used by firms with a high reputation.

It is also important to note other factors that influence the emergence and continuation of the trend of price dispersion for the same goods. In general, they can be characterized as the effectiveness of communication between the client and the selling site. The analysis of the main stages of the buyer's route on the websites of online bookstores revealed communicative violations – problem points of the route (pain points), which are

very many mainly for “beginners” sellers with not very well-known brand. These points of contact also affect the variance of prices for the same books, as they reduce the communication effect and form a distrust of the site.

Such problematic points of the buyer's route should include the following usability violations, leading to a decrease in understanding and trust:

- information overload, inconsistency and duplication of information about the range of books in different tabs of the site;
- social inadequacy of the address to the visitor;
- the complexity of the marketing messages about discounts;
- information insufficiency in the description of books or inconsistency of information about books, putting the buyer at a standstill;
- violation of the logic of the visitor's route;
- lack of information about the company and violation of feedback.

It is important to note that at the strategic level the failure of the effect of consumer confidence in the internet company is the most dangerous, since trust is responsible for the formation of consumer loyalty, which is the guarantor of the successful functioning and development of the company.

Thus, in explaining the causes of the price variance trend for the same goods, the ability to more accurately account for the position of the buyer comes to the fore. Customer-oriented site shifts the focus from the “sale” to the “purchase” concept, which modifies the mission of the site and the main tasks that face it. To achieve the maximum result now we need not to sell, but to help buy. In turn, effective assistance in the first purchase creates the basis for further purchases and thus contributes to the implementation of the principles of “orientation to the future” and “orientation to the end result”, maximizing both current and future profits.

In this regard, the most important principle of ensuring the price premium is a mutual benefit for both the seller and the buyer – “win-win”. This principle creates the basis for the development of mutually beneficial cooperation and the formation of strong partnerships, flowing into the marketing of relations, in which each partner receives more as a result of cooperation than if he acted, focusing only on himself.

Price variance in favor of a particular seller also means the need for special marketing training sales, which makes it possible to deeply understand the market in which the company operates, to structure it into groups of customers in terms of their prospects; to determine their main motives and goals of purchase, especially behavior in the purchase process, to develop effective strategies for attracting. Thus, the search and attraction of customers is carried out not by a “blind method”, which gives mostly random results and is very time-consuming, but on the basis of accurate knowledge of the criteria that determine the “prospects” of customers, accurately describing how to access them, places of treatment, etc., which in turn

significantly increases the efficiency of the selling site in the process of communication with buyers.

Marketing ideas and technologies, on which the sale itself is based, create an opportunity to get not only the traditional and obviously necessary result – a premium price, but also a number of important results from the point of view of sales efficiency:

- a) achieving mutual satisfaction of the online seller and the buyer, which facilitates further contacts and purchases;
- b) the formation of cooperation relationships, that create opportunities for recommendations, open up the prospect of partnership in both current and new projects;
- c) the ability to obtain marketing information about the buyer, which increases the efficiency not only of current sales, but also improves the marketing preparation of future sales.

V. CONCLUSION

In the conditions when trade relations of purchase and sale are carried out in the open information internet space, for consumers the trade mark and the brand of the seller instead of the price as in the traditional offline markets becomes more and more important. Therefore, sellers can set prices not from the standpoint of cost and cost analysis as in competitive markets, and based on the differentiation of goods inherent in models of monopolistic competition. Such strategies require high advertising and promotion costs from the seller. This partly confirms the fact that internet advertising remains the leader of the advertising market in terms of growth dynamics and explains the existing price variance for homogeneous goods in online stores.

This approach is also used by companies in traditional forms of trade. However, its relevance is significantly increased in the context of the development of the information economy. According to forecasts until 2026, published by the consulting company Ovum [2], the main trends in e-commerce will be: proactive service, customer support and free delivery to a specific place and time. It is no coincidence that the key tool to attract customers, increase brand value and strengthen the competitive advantage of the online store will be a positive experience and a tangible impression of online shopping.

It is also important to note that the popularity and credibility of the brand, which are the main reasons for premium margins, largely depend on the usability of the site. Reducing the number of problem points of the buyer's route creates more confidence in the seller and additional price advantages. Premium prices are also stimulated by customer-oriented sales, which is achieved as a result of the orientation of the entire process to take into account the characteristics, capabilities and requirements of the client.

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