

Factors of consumer choice of music streaming services in Russia and China

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Abstract

The streaming music service is one of the most important elements of digital ecosystems. Subscriptions, pre-orders, and in-app track purchases are extremely valuable for developers of streaming services, who are interested in promoting them among users. Previous studies do not contain comparative analyses of consumer behaviour of music streaming services for users in different countries. The purpose of the study is to compare the factors of choice of Russian users and users from China. The study consists of in-depth interviews with Russian service employees, followed by a quantitative survey that helps to identify the main factors of choosing a music streaming service. We discovered differences in the significance of factors for Russian and Chinese users. Logistic regression analysis allowed us to identify a variety of choice factors with different significance for customers who use the service; in order to succeed, ecosystems including music streaming services should immerse themselves in the particularities of consumer behaviour in a certain country, taking into account the uniqueness of the music market.

Keywords

music streaming services, customer behaviour, factors of consumer choice, Russian and Chinese ecosystems

JEL: L82, M31.

1. Introduction

Over the past few years, the music market in developing countries has grown significantly and experienced other dramatic changes. Streaming and streaming services have had a great impact on the development of the music market in recent years (Chung et al., 2022). Streaming is the “process of transferring a multimedia product” (Zhuravleva, 2016); such products include movies, TV series, videos, music, and other video and audio products. The core task of streaming music services is not to sell or provide music for temporary use, but to ensure permanent access to music (Bardhi & Eckhardt, 2012). The streaming services allow consumers to find and view multimedia content and have permanent access to music, podcasts, audiobooks and other materials.

The globally popular streaming music service Spotify reported (2017)¹, that its audience reached 140 million users worldwide; China’s most popular app KuGou has an audience that is twice as big. The growing interest in music streaming services among users and the constant increase in the number of new market players contribute to the relevance of research into this market. Two markets selected for the present study are the Russian and Chinese markets. The Russian market presents special interest because it showed rapid growth between 2017 and 2022; then there was a turning point after the events of February 2022 and many foreign streaming services, such as Apple Music, Spotify, YouTube Music и Deezer left the country. The Chinese streaming services market is unique; it may be useful to study its characteristics with a view to adapting some of its practices for other markets.

The purpose of the paper is to determine the factors of consumer choice of music streaming services in the BRICS countries (based on the experience of Russia and China) in contemporary realities. Having answered the questions of why one service is more appealing than another, and how the Russian and Chinese users choose a service, it is possible to form a pool of recommendations for both new market players and leaders in order to strengthen their competitive advantages.

The study consists of two stages — qualitative and quantitative. A series of in-depth interviews were conducted among employees of Russian (6) and Chinese (3) music streaming services who had been working in marketing departments for at least 1 year. The online survey was conducted between November 2022 and May 2023 using the Google Forms service (for 384 respondents from Russia) and Tencent Survey (for 412 respondents from China). The results obtained were analysed using OLS logistic regression in the packages Gretl.

This study is organised as follows: first, it presents a theoretical framework based on an intentional review of literature about the market of music streaming services

¹ *Exclusive Report: Spotify Artist Payments Are Declining In 2017, Data Shows*. Digital Music News. URL: <https://www.digitalmusicnews.com/2017/05/16/spotify-audiam-low-rates/> (accessed 30.08.23)

in the BRICS countries and factors of consumer choice. The methodology is described, showing the data, models and variables defined; this is followed by results, discussion and the main conclusions.

2. Literature review

2.1. Consumer behaviour in emerging theory and digital practice

The concept of consumer behaviour is based on the assumption that it is not only the consumer that matters, but also his or her behaviour, experience and impressions. Consumer behaviour has become one of the key elements of contemporary marketing and an important subject of research; its role in the formation of empirical marketing and the economy of impressions is indeed significant. There is, however, no universally accepted definition of the concept of consumer behaviour as the views on this phenomenon have been rather varied.

I.N. Dementieva in her work "Theoretical and methodological approaches to the study of consumer behaviour" (2018), identifies four main approaches based on the methodology in use.

The first approach can be called economic. Proponents of this approach define consumer behaviour as "the search for the greatest utility in the acquisition of material goods" (Dai & Wang, 2021). They believe that consumers make decisions regardless of their experience and without taking into account the opinions of other consumers. In their view, consumer behaviour primarily depends on economic factors, namely, income and price.

The second approach is sociological. Supporters of this approach see the consumer as "a series of interrelated social acts carried out by an individual in a market environment" (Verplanken, 2018). They believe that consumer behaviour can be considered only in the structure of the social structure of society and social relations.

The third approach is socio-psychological. For the adherents of this approach "human behaviour is irrational and depends on personal motives" (Gilal et al., 2019).

The fourth approach is behavioural. Within the framework of this approach, consumer behaviour is seen as irrational but "not accidental and not meaningless; on the contrary, quite systematic and predictable" (Ma, Ou, & Lee, 2022). Irrationality here is caused by the need to act under permanent uncertainty.

Based on the sources that have been analysed, comparative Table 1 presents the key characteristics of these approaches to the study of consumer behaviour.

Table 1. Key characteristics of approaches to the study of consumer behaviour

Typology of approaches	Characteristics
Economic	Maximum rationality of behaviour. The main factors of choice are the consumer's income and the prices of the product or service.
Sociological	The importance of the influence of social ties and the structure of society on behaviour.
Socio-psychological	Irrationality of behaviour. Behaviour depends on personal motives and characteristics.
Behavioural	Irrationality of behaviour. The impact of external risks. The significance of emotions and feelings.
Marketing	Importance of the goals, needs or wishes of consumers.

Since consumer behaviour is a process, there are many models in research literature that describe it as a whole or some of its parts in order to study and understand its main aspects. Although the models were becoming more complex over the years, the stages of making a purchase decision were seen differently and sub-stages appeared, consumer behaviour continues to be regarded as a process that consists of several stages with certain factors, or driving forces, that influence the consumer at each stage.

The earliest scientifically designed model of consumer decision-making is the model of J. A. Howard and J. N. Shet (1969). This model is based on the idea that the consumer's choice is rationalised. The key factors that influence the purchase are material and symbolic factors, such as quality, price, distinctiveness, service, accessibility, and social factors – family, group affiliation, social status (Amawate, & Deb, 2019). This model is largely considered classical, as it uses a comprehensive approach to the factors of influence and forms the basis for many other models that appeared later.

Clearly, consumer behaviour cannot be the same online and offline since each of these environments has its own characteristics and, therefore, consumer behaviour in these environments should also have its own characteristics. D. Reibstein believes that the main factor of choice online is the price (2002), since the consumer has the opportunity to quickly and easily study other sellers' offers of the same product and is most likely to make a choice based on the offered price. Subjective individual features that influence consumer's online decision-making include the speed of obtaining information and, at the same time, degree of information overload; tolerance to advertising messages, and, at the same time, blindness to banners. The decision to purchase a product online is also determined by objective factors, such as the price and technical characteristics of the site where the product or service offer is placed (Lee, Hosanagar, & Nair, 2018).

The music streaming services market is part of the music market. According to the "Global Music Report" research by The International Federation of Recording Industries, in 2020 streaming platforms generated 62% of the revenue of the global industry, which is more than \$13 billion.

The analysis of research papers concerning the factors of consumers' choice of music streaming services allows researchers to identify the factors that are the most important for consumers. (Chen, Chen, & Tian, 2022) These are price, availability of premium subscription and premium subscription models, extensive music library, personalisation of content, sound quality, offline access, recommendation system, convenience of the service, and its image.

The present study tests the following hypotheses:

H1: The subscription price has a greater impact on consumers' choice of music streaming service in Russia.

H2: The availability of freemium subscription and premium subscription models has a positive effect on the choice of music streaming service by consumers in Russia.

H3: An extensive music library is a significant factor when consumers choose a music streaming service in Russia and China.

H4: Content personalisation has a greater impact on consumers' choice of music streaming service in Russia and China.

H5: Sound quality is a significant factor when consumers choose a music streaming service in Russia and China.

H6: Offline access to music has a positive effect on consumers' choice of music streaming service in Russia and China.

H7: The recommendation system has a greater impact on consumers' choice of music streaming service in China.

H8: The convenience of the service is a significant factor when consumers choose a music streaming service.

H9: The image of the service positively influences the choice of music streaming service by consumers in Russia and China.

H10: Exclusive content has a greater impact on consumers' choice of music streaming service in China.

H11: The presence of parental control is a significant factor when consumers choose a music streaming service in Russia and China.

H12: Extensive podcast library is a significant factor when consumers choose a music streaming service in Russia and China.

H13: Consumers are more likely to choose a music streaming service belonging to the ecosystem they already use in Russia and China.

2.2. The Russian music streaming service market

According to a study by the consulting company PwC, in 2017 the size of the music market in Russia was \$ 570 million, in 2018 — \$ 596 million, and in 2019 — \$ 694 million. If it were not for the pandemic, according to experts, by 2024 the market would have reached \$ 968 million².

² *A study of the Russian music industry by PwC. Mooscle. URL: <https://mooscle.com/issledovanie-muzykalnoj-industrii-rossii-ot-pwc/> (accessed 12.04.2023)*

In spring of 2022, this market, as well as many others in Russia, changed a lot. Many services stopped selling subscriptions to Russian users due to the suspension of Visa and Mastercard, some of them announced their complete withdrawal from the Russian market³. Only Russian services remained fully operational: Spotify and Deezer completely ceased operations in Russia, Apple Music suspended the sale of subscriptions, as well as YouTube Music. According to the InterMedia analytical agency, the withdrawal of foreign players from the market caused the music streaming market to decrease by 30–50%, by the end of 2022 amounting to 5–7 billion rubles. Only local services (VKontakte Music, Yandex Music, Sound and MTS Music) remained on the Russian music streaming market.

Historically, there was a large percentage of pirated content on the Internet music market in Russia, since the lion's share of Russians always preferred to listen to music on the VKontakte social network, which many copyright holders accused of piracy. The first Russian legal streaming model appeared in 2016, when Mail.ru The Group (owner of the VKontakte social network) entered into agreement with major labels and copyright holders on the monetization of content on the social network. Already in 2018, Russia with its 87% share of user's legal audio streaming services became the world leader; in the USA, this share did not exceed 68%⁴. In 2022, this percentage fell, as some users returned to piracy again due to the departure of their usual services.

A distinctive feature of the music streaming service in Russia is its belonging to the ecosystem. The four main streams are part of the four largest ecosystems: "VK Music" (46,5 mln monthly active users) — VK, "Yandex Music" (over 19 mln monthly active users) — "Yandex", "MTS Music" (about 7.5 mln monthly active users) — "MTS", "Sound" (over 5 mln monthly active users) — "Sber". The ecosystem services offer favorable subscription terms that allow users to get access to streaming along with other offers from the company.

2.3. The Chinese music streaming service

The 2022 Report on The Development of China's Music Industry was released at the 8th Music Industry Forum held in Beijing on May 19. According to the report, the total scale of China's music industry in 2021 reached approximately 378.76 billion yuan or \$54.9 billion, a year-on-year growth of 8.54 percent⁵.

³ *Spotify has suspended the program for subscribing to YouTube in Russia.* DTF. URL: <https://dtf.ru/music/1109290-spotify-approved-the-offer-to-subscribe-to-Youtube-in-Russia> (accessed 25.04.23)

⁴ *Departure of foreign music services has increased the audience of pirated ones to almost 10%.* Sostav. URL: <https://www.sostav.ru/publication/ukhod-inostrannykh-muzykalnykh-servisov-uvlichili-auditoriyu-piratskikh-servisov-pochti-do-10-56228.html> (accessed 02.05.2023)

⁵ *Chinese music industry eyes high-quality development, as streaming market grows.* CGTN. URL: <https://news.cgtn.com/news/2023-05-21/Chinese-music-industry-eyes-high-quality-development-1jZ6gJEBtG/index.html> (accessed 28.08.2023)

All music services in China are free. Apps make money by providing the best quality audio, selling concert tickets, virtual gifts and pre-orders of songs. Also, in the applications, there is the most favourite function for Chinese users – karaoke.

The music streaming services in China are normally part of an ecosystem. The six main streams belong to the three largest ecosystems: “KuGou” (231 mln monthly active users) – TenCent, “QQ” (165 mln monthly active users) – TenCent, “Kuwo” (87 mln monthly active users) – TenCent, “NetEase” (36 mln monthly active users) – Baidu, “Baidu” (24 mln monthly active users) – Baidu, “Xiami” and “Youku” (9 mln monthly active users) – AliBaba.

KuGou Music was found to be used more by people falling within 19 - 28 years age group, while QQ Music appealed to older users. When faced with the choice of paying for access to their choice of music, most Chinese consumers preferred to look for a free source instead. The most commonly touted reason to not pay was the possibility to listen to music for free. This poses a dilemma for the Chinese digital music industry⁶.

China nudged into the top five global markets for the first time this year⁷, with its streaming media supported by a large base of subscriptions and price advantages together with variety of platforms serving as the major force driving the music market.

3. Methodology

The empirical section of the study consists of two parts: qualitative and quantitative research. In-depth interviews were chosen as a tool for qualitative research: this method allows us to understand the issue in more detail, without imposing formal limits. It can also help discover non-obvious areas that should be investigated. This method is used to assess the relevance and significance of the factors that formed the basis of the theoretical studies for business enterprises, in this case for Russian music streaming services. The primary objective of the qualitative research is to identify the factors that are most significant for business in the market under consideration. The sample formed for conducting qualitative research consisted of the employees of Russian and Chinese music streaming services who had been working in marketing departments of these companies for at least 1 year. This was the main selection criterion that was to help obtain the detailed and relevant answers needed for the study. The interview continued until the required level of expert consistency was reached.

⁶ *Digital music industry in China – statistics & facts*. Statista. URL: <https://www.statista.com/topics/4680/digital-music-industry-in-china/#topicOverview> (accessed 28.08.2023)

⁷ US Music Industry Factsheets, February 2023. OMDIA. URL: <https://omdia.tech.informa.com/OM028838/China-Music-Industry-Update-February-2023> (accessed 18.04.2023)

To conduct in-depth interviews, a guide was prepared, the questions in which can be divided into several blocks.

Block No. 1. The questions in this block focus on the current situation with the music streaming services market in Russia, and the changes that occurred after February 2022. For Chinese respondents, the questions concerned only the current situation on the music streaming services market in China.

Block No. 2. The questions in this section are aimed at describing the service in which the respondent works, identifying its key characteristics and comparing it with competitors.

Block No.3. The questions in this block are aimed at identifying the target audience of the service, the peculiarities of its behaviour for both markets, as well as questions on determining changes in consumer behaviour, after February 2022, in the Russian market.

Block No.4 This block of questions is aimed at verifying the importance of the hypotheses put forward for streaming service businesses.

Characteristics of experts for in-depth interviews are presented in Table 2.

Table 2. Characteristics of experts for in-depth interviews

Expert	Position	Company	Experience
Expert No. 1	Partner marketing manager	Sound	3 years
Expert No. 2	Label manager	VK Music	1.5 years
Expert No. 3	Head of product marketing	«Yandex Music	3 years
Expert No. 4	Podcast marketing manager	Yandex Music	1.5 years
Expert No. 5	Head of the service	MTS Music	12 years (working in the industry)
Expert No. 6	Manager of music projects	VK Music	4 years

Chinese experts have not been interviewed in the usual way, their opinions about music streaming services in China were presented on the information portal OMDIA, where three experts describe current trends⁸.

To determine the significance of factors that affect the development of the real business of Russian and Chinese music streaming services, we use the method of expert assessments (Meijering, Kampen, & Tobi, 2013). This method allows us to evaluate the parameter under study in the form of a generalised expert opinion. For evaluation, a direct numerical evaluation method was used, in which experts were asked to evaluate, on the 5-point scale, the significance for their business of a particular consumer choice factor, where 1 — absolutely not significant, 5 — very significant. This method allows

⁸ US Music Industry Factsheets, February 2023. OMDIA. URL: <https://omdia.tech.informa.com/OM028838/China-Music-Industry-Update-February-2023> (accessed 18.04.2023)

us to quantify each of the parameters in certain estimated intervals for the subsequent comparison with each other.

To determine the consensus index of expert opinions, the concordance coefficient is calculated, which is a measure of the consistency of estimates, according to the following formula (Gibbons & Chakraborti, 2003):

$$W = \frac{12 \times S}{n^2 \times (m^3 - m)},$$

where S — sum of the squared deviations of all ratings of the ranks of each evaluation object from the average value; n — number of experts; m — number of evaluation objects.

An online consumer survey was conducted, using Google Forms and Tencent Survey, with a number of questions based on the study of theoretical research. Using the results of theoretical data, in-depth interviews were also conducted to assess their relevance to business, and this was chosen as a quantitative research tool. Surveys serve as an effective tool for studying certain marketing parameters, criteria for choosing a product, or the experience of using it. Since it is necessary to study one of the marketing parameters in this study, we consider this research method to be the most appropriate.

The purpose of the online survey is to collect data for quantitative research. The purpose of the quantitative method is to perform analysis using computational methods of analytics. As a result of quantitative research, the hypotheses put forward earlier will be confirmed or refuted.

To carry out research at this stage, a questionnaire was developed consisting of two blocks: Block No. 1 was a set of questions that filtered out respondents who fit the sample set during the study. In block No. 2, questions were presented to determine the significance of choice factors for respondents. In the questions, respondents needed to assess their opinions of the statement about the importance of a particular factor when choosing a music streaming service. The questions were presented in the form of the 7-point Likert scale, where 1 — completely disagree with the statement and 7 — completely agree with the statement. The Likert scale was used in the survey, as it allowed us to accurately determine the respondent's attitude to a particular question, subject or product (Dittrich *et al.*, 2007). A detailed survey questionnaire is presented in the Appendix.

The sample formed for the quantitative study consisted of men and women aged 20-40 years, living in Russia and China, whose income level is average and above average. These criteria are related to the fact that this audience is the core of the target audience for Russian and Chinese music streaming services. This was revealed during an in-depth interview with experts, as well as a result of market research. Two samples (Russian users and Chinese users) are described in Table 3.

Table 3. Sample distribution by country

Questions	Answers	Respondents, %	
		Russian	Chinese
Your gender	Female	59.8%	33.5%
	Male	40.2%	66.5%
How old are you?	18-24 years	58.0%	67.0%
	25-34 years	26.2%	27.2%
	35-45 years	15.8%	5,8%
What kind of education do you have?	Incomplete secondary	0.8%	0.0%
	High education	75.1%	3.9%
	Secondary specialised (college, vocational school)	2.5%	17.7%
	Unfinished higher education	9.9%	0.0%
	Higher education	1.5%	49.3%
Specify the type of your activity	Two or more higher education	10.2%	29.1%
	Student	48.9%	13.8%
	Worker/employee	13.5%	16.3%
	Specialist	9.2%	13.8%
	Middle Manager	7.4%	21.1%
	Top Manager	5.3%	14.3%
	Entrepreneur, business owner	15.8%	20.6%
Which statement is best suited to describe the financial situation your family?	Retired/unemployed	0.0%	0.0%
	Other	0.0%	0.0%
	We don't even have enough money for food	0.0%	0.0%
	We have enough money for food, but buying clothes and shoes is difficult	3.1%	3.9%
	We have enough money for food and clothes, but we can't buy large household appliances	10.7%	12.9%
	We have enough money to buy large household appliances, but we can't buy a new car	53.9%	46.6%
We have enough money for everything, except for buying such expensive things as a cottage or an apartment		26.5%	1.5%
	We are not experiencing financial difficulties. If necessary, we can buy a cottage or an apartment	5.9%	35.2%

Practically all respondents are consumers of music streaming services (97.1%). The distribution of respondents by preferred music streaming services is shown in Diagram a) and b) (Figure 1).

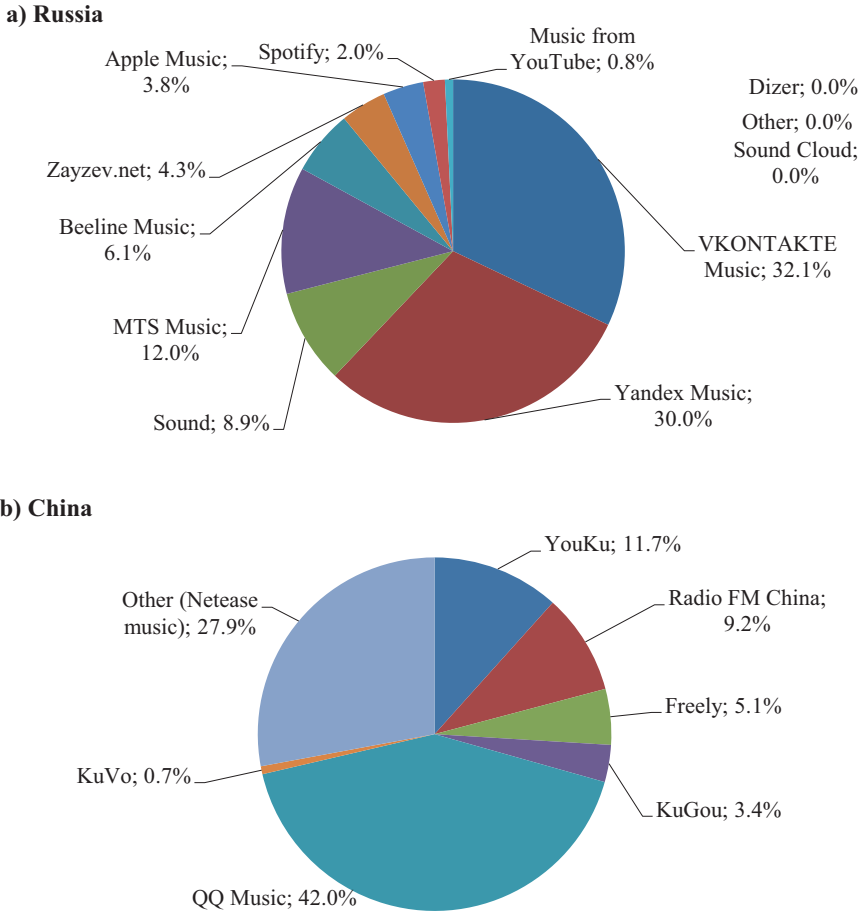


Figure 1. The distribution of respondents by preferred music streaming services

The data obtained during the survey were analyzed using logistic regression. This research method allows us to predict the value of a certain variable based on the values of other variables. Considering the survey data, it was decided that binary logistic regression would be the most suitable type of logistic regression for this type of data. In this type of regression, the dependent variable is binary, most often determining the occurrence or non-occurrence of a certain event, in this case the choice of a streaming service.

OLS logistic regression is widely used for research in medicine, education and marketing (Edward & Spitznagel, 2007). Using this method in marketing research

it is possible to predict the probability of a purchase and the type of consumers who are expected to make it, determine the factors that affect the retention or outflow of customers, whether they make a certain choice or the reasons for their loyalty, as well as predict demand.

The general form of the logistic regression equation with number of independent variables (predictors) is as follows (Meyers et al., 2017):

$$\log\left(\frac{P(x)}{(1-P(x))}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p .$$

The second stage of generating the predicted probability of target group membership is to use the log odds in the following expression to generate the predicted chance of a case being in the target group. So, the logistic regression equation from which the probability of Y is predicted is given by:

$$P(x) = \frac{e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p}}{(1 + e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p})} .$$

where $P(x)$ is the predicted probability of target group membership, e is the base of natural logarithms, and the other coefficients form a linear combination much the same as in multiple regression. The resulting value from the equation varies between 0 and 1. Mathematically, rather than the least-squares estimation procedure, logistic regression uses a maximum likelihood estimation (MLE) procedure, which selects coefficients that the observed values are most likely to have occurred.

4. Data analysis

4.1. Research insights (in-depth interviews)

Obtained through the in-depth interviews, the following research insights confirmed the theses put forward in the theoretical part of the study:

1. The main players in the Russian market and the main competitors of other services are Yandex Music and VK Music; in the Chinese market these are NetEase music and QQ Music.

2. The music streaming market in Russia has a great growth potential, as some users continue to use pirated content, and many representatives of the target audience do not listen to music through streaming services at all.

3. In China's socialist regime, music and many other forms of cultural production and dissemination were under the control of the government. As a result, the music industry in China was undeveloped compared to the West in terms of both the quantity of music works and music related business entities. As a result, as China opened up to the global economy following economic reforms, it became the biggest 'black market' for pirated music, not only Chinese music, but also Western products.

Digital music poses particular problems because regulators find it difficult to monitor and censor all content, and there is such a huge array of music available at any moment in time (interviews with Tencent and Alibaba respondents). This period saw the mushrooming of music-related online services that offered uploading, downloading, searching, collecting and streaming of music. The result was a highly dynamic and diverse ecology. Various players including software developers and equipment makers as well as musicians (Tang & Lyons, 2017) entered the arena and pushed out music apps and services.

The development of online music in China was strongly influenced by its historical context. First, the digital music business was largely 'greenfield development'. Second, the huge public appetite for music and other cultural products attracted large numbers of new players.

4. Part of the audience still uses foreign streaming services, despite the fact that they are not officially available (only when using a VPN). Whereas in China, many users who prefer to listen to Chinese music use a VPN to have access to Chinese music services.

5. There is a huge problem with content on the market, which will only grow, since foreign releases are not uploaded to the streaming sites, and many already released have been deleted. In China, on the contrary, every track is heavily censored and can be banned at the state level.

6. It is typical for both markets that belonging to a certain ecosystem and, as a result, entering into a combo subscription plays an important role for services and helps attract users of these ecosystems.

In addition to research insights, the importance of factors for streaming businesses of Russian and Chinese music was determined using the method of expert assessments. To identify a generalised assessment of each factor, a summary table of all expert assessments was compiled. To determine whether the opinions of experts are consistent, the concordance coefficient ($W=0.84$) is calculated. The concordance coefficient for each factor was also calculated to select the most significant factors (Table 4).

Table 4. Significant factors for the music streaming business

Factor	Sum of ranks	Coefficient (W)
Subscription price	28	1.0
Personalisation of content	28	1.0
Convenience of service	26	0.93
Recommendation system	26	0.93
Service image	22	0.79
Belonging to a certain ecosystem	22	0.79
Availability of freemium and premium subscription models	20	0.71

Factors with a high significance were attributed to factors whose coefficient exceeds 0.7. These factors were included to OLS logistic analysis on the next step.

4.2. Key results of OLS logistic analysis

The following are the results of OLS logistic regression analysis, which was carried out using the Gretl program. The dependent variable was expressed by the question if the respondent used a music streaming service. The answer to this question was a choice between "Yes" and "No". The results of the survey were reduced to a numerical system in the form of a binary classification, where "2" reflected the answer "Yes", "1" – "No". Independent variables were expressed by questions about the significance of certain service factors when choosing a service (Table 5). The dependent variable was encoded as "Usage".

Table 5. Encoding of variables (factors of the consumer's choice of streaming services)

Variables	Title	Encoding
1	Subscription price	«Price»
2	Availability of freemium and premium models	«Freemium»
3	Extensive music library	«Library»
4	Content personalisation	«Personalisation»
5	Music quality	«Sound»
6	Offline access to music (download)	«Autonomy»
7	Smart recommendation system	«Recommendations»
8	Convenience of the service	«Convenience»
9	Service image	«Image»
10	Exclusive content	«Exclusive»
11	Parental control	«Child»
12	Extensive podcast library	«Podcasts»
13	Belonging to the ecosystem	«Ecosystem»

The characteristics of logistic regression variables (The Russian case): mean square error value is 0.381, which means that the logistic regression model has a relatively low error and predicts the probability of occurrence of a dependent event well; Wald's value of the criterion is 620.865, which means that the beta coefficient equal to 4.565 is statistically significant and makes a significant contribution to the prediction of the probability of occurrence of a dependent event; a significance value of 0.000 confirms that the beta coefficient is statistically significant; which indicates the high quality of the model (Bewick *et al.*, 2005).

The characteristics of the model indicate that the model explains the dependent variable well and can be quite accurate in predicting the probability of an event. The final values of the variables of the logistic regression model are shown in Table 6.

Table 6. Values of the variables of the logistic regression model (Russian case)

	Coefficient	Std. Error	t-ratio	p-value	Significance
const	-4,56502	0,00731185	-624,3	<0,0001	***
Price	-0,00159887	0,00144417	-1,107	0,2689	
Freemium	0,0369558	0,00220102	16,79	<0,0001	***
Library	0,00986443	0,00243026	4,059	<0,0001	***
Personalisation	0,00340371	0,00151034	2,254	0,0248	**
Sound	0,00507552	0,00253199	2,005	0,0457	**
Autonomy	0,0125972	0,00180175	6,992	<0,0001	***
Recommendations	0,0195236	0,00131467	14,85	<0,0001	***
Convenience	-0,00558588	0,00189275	-2,951	0,0034	***
Image	0,0255935	0,00133148	19,22	<0,0001	***
Exclusive	0,0101352	0,00159772	6,344	<0,0001	***
Child	0,00132225	0,00132297	0,9995	0,3182	
Podcasts	0,0190873	0,00115314	16,55	<0,0001	***
Ecosystem	0,00353655	0,00243056	1,455	0,1465	
Statistics obtained from transformed data:					
Sum squared resid		0,381032	S.E. of regression		0,031707
R-squared		0,955149	Adjusted R-squared		0,953611
F(13, 379)		620,8648	P-value(F)		3,2e-246
Log-likelihood		805,8078	Akaike criterion		-1583,616
Schwarz criterion		-1527,982	Hannan-Quinn		-1561,569

According to the data in the table, the variables "Price", "Child" and "Ecosystem" do not have significance value and do not influence on the dependent variable "Usage", since it is these variables that have the highest p-value. The variable "Convenience" is lower than 1, which means that the variable has a negative effect on the probability of attributing the observation to the correctly predicted class.

The characteristics of logistic regression variables (The Chinese case): mean square error value is 0.381, which means that the logistic regression model has a relatively low error and predicts the probability of occurrence of a dependent event well; Wald's value of the criterion is 620.865, which means that the beta coefficient equal

to 4.565 is statistically significant and makes a significant contribution to the prediction of the probability of occurrence of a dependent event; a significance value of 0.000 confirms that the beta coefficient is statistically significant; which indicates the high quality of the model.

The characteristics of the model indicate that the model explains the dependent variable well and can be quite accurate in predicting the probability of an event. The final values of the variables of the logistic regression model are shown in Table 7.

Table 7. Values of the variables of the logistic regression model (The Chinese case)

	Coefficient	Std. Error	t-ratio	p-value	Significance
const	-4,55885	0,00779656	-584,7	<0,0001	***
Price	-0,00777881	0,00163988	-4,744	<0,0001	***
Freemium	0,0370355	0,00327627	11,30	<0,0001	***
Library	0,0150027	0,00194754	7,703	<0,0001	***
Personalisation	0,00414341	0,00163867	2,529	0,0118	**
Sound	0,00666355	0,00218894	3,044	0,0025	***
Autonomy	0,0130427	0,00159005	8,203	<0,0001	***
Recommendations	0,0248074	0,00115862	21,41	<0,0001	***
Convenience	-0,0173387	0,00229814	-7,545	<0,0001	***
Image	0,0268582	0,00159613	16,83	<0,0001	***
Exclusive	0,00569695	0,00155747	3,658	0,0003	***
Child	-0,000290231	0,00235386	-0,1233	0,9019	
Podcasts	0,0231989	0,00114667	20,23	<0,0001	***
Ecosystem	0,0209050	0,00335088	6,239	<0,0001	***
Statistics obtained from transformed data:					
Sum squared resid		0,306101	S.E. of regression		0,027733
R-squared		0,946882	Adjusted R-squared		0,945147
F(13, 379)		545,7520	P-value(F)		2,6e-244
Log-likelihood		899,5991	Akaike criterion		-1771,198
Schwarz criterion		-1714,904	Hannan-Quinn		-1748,931

According to the data in the table, only the variables “Child” do not have significance value and do not influence on the dependent variable “Usage”, since it is these variables that have the highest p-value. The variable “Personalisation” has less significance value than others. The variables “Price”, “Convenience” and “Child” are lower than 1, which means that the variable has a negative effect on the probability of attributing the observation to the correctly predicted class.

As a result of logistic analysis, the following hypotheses were tested: H1, H11 – rejected, H13 – rejected for the Russian consumers, confirmed for the Chinese consumers, H2–H10 and H12 – confirmed.

5. Conclusions

The music streaming service market is attractive to many developers and investors. Today, we can confidently say that the streaming music service is one of the most important elements of digital ecosystems. Therefore, the study of this market is of practical importance and is valuable both for understanding the target audience and for understanding changes in market trends and other current realities.

Based on the study of Russian music streaming services, it was revealed that their key features include isolation of content due to the removal of foreign music from venues as major labels had departed, pirated content occupies part of the market, services are strongly integrated with ecosystems of the companies, streaming services expand their activities by buying concert venues and organize labels for artists.

Netease music service was not in the questionnaire, but the respondents noted this particular service in the answer “other”. Currently, Tencent and NetEase were leading the music streaming sector in China. Tencent owns some of the largest music platforms – KuGou Music, QQ Music, and Kuwo Music.

The study showed that the “Child” factor turned out to be insignificant for users of music streaming services in Russia and China, since this service assumes personal settings and access restrictions do not need to be set in principle due to the inability to use someone else’s device (e.g. smartphone or smart speaker). For the Chinese users, the factor of belonging to a certain ecosystem is significant while for the Russian users it is completely insignificant. For Russian users of the music streaming service, the price – subscription cost factor – turned out to be insignificant; In China, although this service is free there, the cost of additional related purchases plays a significant role when choosing a service.

The direction of future research may therefore be the development of a universal methodology using the same questionnaire for conducting reliable cross-cultural research in other BRICS countries. It will enable us to see the differences and similarities between the identified clusters. If the differences are insignificant, it will indicate a low level of cross-cultural effect and the prevailing importance of other factors.

References

- Amawate, V., & Deb, M. (2019). Antecedents and consequences of consumer skepticism toward cause-related marketing: gender as moderator and attitude as mediator. *Journal of Marketing Communications*, 27(1), 31–52. <https://doi.org/10.1080/13527266.2019.1630663>.

- Bardhi, F., & Eckhardt, G. M. (2012). Access-based consumption: The case of car sharing. *Journal of consumer research*, 39(4), 881–898. <https://doi.org/10.1086/666376>.
- Bewick, V., Cheek, L., & Ball, J. (2005). Statistics review 14: Logistic regression. *Critical Care*, 9(1), 112–118. <https://doi.org/10.1186/cc3045>.
- Chen, H., Chen, H., & Tian, X. (2022). The dual-process model of product information and habit in influencing consumers' purchase intention: the role of live streaming features. *Electronic Commerce Research and Applications*, 53, 101150. <https://doi.org/10.1016/j.elerap.2022.101150>.
- Chung, J., Lee, J., & Yoon J. (2022). Understanding music streaming services via text mining of online customer reviews. *Electronic Commerce Research and Applications*, 53, 101145. <https://doi.org/10.1016/j.elerap.2022.101145>.
- Dai, Y., & Wang, T. (2021). Prediction of customer engagement behaviour response to marketing posts based on machine learning. *Connection Science*, 33(4), 891–910. <https://doi.org/10.1080/09540091.2021.1912710>.
- Dementieva, I. N. (2018). Theoretical and methodological approaches to the study of consumer behavior. *Problems of Territory Development*, 1(93), 122–132.
- Dittrich, R., Francis, B., Hatzinger, R., & Katzenbeisser, W. (2007). A Paired Comparison Approach for the Analysis of Sets of Likert-scale Responses. *Statistical Modelling*, 7(1), 3–28.
- Edward, L. & Spitznagel, Jr. (2007). Logistic Regression. *Handbook of Statistics*, 27, 187–209. [https://doi.org/10.1016/S0169-7161\(07\)27006-3](https://doi.org/10.1016/S0169-7161(07)27006-3).
- Gibbons, J. D., & Chakraborti, S. (2003). *Nonparametric Statistical Inference*. New York: Marcel Dekker.
- Gilal, F. G., Zhang, J., Gilal, N. G., & Gilal, R. G. (2019). Linking self-determined needs and word of mouth to consumer e-waste disposal behaviour: a test of basic psychological needs theory. *Journal of Consumer Behaviour*, 18(1), 12–24, <https://doi.org/10.1002/cb.1744>.
- Howard, J. A., & Sheth, J. N. (1969). *The Theory of Buyer Behavior*. New York: John Wiley.
- Lee, D., Hosanagar, K., & Nair, H., (2018). Advertising Content and Consumer Engagement on Social Media: Evidence from Facebook. *Management Science*, 64(11), 4967–5460.
- Ma, L., Ou, W., & Lee C. S. (2022). Investigating consumers' cognitive, emotional, and behavioral engagement in social media brand pages: A natural language processing approach. *Electronic Commerce Research and Applications*, 54, 101179. <https://doi.org/10.1016/j.elerap.2022.101179>.
- Meijering, J. V., Kampen, J. K., & Tobi, H. (2013). Quantifying the development of agreement among experts in Delphi studies. *Technological Forecasting & Social Change*, 80, 1607–1614. <http://dx.doi.org/10.1016/j.techfore.2013.01.003>.
- Meyers, L. S., Gamst, G., & Guarino, A. J. (2017). *Applied Multivariate Research: Design and Interpretation*. Thousand Oaks, CA: Sage Publication.
- Reibstein, D. J. (2002). What Attracts Customers to Online Stores, and What Keeps Them Coming Back? *Journal of the Academy of Marketing Science*, 30, 465–473. <https://doi.org/10.1177/009207002236918>.
- Tang, D., & Lyons, R. (2016). An ecosystem lens: Putting China's digital music industry into focus. *Global Media and China*, 1, 350–371. <https://doi.org/10.1177/2059436416685101>.
- Verplanken, B. (2018). Promoting sustainability: towards a segmentation model of individual and household behaviour and behaviour change. *Sustainable Development*, 26(3), 193–205, <https://doi.org/10.1002/sd.1694>.

Zhuravleva, A. A. (2016). Personal Internet radio as the main competitor of traditional music broadcast radio. *Sign: the problematic field of media education*, 1, 1–37.

Appendix

The questionnaire. Block No. 1

Your gender

- Female
- Male

How old are you? _____

What kind of education do you have?

- | | |
|--|--|
| <ul style="list-style-type: none"> • Incomplete secondary • Secondary specialized (college, vocational school) • Higher | <ul style="list-style-type: none"> • Average • Unfinished higher education • Two or more higher |
|--|--|

Specify the type of your activity

- | | |
|--|--|
| <ul style="list-style-type: none"> • Student • Specialist • Top Manager • Retired/unemployed | <ul style="list-style-type: none"> • Worker/employee • Middle Manager • Entrepreneur, business owner • Other |
|--|--|

Which statement is best suited to describe the financial situation your family?

- We don't even have enough money for food
- We have enough money for food, but buying clothes and shoes is difficult
- We have enough money for food and clothes, but we can't buy large household appliances
- We have enough money to buy large household appliances, but we can't buy a new car
- We have enough money for everything, except for buying such expensive things as a cottage or an apartment
- We are not experiencing financial difficulties. If necessary, we can buy a cottage or an apartment

Do you use music streaming services?

- Yes
- No

What music streaming services do you use? (multiple choice):

For Russian

- VKONTAKTE Music
- Yandex Music
- Sound
- MTS Music
- Beeline Music
- Zayzev.net
- Apple Music
- Spotify
- Dizer
- Sound Cloud
- Music from YouTube
- Other

For Chinese

- Youku
- Radio FM China
- Freely
- KuGou
- QQ Music
- KuVo
- Other

The questionnaire. Block No. 2

Please rate how important each of the factors is to you when choosing a music streaming service, where 1 is absolutely not important, 7 is very important.

Subscription price	1	2	3	4	5	6	7
Availability of freemium and premium models	1	2	3	4	5	6	7
Extensive music library	1	2	3	4	5	6	7
Content personalization	1	2	3	4	5	6	7
Music quality	1	2	3	4	5	6	7
Offline access to music (download)	1	2	3	4	5	6	7
Recommendation system	1	2	3	4	5	6	7
Convenience of the service	1	2	3	4	5	6	7
Service image	1	2	3	4	5	6	7
Exclusive content	1	2	3	4	5	6	7
Availability of children	1	2	3	4	5	6	7
Extensive podcast library	1	2	3	4	5	6	7

Belonging to the ecosystem I use

For Russian

- VKontakte
- Yandex
- Sber

For Chinese

- Alibaba Group
- Baidu
- Tencent