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APPROACHES TO DEFINING AND MEASURING RUSSIA'S INTERNET ECONOMY

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Our study object is the Russian Internet economy, i.e. economic activities of companies relying on the Russian-language segment of the World Wide Web. The purpose of this study is to classify businesses engaged in the national Internet economy and measure its size (as a share of GDP) using official statistics.

The analysis of international approaches used for such studies allowed us to classify these according to the following criteria: the direct impact of the Internet on the economy, indirect economic impact of the Internet, and its indirect impact on the social sphere.

To assess the size of the Russian Internet economy we used the approaches applied by international organizations (OECD, BCG, McKinsey) for the analysis of the direct impact of the Internet on the economy [BCG (2014), McKinsey (2011), OECD (2014), etc.].

The authors singled out three sectors within the Internet economy: the sector of ICT infrastructure and its maintenance; the sector of companies doing business purely on the Internet, and the sector of companies combining an online and offline business. To assess the share of the Internet economy in GDP using the production approach we first defined the above sectors in accordance with All-Russian Classification of Economic Activities (OKVED) Rev. 1.1 and subsequently calculated gross value added (GVA) for each sector. For this purpose, the GVA data calculated by Federal Service of State Statistics (Rosstat) was disaggregated while the share of the GVA contributed by the third sector companies (i.e. combining an online and offline business) was assessed using the results of special surveys and Rosstat data.

To measure the size of the Internet economy using the expenditure approach we focused on consumer spending on goods bought through the Internet, ICT equipment and Internet access as well as institutions' expenditure for ICT equipment, fixed capital investment of enterprises engaged in Internet activities, public sector ICT spending, net exports of ICT goods and services.

According to our estimates obtained by two methods such as the production approach and expenditure approach, the share of the Internet economy in GDP in 2014 amounted to 2.7 and 2.6%, respectively.

Future studies would require a more detailed definition and description of the Internet-related economic activities on the basis of OKVED2 with subsequent calculation of GVA for appropriate companies as well as development of statistical tools for collecting data on household spending.

JEL: C80, F62, E01, L16, L81, M21, O14

Key words: Internet economy, online and offline business, Internet, System of National Accounts

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This Working Paper is an output of the research study "Monitoring of state and dynamics of KIBS market in Russia" implemented within the framework of the Basic Research Programme of the National Research University Higher School of Economics (HSE) in 2015. The publication is based on the results of the projects "Examination of the Structure and Size of the Russian Internet Sector Economy" carried out for the Presidential Administration of the Russian Federation, and "Monitoring of Global Technological Trends".

Introduction

The last two decades demonstrate an explosive growth of online economic activities including Internet access provision and Internet-based services. The Runet, a Russian-language segment of the World Wide Web, is no exception to this phenomenon. Development of the Runet has a special importance for Russia due to the reasons of the country's size, inadequate transport infrastructure in many regions, and considerable socioeconomic heterogeneity of constituent entities of the Russian Federation.

The present HSE's study focused on determining the boundaries of the Internet economy and assessing its size. The major distinctions of this study from similar research are as follows: reliance on the official statistics as the main source of information, consistency of approaches to determining the boundaries and size of the target segment with the System of National Accounts (SNA) and international practice, classification of Internet economy sectors. The use of these principles can ensure stable and reproducible calculations, reliability and comparability of assessment results, and conformance to the national statistical standards.

The study included the determination of the structure and composition of the Internet-related economy sectors in accordance with the All-Russian Classification of Economic Activities (OKVED) Rev. 1.1. Methodological approaches to the assessment of the share of Internet activities in GDP were developed and approved on the basis of federal statistical data and our own research. These solutions involve the implementation of SNA methodology: the first method is based on measuring the output generated by companies providing Internet services (the production approach) while the second one focuses on evaluating consumer spending for these services (the expenditure approach).

The production approach involves the calculation of GVA generated by the Internet economy. It is estimated that in 2014 the GVA amounted to 1.7 trillion rubles. The expenditure approach relies on the calculation of aggregate expenditure estimated at about 1.8 trillion rubles. Therefore, we can estimate the Internet economy size as 2.6–2.7% of GDP.

The results of this study can be used to draw cross-country comparisons of the Internet economy development. Thus, looking at the estimates obtained by experts of the Boston Consulting Group (BCG) one can see that the contribution of the Russian Internet economy to GDP in 2014 is comparable with the 2010 figures for Mexico (2.5%), France (2.9%), Canada, Germany (3%), and nearly three times lower than those for the UK (8.3%) (Fig. 1).

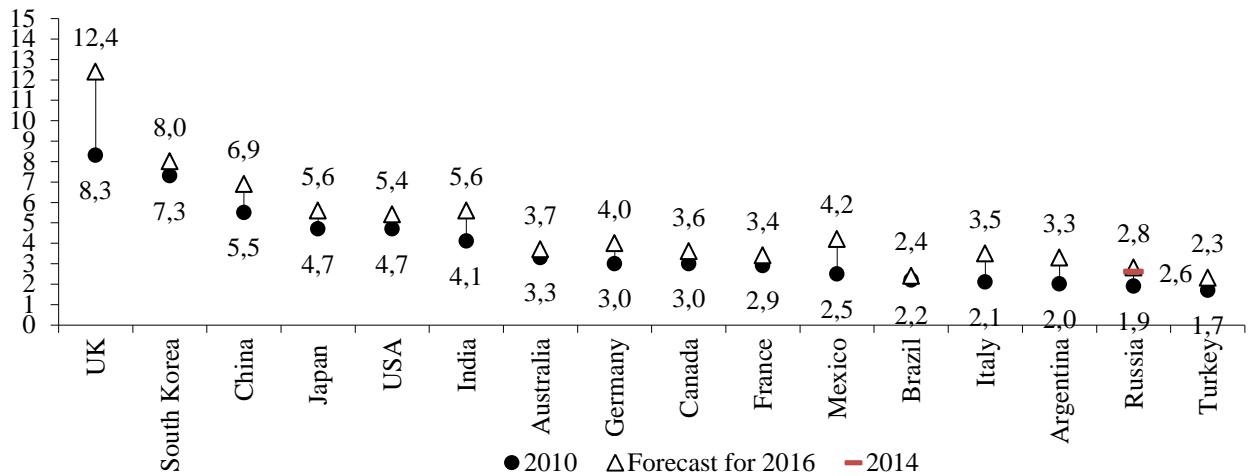


Fig. 1 – The Share of Internet Economy in GDP Calculated by the Expenditure Method

Source: BCG, 2012 (estimates for 2010, forecast for 2016); 2014 estimates were made by HSE on the basis of the Rosstat data.

Studying the Internet Economy:

International and Russian Experience

A considerable number of studies was dedicated to measuring the impact of the Internet on country's development and economy, in particular. Among the most well-known and authoritative studies one should mention the research work performed by OECD, McKinsey, BCG, etc. [OECD, 2013; McKinsey, 2011; BCG, 2012].

The array of research on the subject consists of the two groups. The studies belonging to the first group focus on examining the factors influencing the Internet economy and reflecting its development potential. Using various indices such studies assess the Internet penetration, physical parameters of its infrastructure development and economic indicators of Internet access and frequency of usage as well as other proxies such as the presence of human capital [BCG, 2011, 2013, 2014; McKinsey, 2011].

The second group includes the studies that, on the contrary, assess the impact of the Internet on economy and social sphere, namely:

- *Direct impact on the economy*, i.e. contribution of the Internet economy to GDP [Deloitte, 2011; OECD, 2013; McKinsey, 2011; BCG, 2012];

- *Indirect impact on the economy*, i.e. the influence of the Internet not only on the industries directly involving its use, but other segments of economy, too. Thus, to estimate the impact of the World Wide Web on transport industry one has to assess the revenues of both aggregators (Yandex, Uber, Gett) and “traditional” carriers since in this case development of the Internet sector would substantially decrease the size of the offline economy [Stiglitz *et al.*, 2009; BCG, 2010];
- *Indirect impact on social sphere*, i.e. development of e-services in healthcare, e-education, e-government services [OECD, 2013; Shah *et al.*, 2001; Morton, 2006; Greenstein, McDevitt, 2011]. Development of the Internet not only influences the companies’ output in a given industry, but also has a considerable effect related to consumer surplus and social capital formation.

Today there is no single commonly accepted methodology for assessing the direct and indirect impact of the Internet on economy and social sphere. This also concerns valuation of the Internet economy sectors’ contribution to GDP. In most cases, studies performed by consulting and research institutions rely on their own data and calculations as the main source of information.

To calculate the share of the Internet economy in GDP international experts use the expenditure approach [McKinsey, 2011; BCG, 2012; OECD, 2013]. All the research projects rely on a similar formula for calculations though they consider variations in the composition of expenditures included in the “consumption”, “investment”, “public spending” and “net exports” categories. As information sources, they use the data provided by national statistical services, Eurostat, OECD, and Gartner as well as the surveys conducted by Google and IAB Europe. Besides, if the relevant official statistics are lacking, each institution designs its own proxy indicators.

Let us consider the formula for measuring the Internet economy proposed by the BCG and acknowledged by OECD as the most relevant:

Internet Economy = Consumption + Gross Capital Accrued + Public Spending + Net Exports,
where:

Consumption = Expenditure on goods and services bought on the Internet + expenses for gaining Internet access + payments to Internet service providers (ISPs) + expenses for purchasing equipment required to access the Internet,

including:

Expenses for gaining access to the Internet = expenses for fixed Internet access + expenses for mobile Internet connection + share of expenses for purchasing

computers, mobile phones providing access to the Internet and infrastructure equipment (e.g. wireless routers).

Gross capital formation (Investment) = Investment in the Internet-related capital facilities made by telecommunication companies + private sector investment in ICT (excluding investment of international companies in software development)?

including:

Investment in purchasing capital facilities made by telecommunication companies = investment in equipment for providing fixed Internet access + investment in equipment for providing Internet access to mobile phone users.

Private sector investment in ICT = investment in telecommunication equipment + investment in computer equipment and software in the companies having access to the broadband Internet used by their staff.

Public spending = total public expenditures on ICT, including computer hardware and software, telecommunications and supporting services.

Net exports = sum of goods and services purchased/provided online and expenses for ICT equipment (exports) minus sum of goods and services purchased/provided online and expenses for ICT equipment (imports). The calculation is carried out on the basis of the data on e-commerce and ICT equipment sales.

The BCG and McKinsey Company have calculated the share of the Internet economy in the GDP of the Russian Federation. The BCG estimates its share in 2010 at 1.9% with a forecasted growth to 2.8% by 2016 [BCG, 2012]. According to the calculations, in 2010 Russia's Internet economy was worth USD 27 bln. The contributions of public spending, investment, and consumption amounted to USD 2 bln, 12 bln, and 18 bln, respectively. However, the total of these contributions was diminished due to the negative balance of net exports (-5 bln). The online commerce generated USD 12 bln (1.7% of total sales in goods and services) while retail sales of goods researched online and purchased offline totaled USD 33 bln (4.8% of total sales).

According to McKinsey's estimations, the contribution of the Russian Internet economy to GDP amounted to 0.8% [McKinsey, 2011]. This sector develops mainly due to the growing consumption and investment. The major obstacle to further growth is a negative balance of net exports.

There are considerably fewer studies aimed at calculating the added value generated by the Internet sector companies [Deloitte, 2011; OECD, 2013]. The main problem facing such studies is

that the level of detail of data available from official statistical agencies and the Standard Industrial Classification of All Economic Activities (ISIC) is not sufficient to identify the Internet-related activities and to derive the appropriate estimates while the data on companies' activities on the Internet is absent. The second limitation is that industrial classification systems do not distinguish between online and offline activities of the sectors combining both of these lines of work. As a result, errors of type I and II arise – these are related both to the determination of boundaries of the Internet economy and its share in the GDP. The most developed statistical instruments for keeping e-commerce records are available in the US though the data of the US Bureau of Statistics is not sufficient for correct measurement of the value added.

To measure the size of the Internet economy by assessing the value added generated by Internet-related activities, the Deloitte Company used the summing up method. It comprises the accumulation of the revenues of ISPs, search engines and institutions processing and storing information; revenues from computer equipment sales, IT-consultations and software sales; Internet publications and broadcasting; advertising and website design and development; public spending on the Internet-related equipment and services; value of e-commerce [Deloitte, 2011].

Initially OECD recommended to use the SNA data for the calculation of the value added [OECD, 2010]. In 2011 OECD initiated new studies aimed at the development of new methodological approaches to measuring the Internet economy. These approaches use the results of existing research and statistical definitions formulated earlier [OECD, 2011]. The idea was to switch over to the data analysis in accordance with the concept of value added set out in the SNA to standardize and enable cross-country comparisons [OECD, 2014]. It should be noted that practical calculations based on this methodology were used only in the USA (annual calculations of the Bureau of Statistics) and only once in Australia [Deloitte, 2011]. While promoting this method, OECD emphasizes complexity of its practical application.

As far as the Russian experience is concerned, there are numerous publications containing quantitative estimates of the Internet-related activities, but studies involving measurement of the direct impact of the Internet on economy are rare. Depending on the scale of coverage all the studies can be divided into three groups. The first group accumulates the research involving the analysis of the audience and structure of participants of the Russian-language segment of the World Wide Web. Studies belonging to the second and third group focus on the state of separate online markets, and Russian Internet economy as a whole, respectively.

The first group includes a considerable number of widely cited studies [TNS, 2014; CSI Enter, 2014], but these are not directly relevant to the subject of this research.

Among the most authoritative in the second group, one should mention the research work carried out by such companies as the Data Insight [Data Insight, 2014], East-West Digital News [EWDN, 2013], Association of Internet Commerce Companies [AICC, 2014]. These studies aggregate the data of other companies on narrow segments of the Internet market and in some cases, the results of their own questionnaire surveys among the general population or market participants commissioned by the research organizers. Quantitative estimates exist for various segments of the Russian-language sector of the Internet such as electronic and household appliances, clothes and footwear, spare car parts, games, tickets, etc. The volume and dynamics of e-sales are measured within each segment. Among the advantages of these projects, one can mention the reliability of separate Internet economy segments' estimations while its shortcomings are seen in fragmented information (they assess not the Internet economy as a whole, but the companies which we previously classified as belonging to the sectors of economy combining online and offline business) and reliance on research and questionnaire survey data. This complicates reproducibility and comparability of the results.

To date the annual studies performed by the Russian Association of Electronic Communications (RAEC) represent the only integrated piece of research into the Russian Internet economy relying on its own methodology [RAEC, 2012, 2013, 2014, 2015]. Using the Delphi method the authors performed structuring of the Russian Internet economy by singling out such sectors as marketing and advertising (media, contextual, video, mobile advertising, search engine optimization, social media marketing), infrastructure (SaaS, hosting, domains), e-commerce (online retail, online travel, e-payments), digital content delivery (books and media, games, music, video)⁴. We provide the results of the estimates in Table 1.

The study consists of the two stages. The first stage involves holding foresight sessions with key industry experts and the second stage is devoted to conducting questionnaire surveys among a wider group of industry experts. Processing of the data for each sector of the Internet economy results in the development of integrated indicators which characterize the size of the Internet market, its dynamics, structure, external factors, potential, and growing points.

⁴ The list of sectors in RAEC studies performed since 2011 has varied annually. Unless otherwise mentioned, from this point onwards when referring to the RAEC methodology and data we mean the 2015 study [RAEC, 2015].

Table 1. The Results of RAEC Studies “The Runet Economy”

Study	Year	Size, bln rub
Runet Economy 2011–2012	2011	554
Runet Economy 2012–2013	2012	831
Runet Economy 2013–2014	2013	1100
Runet Economy 2014–2015	2014	1570

*In 2012–2013 RAEC assessed the size of Internet-dependent markets. These are traditional markets experiencing considerable influence of online technologies including Internet access, investment in Internet companies, and B2B e-commerce [RAEC, 2014]. In 2012, 2013, and 2014 their size was estimated at 4.9, 6.7, and 11.8 trln rub., respectively.

Measuring the Internet Economy

The statistical tools for calculating GDP describe common patterns, interrelationships and proportions. Their capability to measure digital economy are limited. However, they have a number of advantages such as regular information collection and the presence of a clearly defined program for performing calculations. Estimations of the Internet sector will allow to draw consistent comparisons with the estimations for other sectors of economy. Besides, over the recent years the official statistical methodology has undergone significant changes under the OECD influence, specifically as regards information society statistics. Therefore the Russian statistical tools follow global trends, and a number of gaps in the official accounting can be offset by empirical studies.

Yet another basic constraint associated with the standard statistical tools is that merely measuring the share of Internet economy in GDP, even over a number of years, does not allow one to analyse the underlying economic processes responsible for the observed changes. GDP dynamics is determined by changes in prices and output (sales) of goods and services produced by an industry. Thus, a negative trend reasons are either output decline outrunning price increase or price increase outrunning output decline, or a concurrent fall in both indicators. Analysis of the sector development dynamics requires estimates of GVA at constant prices and the appropriate deflator. However, carrying out estimates both of Internet economy and other sectors of new economy is a rather complex task since it demands simultaneous capture of product quality (development of the so-called constant quality indices – otherwise price movement may arise from product changes [Bessonov *et al.*, 2011; Triplett, 2006; Berndt, Hulten, 2007]). We regard this approach as promising, but due to its high labour intensity and lack of basic estimates for the scale of Internet economy it was left outside the scope of this research.

The methodological approaches presented in this paper help measuring the direct contribution of Internet-related institutions to GDP.

To calculate the size of the Internet economy we applied two methods used within the SNA when determining GDP: namely, the production approach (measuring GDP by gross value added) and the expenditure approach (measuring GDP by expenditure).

We ground our estimates on the official Rosstat's data derived from the SNA, business statistics, information society statistics, living standards of population statistics, domestic and foreign trade statistics, and the export and import of services data provided by the Bank of Russia and communication statistics provided by the Ministry of Telecom and Mass Communications of the Russian Federation and the results of special surveys conducted within the framework of the HSE study.

We have developed the methodological approaches to measuring Russia's Internet economy with due account for the relevant international experience as well as opportunities and limitations involved in using the Russian official statistics.

Measuring Gross Value Added (the production approach)

The production approach involves determining the gross value added (GVA) generated by enterprises engaged in Internet activities.

We calculate the gross value added at the industry and industry sector levels by subtracting intermediate consumption from gross output of goods and services. Gross output of goods and services represents the total value of commodities produced by all resident units of a national economy in an accounting period. Intermediate consumption consists of the value of the goods and services transformed or used up by the production process in an accounting period.

Accordingly, bearing in mind the opportunities and limitations inherent in the Russian official statistics, the first task in the implementation of this approach is to identify the enterprises engaged in Internet activities in accordance with the All-Russian classifications.

One can distinguish three aggregated sectors within the Internet economy structure:

- Sector of ICT infrastructure and its maintenance;
- Sector of companies doing business purely on the Internet (e.g. search engines);
- Sector of companies combining an online and offline business, the latter being the primary line of activities (e.g. travel companies, banks, etc.).

Let us take a closer look at the composition and structure of these sectors having noted that we use the suggested classification in this study for analytical purposes. Subsequently, to perform

calculations on the basis of official statistics and in accordance with OKVED we shall put forward another variant of classification relying on special considerations related to the use official classification rather than a substantive approach.

The Sector of ICT infrastructure and its maintenance. In a broad sense, the term “information and communications technologies” refers to technologies relying on microelectronic techniques for collection, storage, processing, search, transmission and provision of data, texts, images, and sound [HSE, 2016]. For the purpose of this study, the term “sector of ICT infrastructure and its maintenance” shall be understood as the field of business activities embracing design, implementation and development of information systems and resources (ISR), and ICT components – network service access points (NSAP) (set of NSAPs connected vis data transmission links and commutation devices, i.e. any devices such as computers, mobile phones, terminals, equipment (servers, routers) allowing the user to get access to the Internet no matter what the type of Internet connection or data transmission technology may be).

In general terms the classification of the ICT sector infrastructure and its’ maintenance can be presented as follows:

- development and distribution of ISR using the SaaS and other models including analytical information systems, general management systems (Customer Relationships Management, CRM); information systems (e.g. for websites), content management systems (CMS), i.e. the software that supports a collaborative process of creating, editing and managing digital content; service technology systems (software for the automation and support of communication lines); systems for staff management, review, and training (software for distance learning, interviewing and communicating with staff via Internet);
- development and distribution of components of the information and telecommunication infrastructure including electronic communication support systems; operation, tracking, and modernization systems; external communication infrastructure (network service access points); hardware and software security systems including electronic digital signature; systems for data storage, centralized data processing, and electronic archives development; data print and copy services, publishing systems; and internal telecommunication infrastructure.

The Sector of companies doing business purely on the Internet. We treat the companies belonging to this sector as typical representatives of the Internet economy since they carry out all their business processes online. The activities within this sector can be tentatively broken down into the following groups:

- e-commerce – online distribution of goods, online sale of domain names and hosting (domain name registrars, hosting providers); online sale of fast moving consumer goods (FMCG), consumer products including durable goods (e.g. household electrical appliances); sale of digital content (audio, video, etc.); online sale of airline and railway tickets, real estate property, booking services;
- development of web applications and provision of services – development and promotion of mapping services, mail services, mobile applications, online games, web search technologies, and search engine optimization; development of specialized and professional portals (staff management portals, bulletin boards, discount and loyalty program portals); social network services (social networks and dating sites); web development including website design and formatting, website and web application programming;
- provision of services in the field of advertising, marketing and online banking – delivery of web services including social media marketing (SMM), i.e. the process of gaining website traffic or attention to a product or a brand name through social media usually by creating content that attracts attention and encourages readers to share it across their social networks; Internet media, web-based publications, Internet radio and TV; advertising placement services, sales promotion, public relations; electronic banking services (e-payments for goods and services); e-Insurance (simplified procedure for selling insurance policies directly through the insurance company’s website).

The Sector of companies combining an online and offline business. The companies belonging to the third sector combine an online business with offline activities involving direct contact with customers purchasing various goods and services. Here we are also referring to enterprises that have their own websites offering a description of the available goods and services and helping customers to make their choice. However, these goods and services can be accessed online, but their actual provision can be done only offline.

This sector is represented mainly by the companies engaged in such activities as: sale of goods, airline and railway tickets, real estate, tourism, sale and distribution of ICT infrastructure,

and banking services. The previously mentioned reliance of the authors on the official statistics and All-Russian classifications does not allow the determination of the Internet economy's boundaries fully in accordance with the approaches presented above. With certain reservations, according to OKVED Rev. 1.1 the three sectors described we define as follows (Fig. 1):

- *The sector of ICT infrastructure and its maintenance* includes institutions carrying out activities in the field of telecommunications and information services (OKVED Rev. 1.1 codes: 64.20.12, 64.20.3, 64.20.4, 64.20.5, 64.20.6, 64.20.7, 72.1, 72.2, 72.6);
- *The sector of companies doing business purely on the Internet* embraces electronic retailers and institutions engaged in data processing, development and use of databases and information resources including Internet resources (OKVED Rev. 1.1 codes: 52.61.2, 72.3, 72.4);
- *The sector of companies combining an online and offline business* is made up of institutions involved in publishing, transport, advertising, financial intermediation, insurance, film distribution and screening, radio and TV broadcasting, retailing, and travel (OKVED Rev.1.1 codes: 22.1, 52.1, 52.2, 52.3, 52.4, 52.5, 52.6 (except 52.61.2), 63.21.1, 63.21.21, 63.22.11, 63.23.1, 63.3, 65, 66, 74.4, 92.1, 92.2, 92.4).

We calculate the GVA generated by institutions engaged in Internet activities, i.e. by Internet economy (IE GVA) as the sum of three components: GVA for the sector of ICT infrastructure and its maintenance (GVA1), GVA for companies doing business purely on the Internet (GVA2), and GVA for companies combining an online and offline business (GVA3) adjusted for the share of Internet economy (C):

$$\text{IE GVA} = \text{GVA1} + \text{GVA2} + \text{GVA3} * \text{C}$$

Depending on the Rosstat's database capabilities, GVA of the enterprises belonging to different sectors of the Internet economy can be measured using a variety of approaches and information sources.

For enterprises involved in publishing (OKVED Rev. 1.1 code: 22.1), activities related to film production, distribution and screening, radio and TV broadcasting (92.1, 92.2), financial intermediation (65), insurance (66), the authors used the Rosstat data compiled within the SNA.

Enterprises engaged in Internet activities		
Sector of ICT infrastructure and its maintenance	Sector of companies doing business purely on the Internet	Sector of companies combining an online and offline business
<p><i>Communication enterprises</i></p> <p>Mobile communications (OKVED Rev. 1.1 code 64.20.12)</p> <p>Intersystem communication services (64.20.3)</p> <p>Data communication (64.20.4)</p> <p>Telematic services (64.20.5)</p> <p>Cable, over-the-air, and wire radio broadcasting (64.20.6)</p> <p>Other telecommunication activities (64.20.7)</p> <p><i>Enterprises providing IT services</i></p> <p>Consulting on computer hardware (72.1)</p> <p>Software development and consulting (72.2)</p> <p>Other activities linked to the use of computer equipment and information technology (72.6)</p>	<p><i>Retailing enterprises</i></p> <p>Retailing directly relying on television, radio, telephone, and the Internet (52.61.2)</p> <p><i>Enterprises providing IT services</i></p> <p>Data processing (72.3)</p> <p>Database and information resource creation and use activities, including Internet resources (72.4)</p>	<p><i>Publishers</i></p> <p>Publishing of books (22.11)</p> <p>Publishing of newspapers (22.12)</p> <p>Publishing of journals and periodicals (22.13)</p> <p>Publishing of sound recordings (22.14)</p> <p>Other publishing (22.15)</p> <p><i>Retailing enterprises</i></p> <p>Retailing other than motor trade and specialized e-commerce (52.1, 52.2, 52.3, 52.4, 52.5, 52.6 (except 52.61.2))</p> <p><i>Enterprises engaged in auxiliary and complementary transport activities</i></p> <p>Other auxiliary railway transport activities (63.21.1)</p> <p>Terminal related activities (coach stations, etc.) (63.21.21)</p> <p>Seaport, wharf, and canal lock operations, including delivery of services to passengers at seaport terminals (63.22.11)</p> <p>Transport terminal operations (airports, etc.), airport management (63.23.1)</p> <p><i>Enterprises engaged in the activities related to film production, distribution and screening, radio and TV broadcasting</i></p> <p>Motion picture and video activities (92.1)</p> <p>Radio and television activities (92.2)</p> <p>News agency activities (92.4)</p> <p><i>Enterprises providing other services</i></p> <p>Activities of travel agencies (63.3)</p> <p>Advertising (74.4)</p> <p>Financial intermediation (65)</p> <p>Insurance (66)</p>

Source: data compiled by the authors on the basis of the OECD publication [OECD, 2013].

Fig. 2. The Internet Economy Broken Down by Type of Economic Activity in Accordance with OKVED Rev. 1.1

For other enterprises, we carried out experimental calculations on the basis of the Rosstat data on the GVA generated by the activities included in OKVED that were as close as possible to the activities of institutions involved in the Internet economy using coefficients which allowed to break them down to the required level of detail. For example, for enterprises engaged in advertising (OKVED Rev. 1.1 code: 74.4) the closest OKVED item used by the Rosstat to determine GVA is “Other business activities provision of other types of services” (OKVED Rev. 1.1 code: 74). In this case, we calculated GVA according to the following formula:

$$GVA_{74.4} = GVA_{74} * DC,$$

$$DC = I_{74.4} / I_{74}, \text{ where:}$$

DC – disaggregation coefficient;

I – value of the indicator used to break down the GVA for the respective OKVED item.

The analysis of the business statistics and other branches of statistics for each type of activities related to the Internet economy allowed us to determine both the data sources and indicators for calculating GVA disaggregation coefficients. The list of the data sources and coefficients is shown in Table 2 below.

Table 2. Indicators Used to Calculate GVA

Enterprises engaged in the Internet economy	OKVED Rev.1.1codes	Disaggregation coefficient used to break down GVA	Data Source
Retailing (except e-retailing)	52.1, 52.2, 52.3, 52.4, 52.5, 52.6 (except 52.61.2)	GVA (without including data on small business enterprises)	Form № 1-enterprise «Basic information on enterprise’s activities»
E-retailing	52.61.2	Retail turnover	Form № P-1 «Information on production and shipment of goods and services delivered»
Telecommunications	64.20.12, 64.20.3, 64.20.4, 64.20.5, 64.20.6, 64.20.7	Total revenues from communications services (excluding fixed-line telephone and telegraph services)	Form № 65-communications (services) «Information on revenues from communications services»
Enterprises engaged in auxiliary and complementary transport activities	63.21.1, 63.21.21, 63.22.11, 63.23.1	Own produced goods shipped, work done and Services performed with own resources (excluding VAT and excises)	Form № P-1 «Information on production and shipment of goods and services delivered»
Activities of travel agencies	63.3		

Enterprises engaged in the Internet economy	OKVED Rev.1.1 codes	Disaggregation coefficient used to break down GVA	Data Source
Enterprises providing IT services	72.1, 72.2, 72.3, 72.4, 72.6	GVA (without including data on small business enterprises)	Form № 1-enterprise «Basic information on enterprise's activities»
Advertising companies	74.4		
News agency activities	92.4		

The data compiled in accordance with the described approaches allowed to assess the GVA generated by the sector of ICT infrastructure and its maintenance and the sector of companies doing business purely on the Internet which amounted to 1,192 bln rub. (2% of GDP) and 124 bln rub. (0.2% of GDP), respectively. As was noted above, the GVA values for the first two sectors were included in total in the Internet economy estimates whereas assessment of the third sector's contribution requires setting apart the results of online and offline activities.

To assess the e-commerce share of total retail sales made by the companies combining an online and offline business the Russian Public Opinion Research Centre (VCIOM) carried out a special survey commissioned by the HSE.

The survey had two stages:

- 1) a qualitative study including 40 in-depth interviews – 10 interviews for each of the study areas (insurance, publishing, retailing, and tourism); and
- 2) a quantitative study consisting of 106 interviews with representatives of the companies belonging to the “insurance” and “travel” industries (26 and 80 interviews, respectively).

The survey data served as the basis for assessing the share of online sales made by the companies belonging to the sectors listed above and the obtained estimations were used for further calculations (Table 3).

Table 3. The Share of Revenues from Online Sales by Sector of Economy

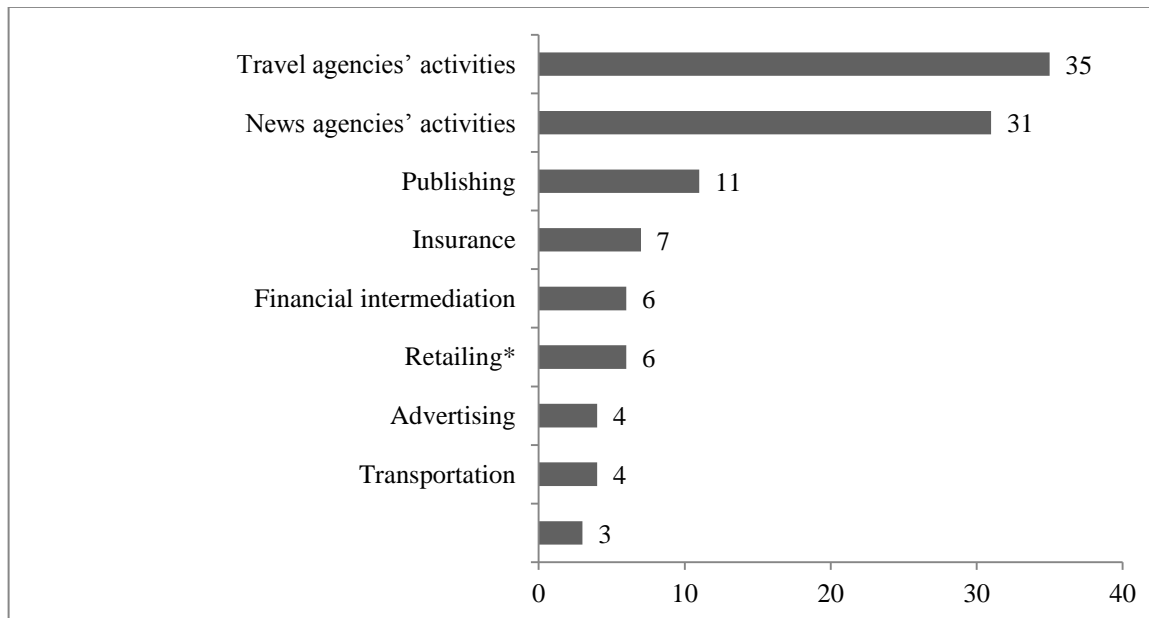
№	Percentage share of revenues from online sales	Comments
1.	Insurance	
	7%, On average, and specifically: - around 4% for large companies, and	Small share of online sales is explained by a number of factors. First of all, the industry relies primarily on agent networks that allow to reach potential target

№	Percentage share of revenues from online sales	Comments
	<ul style="list-style-type: none"> - around 35% for small and medium sized enterprises (SMEs) 	<p>clients with specific characteristics much more effectively than an e-sales system. One should also note a significant share of B2B sales.</p> <p>The most developed segments of online sales are: foreign travel insurance, and repeat sales of insurance policies.</p>
2.	Publishing	
	<p>11%</p> <p>In addition, it should be noted that:</p> <ul style="list-style-type: none"> - the shares of online sales in big and small publishing companies are comparable; - experts' estimates of the volume of e-sales depend on whether they include the publishing companies' revenues from sales of the products initially sold offline, but subsequently resold online by a partner (or a customer). 	<p>The companies mainly focus on developing partnerships with big Internet stores. They don't deny the need for their own web stores, but do not value their potential, not least because of substantial investment required to develop these resources.</p> <p>They believe that poorly developed regional networks of retail outlets may be a factor for growth of online sales.</p>
3.	Retailing	
	<p>6%</p> <p>In addition, it should be noted that the indicator varied both between the industry segments and different companies of the same segment:</p> <ul style="list-style-type: none"> - baby and children's goods, 6% to 10% (a higher percentage is characteristic of big companies); - perfumery and cosmetics, around 5%; - electronic and household appliances, from 10% to 23%; - clothing, 5–6%. 	<p>Economic downturns provide strong incentives for developing online sales since e-commerce allows to save a lot of money by cutting rental costs. However, the companies working in this industry (just as insurance companies) do not plan to reduce sales using traditional distribution channels such as retail outlets.</p>
4.	Travel industry	
	<p>35%</p> <p>It may just be noted here that:</p> <ul style="list-style-type: none"> - the share of online sales in total revenues of big tour operators selling their tours mostly to travel agencies (B2B segment) amounts to 95–100% of sales. 	<p>Current decline observed for travel industry sales is not conducive to introduction of Internet technologies since many companies have no opportunity for investing in development.</p> <p>Constant currency fluctuations complicate automatic pricing of a trip. Databases constantly require updates since data quickly becomes irrelevant which creates problems both for travel agencies and their clients.</p>

Source: results of the survey among the representatives of companies combining online and offline business performed by VCIOM in 2015 at the request of the HSE.

Similar data⁵ of the federal statistical monitoring according to Form № 3-inform “Information on the Use of ICTs and Computer Hardware and Software Production, and Service Delivery in These Fields” was used to estimate the value of e-sales made by the financial sector institutions involved in film production, distribution and screening, radio and TV broadcasting as well as news agencies.

The estimates of the share of e-sales made by the above mentioned enterprises are shown in Fig. 3. It should be taken into account that GVA estimates relying on the structure of sales involve a considerable degree of arbitrariness. However, in the information field we treat this as inevitable. The same approach is also used internationally for Internet economy assessment [OECD, 2013].



* The data represent the share of e-sales of non-foodstuffs (excluding specialized online retail).

Fig. 3 The Share of Online Sales in the Total Sales of Enterprises Engaged in Different Lines of Activity (%)

Source: HSE's calculations based on the results of a special survey and Rosstat data.

For the sector of companies combining an online and offline business as a whole, the share of GVA generated by online activities did not exceed 6%. According to our calculations, the contribution of the Internet economy to GDP in 2014 amounted to 2.7%. The share of the sector of ICT infrastructure and its maintenance in the GVA generated by Russia's Internet economy was

⁵ The data entered on this form includes information on the share of sales over the Internet and other global information networks relying on specially designed techniques for receiving or placing orders (excluding orders received via e-mail) using special online forms posted on a website or extranet or EDI-systems.

over 70% while the other two sectors, i.e. companies doing business purely on the Internet, and companies combining an online and offline business, accounted for 7% and 20%, respectively (Fig. 4).

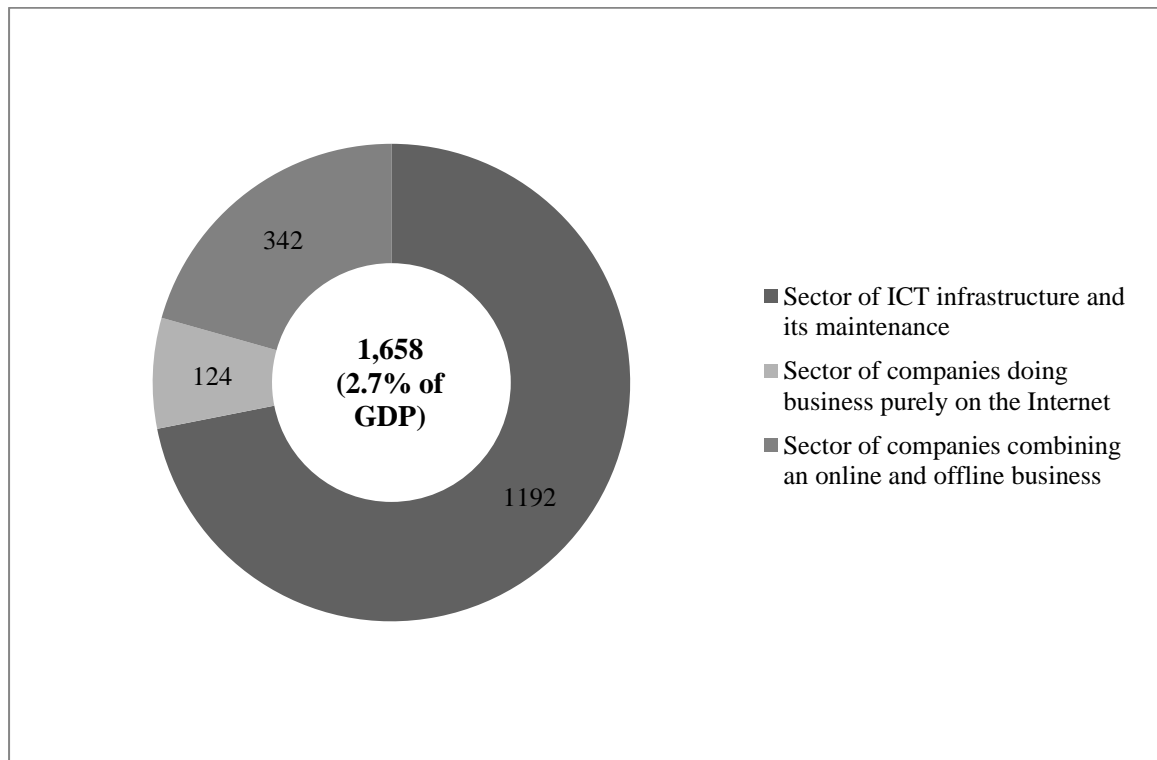


Fig. 4. Gross Value Added Generated by the Russian Internet Economy in 2014 (bln rub.)

Source: HSE's calculations.

The Expenditure Approach

The expenditure approach involves calculating and adding up all the expenditures related to consumption, gross capital formation, and net exports.

Consumption:

- personal consumption expenditures on goods bought over the Internet (Eog);
- personal consumption expenditures for the purchase of ICT equipment (Eoe);
- personal consumption expenditures on the Internet access services (Eos).

Gross fixed capital formation:

- corporate expenditures for the purchase of computer hardware and software, and telecommunication equipment (Ec);
- fixed capital investment of enterprises engaged in Internet-related activities (Ica);

Public expenditure on ICT (Ep).

Net exports:

- exports of ICT goods and services (X);
- imports of ICT goods and services (Im).

An algorithm for assessing the size of the Internet economy by expenditure (IE GDP) can be described as follows:

$$IE\ GDP = (Eog + Eoe + Eos) + (Ec + Ica) + Ep + (X - Im).$$

The following sources of data were used in calculating the contribution of the Internet economy to GDP: results of the Rosstat's household budget survey, business statistics, trade statistics, information society statistics; and customs statistics; balance of payments statistics compiled by the Bank of Russia; data on public procurement contracts for ICT goods, works and services delivery.

Operating within the framework of current federal statistical observations, we adopted the following procedure for calculating the Internet-related expenditures reflecting the size of Internet economy.

The calculation of *personal consumption expenditures on goods bought over the Internet* (E_{pgi}) was based on the data on total revenues from retail sales of nonfood stuffs and the respective share of online sales (S_{os}):

$$E_{pgi} = R_{rsn} * S_{os} / 100,$$

where:

R_{rsn} – total revenues from retail sales of nonfood stuffs calculated according to the Rosstat's data (Forms № P-1 «Information on production and shipment of goods and services delivered», № P-5(m) «Basic information on enterprise's activities», № PM «Information on key indicators of small enterprise performance», № MP (micro) «Information on key indicators of micro-enterprise performance»);

S_{os} – share of online sales in the total revenues from retail sales of nonfood stuffs (calculated on the basis of HSE's survey data).

We did not take into account the volume of online food sales due to the absence of the relevant data. In authors' view, the constraints inherent in the assessment context and methodology used did not have a considerable impact on the Internet economy estimates. We ground this conclusion on the data of the federal statistical survey conducted using form № 1-IT «Sample

Survey Questionnaire on the Use of Information Technologies and IT Networks”: the share of the population buying foodstuffs over the Internet amounted to 9% of online shoppers and 2% of the total population aged 15 to 72 years.

We should like to note that in accordance with the SNA approaches the expenditure item under consideration includes total expenditure on goods bought over the Internet.

The item “*personal consumption expenditures for the purchase of ICT equipment* (E_{oe})” includes the data on household spending on the purchase of personal computers, computer peripheral and accessory equipment, other data processing devices and their associated spare parts (E_h) collected within the framework of the federal statistical monitoring according to Form № 1-B “Questionnaire for Examining Household Budgets”. Since a part of these expenditures is recorded under the item “personal consumption expenditures on goods bought over the Internet”, the resulting value is adjusted for the share of online sales in the total volume of nonfood stuffs sales (S_{os}):

$$E_{oe} = E_h - (E_h * S_{os} / 100).$$

Personal consumption expenditures on the Internet access services were estimated on the basis of the data of the federal statistical monitoring according to Form № B “Questionnaire for Examining Household Budgets”.

Corporate expenditures for the purchase of computer hardware and software, and telecommunication equipment were calculated using the data on the respective expenditures listed on Form № 3-inform “Information on the Use of ICTs and Computer Hardware and Software Production, and Service Delivery in These Fields”. The resulting estimates were recalculated to include the full range of enterprises taking into account the basis of comparison between the number of employees in the surveyed companies and total employment figures.

Taking into account that general and vocational educational institutions were left outside the scope of the enterprises surveyed using Form № 3-inform, their expenditures on information, computer and telecommunication equipment were additionally assessed on the basis of the data of the federal statistical monitoring according to Form № P-2 (invest) “Information on Investment Activities”.

Generally speaking, corporate expenditures for the purchase of computer hardware and software, and telecommunication equipment were calculated according to the following formula:

$$E_c = \sum (Elmi / Nlmi * Ni) + Eed,$$

where:

Ec – corporate expenditures for the purchase of computer hardware and software, and telecommunication equipment;

Elmi – expenditures for the purchase of computer hardware and software, and telecommunication equipment made by large and medium-sized companies engaged in an i-line of economic activity;

Ni – number of employees in all institutions engaged in an i-line of economic activity;

Nlmi – number of employees in large and medium-sized companies engaged in an i-line of economic activity;

Eed – expenditures of educational institutions for the purchase of new information, computer and telecommunication equipment.

While calculating expenditures under this item, we omitted the expenditures for the purchase of computer and telecommunication equipment made by the institutions belonging to the sector of ICT infrastructure and its maintenance as well by the companies doing business purely on the Internet since this expenditure falls under the category of fixed capital investment.

The volume of the ICT infrastructure sector companies' capital assets investments and their maintenance as well as companies' pure Internet (Isi) business were assessed on the basis of the federal statistical monitoring data according to Forms № P-2 (invest) "Information on Investment Activities", № PM "Information on key indicators of small enterprise performance", and № MP (micro) "Information on key indicators of micro-enterprise performance"):

$$Isi = Iec + Iit + Ier,$$

where:

Iec– volume of fixed capital investments of the enterprises operating in the field of telematics services, data transmission, and mobile communications (OKVED Rev. 1.1 codes: 64.20.12, 64.20.3, 64.20.4, 64.20.5, 64.20.6, 64.20.7);

Iit– volume of fixed capital investments of the enterprises providing IT services (OKVED Rev. 1.1 codes: 72.1, 72.2, 72.3, 72.4, 72.6);

Ier– volume of fixed capital investment in e-retailing companies (OKVED Rev. 1.1 52.61.2).

The assessment of *public expenditure on ICT* relied on the data on public procurement contracts for ICT goods, works and services delivery.

Net exports (NX) were evaluated by using the balance of payments statistics data compiled by the Bank of Russia as well as customs statistics:

$$NX = Xcs - Ics + Xpc - Ipc,$$

where:

Xcs and *Ics* respectively stand for the exports and imports of computer and information services (*Data source: Bank of Russia*).

Xpc, *Ipc* respectively signify the exports and imports of computers and peripheral devices (Commodity Classification of Foreign Economic Activities (TN VED) codes: 844331, 844332, 847050, 8471, 847290, 847330, 847350, 852351, 852841, 852851, 852861).

The total Internet-related expenditure in 2014 amounted to 1,824 bln rub. or 2.6% GDP (Table 4).

Table 4. The Volume of Internet Economy Measured by Expenditure

Expenditure Item	Value, bln rub.
Internet economy	1,824
Consumption	1,047
Personal consumption expenditures on goods bought over the Internet	678
Personal consumption expenditures for the purchase of ICT equipment	155
Personal consumption expenditures on the Internet access services	214
Gross capital formation	1,024
Corporate expenditures for the purchase of ICT equipment	628
Investments in capital assets of the companies belonging to the sector of ICT infrastructure and its maintenance as well companies doing business purely on the Internet	223
Public expenditure on ICT	173
Net exports	-247
Exports of ICT goods and services	175
Imports of ICT goods and services	422

Conclusions

To date methodological problems posed by the research in the Internet economy measurement area have not yet been resolved. This is true not only about Russia but also about other countries, too. Various research institutions examining the economic impact of the Internet propose different definitions of this impact, develop their own indices, and use original approaches to performing the appropriate calculations.

This study presents an estimate of Russia's Internet economy calculated by means of the official statistics data. It is comparable with the results obtained by other researchers (Table 5).

Table 5. Russia's Internet Economy Estimates

Study	Research Institution	Year	Russia's Internet Economy Volume	
			Mln rub.	% of GDP
Examining the Structure and Size of the Internet Economy	HSE	2015	1658* 1824**	2.6–2.7
The Runet Economy 2014–2015	RAEC	2015	1570***	2.2
Sizing the Internet economy	McKinsey	2011	370**	0.8
The Internet Economy in the G-20	BCG	2010	810**	1.9 (2.8, forecasted value for 2016)

* Calculated by the production method.

** Calculated by the expenditure method.

*** RAEC estimated the volume of Internet-dependent markets at 11,800 bln rub.

Creation of an adequate information and statistical framework for measuring the Internet economy is a necessary requirement for developing the approaches presented in this study. The priority measures to improve the quality of assessment of Internet-related activities include:

- detailed elaboration of GVA data for Internet-related economic activities;
- collection of the missing data within the framework of the existing forms of federal statistical monitoring and formation of consolidated items while aggregating the primary data of federal statistical monitoring at a higher level of distinct Internet-related economic activities;
- compiling a list of Internet-related economic activities on the basis of OKVED2;
- monitoring indicators that enable us to determine the share of online activities in company's operations.

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