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CIGARETTE AFFORDABILITY IN THE RUSSIAN FEDERATION

2002-2017

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ACKNOWLEDGMENTS

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ABBREVIATIONS

CAI: Cigarette Affordability Index

COPD: Chronic Obstructive Pulmonary Disease

CPI: Consumer Purchasing Price

EU: European Union

WHO FCTC: World Health Organization Framework Convention on Tobacco Control

GATS: Global Adult Tobacco Survey

GDP: Gross Domestic Product

GYTS: Global Youth Tobacco Survey

IPC: Income Purchasing Capacity

LMICs: Low- and Middle-Income Countries

OECD: Organization for Economic Co-operation and Development

PPP: Purchasing Power Parity

RIP: Relative Income Price

RLMS: Russian Longitudinal Monitoring Survey

UBS: Union Bank of Switzerland

VAT: Value Added Tax

WHO: World Health Organization

EXECUTIVE SUMMARY

The Russian Federation (Russia) is the world's third largest cigarette consuming nation (after China and Indonesia) and has the highest per capita cigarette consumption in the world. Russia adopted the World Health Organization's Framework Convention on Tobacco Control (WHO FCTC) in 2008, and since then has taken a comprehensive approach to combatting tobacco use by implementing a wide range of tobacco control interventions. Russia's Law 15 FZ, which took full effect in 2014, has been recognized as one of the most comprehensive anti-tobacco laws in the world.

Raising tobacco taxes and prices is recommended by WHO as the single most effective measure for reducing tobacco use, and therefore is a key component of Law 15 FZ. In the past two decades, the government has raised tobacco excise tax and prices annually, with Law 15 FZ accelerating the pace of these increases in recent years. Big achievements have been made so far: the average excise per pack of 20 sticks of cigarettes increased from 6 rubles to 48.7 rubles between 2010 and 2017, while the total tax (including VAT) increased from 10.4 rubles per pack to 67 rubles per pack, an increase of 544 percent in nominal terms and 283 percent in real terms. Also during this period, the average nominal price of a pack of 20 cigarettes increased by 313 percent, from 29.1 rubles per pack in 2010 to 120.1 rubles per pack in 2017, and the average real price increased by 145.5 percent, from 29.1 rubles per pack to 71.4 rubles per pack (2010 based). As a result of tax and price increases, along with other tobacco control interventions, tobacco sales fell by almost 30 percent and the number of smokers decreased 21 percent between 2009 and 2016 (World Health Organization 2017).

People change their smoking behavior not because cigarettes are expensive or cheap, but because cigarettes are becoming more or less expensive. Tobacco taxes only reduce tobacco consumption if they increase prices and reduce cigarette affordability by adjusting the tax increases for inflation and any rise in per capita incomes. In most low- and middle-income countries (LMICs), income and purchasing power capacity of the population is rising due to favorable economic growth trends. Thus, cigarettes will become de facto more affordable for consumers, increasing consumption, unless tobacco taxes rise even faster.

The goal of this study is to examine cigarette affordability in Russia between 2002 and 2017 in order to provide an understanding of the country's current tobacco excise tax policy, and to identify opportunities and next steps.

Main findings of this study include:

- From 2002 to 2017, cigarette nominal average prices rose steadily by 917.9 percent, from 11.8 rubles to 120.1 rubles per pack. However, cigarette affordability presented two stages during this period: an ascending trend between 2002 and 2008, and a descending trend between 2008 and 2017. The most affordable year for Russian smokers was 2018, when cigarettes were 2.07 times more affordable than in 2002. By contrast, 2017 was the least affordable year, when cigarettes were 22 percent less affordable than in 2002 and 62 percent less affordable than the peak year of 2008.

- In Russia, a positive correlation is perceived between cigarette affordability and cigarette consumption: between 2002 and 2008, cigarette consumption increased by 17 percent, along with a 22 percent increase of cigarette affordability; by contrast, between 2008 and 2017 cigarette consumption decreased by 34 percent, accompanied by a 62 percent decrease in cigarette affordability.

- For each year during the period 2010–2017, economy brands were the least affordable category, while mid-price brands held the middle level and premium brands remained the most affordable for their corresponding smoking cohort.

- All three price categories present descending affordability trends since 2010; affordability for the economy category reduced the most, by 62 percent, leading to a 53 percent consumption decrease, while the mid-price category fell by 51 percent, leading to a 16 percent consumption decrease; the premium category reduced the least, by 43 percent, leading to a 26 percent consumption decrease. The differences of affordability decrease among price categories restructured the market share: the market share of the economy brands was taken largely by the mid-price brands while the premium brands held a stable market share during the period 2010–2017.

- From a global perspective, Russia has been the country with the most affordable cigarettes among the main tobacco use countries during the period 2006–2016. This indicates that despite striking progress achieved in reducing the affordability of cigarettes, Russia still has an ample room to do more. Given the still high smoking prevalence rates, and the huge preventable loss of life from smoking, big tax increases with recurrent hikes over time to keep cigarette prices climbing more steeply than per capita real income growth should be given high priority as a key part of Russia's overall tobacco control effort.

This paper is organized as follows: the introduction provides background, including smoking prevalence, cigarette tax and prices, cigarette market and macroeconomic background in Russia. The Measuring Affordability section summarizes the existing literature on the best ways to measure cigarette affordability. The Methodology section summarizes data sources and explains the methods used to measure cigarette affordability. The Results and Discussion sections present the main findings and provide future policy implications.

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INTRODUCTION

Smoking Prevalence in the Russian Federation: Health and Economic Consequences

The Russian Federation (Russia) has one of the highest smoking prevalence rates in the world, particularly among men. According to the Global Adult Tobacco Survey 2016, 30.5 percent of adults in Russia (36.4 million people – 49.8 percent male and 14.5 percent female) currently use tobacco. Overall, 29.9 percent of adults in Russia (35.8 million) were current cigarette smokers (48.8 percent among men and 14.2 percent among women) (World Health Organization 2017).

In addition to GATS, annual data on the prevalence of smoking are assessed using the nationally representative Russian Longitudinal Monitoring Survey (RLMS). This survey is not designed to accurately assess smoking habits, but rather involves interviewing all household members about factors such as work status, incomes, expenditures and health. Some respondents may wish not to disclose in front of other family members the fact that they smoke, which can lead to lower estimates than those provided by GATS. Nevertheless, the use of RLMS allows the dynamics of Russian smoking prevalence to be tracked over years (figure 1). GATS and RLMS are roughly consistent in their assessment of the decline in male smoking prevalence between 2009 and 2016. By contrast, GATS shows a substantial

Figure 1: Smoking prevalence among adults, RLMS versus GATS 2000–2016
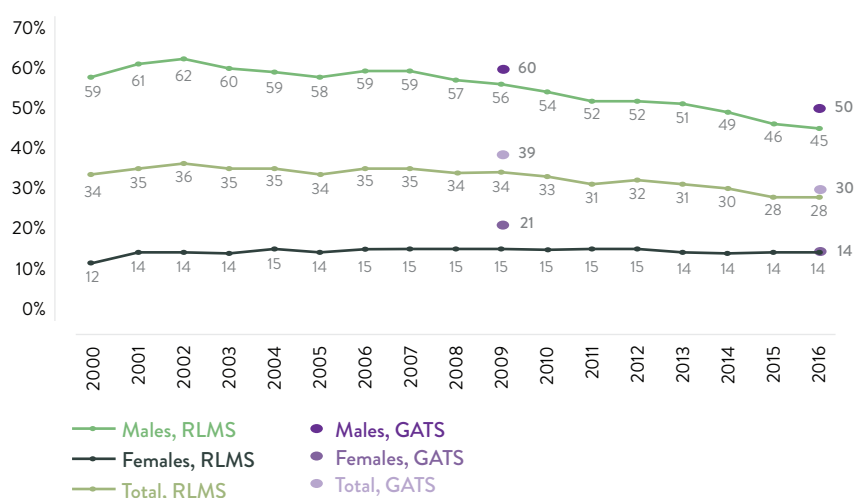
Source: GATS and RLMS. Data at *http://www.who.int/tobacco/surveillance/survey/gats/rus/en/ RLMS*; and *https://www.hse.ru/en/rlms/*.
Note: Adults are those ages 15 and older.

decline among females from 21 percent to 14 percent during those years, with RLMS showing a lesser decline, from 15 percent to 14 percent.

Traditionally, smoking was not widespread among women, but from 1992 to 2002 – within a decade of the collapse of the Soviet Union – the prevalence of smoking among women had more than doubled (Perlman et al. 2007). Much of the available literature attributes this rapid growth to an aggressive campaign by transnational companies to conquer the Russian tobacco market (Lillard and Dorofeeva 2015), as well as to changes in cultural and social norms around female smoking that had already begun in the late Soviet period (Quirmbach and Gerry 2016).

In 2016 Russia was the world's third largest cigarette-consuming nation, behind China and Indonesia. However, Russia has by far the highest per capita consumption (table 1).

Table 1: Ten countries with the largest cigarette consumption, 2016

COUNTRY	RETAIL VOLUME, 2016 (BILLION STICKS)	PER CAPITA CONSUMPTION, 2016 (STICKS PER PERSON)
China	2,350.5	1,705
Indonesia*	316.1	1,211
Russia	**278.4**	**1,929**
USA	263.4	814
Japan	173.9	1,369
Turkey	105.5	1,327
Egypt	90.0	941
Bangladesh	86.1	528
India	84.9	64
Philippines	79.1	766
*Excluding hand-rolled *kreteks*.		

Sources: Retail volume data are sourced from Euromonitor International, 2017; Population data are sourced from World Bank; Per capita consumption data are calculated by the authors.

Harm from Secondhand Smoke

According to GATS 2016, an estimated 21.8 percent of adults are exposed to secondhand smoke in enclosed workplace areas, 23 percent of adults are exposed to secondhand smoke at home; 20 percent of adults are exposed in restaurants, and 10.5 percent on public transportation (World Health Organization 2017). Among youth, 36 percent (ages 13–15) are exposed to secondhand smoke in public places and at home (Sakharova et al. 2017).

Harm to Health

Tobacco use is deadly. National evidence reveals that tobacco-related diseases are among the most significant contributors to Russia's premature mortality burden, independently doubling the Russian population's mortality risk and shortening life expectancy by 6.7 years for men and 5.3 years for women (Gerasimenko and Demin 2001). International research paints an even deadlier picture, estimating an average loss of a decade of life – and up to two decades of life – for the approximately half of smokers who die of tobacco-related diseases (Jha and Peto 2014).

Around 282,000 Russians died from smoking-attributable diseases in 2016, and nearly a quarter of all male deaths and 4 percent of all female deaths were smoking-related – about 14 percent of deaths overall. Approximately 80 percent of tracheal, bronchus and lung cancer mortality, 59 percent of chronic obstructive pulmonary disease (COPD) mortality, and 15 percent of hypertensive heart disease deaths are related to smoking (IHME 2018). Other studies produce similar estimates: for example, in 2009 smoking caused the death of 278,000 people (or 14 percent of total mortality), of which 63 percent were the result of cardiovascular diseases (Maslennikova and Oganov 2011).

Harm to Development and Household Economy

In 2005 the Russian population spent 83.4 billion rubles (US$2.9 billion) or 0.4 percent of the gross domestic product (GDP) on cigarettes, an amount that represents the short-term financial opportunity cost of smoking (i.e. money that could be spent on other goods) (Ross et al. 2008). In 2009, money spent on tobacco products amounted to almost 0.9 percent of the nation's GDP (World Health Organization 2010). A smoker with average per capita income in Russia would have to spend 3.2 percent of their income to purchase 10 pieces of the most popular cigarettes to smoke daily each year (Drope et al. 2018).

Harm to the Environment

Cigarette butts are the most commonly discarded pieces of waste worldwide. It is estimated that 130,882 tons of butts and packs end up as toxic waste in the Russia each year (Drope et al. 2018).

Damage to the National Economy

Tobacco use generates significant healthcare costs as a result of tobacco-related illnesses. The treatment of cardiovascular and respiratory diseases primarily associated with tobacco consumption represent about 34 percent of all healthcare expenditures in Russia (Gerasimenko et al. 2007). Lunze and Migliorini (2013) estimate that cardiovascular

and respiratory diseases alone have cost Russia's health system 125 billion rubles (US$4.2 billion). Smoking causes substantial ill health, thus reducing the quality of life and productivity. One study calculated the productivity loss to tobacco use in 1999 as US$4.44 billion (Ross et al. 2008). Using a different methodology, another study estimated the smoking-attributable productivity loss to be US$364 million in 2000 (Maslennikova et al. 2004). In 2005, the costs of productivity losses due to tobacco-related premature deaths were estimated to be US$24.7 billion annually, more than 3 percent of Russia's GDP (Ross et al. 2008). According to the Tobacco Atlas, the economic cost of smoking in Russia amounts to US$41.4 billion. This includes direct costs related to healthcare expenditures and indirect costs related to lost productivity due to early mortality and morbidity (Drope et al. 2018). In sum, although different methodologies produce different results, the economic costs of smoking are very high, whether in absolute terms or as a share of Russia's GDP.

Tobacco Tax Reform and Tobacco Tax Structure

Cigarette taxation in Russia has had many revisions since the collapse of the Soviet Union. At the beginning of the 2000s, tobacco excise taxes were extremely low, and in 2003 a mixed excise duty was introduced, with both a specific and an ad valorem component. As a result of the 2003 tax reform, cigarette excise taxes increased by about 230 percent for high-priced premium cigarette brands (such as Marlboro) and by about 146 percent for mid-priced cigarette brands (based on Economist Intelligence Unit prices). The excise tax system redesigned in 2007 resulted in an excise tax system with a maximum retail price and a minimum federal-level excise tax (table 2). It had, until 2010, two tiers, with taxes on filtered cigarettes far higher than those on unfiltered cigarettes, so providing an incentive for downward substitution.

Russia adopted the World Health Organization's Framework Convention on Tobacco Control (WHO FCTC) in 2008, and tobacco control policies have been prioritized ever since. In 2010, the Russian government introduced the "National strategy on creation of a public policy to combat tobacco consumption for the period of 2010–2015." This was followed by the adoption of national tobacco control legislation in 2013. Federal Law No.15 "On protecting the health of citizens from the effects of second-hand tobacco smoke and the consequences of tobacco consumption" became one of the most comprehensive laws globally. Among other crucial measures, the law underlined price and tax measures aimed at reducing demand for tobacco by increasing tobacco taxes.

In line with WHO FCTC Article 6, Russia has raised tobacco taxes regularly since 2010, annually increasing the average excise burden by at least 30 percent. In 2011 it equalized the specific excise tax and minimum total tax per stick between filtered and non-filtered cigarettes. The continued increase in taxes, alongside other tobacco control measures

from the country's comprehensive tobacco control law, greatly reduced tobacco sales in the country, boosted tobacco excise revenue and resulted in a number of other significant benefits (table 2, figure 2).

Nominal prices increased by 313 percent, from 29.1 rubles per pack in 2010 to 120.1 rubles per pack in 2017. Real prices, deflated by the Consumer Purchasing Price (CPI), increased by 145.5 percent, from 29.1 rubles per pack to 71.4 rubles per pack (based on 2010 prices) during this period. In 2011, the specific excise tax rate rose significantly, tripling for unfiltered cigarettes and equalizing between filtered and unfiltered cigarettes. It then increased from 175 rubles per 1,000 cigarettes in 2010 to 1,562 rubles in 2017 (an increase of 431 percent in real terms) (table 2).

Table 2 : Excise tax rates on filtered and non-filtered cigarettes, 2002–2017

	FILTERED CIGARETTES (PER 1,000 PIECES)	NON-FILTERED CIGARETTES (PER 1,000 PIECES)
2002	39.2 rubles	11.2 rubles
2003	50 rubles + 5% wholesale price	19 rubles + 5% wholesale price
2004	60 rubles + 5% wholesale price w/o excise & VAT	23 rubles + 5% wholesale price w/o excise & VAT
2005	65 rubles + 8% wholesale price w/o excise & VAT	28 rubles + 8% wholesale price w/o excise & VAT
2006	78 rubles + 8% wholesale price w/o excise & VAT	35 rubles + 8% wholesale price w/o excise & VAT
2007	100 rubles + 5% max retail price (not <115 rubles)	45 rubles + 5% max retail price (not <60 rubles)
2008	120 rubles + 5.5% max retail price (not <142 rubles)	55 rubles + 5.5% max retail price (not <72 rubles)
2009	145 rubles + 6% max retail price (not <172 rubles)	70 rubles + 6% max retail price (not <90 rubles)
2010	175 rubles + 6.5% max retail price (not <210 rubles)	90 rubles + 6.5% max retail price (not <115 rubles)
2011	280 rubles + 7% max retail price (not <360 rubles)	280 rubles + 7% max retail price (not <360 rubles)
2012	360 rubles + 7.5% max retail price (not <460 rubles)	360 rubles + 7.5% max retail price (not <460 rubles)
2013	550 rubles + 8% max retail price (not <730 rubles)	550 rubles + 8% max retail price (not <730 rubles)
2014	800 rubles + 8.5% max retail price (not <1,040 rubles)	800 rubles + 8.5% max retail price (not <1,040 rubles)
2015	960 rubles + 11 % max retail price (not <1,250 rubles)	960 rubles + 11 % max retail price (not <1,250 rubles)
2016	1,250 rubles + 12% max retail price (not <1,680 rubles)	1,250 rubles + 12% max retail price (not <1,680 rubles)
2017	1,562 rubles + 14.5% max retail price (not <2,123 rubles)	1,562 rubles + 14.5% max retail price (not <2,123 rubles)

Sources: Summarized by authors based on excise tax code of the Russian Federation.
Note: Values at the beginning of the year. The tax was increased twice in 2012.

The unified ad valorem excise tax on both filtered and unfiltered cigarettes increased from 6.5 percent to 14.5 percent of the maximum retail price from 2010–2017 (table 2), as a result of which the average excise per pack of 20 cigarettes increased from 6 rubles to 48.7 rubles (figure 2). Total tax (including VAT) increased from 10.4 rubles per pack to 67 rubles per pack, an increase of 544 percent in nominal terms and 283 percent in real terms. Taking account of the increase in tax as a percentage of retail price, total taxes on filtered cigarettes increased by 20 percentage points, from 35.7 percent of the average retail price in 2010 to 55.8 percent in 2017, which is still far below the WHO recommendation of 75 percent.

The share of excise tax in the retail price has grown significantly since 2010, by 2017 reaching 40.5 percent. This is still substantially below the WHO-recommended level of 70 percent for excise taxes,[1] which suggests that excise tax in Russia remains low, with substantial room for further increases despite significant tightening undertaken in recent decades (figure 2).

Russia's Cigarette Market

Tobacco has been popular in Russia for more than 300 years. Today, international tobacco companies dominate Russia's cigarette market, and hold about 90 percent of market share. In 2016, Japan Tobacco Incorporated held 33.5 percent of the market share by volume, followed by Philip Morris International (27 percent), British American Tobacco (21 percent) and Imperial Tobacco Group (8 percent). More than 278 billion cigarettes were sold in Russia in 2016 (Euromonitor International 2017).

Total cigarette sales saw a steady rise between 2002 and 2008, and a downward trend from 2008 to 2017 (figure 3), decreasing by almost 19.6 percent between 2013 and 2016. This corresponded with a decrease in smoking prevalence from 31 percent to 28 percent.

Economic Fluctuation and Impact on Household Income

Russia has experienced dramatic economic fluctuation in the past two decades, from the prosperity of the 2000s to the onset of recession in 2009 (figure 4). Particular aspects of this fluctuation have increased the uncertainty of household income and influenced the affordability of cigarettes overall and also on different income groups, including:

- the country's high level of social inequality. Russia's middle-class accounts for 40 percent of the population and spends less than half of its income on necessities,

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[1] See *http://www.who.int/tobacco/economics/taxation/en/index1.html*.

Figure 2: Price, tax and tax incidence in average price of a pack of cigarettes, 2010–2017
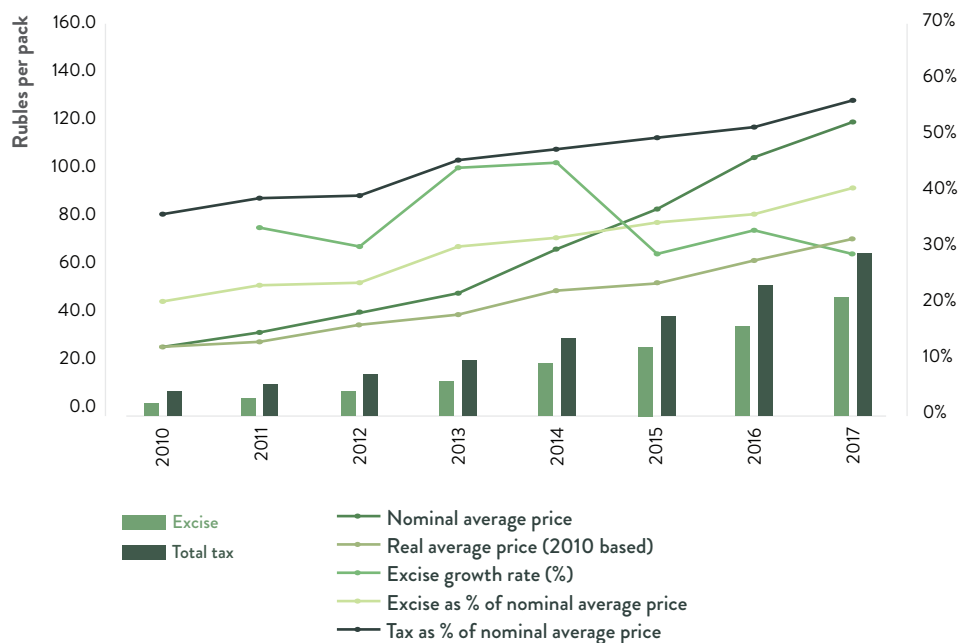
	2010	2011	2012	2013	2014	2015	2016	2017
Excise	6.0	8.0	10.4	15.0	21.8	28.3	37.6	48.7
Total tax	10.4	13.2	17.0	22.6	32.2	40.9	53.6	67.0
Nominal average price	29.1	33.9	43.1	49.9	68.2	82.8	104.7	120.1
Real average price (2010 based)	29.1	31.3	37.8	41.0	52.0	54.6	64.6	71.4
Excise growth rate (%)		33.3%	30.0%	44.2%	45.3%	29.8%	32.9%	29.5%
Excise as a % of nominal average price	20.6%	23.6%	24.1%	30.1%	32.0%	34.2%	35.9%	40.5%
Tax as a % of nominal average price	35.7%	38.9%	39.4%	45.3%	47.2%	49.4%	51.2%	55.8%

Source: Excise and total tax were calculated by the authors according to the tax rate listed in table 2. Price data is listed in Appendix 1. Growth rate and tax as a percentage of retail price were calculated by the authors.

Figure 3: Retail sales of cigarettes by brand type, 2002–2017
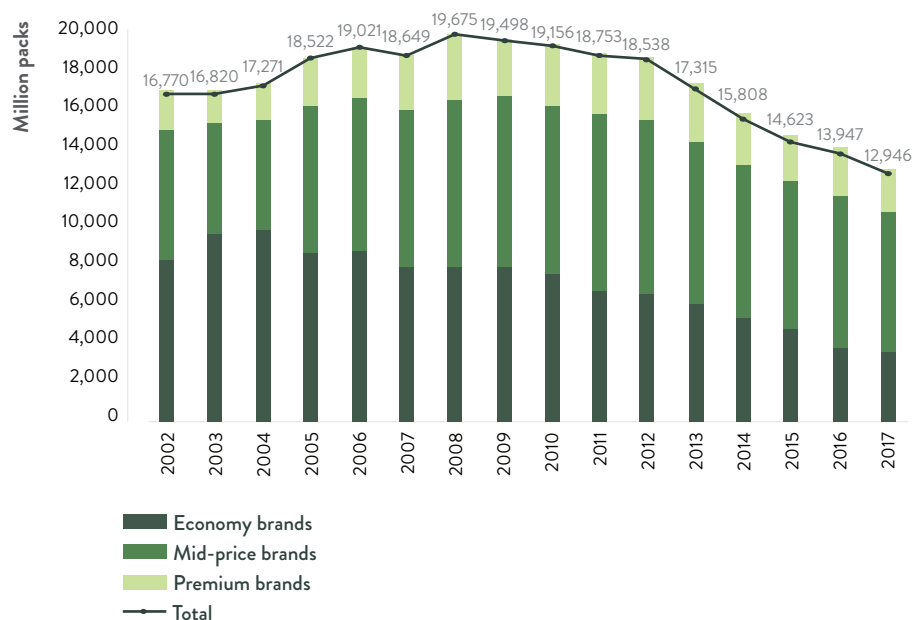
Source: Euromonitor International (2017).

is able to accumulate savings, and can make consumer choices, including private education, healthcare, cultural activities and private pension services. The remaining 60 percent of households are essentially deprived of these choices (Akindinova et al. 2016);

- the high level of inflation and the devaluation of the Russian ruble that have eroded savings and hindered investments;

- the drop in oil prices and sanctions imposed by the West after 2009 that have put the nation into an economic tailspin.

Figure 4: Nominal GDP growth rate 2002–2017

Source: World Bank, *https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=RU&view=chart.*

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MEASURING AFFORDABILITY

Affordability refers to an individual's purchasing power with regard to a particular product. Various methodologies have been developed in recent decades to define cigarette affordability as a function of cigarette price and individuals' income levels, with reference to the quantity or share of resources required to buy a pack of cigarettes. Existing literature suggest two measures of affordability using narrow and broad income measures.

A **broad measure** of income is per capita GDP, which takes into consideration the values of non-money income such as the provision of public goods and services (Blecher 2010). Based on the broad measure of income, Blecher and van Walbeek (2004) developed the Relative Income Price (RIP) as the measurement indicator of cigarette affordability. RIP calculates the percentage of per capita GDP required to buy 100 packs of cigarettes. In this study, Russia was ranked as having the second highest level of cigarette affordability of 18 lower-middle-income countries studied during the period 1999 to 2001. Since then, Blecher's RIP method has been widely used to measure cigarette affordability.

Blecher and van Walbeek (2008) investigated the RIP for each year in the period 1990–2006 for countries with available data. The results in this study show that cigarettes have become three times more affordable during this period in Russia. More recently, Blecher et al (2013) analysed trends in the affordability of cigarettes in Europe between 2004 and 2010, and of the 37 European countries studied, Russia has experienced the largest increase in cigarette affordability.

Based on the **narrow measure** of income, such as money income or wages, Guindon et al. (2002) used the earnings of 12 occupations, assessed via a survey of earnings by the Union Bank of Switzerland (UBS), to calculate the average number of working minutes required to purchase a pack of local brand or Marlboro (or equivalent) cigarettes. As one of the observed cities in the study, smokers in Moscow in 2000 needed to work for 71.3 minutes to buy a pack of Marlboro, or 42.8 minutes to buy a pack of local brand cigarettes. Using the UBS earnings data, and considering seven (out of 14) occupations with the lowest earnings, Kan (2007) investigated cigarette affordability by measuring cigarette prices as a proportion of daily income in 60 cities in 2006. Moscow was listed as the 15th highest affordable city among the 60 cities studied (most of the cities ranked above Russia were in high-income countries such as the United States, Switzerland and Spain). All the above cross-country studies defined the price as the retail price of a specific brand such as the most-sold local brand. Kostova et al (2014) points out that a comparison of the retail price of a single brand fails to account for the variability of cigarette prices within a number of countries. Kostova's study derived the average price smokers paid per 20 cigarettes from

the GATS, using the RIP method. The results of this study showed that Russia was the only country (out of 15) where RIP was below 1 percent according to GATS data available in 2009, which means Russia was the country that had the most affordable cigarettes.

All these studies included Russia as one of the nations observed in cross-country analyses of cigarette affordability, and all study results concluded that:

- cigarettes in Russia became more and more affordable during the 1990s; and 2000s;
- Russia has highly affordable cigarettes by international comparison.

So far there are few studies exclusively focusing on cigarette affordability within Russia, particularly looking at the period immediately before and after Russia adopted the WHO FCTC. This study examines cigarette affordability in Russia during the period 2002–2017, focusing on overall average cigarette affordability. It also looks at the different price categories consumed by different income groups, and analyses the factors driving affordability. These factors are helpful in understanding the successes and shortfalls of tobacco control policies in Russia, in particular the tobacco taxation policy applied after Russia adopted the WHO FCTC in 2008.

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METHODOLOGY

Defining Cigarette Affordability

Among all methods applied in previous studies, the RIP method (which defines cigarette affordability as the percentage of per capita GDP required to buy 100 packs of cigarettes) has been widely used. Its advantages over other methods include:

- Per capita GDP is a good indicator of living standard and income.
- GDP data are commonly available, which makes it easier to calculate cigarette affordability (Blecher and van Walbeek 2004). Every country calculates per capita GDP annually using a consistent methodology, thus enabling global comparison of tobacco affordability at country level.
- WHO has adopted the RIP method, calculating cigarette affordability for all countries with available data. This makes it possible for our study to identify current cigarette affordability in Russia compared to other countries.

In terms of looking into cigarette affordability in Russia and across different income groups, this report adopts per capita disposable income (i.e. per capita income after taxes) as the measure of income instead of the traditional per capita GDP.

In Russia, the average household net-adjusted disposable per capita income is estimated at US$16,657 per year, lower than the OECD average of US$30,563 per year. There is a considerable gap between the richest and poorest – the top 20 percent of the population earn almost eight times as much as the bottom 20 percent.[2] The Gini coefficient of disposable household income is 0.376 in Russia, higher than the OECD average, which reached 0.318 in 2014.[3]

The large disparities in income distribution in Russia mean that the use of average income as an indicator may fail to identify the affordability distribution across different income groups. In addition, the smoking behavior of various income groups varies – smoking prevalence is usually higher among lower income groups than among higher income groups. Therefore, we further investigate the cigarette affordability across high-, middle- and low-income groups respectively in order to examine the differential impact of cigarette tax increases on different price categories consumed by different income groups.

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[2] See *http://www.oecdbetterlifeindex.org/countries/russian-federation/.*
[3] See *http://www.oecd.org/social/income-distribution-database.htm.*

RIP Equation

The RIP method defines cigarette affordability as the percentage of per capita disposable income[4] required to buy 100 packs of cigarettes. Equation (1) demonstrates the RIP rationale.

$$RIP = \frac{100 \times P}{\text{Disposable Income}_{\text{per capita}}} \qquad (1)$$

where RIP represents the relative income price of cigarettes, P is the retail price of a pack of cigarettes with 20 individual pieces. The RIP measures the level of cigarette affordability – the higher the RIP, the less affordable cigarettes are, and vice versa.

This report also makes use of the income purchasing capacity (IPC) developed by Zheng et al (2017), which measures how many packs of cigarettes could be purchased with the per capita disposable income in a given setting. Unlike the RIP, the higher the IPC the more affordable cigarettes are, and vice versa. Equation (2) demonstrates the IPC rationale and shows that the IPC is essentially the inverse of the RIP (but not multiplied by 100 – a constant that in any event drops out when comparing years or countries):

$$IPC = \frac{\text{Disposable Income}_{\text{per capita}}}{P} \qquad (2)$$

where IPC represents the income purchasing capacity for cigarettes, and P is the retail price of a pack of cigarettes with 20 individual pieces.

For better evaluating the trend of cigarette affordability across a long period, we adopt the Cigarette Affordability Index (CAI) method which measures the changing magnitude of cigarette affordability compared with the base year.

Equation (3) demonstrates the rationale of CAI method:

$$CAI_t = \frac{RIP_{2002}}{RIP_t}, \qquad \text{where } t \ = \ 2002, 2003 \dots 2017 \qquad (3)$$

Equation (4) demonstrates the CAI rationale of the IPC method. In other words, the CAI is an index of the IPC, with the base year set at 2002:

$$CAI_t = \frac{IPC_t}{IPC_{2002}}, \quad \text{where } t \ = \ 2002, 2003 \dots 2017 \qquad (4)$$

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[4] In this report the traditional per capita GDP method is used only in the global ranking comparison.

Price Data

Two sets of cigarette price data were adopted for this report. One set is overall average retail price 2002–2017 (estimated based on Euromonitor data of retail sales in rubles, per million sticks). The other set is retail prices by price category 2010–2017: specifically, the average price of Kent is selected to represent the premium category,[5] while the market retail price of Winston Blue is selected to represent the mid-price category.[6] The average price of a domestic brand sourced from Rosstat is used to represent the economy-price category.[7]

Income Data

Analysing cigarette affordability in each price category requires estimating average income in high-, middle- and low-income groups respectively. High- and low-income groups were defined as the first and the fifth quintiles of income distribution, while the middle-income group includes the second, third and fourth quintiles. To estimate average income of these groups, Rosstat data on average disposable income were used, alongside available income distribution data.[8]

[5] See *https://service.nalog.ru/tabak.do*.
[6] See *https://service.nalog.ru/tabak.do*.
[7] See *http://www.gks.ru/dbscripts/cbsd/dbinet.cgi*.
[8] See *https://fedstat.ru/indicator/31399*; *http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/population/level/*#

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RESULTS

Affordability: Levels, Trends, Magnitude of Change and Growth Rate

Using disposable per capita income and average retail prices, cigarette affordability indexes for 2002–2017 were derived by measuring RIP, CAI and IPC with the following aims: (a) to estimate the levels of cigarette affordability in each year; (b) to present trends in cigarette affordability during the period; (c) to calculate the magnitude of cigarette affordability change; and (d) to examine annual growth rates, as well as the fixed-base growth rates of cigarette affordability over the period.

Figure 5 presents cigarette affordability as measured by the CAI for the period 2002–2017. Average cigarette affordability showed two trends during the study period: it rose from 2002 to 2008, and fell between 2009 and 2017. The lowest cigarette affordability level was 2017, when cigarettes were 0.38 times less affordable than 2008 – the peak of cigarette affordability during the whole period studied.

Figure 5: Cigarette affordability and consumption, 2002–2017
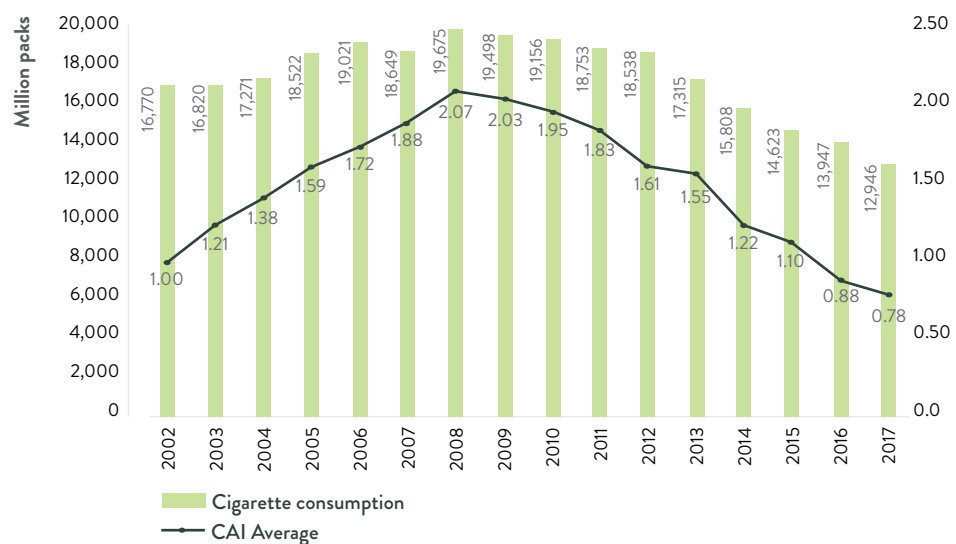
Source: Cigarette sales volume data is sourced from Euromonitor International; CAI average is calculated by the authors.

Relating Affordability and Consumption

Cigarette affordability has a positive correlation with cigarette consumption in Russia. As shown in figure 5, cigarette affordability more than doubled between 2002 and 2008,

and cigarette consumption also rose (except for a brief fall in 2007). Falling cigarette affordability in the period 2009–2017 is associated with declining consumption.

Over the whole observed period 2002–2017, cigarette affordability decreased by 21.66 percent along with the decrease of cigarette consumption by 22.81 percent from 16,770 million packs in 2002 to 12,946 million packs in 2017. However, comparing peak affordability in 2008 and lowest affordability in 2017 shows a 62.24 percent drop, with consumption correspondingly decreasing by 34.20 percent. In per capita terms, the decline in consumption – made up of decreases both in prevalence and packs per adult (ages 15 and older) – is even sharper, falling by 21.75 percent between 2002 and 2017 (32.70 percent between 2008 and 2017).

Impact of Changes in Price and Income

Cigarette affordability depends on two dynamic factors – price and income. Cigarettes become more affordable when prices rise less than income, and become less affordable when price rises outstrip rises in income.

Figure 6-A compares affordability trends between 2001 and 2017 by examining annual rises in income and prices. It shows that the average cigarette price rose during the whole period – with a gentle rise up to 2008 and a more rapid rise after 2008 due to the accelerated excise increase after Russia adopted the WHO FCTC. Figure 6-B also shows how cigarette affordability rose when the annual growth rate of income outpaced the annual growth rate of price (the case during 2002–2008), and fell during the period 2008–2017.

Figure 6: Price, excise and income growth and cigarette affordability 2002-2017
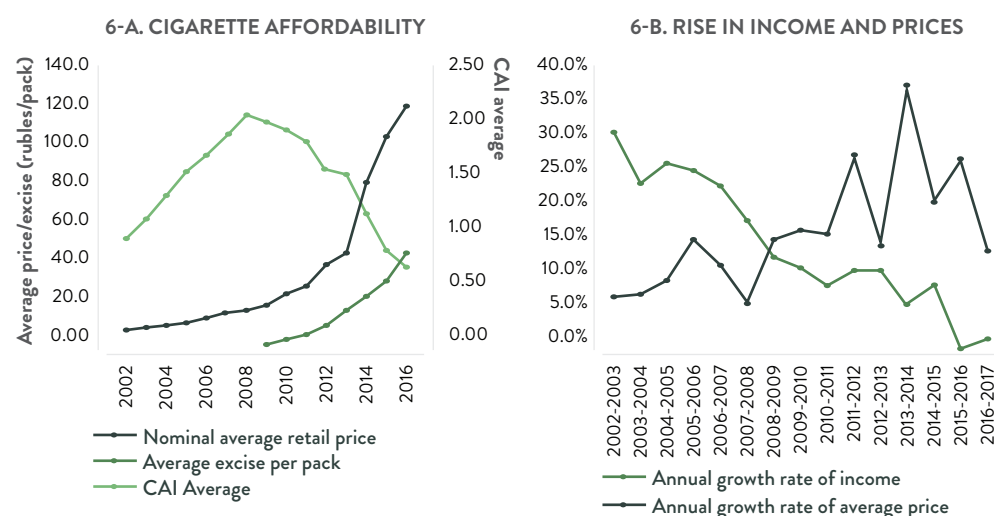
Relating Affordability and Economic Growth

As demonstrated in figure 7, cigarette affordability was 21.66 percent lower in 2017 than it was in 2002. Between those two dates affordability rose and fell – increasing most sharply in 2003 (by 21.01 percent) and decreasing most sharply (by 21.56 percent) in 2014.

Figure 7: Annual and cumulative growth rate of cigarette affordability 2002–2017 (including a summary of negative growth 2008–2017)

Source: Calculated by the authors.

Growing cigarette affordability in the period 2002–2008 was mainly the result of the country's strong economic performance, which led nominal disposable income to outstrip the excise-tax driven increase of average cigarette prices. As a result, cigarette affordability climbed steadily during this period (see figure 6 and figure 8).

After a decade of high growth, the Russian economy eventually slowed in the wake of the global financial crisis in 2008. Since 2009, with the deepened global recession, Russia has experienced larger-than-expected losses in output and employment, and a sharp rise in poverty. Russia's nominal GDP in 2009 contracted by about 7.8 percent (The World Bank in the Russian Federation 2009a) . Although nominal disposable income did not contract as much as GDP, its growth rate for the first time fell behind that of nominal cigarette prices (see figure 6).

The Russian economy, helped by higher oil prices and stronger global demand, began to grow slowly in 2010, but downside risks associated with weak domestic demand and remaining structural constraints remained (World Bank in the Russian Federation 2009b). Russia's economy has not returned to its pre-recession size, meaning that the rise in nominal disposable income has fallen behind the tax-induced nominal cigarette price rises. As a result, cigarette affordability has steadily fallen during the period 2008–2017, making 2008 the peak and turning point for cigarette affordability during the period 2002–2017 (figure 8).

Figure 8: Cigarette price, tax, affordability and income, 2002–2017
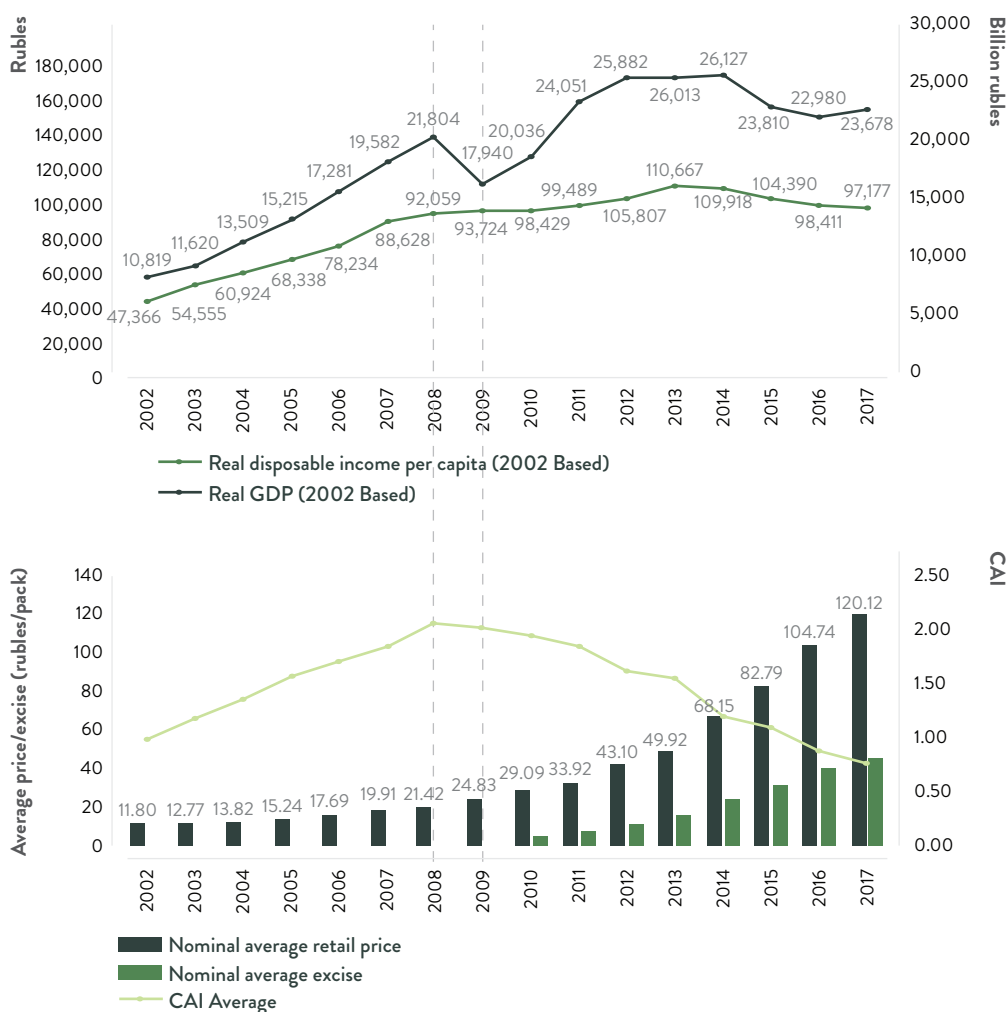
Source: Both GDP and population data are sourced from World Bank. Real disposable income per capita calculated by the authors. Data at *https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=RU&view=chart*.

Cigarette Affordability of Price Sub-Categories 2010–2017

In general, the prevalence of tobacco use is higher among low-income groups than middle- and high-income groups (IARC 2011). Previous studies have demonstrated that different income groups respond differently to price-related measures. Usually, lower-income groups are more price responsive than higher-income groups – a trend seen in high-income countries such as the United States (Hersch 2000) and lower-middle-income countries such as Indonesia (Adioetomo et al. 2005). When the smoking prevalence rate is declining, smoking is typically observed more in the lower socioeconomic sector of the population (Graham 1996; Lopez et al. 1994; Pierce et al. 1989).

In Russia, tax hikes on tobacco since 2010 have made cigarette prices increase significantly for all price categories. Specifically, from 2010 to 2017 the retail price of economy cigarettes increased the most, by 4.5 times; premium category cigarettes increased the least, by 2.9 times; and mid-price category cigarettes increased by 3.4 times. The overall average price of all brands increased by 4.1 times during this period (figure 9). However, the impact of tax and price increases on the affordability of different price categories – and therefore on consumption within each category – remains unknown.

Figure 9: Nominal retail price per pack (20 sticks) by brand types and on average, 2010–2017
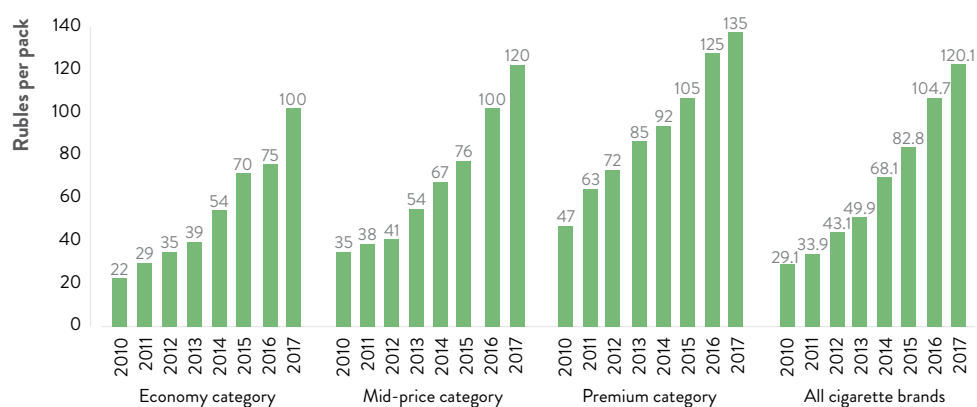
Source: Based on Appendix 1 and Appendix 2.

The analysis of the affordability of price sub-categories is based on a few assumptions:

- Economy, mid-price and premium brands are consumed to a very large extent by low, middle- and high-income groups respectively, measured by per capita disposable income.

- The low-income group accounts for the lowest quintile of per capita disposable income, the high-income group accounts for the highest quintile of per capita disposable income, and the middle-income group accounts for the three middle quintiles of per capita disposable income.

- The economy brands consumed by low-income groups accounted for 28–40 percent of consumption during the period 2010–2017 as a result of the higher smoking prevalence of low-income groups.
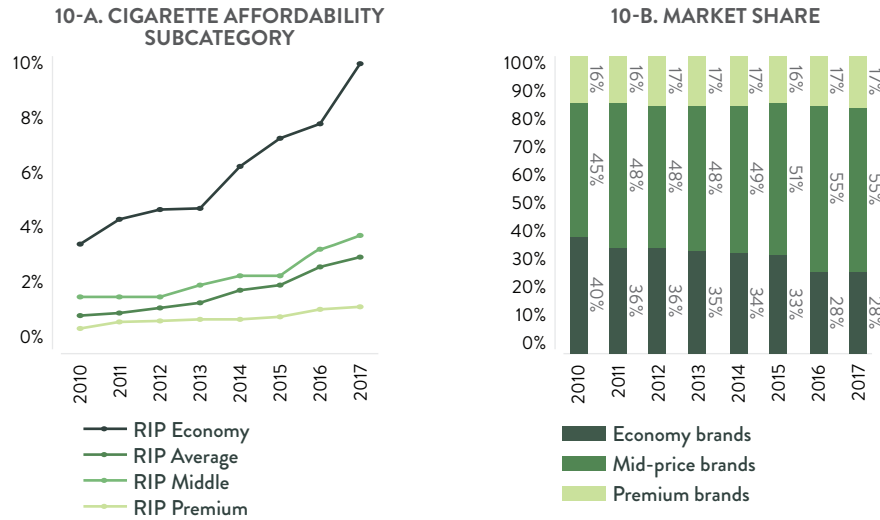
Cigarette affordability by cigarette subcategory and by corresponding sub-groups (2010–2017) is presented in figure 10, and Appendix 2. The main findings include:

- Cigarette affordability of all three categories has declined since 2010.

- Economy brands are the least affordable category; mid-price brands hold the middle level of affordability; and premium brands maintain the most affordable position in each year during the whole period. For example, in 2017, low-income smokers spent 9.81 percent of their per capita disposable income to buy 100 packs of economy cigarettes, while high-income smokers spent only 1.53 percent of their per capita disposable incomes for 100 packs of premium brands. Meanwhile, middle-income smokers spent 3.99 percent of their per capita disposable income for 100 packs of mid-priced cigarettes.

- From 2010 to 2017, affordability of economy cigarettes fell the most (62 percent), while the affordability of mid-price cigarettes fell by 51 percent, and premium cigarettes fell (the least) by 43 percent (figure 11).

- The differing levels of falling affordability among the three sub-categories reshaped the market share. As figure 10 shows, the market share of economy brands shrank dramatically, from 40 percent in 2010 to 28 percent in 2017; mid-price brands and premium brands, whose affordability also reduced but to lesser degrees, expanded their market share by 10 percent and 1 percent respectively.

- Utilizing tax and price policy to combat tobacco use is based on price elasticity theory and income elasticity theory: affordability, therefore, reflects the dynamic equilibrium of price elasticity and income elasticity. As shown in figure 12, the more affordability fell, the more consumption also fell. During the period 2010–2017, falling affordability in the economy category led to consumption decreasing by 53 percent (the most among all categories); while consumption in the mid-price and premium categories declined by 16 percent and 26 percent respectively.

Figure 10: Cigarette affordability and market share by sub-category, 2010–2017

10-A. CIGARETTE AFFORDABILITY SUBCATEGORY

10-B. MARKET SHARE

Legend for 10-A:
- RIP Economy
- RIP Average
- RIP Middle
- RIP Premium

Legend for 10-B:
- Economy brands
- Mid-price brands
- Premium brands

Source: Market share was sourced from Euromonitor International 2017. RIP for sub-categories was calculated by the authors.

Figure 11: Annual and cumulative cigarette affordability growth rate by subcategory, 2010–2017
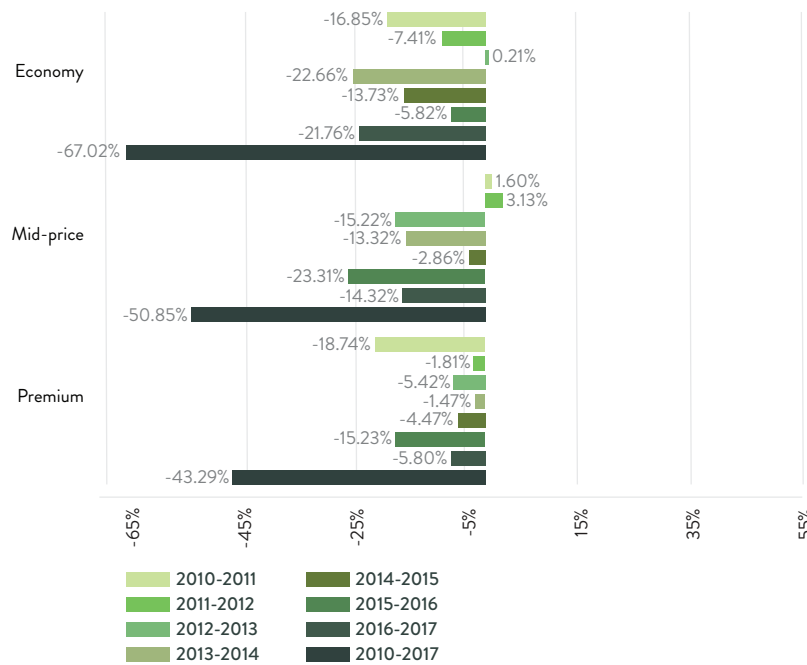
Economy
- -16.85%
- -7.41%
- 0.21%
- -22.66%
- -13.73%
- -5.82%
- -21.76%
- -67.02%

Mid-price
- 1.60%
- 3.13%
- -15.22%
- -13.32%
- -2.86%
- -23.31%
- -14.32%
- -50.85%

Premium
- -18.74%
- -1.81%
- -5.42%
- -1.47%
- -4.47%
- -15.23%
- -5.80%
- -43.29%

Legend:
- 2010-2011
- 2011-2012
- 2012-2013
- 2013-2014
- 2014-2015
- 2015-2016
- 2016-2017
- 2010-2017
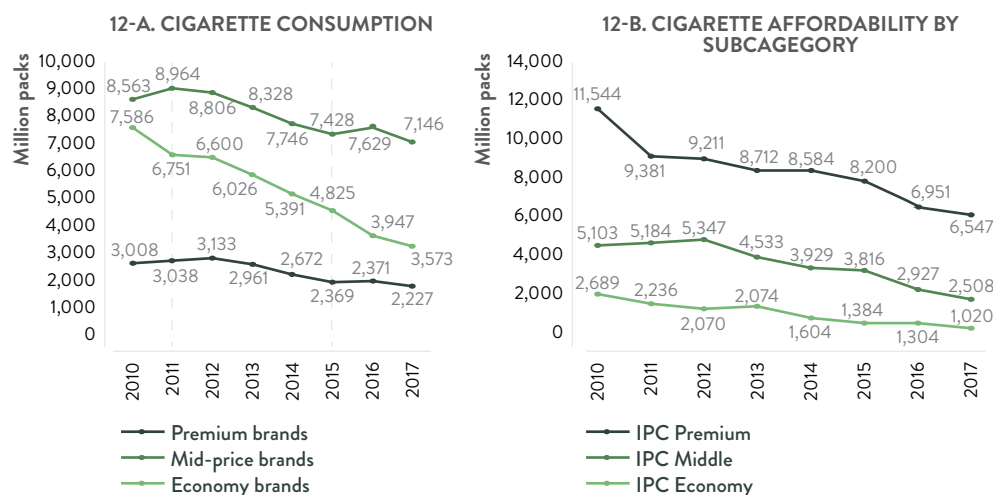
Source: Market share was sourced from Euromonitor International 2017. RIP for sub-categories was calculated by the authors.

Figure 12: Cigarette consumption and affordability by subcategory, 2010–2017

12-A. CIGARETTE CONSUMPTION

Million packs

	2010	2011	2012	2013	2014	2015	2016	2017
Mid-price brands	8,563	8,964	8,806	8,328	7,746	7,428	7,629	7,146
Economy brands	7,586	6,751	6,600	6,026	5,391	4,825	3,947	3,573
Premium brands	3,008	3,038	3,133	2,961	2,672	2,369	2,371	2,227

12-B. CIGARETTE AFFORDABILITY BY SUBCAGEGORY

Million packs

	2010	2011	2012	2013	2014	2015	2016	2017
IPC Premium	11,544	9,381	9,211	8,712	8,584	8,200	6,951	6,547
IPC Middle	5,103	5,184	5,347	4,533	3,929	3,816	2,927	2,508
IPC Economy	2,689	2,236	2,070	2,074	1,604	1,384	1,304	1,020

— Premium brands
— Mid-price brands
— Economy brands

— IPC Premium
— IPC Middle
— IPC Economy

Source: Consumption data was sourced from Euromonitor International 2017. IPC for subcategories was calculated by the authors.

Russia is the Most Affordable Country for Cigarettes since 2006

Previous studies (Blecher and van Walbeek 2008; Kostova et al. 2014) have compared the level of cigarette affordability of a number of countries (low- and middle-income countries with high smoking prevalence) including Russia, and concluded that cigarettes were most affordable in Russia in 2006 and 2009. To understand whether Russia's regular tax and price increases since 2010 have altered the country's top position for cigarette affordability, this report ranks the level of cigarette affordability of the 14 countries observed in previous studies for the years 2008 and 2016. Table 3 presents the global ranking of cigarette affordability in 2006, 2008, 2009 and 2016, and reveals that Russia has been the most affordable country for cigarettes during each of the four years. In other words, Russia has maintained the highest level of cigarette affordability of all 15 countries studied since 2006.

Main Findings

1. From 2002 to 2017, cigarette nominal average prices followed a rising trend, increasing by 917.9 percent, from 11.8 rubles to 120.1 rubles per pack. However, cigarette affordability presents two stages during this period: an ascending trend between 2002 and 2008, and a descending trend between 2008 and 2017. The most affordable year for Russian smokers was 2008, when cigarettes were 2.07 times more affordable than in 2002. By contrast, 2017 was the least affordable year, when cigarettes were 22 percent less affordable than in 2002 and 62 percent less afford-able than 2008.

Table 3: Global comparison of cigarette affordability rankings

COUNTRY AFFORDABILITY RANKING FROM BLECHER AND VAN WALBEEK[a]	COUNTRY AFFORDABILITY RANKING FROM AUTHORS[b]	COUNTRY AFFORDABILITY RANKING FROM KOSTOVA ET AL[c]	COUNTRY AFFORDABILITY RANKING FROM AUTHORS[b]
2006	2008	2009	2016
MOST AFFORDABLE (LOWEST RIP)			
Russia	Russia	Russia	Russia
Mexico	Ukraine	Brazil	China
Poland	Philippines	China	Brazil
Romania	Brazil	Philippines	Uruguay
Brazil	Poland	Ukraine	Ukraine
Uruguay	China	Turkey	Philippines
Philippines	Turkey	Egypt	Mexico
Thailand	Egypt	Poland	Poland
Turkey	Uruguay	Vietnam	Egypt
Indonesia	Mexico	Mexico	Indonesia
China	Romania	Uruguay	Vietnam
Vietnam	Thailand	Romania	Thailand
Egypt	Indonesia	Thailand	Turkey
India	Bangladesh	Indonesia	Romania
Bangladesh	Vietnam	Bangladesh	Bangladesh
	India	India	India
LEAST AFFORDABLE (HIGHEST RIP)			

Notes: [a] Ranking based on RIP which is the retail price of 100 packs of the most-sold brand as a percentage of GDP per capita for year 2006, as reported in Blecher and van Walbeek (2008).

[b] Ranking based on RIP as the retail price of 100 packs of the most-sold brand as a percentage of GDP per capita for year 2008 and 2016 respectively. The RIP of Russia was calculated by the authors, and the RIP of other countries was sourced from the appendix of WHO (2017).[10]

[c] Ranking based on RIP calculated as the Global Adult Tobacco Survey-derived median price paid for 2,000 cigarettes, relative to per capita GDP in PPP-adjusted constant dollars, as reported in Kostova et al (2014).

The RIP for China in 2006, 2008, 2009 and 2016 was sourced from the study of cigarette affordability in China conducted by Zheng et al (2017). The RIP for Indonesia in 2006, 2008, 2009 and 2016 was sourced from the study of cigarette affordability in Indonesia conducted by Zheng et al (2018).

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[10] Available at *http://www.who.int/tobacco/global_report/2017/appendix-ix/en/.*

2. A positive correlation is perceived between cigarette affordability and cigarette consumption in Russia. From 2002 to 2008, cigarette consumption increased by 17 percent along with 107 percent of affordability increase; from 2008 to 2017, cigarette consumption decreased by 34 percent, with a 62 percent of affordability decrease.

3. From 2010 to 2017, economy cigarettes were the least affordable category, while mid-price cigarettes held the middle level of affordability, and premium cigarettes remained the most affordable category of cigarette in each year during this period. All three categories present descending affordability trends since 2010: affordability for economy cigarettes fell the most (by 62 percent), leading to a 53 percent consumption decrease; mid-price cigarette affordability fell by 51 percent, leading to a 17 percent decrease of consumption; and premium cigarette affordability fell the least (by 43 percent), leading to a 26 percent consumption decrease. As a result, the economy cigarettes' market share shrank dramatically, while mid-price brands and premium brands expanded their market shares.

4. From the perspective of global comparison, Russia has been ranked as the most affordable country among counterpart countries during the period 2006–2016. This indicates that despite striking progress since 2010 in reducing the affordability of cigarettes, Russia still has ample room to do more. Given the country's still-high smoking prevalence rates, and the huge preventable loss of life from smoking, raising tobacco taxes to substantially reduce cigarette affordability should be given high priority as a key part of Russia's overall tobacco control effort.

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DISCUSSION

The Specific Oriented Excise Structure is Favorable for Delivering Optimal Results

Russia applies a mixed cigarette excise tax structure with high reliance on specific tax (for example, in 2017, specific tax accounts for 65 percent of total excise), a minimal retail price setting, and a uniform specific tax applied for both filter and non-filter cigarettes. All these features are favorable to delivering optimal results.

The specific-oriented excise tax structure benefits for reducing the price gap between higher- and lower-priced products. In Russia for instance, the economy brand category had a lower affordability level than the middle and premium brand categories during each of the observation years between 2010 and 2017 because the lower-income group is far poorer than the middle and higher income groups. The affordability of the economy category also declined the most, by 62 percent, which led to consumption also decreasing the most among all brand categories (by 53 percent). This is, to a substantial extent, the result of the effect on sales prices of the highly desirable structural shift in tobacco taxes from ad valorem to uniform specific excises. This shift maximizes health benefits for three reasons: lower-income groups tend to smoke more and be more price responsive; importantly, young people, still with relatively low disposable incomes and not yet firmly addicted to tobacco, also are more price responsive; and uniform specific excises encourage higher- and middle-income smokers to stop or cut back rather than to swap to lower-price brands.

Macroeconomic Environment Helps Drive Cigarette Affordability in Russia

The Russian government raised excise tax on cigarettes annually during the observation period of 2002–2017, which led not only to average price rises but also sub-category price rises. With the consistent ascending price trend during the period 2002–2017, the affordability, however, presented two stages with opposite trends, which to a large extent were due to the difference in income growth during 2002–2008 and 2008–2017. In other words, the macroeconomic environment plays an important role in cigarette affordability trends in Russia. This is because:

- The Russian economy heavily relies on its energy sector exports. After the debt crisis in 1998, the devaluation of the Russian ruble, together with the uninterrupted upward trend that oil prices experienced in the period from 1999 to 2008, propelled

the Russian economy to grow at an annual average rate of 7 percent.[11] Tax increases did not provide a sufficient rise in retail prices, so rapid increases in nominal per capita disposable incomes resulted in an increase of cigarette affordability of 107.5 percent between 2002 and 2008.

- Russia was among the economies hardest-hit by the 2008-2009 global economic crisis: the economy plunged 7.8 percent in 2009 as oil prices plummeted and foreign credit dried up. The economic contraction was the sharpest since 1994, which directly resulted in the decreasing in cigarette affordability in 2009. Although no long-term damage was caused due to the government's proactive and timely response to ring-fence key sectors of the economy from the effects of the crisis, Russia's economy did not return to its pre-recession size. That, together with increases in tobacco taxes that accelerated from 2010, caused cigarette affordability after 2008 to follow a continuous descending trend.

Big Achievements, but Challenges Remain

Russia has accelerated implementing tobacco control measures, including raising tax and prices after adopting the WHO FCTC in 2008. From 2010 to 2017 the average excise tax increase in Russia was seven-fold. This increase helped to deliver the following results

- Real cigarette prices increased by 145 percent from 2010 to 2017, while real disposable per capita income increased by only 12 percent, making cigarettes much less affordable.

- Sales decreased from 383 billion cigarettes in 2010 to 259 billion cigarettes in 2017 – a decrease of 124 billion cigarettes, or 32 percent, and by 31 percent per capita.

- According to the Global Adult Tobacco Survey, tobacco use prevalence significantly decreased among Russian adults, falling from 39.1 percent in 2009 to 30.5 percent in 2016 (from 60.2 percent to 49.8 percent among males; from 21.7 percent to 14.5 percent among females). This represents a 22 percent relative decline in tobacco use prevalence for the period under review.

However, big challenges remain despite the achievements made. Smoking prevalence still is among the highest in the world and the average cigarette price is still very cheap – in 2017, the average price of a pack of 20 sticks was 120 rubles (US$1.8). Total tax, including VAT, amounts to only 55.8 percent of retail price, far below the 75 percent recommended by the WHO. Even after the recent tax increases, cigarette affordability remains at the highest level among the largest tobacco-using countries, as it has since 2006. The combination of very high prevalence and very high affordability, both in comparison with

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[10] See *https://www.focus-economics.com/countries/russia.*

other countries, suggests the importance of continuing rapid tobacco tax reform. This means continued and accelerated significant increases in specific tobacco excise taxes and tobacco prices at a rate well above current rises in disposable income. This, as a crucial element in Russia's overall effort at tobacco control, would result in: improved health and increased life expectancy, particularly for lower-income groups; and increased family incomes and national productivity.

REFERENCES

1. Adioetomo SM, Djutaharta T, Hendratno. 2005. *Cigarette Consumption, Taxation, and Household Income: Indonesia Case Study*. Washington, DC: World Bank.

2. Akindinova N, Kuzminov Y, Yasin E. 2016. "Russia's Economy: Before the Long Transition." *Russian Journal of Economics* 2(3).

3. Drope J, Schluger N, Cahn Z, Drope J, Hamill S, Islami F, Liber A, Nargis N, Stoklosa M. 2018. *The Tobacco Atlas*. Atlanta: American Cancer Society and Vital Strategies.

4. Blecher E. 2010. "Targeting the Affordability of Cigarettes: A New Benchmark for Taxation Policy in Low-Income and-Middle-Income Countries." *Tobacco Control* 19(4): 325–30.

5. Blecher E, Ross H, Leon ME. 2013. "Cigarette affordability in Europe." *Tobacco Control* 22(4): e6.

6. Blecher EH, van Walbeek CP. 2008. *An Analysis of Cigarette Affordability*. Paris: International Union Against Tuberculosis and Lung Disease.

7. Blecher EH, van Walbeek CP. 2004. An International Analysis of Cigarette Affordability. *Tobacco Control* 13(4): 339–46.

8. Euromonitor International. 2017. Cigarettes in Russia: Country Report. London: Euromonitor International.

9. Gerasimenko N, Demin A. 2001. *Tobacco Policy and Politics in Russia*. Moscow, Russia: Public Health Association.

10. Gerasimenko N, Zaridze D, Sakharova G, eds. 2007. Health and Tobacco: Facts and Figures. Washington, DC: Campaign for Tobacco-Free Kids.

11. Graham H. 1996. "Smoking Prevalence Among Women in the European Community 1950–1990." *Social Science & Medicine* 43(2): 243–54.

12. Guindon GE, Tobin S, Yach D. 2002. "Trends and Affordability of cigarette Prices: Ample Room for Tax Increases and Related Health Gains." *Tobacco Control* 11(1): 35–43.

13. Hersch J. 2000. "Gender, Income Levels, and the Demand for Cigarettes." *Journal of Risk and Uncertainty* 21: 263–82.

14. International Agency for Research on Cancer. 2011. "Effectiveness of Tax and Price Policies for Tobacco Control." WHO, Handbook of Cancer Prevention, 14. *http://www.iarc.fr/ en/publications/pdfs-online/prev/ handbook14/.*

15. Institute for Health Metrics and Evaluation (IHME). 2018. *Global Burden of Disease 2016*. Seattle, WA: University of Washington.

16. Jha P, Peto R. 2014. "Global Effects Of Smoking, of Quitting, and of Taxing Tobacco." *New England Journal of Medicine* 370(1): 60–8.

17. Kan M-y. 2007. Investigating Cigarette Affordability in 60 Cities Using the Cigarette Price-Daily Income Ratio. *Tobacco Control* 16: 429–32.

18. Kostova D, Chaloupka FJ, Yurekli A, et al. 2014. "A Cross-Country Study of Cigarette Prices and Affordability: Evidence from the Global Adult Tobacco Survey." *Tobacco Control* 23(1): e3.

19. Lillard D, Dorofeeva Z. 2015. *Smoking in Russia and Ukraine Before, During and After the Soviet Union. In Life-Course Smoking Behavior:* Oxford: Oxford University Press.

20. Lopez AD, Collishaw NE, Piha T. 1994. "A Descriptive Model of the Cigarette Epidemic in Developed Countries." *Tobacco Control* 3(3): 242.

21. Lunze K, Migliorini L. 2013. "Tobacco Control in the Russian Federation – A Policy Analysis." *BMC Public Health* 13: 64.

22. Maslennikova GI, Martynchik SA, Shalnova SA, et al. 2004. "Medical and socioeconomic losses caused by smoking in the male population of Russia." *Profilac Zabol Ukrep Zdor* 3: 5-9.

23. Maslennikova GY, Oganov RG. 2011. "Medical and Socioeconomic Damage Caused by Tobacco Smoking in the Russian Federation: Diseases of the Circulatory System." *Preventive Medicine* 3: 19-27.

24. Perlman F, Bobak M, Gilmore A, McKee M. 2007. Trends in the Prevalence of Smoking in Russia During the Transition to a Market Economy. *Tobacco Control* 16(5): 299–305.

25. Pierce JP, Fiore MC, Novotny TE, Hatziandreu EJ, Davis RM. 1989. "Trends in Cigarette Smoking in the United States: Educational Differences are Increasing." *Jama* 261(1): 56–60.

26. Quirmbach D, Gerry CJ. 2016. "Gender, Education and Russia's Tobacco Epidemic: A Life-Course Approach." *Social Science Medicine* 160: 54–66.

27. Ross HZ, Shariff S, Gilmore A. 2008. *Economics of Tobacco Taxation in Russia*. Paris: International Union Against Tuberculosis and Lung Disease.

28. Sakharova G, Antonov N, Salagay O. 2017. Tobacco Control: a comprehensive approach at country level in the Russian Federation. Denmark: World Health Organization Regional Office for Europe.

29. The World Bank in the Russian Federation. 2009a. Russian Economic Report No.19. Washington, DC: World Bank.

30. The World Bank in the Russian Federation. 2009b. Russian Economic Report No.20. Washington, DC: World Bank.

31. World Health Organization Regional Office for the Eastern Mediterranean. 2010. Global Adult Tobacco Survey. Russian Federation 2009 Country Report. World Health Organization: Cairo.

32. World Health Organization Regional Office for the Eastern Mediterranean. 2017. Global Adult Tobacco Survey. Russian Federation 2016 Country Report. World Health Organization: Cairo.

33. Zheng R, Marquez PV, Ahsan A, Hu X, Wang Y. 2018. Cigarette Affordability in Indonesia: 2002-2017. Washington, DC: World Bank.

34. Zheng R, Wang Y, Hu X, Marquez PV. 2017. Cigarette Affordability in China: 2001–2016. Washington, DC: World Bank.

APPENDIX 1: CIGARETTE PRICE AND CIGARETTE AFFORDABILITY, 2002-2017

YEAR	DISPOSABLE INCOME PER CAPITA NATIONWIDE (RUBLES)	NOMINAL AVERAGE PRICE (RUBLES PER PACK)	REAL AVERAGE PRICE (RUBLES PER PACK, BASE YEAR 2002)	RELATIVE INCOME PRICE AVERAGE (%)	INCOME PURCHASING CAPACITY AVERAGE (PACKS)	CIGARETTE AFFORDABILITY INDEX
2002	47,366	11.80	11.80	2.49	4,014	1.00
2003	62,009	12.77	11.23	2.06	4,857	1.21
2004	76,788	13.82	10.96	1.80	5,557	1.38
2005	97,060	15.24	10.73	1.57	6,371	1.59
2006	121,858	17.69	11.36	1.45	6,889	1.72
2007	150,482	19.91	11.73	1.32	7,556	1.88
2008	178,363	21.42	11.06	1.20	8,327	2.07
2009	202,740	24.83	11.48	1.22	8,164	2.03
2010	227,501	29.09	12.59	1.28	7,820	1.95
2011	249,360	33.92	13.53	1.36	7,351	1.83
2012	278,653	43.10	16.37	1.55	6,465	1.61
2013	311,138	49.92	17.75	1.60	6,233	1.55
2014	333,199	68.15	22.48	2.05	4,889	1.22
2015	365,599	82.79	23.64	2.26	4416	1.10
2016	368,933	104.74	27.94	2.84	3,523	0.88
2017	377,724	120.1	30.90	3.18	3,144	0.78

Sources: Disposable income per capita nationwide is sourced from Federal Statistics. Data at https://www.fedstat.ru/indicator/30992; http://www.gks.ru/free_doc/new_site/population/urov/urov_14g.xls. The nominal average price is calculated by the authors, based on Euromonitor's data retail sales value and sales volume; the real average price is calculated from the nominal average price and CPI sourced from the World Bank. Data at https://data.worldbank.org/indicator/FP.CPI.TOTL?locations=RU. The RIP average, IPC average, and CAI average are calculated by the authors.

APPENDIX 2: CIGARETTE AFFORDABILITY OF ECONOMY, MID-PRICE AND PREMIUM BRANDS, 2010-2017

YEAR	DISPOSAL INCOME PER CAPITA (RUBLES PER PACK)			PRICE (RUBLES PER PACK)			RIP (%)		
	HIGH-INCOME	MIDDLE-INCOME	LOW-INCOME	PREMIUM BRANDS	MID-PRICE BRANDS	ECONOMY BRANDS	PREMIUM BRANDS	MID-PRICE BRANDS	ECONOMY BRANDS
2010	54,2589	178,588	59,150	47	35	22	0.87	1.96	3.72
2011	59,0983	196,994	64,834	63	38	29	1.07	1.93	4.47
2012	66,3195	219,207	72,450	72	41	35	1.09	1.87	4.83
2013	74,0509	244,762	80,896	85	54	39	1.15	2.21	4.82
2014	78,9682	263,227	86,632	92	67	54	1.17	2.55	6.23
2015	860,986	290,042	96,884	105	76	70	1.22	2.62	7.23
2016	868,837	292,687	97,767	125	100	75	1.44	3.42	7.67
2017	883,884	300,924	101,988	135	120	100	1.53	3.99	9.81