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RESEARCH ARTICLE

Progressiveness Assessment of the Value Added Tax in Russia

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Abstract

The issue of tax burden distribution among the population is frequently discussed in Russia. In particular, some authors argue that the VAT burden is regressive and advocate for expanding the list of goods subject to the reduced VAT rate. However, most of these studies focus on comparing aggregate consumption and disposable income as tax bases.

This paper, by contrast, concentrates on identifying which categories of expenditure in Russia are subject to progressive or regressive VAT treatment, as such estimates can inform proposals for specific tax design reforms. To analyse the structure of VAT burden distribution, data from the Russian Longitudinal Monitoring Survey (RLMS), conducted by the Higher School of Economics, is employed.

Total consumption expenditure is divided into the following categories: current consumption, expenditure on durable goods, investments in human capital, and spending on entertainment and leisure. Based on the distributional analysis, it is found that the structure of household consumption remained stable over the period from 2007 to 2019.

During periods of declining income, a decrease in the progressivity of the VAT scale is observed. This is due to higher-income groups reducing their expenditure on durable goods in favour of current consumption and investments in human capital – both of which are often subject to zero or reduced VAT rates. Among all categories, only investments in human capital display a regressive VAT burden distribution.

VAT design proves to be progressive for spending on leisure and entertainment, primarily due to the inclusion of expenditure on tourist trips, which are subject to the standard VAT rate.

Keywords

tax burden, VAT, distributional analysis, disposable income, consumption expenses, investments in human capital

JEL codes: E62, H21, H22, H24, H31, H71

Introduction

In Russia, the issue of tax burden distribution across the population is a topic of ongoing debate. In particular, Ordynskaya et al. (2022) argue that the VAT burden is regressive and suggest that expanding the list of goods eligible for the reduced VAT rate would be beneficial. Several authors support this position, noting, for example, that "the potential of VAT rate differentiation in reducing inequality has not been realised" (Pugachev 2023a).

However, we believe that caution should be exercised when considering an expansion of the reduced VAT rate to additional goods and services. For instance, extending the reduced rate to housing and utility services would likely result in the least well-off households receiving a smaller share of the implicit "subsidy" – that is, the shortfall in public revenue resulting from the rate reduction (Belev and Vekerle 2018). Similar considerations apply to other categories such as food and baby products.

Pugachev (2023b) also points out that the current VAT rate differentiation does not worsen inequality in Russia if tax progressivity is assessed relative to household consumption rather than disposable income. Our own estimates similarly show sensitivity to the choice of base.

In this study, we assess the degree of VAT progressivity relative to household consumption in Russia. Unlike the previously mentioned works, our analysis is based on data from the Russia Longitudinal Monitoring Survey (RLMS-HSE), conducted by the National Research University Higher School of Economics and OOO "Demoscope", in collaboration with the Carolina Population Center at the University of North Carolina at Chapel Hill and the Institute of Sociology of the Federal Centre of Theoretical and Applied Sociology of the Russian Academy of Sciences. The analysis covers the period from 2007 to 2019.

It has been noted in the literature that estimates of the impact of taxes on inequality can vary depending on the measure of inequality used. Caspersen and Metcalf (1994) demonstrated that this is particularly true in the case of VAT progressiveness. Their work was among the first to show that estimates may differ significantly depending on whether income or consumption is used as the basis of analysis. Recent cross-country studies have confirmed this finding (Gaarder 2019; Thomas 2021; Decoster et al. 2010; Blasco et al. 2023). When measuring inequality using household consumption, VAT appears either more progressive or at least less regressive than when inequality is assessed relative to disposable income. However, most studies focus on comparing aggregate consumption and total disposable income. It would be valuable to investigate whether VAT progressiveness varies across specific categories of consumer spending in Russia. Such estimates could serve as a basis for proposals on targeted tax design.

An important argument in favour of using consumption rather than disposable income to assess tax progressiveness is that household well-being is more closely associated with consumption (Kapeliushnikov 2019). However, not all categories of consumer spending contribute equally to current well-being. Specifically, expenditures on health (Donaldson et al. 2002; Becchetti and Pisani 2021) and education (Rosenzweig 1995; Kirchsteiger and Sebald 2010; Boneva and Rauh, 2018) are often considered investments rather than consumption. These categories are commonly referred to in the literature as "investment goods". There is also ongoing debate about whether health should be regarded solely as an asset or also as a consumption good (Finkelstein et al. 2009; Gyrd-Hansen 2017), but in most empirical studies, health-related expenditures are treated separately from general consumption (Finkelstein et al. 2012).

Accordingly, in this study, we classify health and education expenses as a distinct category of "investments in human capital" (Attanasio et al. 2020; Madsen 2016). The literature on optimal taxation rarely addresses whether indirect tax rates should be differentiated for human capital investments. A notable exception is the work by Bastani and Koehne, who recommend lower tax rates for educational services (Bastani and Koehne, 2022).

The next category of consumption that should be considered separately is leisure-related expenditure. The allocation of time between leisure, housework, and paid work is a classical household decision problem (Bergstrom 1996). In this context, leisure-related expenses are often analysed independently of other components of consumption (Attanasio et al. 2012).

The classical results of Atkinson and Stiglitz (1976) and Deaton (1979) argue that redistribution should be achieved through direct rather than indirect taxes (including VAT). If wealthier households disproportionately consume goods and services subject to reduced VAT rates, a portion of the resulting tax expenditure – reflected in lost budget revenue – effectively subsidises households that are less in need of support. However, these conclusions rely on the assumption that leisure and consumption are separable. If this assumption does not hold, it may be optimal to apply higher VAT rates to goods that complement leisure and lower rates to goods that reduce the burden of housework (Cremer and Gahvari 2015; Mocan 2019; Olovsson 2015).

Expenditure on durable goods should also be considered separately, as households derive utility from these purchases over an extended period. Therefore, it is not appropriate to equate current consumption with spending on durable goods (Amendola and Vecchi, 2022). The question of whether indirect tax rates should be differentiated based on the longevity of goods has only recently gained attention in the literature, and no consensus has yet emerged. For instance, Koehne (2018) argues that higher tax rates should be applied to durable goods, although this conclusion holds only under specific and restrictive conditions.

Methods

Data description

To analyse the distribution of the VAT burden, we use data from the HSE-RLMS (Russian Longitudinal Monitoring Survey – HSE), which contains detailed information on household expenditures. The survey also includes data on consumption in physical terms, which theoretically allows for the reconstruction of monetary expenditures using statistical price data. However, for the purposes of this analysis, we rely on data already expressed in monetary terms. There are several reasons for this approach.

Firstly, the physical consumption data contains a substantial number of systematic omissions, corresponding to responses such as "no answer," "refused to answer," or "difficult to answer." This is primarily because respondents are generally more capable of reporting how much money they spent on certain goods and services than they are of recalling the exact quantities purchased.

Secondly, the survey-based method of data collection is not, in itself, particularly robust. Further transformations of the data or supplementation from external sources risk compounding the already limited reliability of the responses, potentially leading to greater bias in the resulting parameter estimates.

Thirdly, when converting data from physical to monetary terms, it is necessary to take into account regional price differentiation across Russia. Even if this differentiation is con-

sidered, it remains difficult to adjust for the heterogeneity of preferences, as households may choose the same products from different price segments. The data originally obtained in monetary terms also exhibits similar heterogeneity.

The data used includes information on expenditure for more than 60 food items, meals outside the home, clothing and footwear, fuel (three categories), rent and utilities, as well as more than 20 categories of services (such as transport, repairs, medicine, education, entertainment, insurance, and so on). The expenditure data is reported for different periods: over the last 7 days, 30 days, 3 months, and 12 months. We standardised all data to the 30-day period by multiplying by a factor corresponding to the length of each reporting interval. Weekly data was multiplied by 30/7, three-month data by 30/90 or 1/3, and annual data (from the past 12 months) by 30/365. The highly detailed consumption information in the HSE-RLMS database allows individual goods and services to be grouped into distinct categories, enabling the construction of composite consumption aggregates.

To reconstruct VAT payment data, it is necessary to compare the tax rate for each consumption category. Over the review period (2007–2020), the standard value-added tax rate was increased from 18% to 20% in 2019. Throughout the period, in addition to the standard rate, a reduced rate of 10% was applied to a number of goods and services. In particular, this preferential VAT rate applied to food, medicines, printed materials, and transport services. Furthermore, the Tax Code of the Russian Federation provides VAT exemptions (zero rate) for certain categories of goods and services, such as medicines, legal, educational, and medical services. Some types of expenditure likely to be informal (services provided by individuals without contracts, paid in cash, and therefore not subject to taxation) are also considered to be VAT-exempt.

In order to analyse the tax structure, total consumption expenditures are divided into the following categories:

- current consumption, which includes expenses for food, housing services, fuel, transport services, hairdressing, dry cleaning, and other categories not related to investment expenditure;
- expenses for durable goods (goods with a useful life of more than one year, as well as services for their repair). These goods include clothing, household appliances, and cars. Expenditures related to the purchase, construction, and repair of housing are not considered consumer expenses (see Structure of Household Consumer Expenditures);
- expenses for entertainment and leisure, including the purchase of tickets to the theatre, circus, cinema, concerts, cultural parks, and other entertainment events; expenses for vouchers to sanatoriums, holiday homes, children's camps, tourist trips, and similar services (excluding transport costs), as well as expenditures on sports products;
- investments in human capital, including spending on education, healthcare (including the purchase of medicines), various extracurricular clubs and activities, and the purchase of sports equipment. It is worth noting that tutoring services are often provided informally or by self-employed individuals; therefore, a VAT rate of zero has been applied to these services.

As shown in Figure 1, the structure of consumption expenditures remains relatively stable over time. A significant proportion is allocated to current consumption; however, as household wealth increases, the share of spending on durable goods and on leisure and entertainment also rises. This increase is particularly pronounced during the transition from the 7th to the 8th decile, and again from the 9th to the 10th decile.

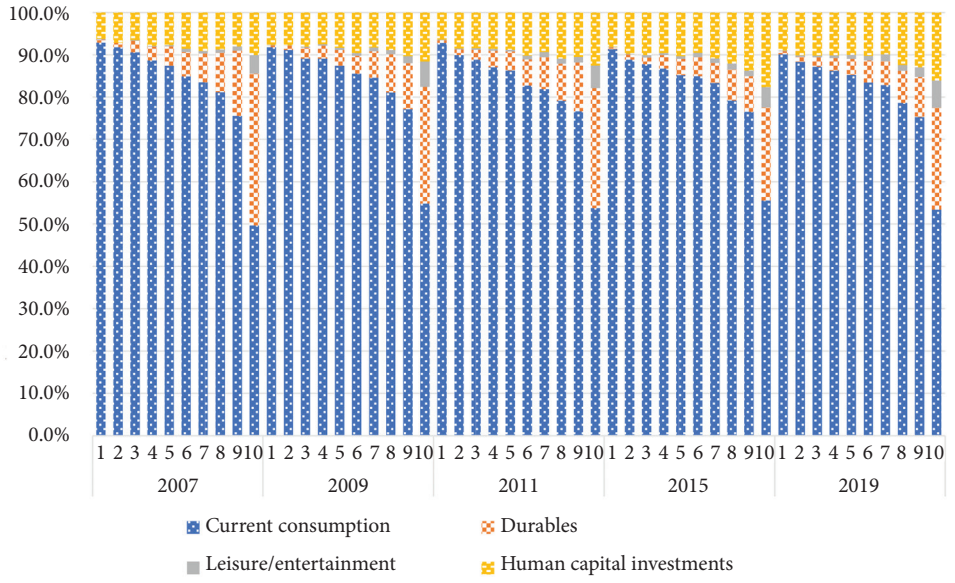

Figure 1. Household consumption expenditure structure by decile groups in 2007, 2009, 2011, 2015 and 2019

The analysis of consumption structure reveals that, for the first eight deciles, more than 80% of total expenditure is devoted to current consumption. Within this category, the largest portion is spent on food and goods for children, which are subject to a reduced VAT rate. Therefore, a reduction in the basic VAT rate – under which all durable goods are taxed – would render the VAT system less progressive, since the primary consumers of goods taxed at the basic rate are the wealthiest households. Similarly, an increase in the preferential VAT rate would have the same effect.

VAT progressiveness assessment: effective rate analysis for households across decile groups based on total expenditure

We examine the variation in the effective VAT rate across decile groups as an indicator of the tax's progressiveness or regressiveness. In this context, the effective tax rate refers to the ratio of VAT paid to the corresponding amount of expenditure for each category of goods and services. Figure 2 below illustrates the effective VAT rate for each decile group. This indicator enables us to assess the proportion of tax paid within the total expenditure of households by expenditure category.

An analysis of Figure 2 reveals that effective VAT rates remain stable over time across all categories, except for leisure and entertainment expenses. Less than 20% of all households in the panel data reported expenditures in this category, with over 90% of such spending concentrated among households in the two most affluent deciles in terms of total expenditure. Consequently, the effective VAT rate for households in the first five deciles was averaged; that is, the ratio of VAT paid on leisure and entertainment to total expenses in this category was calculated collectively for these deciles. Due to the limited number

of observations, there is noticeable instability in the effective VAT rate for the 6th and 7th deciles. For calculating the effective rate per decile, it suffices that at least one individual in the decile has expenses in this category. Meanwhile, trips to the theatre, circus, and cinema are exempt from VAT, whereas expenses on sporting goods and tourism are taxed at the basic rate (18% before 2018, and 20% thereafter). These fluctuations can be explained by the fact that in different years, a small number of households in these deciles purchase different types of goods with varying VAT rates. The increase in the effective VAT rate for leisure and entertainment as household consumption rises is attributable to higher spending on vouchers or tourist trips. Considering consumption expenditure as a proxy for household wealth, wealthier households tend to spend more on tourist trips rather than on movie or theatre tickets. Conversely, less affluent households prefer more affordable forms of entertainment, often not subject to VAT. This explains the sharp increase in the effective VAT rate for the leisure and entertainment category among the 8th to 10th deciles.

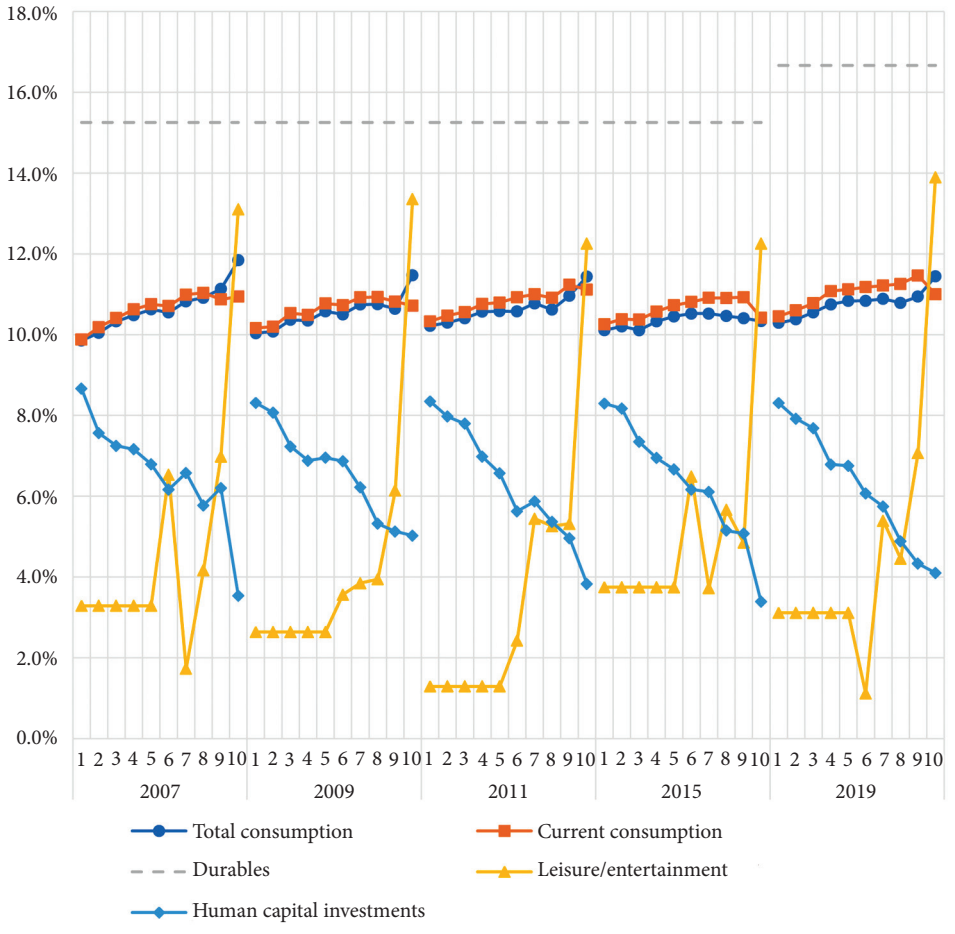

Figure 2. Effective VAT rate by different consumption category in 2007, 2009, 2011, 2015 and 2019

In every period except 2015, there is a consistent increase in the effective VAT rate on total expenses across the decile groups, with the largest rise observed in the 9th and 10th deciles. This suggests a general progressiveness in the VAT system. The decline in the effective VAT rate on total expenses when moving from the 9th to the 10th decile in 2015, compared to 2011, can be attributed to the 2014 economic crisis, which led to price increases for durable goods. Consequently, the wealthiest households reduced their consumption of durable goods, while the share of investments in human capital grew (see Figure 1). Since a significant portion of these investments is exempt from VAT, this explains the lower effective VAT rate among the highest deciles.

For the first nine deciles, the effective VAT rate on current consumption expenses remains stable over time. Only in 2015 did the top decile experience a slight decrease in the effective rate for total consumption, partly because a substantial portion of current consumption includes transportation, legal services, and other categories taxed at preferential rates.

The stability over time in the effective VAT rate on durable goods expenses is due to all goods in this category being subject to the standard VAT rate of 20% within the Russian Economic Zone. This explains the increase in the effective rate over time, notably after the basic VAT rate rose from 18% to 20% in 2019. The lack of variation in VAT rates on durable goods accounts for the consistency of the effective rate across income groups.

The effective VAT rate on expenses related to investments in human capital decreases as total consumption expenditures increase. This is because the majority of these expenses pertain to health and education services, which are exempt from VAT. As wealth rises, individuals tend to place greater emphasis on health and education, meaning they more frequently use paid services in these sectors. For less affluent households, medicine expenses – which are subject to a reduced VAT rate – constitute the largest portion of healthcare-related spending. This explains the regressiveness of VAT within this category. Additionally, spending on educational services contributes significantly to regressiveness, as less well-off households tend to use fewer paid services, opting instead for those provided by the state.

Based on Figure 2, it can be inferred that, overall, the VAT system exhibits a flat or slightly progressive structure. However, when decomposing expenditures into the categories identified, taxation on investments in human capital clearly demonstrates a regressive character.

VAT progressiveness assessment: econometric analysis

In this section, we apply an econometric analysis to provide a more precise assessment of the progressiveness of the current VAT system across different expenditure categories. The dependent variable in the estimated model is the effective VAT rate, while the logarithm of household expenses serves as the key explanatory variable. The model estimated can be specified as follows:

$$\frac{T_h^{vat}}{C_h} = \text{const} + \beta \cdot \text{In}C_h + \sum_{i=1}^{n-1} D_{ih} + \varepsilon_h,$$

where T_h^{vat} – VAT paid by household h;
C_h – consumption expenses of household h;
D_{ih} – time dummy variable household h;
ε_h – error model h;
n – a number of a year;
β – coefficient of interest in regression.

The choice of a semi-logarithmic functional form is motivated by the interpretability of the regression coefficient on the logarithm of expenses: it indicates how many percentage points the effective tax rate differs between two respondents whose expenditures in the given category differ by one percent. Additionally, unlike a fully logarithmic specification, this approach avoids technical difficulties in handling cases where the effective VAT rate is zero.

The estimated coefficient approximately represents the difference between the marginal and average tax rates, which is crucial for assessing the degree of tax progressivity (Norregaard 1990; Kakwani and Son 2021). Assuming a linear relationship between the average VAT rate and the logarithm of expenses, the equality of differentials allows interpreting the coefficient as this difference between marginal and average rates. A positive coefficient indicates progressivity, while a negative coefficient point to regressivity. For these reasons, the semi-logarithmic specification was chosen.

$$d\left(T_h^{vat}\right) = \beta \cdot d\left(\mathrm{In}C\right) \rightarrow \frac{T_c^{'} \cdot C - T_{(c)}}{C^2} dC = \beta \cdot \frac{dC}{C} \rightarrow \left(\underbrace{T_c^{'}}_{\substack{Marginal \\ rate}} - \underbrace{\frac{T_{(c)}}{C}}_{\substack{Average \\ rate}} \right) \frac{dC}{C} = \beta \cdot \mathrm{In}(C),$$

where C – consumption expenses;
$T_{(c)}$ – VAT paid at the level of consumption equal to C;
β – coefficient of interest in regression.

A positive coefficient on the logarithm of expenses in this regression indicates progressiveness of the VAT scale, whereas a negative coefficient signifies regressiveness. Moreover, the larger the absolute value of this coefficient, the stronger the degree of progressivity or regressivity.

The unit of observation is the household. Since the effective VAT rate for a given household and expenditure category can only be computed if the household incurred expenses in that category, observations where no expenses were reported are excluded from the regression. This exclusion particularly affects the categories of durable goods and leisure/entertainment, where the majority of expenditures are concentrated among the most affluent households.

Results

Figure 3 illustrates the dynamics of the estimated regression coefficients across different years within the study period. All coefficients shown are statistically significant at the 5% level; coefficients that were not significant – specifically those related to durable goods – have been replaced with zeros. The results demonstrate a clear progressiveness of VAT when considering aggregate consumption, which aligns with findings from other studies (Thomas 2021).

Notably, the degree of progressiveness decreases during post-crisis periods (2009–2011 and 2015–2016), indicating a temporal weakening of VAT progressivity following economic downturns.

There is a progressive VAT scale for expenses on current consumption and durable goods. The progressiveness of VAT on current consumption arises because a large proportion of the consumer basket of less affluent households consists of food expenses, which are taxed at a

preferential VAT rate. In contrast, for more affluent households, current consumption includes goods and services such as car fuel, dry cleaning, hairdressing, cellular communication, Internet, television, cosmetics and perfumes, and meals outside the home (restaurants, cafes, etc.), which are subject to the basic VAT rate. The overall progressivity of VAT on total consumption is explained by the fact that all household groups allocate a large share of expenses to current consumption, while high-income groups are characterized by a substantial share of expenditures on durable goods.

In contrast, the category of investments in human capital exhibits a regressive VAT structure. This is because it mainly includes expenses on education and healthcare, which are either exempt from VAT or subject to reduced rates. When expenditure level is considered as a measure of household welfare, it is observed that spending on investments in human capital increases most significantly with rising household wealth. Moreover, during periods of external shocks – such as the post-crisis increase in durable goods prices in 2015 – and following the VAT rate increase in 2019, the wealthiest households appear to have shifted their spending towards investments in human capital.

However, this does not imply that the VAT system inherently facilitates greater access to health and education services for poorer households. Our analysis does not account for free health and education services financed through government budgets. Such publicly funded services are excluded from consumption expenditures, but government spending in these areas helps to mitigate the regressive nature of VAT on human capital investments and promotes equity in the consumption of these essential services.

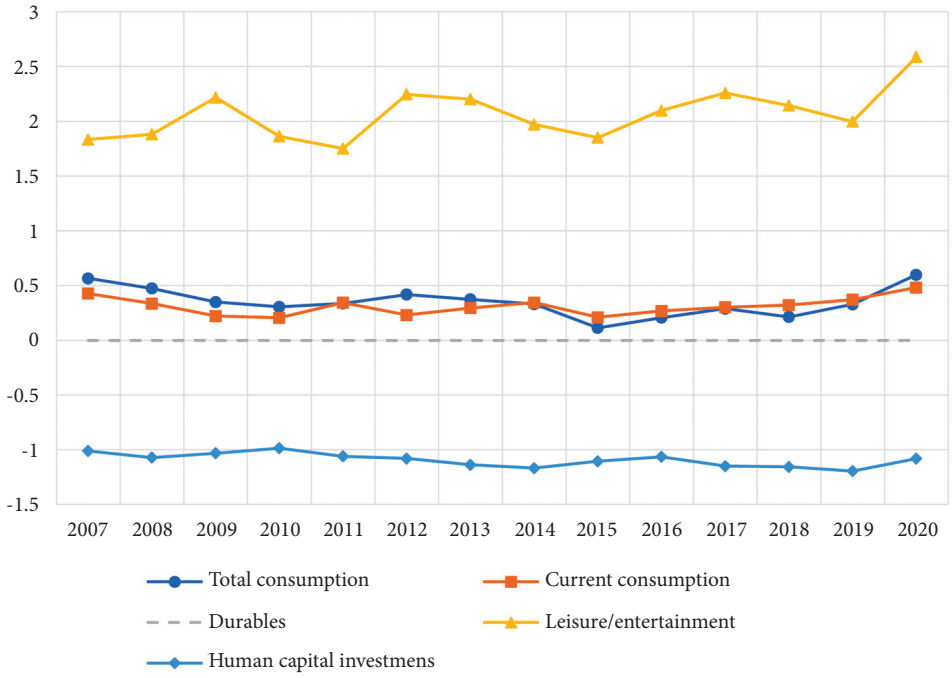

Figure 3. Coefficients of the VAT progressiveness

The progressiveness of the effective VAT rate on leisure and entertainment expenditures is primarily driven by the inclusion of tourist trips, which are subject to VAT. To assess the stability of these estimates over time, LSDV regressions with time fixed effects were estimated using panel data (see Table 1). Consistent with the year-by-year regression results (Figure 3), the VAT scale exhibits progressiveness for total consumption, as evidenced by a significantly positive coefficient on the logarithm of consumption expenditures. Progressiveness is also confirmed for current consumption and leisure/entertainment spending categories.

Table 1. LSDV models for assessing VAT progressiveness

	Total consumption	Current consumption	Durables	Leisure / entertainment	Human capital investmens
const	9.8688***	10.0816***	15.2542***	4.3817***	6.8076***
	(0.0394)	(0.0347)	(0.0000)	(0.2295)	(0.0572)
Ln(C)	0.3483***	0.3061***	0.0000	2.0769***	-1.0972***
	(0.0128)	(0.0119)	(0.0000)	(0.0346)	(0.0109)
2008	-0.1604***	-0.1433***	0.0000	-0.7411**	0.2081***
	(0.0443)	(0.0383)	(0.0000)	(0.2979)	(0.0798)
2009	-0.2081***	-0.0976**	-0.0000	-1.1434***	0.3556***
	(0.0441)	(0.0391)	(0.0000)	(0.2912)	(0.0790)
2010	-0.1534***	-0.0101	0.0000	-1.2116***	0.5581***
	(0.0419)	(0.0376)	(0.0000)	(0.2681)	(0.0735)
2011	-0.1952***	-0.0128	0.0000	-1.5283***	0.5781***
	(0.0425)	(0.0374)	(0.0000)	(0.2730)	(0.0736)
2012	-0.2612***	-0.1097***	-0.0000	-1.1488***	0.7603***
	(0.0408)	(0.0355)	(0.0000)	(0.2684)	(0.0721)
2013	-0.3708***	-0.1830***	0.0000*	-1.8590***	0.7696***
	(0.0408)	(0.0358)	(0.0000)	(0.2601)	(0.0714)
2014	-0.4946***	-0.2435***	0.0000	-1.7660***	0.8470***
	(0.0426)	(0.0371)	(0.0000)	(0.2691)	(0.0743)
2015	-0.5996***	-0.2823***	0.0000	-1.8476***	0.9724***
	(0.0421)	(0.0366)	(0.0000)	(0.2776)	(0.0754)
2016	-0.6888***	-0.3965***	0.0000	-1.9987***	1.1366***
	(0.0418)	(0.0363)	(0.0000)	(0.2674)	(0.0750)
2017	-0.6350***	-0.3758***	0.0000	-2.1243***	1.0128***
	(0.0415)	(0.0359)	(0.0000)	(0.2660)	(0.0748)
2018	-0.6063***	-0.2542***	0.0000	-2.6789***	0.9884***
	(0.0425)	(0.0372)	(0.0000)	(0.2642)	(0.0761)
2019	-0.2626***	0.0430	1.4124***	-2.6651***	1.0552***
	(0.0447)	(0.0395)	(0.0000)	(0.2673)	(0.0762)

	Total consumption	Current consumption	Durables	Leisure / entertainment	Human capital investmens
2020	-0.3723***	-0.2250***	1.4124***	0.7798*	1.3583***
	(0.0426)	(0.0367)	(0.0000)	(0.4198)	(0.0743)
R-squared	0.0259	0.0215	1.0000	0.2869	0.1799
R-squared Adj.	0.0257	0.0212	1.0000	0.2861	0.1797
Num observations	61 887	61 887	21 637	11 896	52 087

In contrast, a flat VAT scale characterizes durable goods expenditures, reflecting the uniform application of the basic VAT rate across all goods in this category. The significant positive temporal effects observed in 2019 and 2020 correspond to the legislative increase in the basic VAT rate from 18% to 20%.

Finally, investments in human capital display a regressive VAT pattern, with a negative coefficient on the logarithm of expenses. The negative time effects on aggregate consumption become more pronounced over the years, diminishing somewhat in 2019–2020 but remaining negative overall.

Conclusion

When assessing the progressiveness of VAT, it is crucial to specify which household welfare indicator is being analyzed. The literature indicates that the conclusion on VAT progressiveness may differ depending on whether consumption expenditure or income is used as the welfare measure.

Between 2007 and 2019, the composition of household expenditures in Russia – across investments in human capital, leisure, durable goods, and current consumption – remained largely stable. The increase in the basic VAT rate in 2019 did not significantly alter this expenditure structure.

Our estimates demonstrate that VAT taxation is progressive with respect to goods and services related to current and total consumption. A flat tax pattern is observed for durable goods, while VAT appears progressive for leisure and entertainment expenditures, primarily due to taxable travel and tourist packages.

During periods of declining incomes, the progressiveness of the VAT scale decreases. This is because the highest-income households reduce durable goods consumption, increasing the relative share of current consumption and investments in human capital – categories that are either zero-rated or subject to reduced VAT rates.

Only investments in human capital exhibit regressiveness. However, this does not imply greater distributional gains for wealthier households, as the analysis does not account for state-funded services such as preschool, school, higher education, and healthcare. The provision of such free services mitigates inequality in consumption of these essential goods.

Overall, the VAT rate structure in Russia from 2007 to 2019 does not exhibit regressive characteristics. Expanding the list of goods subject to reduced VAT rates could enhance progressiveness if these preferential rates apply to items predominantly consumed by less

affluent households. Nonetheless, since there are no goods or services exclusively consumed by the poor, most revenue foregone through reduced VAT rates would effectively subsidize wealthier households.

Therefore, caution is warranted regarding the use of VAT rate differentiation as a tool to reduce inequality. Researchers widely agree that this approach is inefficient. Instead, policies such as personal income tax deductions and direct transfers represent more effective instruments for achieving redistribution and reducing inequality.

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