Regional taxable capacity measurement methodology based on factors that determine tax gaps based on the example of the Republic of Dagestan

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Background: This paper analyses the existing methods for measuring a region’s taxable capacity and presents the authors’ proposed approach.

Objective: The paper’s objective is to develop a method for measuring a region’s taxable capacity which could significantly increase accuracy in tax revenue predictions.

Methods: Comparative and situational analyses, as well as expert evaluations are applied.

Findings: A method for measuring regional taxable capacity is developed based on tax gap figures. This study specifies and supplements a method for evaluating a region’s tax potential using the indicators that determine a tax gap. Unlike well-known approaches, this method can significantly improve the evaluation’s reliability and accuracy, and allows identification of opportunities in order to grow the tax revenues of sub-federal budgets. A comparative analysis of the results of evaluating the taxable capacity of the Republic of Dagestan using different methods shows that the highest value is its tax potential, which takes the tax gap into account. This suggests that the real tax potential is not fully realized and there is room for development.

Conclusions: The measurement methodology used to determine a region’s taxable capacity involves an integral indicator, which is composed of private parameters. The final measurement indicator should be based on criteria that can be represented by a number of qualitative indicators. These criteria should accurately and completely determine the actual taxable capacity of a region.

* Please see the affiliation of the author at the first author of the paper (Ramazan Magomedovich Magomedov).
Introduction

The development of efficient tools to measure a region’s (territory’s) taxable capacity is a crucial task for governments when they implement tax planning and forecasting activities. At the same time taxable capacity is considered to be the maximum level of financial resources that can be accumulated in budget revenues by applying the existing standards in fiscal legislation. A reliable evaluation of a region’s taxable capacity plays a crucial role for the government as it performs its duties and for the country in its effort to find possible reserves in a territory’s taxable capacity.

The theoretical and applied aspects of measuring a region’s taxable capacity have been extensively examined in national and foreign economic publications. At the same time, a lack of unified tools for legislation-based measurement of a region’s taxable capacity results in significant difficulties when planning budgeted tax revenues at different levels. Sub-federal authorities can independently choose the calculation methodology, whereas the parameters of taxable capacity and the measurement tools for the tax base, which are used for planning budgeted revenues, are not specific statistical indicators, which decreases efficiency in implementing fiscal policy.

Aliev et al. (2014), Bénassy-Quéré et al. (2014), and Garbarino (2014) describe a number of methodological approaches for measuring a region’s taxable capacity. These methods are essentially based on per capita income, tax rates, tax bases, gross regional product, and other information. The choice of measurement methods depends on a number of factors, including data about the behaviour of financial resources in a Russian Federation (RF) subject; the reliability of the information on the region’s social and economic development; and easy-to-use measurement procedures, among others. Moreover, we believe that the measurement methodology must be simple, fool proof, and reliable. It should cover the maximum number of components that characterize the actual taxable capacity of a territory.

Thus, the purpose of this study is to solve an important problem – developing a methodology for measuring a region’s taxable capacity, with the goal of increasing the accuracy of estimating tax collection. Moreover, understanding the actual taxable capacity with all its determinants plays a crucial role.

Methods

The development of a method for measuring a region’s taxable capacity involves the general scholarly methods of scientific abstraction; dialect logics; comparative situational, financial, statistical, economic, and mathematical analysis; as well as expert analysis. Economic publications provide many methods for measuring a region’s taxable capacity.

One method for measuring a region’s taxable capacity is based on gross regional product (GRP), which considers the total costs of goods (work and services) manufactured using the region’s economic resources (land, labour, and capital) for a par-
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Specific time period and accounts for the revenues generated in a region with no regard for the registration location of physical persons or entities. The incomes of citizens residing in a particular region make up a significant share of GRP volume, because they work where they live. Beside citizen incomes, GRP includes the incomes of non-residents that are also taxed and attributed to the region, as well as revenues from hotel services and tourists’ purchases. This method has some disadvantages, such as discrepancies caused by the specific features of the tax structure that occur when identifying a region’s taxable capacity. For example, companies pay profit tax depending on where they are registered, without regard for the location of their business activities. Also, the sums of inter-budget transfers from the federal budget to sub-federal level budgets are not taken into account. This approach makes it difficult to plan and forecast tax revenues, because the capacity measurement is delayed. These circumstances cause discrepancies in evaluating taxable capacity and a region’s GRP.

In contrast to the previous method, a method based on taxable resource evaluation provides more trustworthy information regarding taxable capacity by reducing the gap between GRP and the actual taxable resources. This method was developed as an alternative to the method based on GRP, and is a result of the fact that taxable capacity calculations did not account for the impact of some federal taxes and the financial aid to regions from the federal centre. This method more accurately reflects the actual values of a region’s tax resources when compared to the GRP method, and does not suffer from distortion of regional data. An advantage of the method is its compliance with the general competency of top-down governance, spread between budget distribution and fiscal legislation. However, it requires a significant amount of information and does not identify the dynamics in taxable capacity in terms of structural changes.

A method based on the taxable capacity coefficient (TCC) simplifies forecasting as it depends on one factor only. This method has a number of disadvantages. First, it is based on tax revenues actually in the budget with no adjustment for tax arrears, which causes an unfavourable result. The method also lacks motivation for territories to fairly identify their taxable capacity, as well as their involvement in finding the reserves to increase it. This measurement method presupposes a linear correlation between tax collection and added value, which is invalid because of tax progressivity.

Another method for measuring a region’s taxable capacity is based on per capita income indicator and is mainly connected to income tax. To estimate the region’s taxable capacity, the population’s average income is found, and the indicators that reflect the population differentiation levels based on per capita income are defined. This method can be applied if there is information about per capita income in RF regions. A disadvantage of this method is that it should not be applied unless
individual income tax is the largest fiscal value in the revenue portion of the territories’ budgets.

Simplicity and transparency play a crucial role in measuring a region’s taxable capacity. This is true for the method of identifying taxable capacity based on tax revenues actually collected in the region. The key idea for this method is that the maximum taxable capacity (the law-based capacity) cannot be reached because of two factors: arrears and allowances. This method estimates a region’s taxable capacity with due regard for the taxes actually collected, the amount of tax arrears in the period examined, and the amount of shortfalls caused by regional and local allowances.

### Table 1

**Classification of the methods for measuring a region’s taxable capacity**

<table>
<thead>
<tr>
<th>Method</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Methods based on a resource approach</strong></td>
<td></td>
</tr>
<tr>
<td>A set of tax resources</td>
<td>High degree of factual accuracy about the actual taxable resources in the territory</td>
<td>Significant expenses in preparing the information bases, incomplete records of taxation elements, different conditions for filing, and exploitation of resources</td>
</tr>
<tr>
<td></td>
<td><strong>Attracting new resources</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Helps in evaluating the actual resources of the region that shape the taxable capacity</td>
<td>Difficulty determining the estimates due to the need to process a huge amount of data</td>
</tr>
<tr>
<td></td>
<td><strong>Methods based on a fiscal approach</strong></td>
<td></td>
</tr>
<tr>
<td>Direct account</td>
<td>High accuracy and completeness of accounting for tax bases; somewhat helps in accounting for shadow turnover</td>
<td>Effort-intense, high requirements for the quality of the information; it does not account for additional resources that can be involved in taxation; applied in case of a lack of information for the RTS method</td>
</tr>
<tr>
<td>Per capita income</td>
<td>Taxable capacity depends on population incomes; fool-proof calculations and information are available</td>
<td>The method can be applied provided personal income tax has fiscal importance for the revenue of the territory’s budget; approximate estimates of capacity</td>
</tr>
<tr>
<td>The additive property of taxable capacity</td>
<td>A possibility of accounting for federal allowances</td>
<td>This method requires a huge amount of data</td>
</tr>
<tr>
<td>Tax revenues actually collected</td>
<td>Fool proof calculations, information for estimates is available</td>
<td>Territory development capacity cannot be identified, the region’s taxable capacity is difficult to plan, a gap exists between the taxes actually collected and actual taxable capacity</td>
</tr>
</tbody>
</table>

(Continued on the next page.)
Regional taxable capacity measurement methodology based on factors that determine tax gaps based on the example of the Republic of Dagestan

(Continuation.)

<table>
<thead>
<tr>
<th>Method</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Representative Tax System (RTS)</td>
<td>An unbiased approach that is highly accurate in measuring a region’s taxable capacity</td>
<td>A labour-intensive approach, difficult to understand</td>
</tr>
<tr>
<td>Simplified measurement method</td>
<td>Easy to do, information is available</td>
<td>Distortions in the measurements due to estimates based on the key budget-funded taxes, limitations in measuring the taxable capacity of municipal units</td>
</tr>
</tbody>
</table>

Methods based on a mixed approach

| Taxable capacity coefficient                | Easy to do and low labour intensity                                         | Arrears at the budget system levels are not accounted for, low motivation for territories to find their local reserves, estimates based on a possible linear relationship between added value and tax revenues |
| Regression analysis                         | Requires less input, low labour intensity for calculations, no need for accurate calculation of standard tax bases and representative tax rates | A significant number of tax bases are limited by the regions’ data, method difficulty, method lacks relative transparency |

Methods based on a reproduction approach

| GRP                                         | Accounts for incomes in a region with no regard for the registration places of individuals or an entity’s location | Discrepancies in identifying the region’s taxable capacity determined by the specific features in the tax structure, measurement is delayed, no recognition of a specific approach for calculating GRP |
| Evaluation of veiled activities             | Information about veiled incomes specifies the amount of the regional tax base | Reliable information is difficult to obtain, credibility is relative to the transactions in the veiled activities, no regard for specific regional features in measuring taxable capacity |

Methods based on an institutional approach

| Distribution of transfers from the Fund for Financial Support of the Regions (FFSR) | The most transparent method and calculations can be controlled | Comprehensive and conceptual difficulty regarding the object to be measured, criteria for budget alignment, region’s consumption needs, and taxable capacity |
| Indicative analysis                         | Information for calculating taxable capacity is available | Taxable capacity does not consider veiled incomes |

This analysis helps classifying the methodologies into the following categories: resource approaches, fiscal approaches, mixed estimates, and reproduction and institutional conceptual approaches (Table 1).
Justification of the assessment criteria for tax cooperation in the region

Our understanding of taxable capacity supposes that the methodology for measuring the competitive capacity of a region uses an integral indicator which could be composed of a system of private parameters that:
- affect the theoretical taxable capacity;
- identify the possibility of including a forecasted tax base;
- affect the scales of the veiled tax base; and
- affect the dynamics of tax debts.

In contrast to private parameters, an integral indicator offers a comprehensive understanding of a region’s taxable capacity. Moreover, the private parameters identify a set of factors that impact the development of the actual taxable capacity, offering the ability to design a mechanism for its improvement.

The final evaluation indicator must be based on criteria that could be represented by a number of qualitative and quantitative indicators. In turn, these criteria must fully and reliably represent the region’s actual taxable capacity, because the reliability of the final evaluation depends on an unbiased approach to the key parameters of the object in question. We believe that key criteria that satisfy these requirements include:
- comprehensiveness (comprehensive coverage of the information about the research’s object);
- reliability (showing reliable data in the research processes);
- an unbiased approach (evaluation indicators are independent from the impact of other factors);
- clarity (clear potential for identifying the research object for a parameter characterized aspect);
- efficiency (the choice of an adequate number of indicators, without too many details, that provides an efficient analysis of the object in question);
- mobility (showing the development of the research process under the influence of factors from internal and external surroundings);
- compatibility (possibility of comparison based on the analysed subject and object, time period and evaluation approach);
- complementarity (compliance with the set tasks; each indicator should be aimed at measuring the progress toward achieving a particular goal);
- additivity (the ability to decompose a whole analysed object into its structural parts);
- combinability (complementarity of the indicators, which could show different sides of the object in question).

Thus, a structural logical diagram to define the criteria and indicators for measuring a region’s taxable capacity is shown in Figure 1:
Keeping the enumerated criteria in mind, a measurement methodology should primarily be based on a representative fiscal system adjusted to the indicators and parameters setting the estimation errors. The results of the research show that this approach results in fewer estimation errors (Mironova–Khanachev 2016, Okello 2014). The calculation method is additionally adjusted for specific evaluation goals and tasks, factors that determine the region’s taxable capacity, and the specific features of the territory’s institutional and economic organization.
Results

The amount of funds planned to be mobilized into the budgetary system does not typically match the values actually calculated. The difference is usually negative; that is, the state budget receives a lower amount of taxes compared to the level expected. This phenomenon is known worldwide as a tax gap. A tax gap indicates a difference between the sum of taxes which could theoretically be paid by the taxpayers provided they completely and timely observe the fiscal legislation and the sum of taxes actually paid. This term was borrowed from the English (tax gap), where it is applied with a similar meaning. This means that the tax gap issues exist in all countries and is global in nature.

There is a direct correlation between the value of the taxable capacity and the tax gap, because the latter is connected to the tax base and tax liability. Violations of fiscal legislation standards (purposeful or unintended) result in a reduced tax base and distort the calculations of actual taxable capacity. Moreover, the annual tax base and associated macroeconomic indicators can change.

Tax gaps can arise for different reasons, although they significantly distort the final estimates of taxable capacity. By summarizing the practices in other countries and in Russia, we can identify the following reasons for tax gaps:

- errors made by the bodies performing the registration and holding the records of taxpayers and taxable items;
- changes in fiscal legislation, usually leading to a reduction in the budget revenue base (a lower tax rate, tax allowances, or tax abolition);
- an income decrease and shadow financial and economic activities;
- wilful tax evasion;
- excessive minimization of tax liabilities to keep an enterprise operating;
- registration of organizations in low tax zones;
- tax arrears for various reasons; and so on.

We believe there are far more reasons for tax gaps. This complicates the measurement of the tax gap value and thus taxable capacity. Further, some reasons are rather difficult to predict and assess, because the mechanisms used by economic entities to veil taxable items are difficult to identify.

In many countries, the occurrence of tax gaps is monitored by key budget-funded taxes based on random inspections and verification of the indicators of financial and economic performances. Some scientists-economists estimate that the tax gap level in Russia is less than 7.6% (Igonina et al. 2016a). However, we disagree with this approach due to the high level of the shadow sector in the Russian economy (approximately 50%) and the scale of tax evasion. These two specified parameters could result in a much higher value for the tax gap.
We feel that the tax gap should be estimated in terms of tax types, while studying all the factors that affect it. In turn, taxable capacity can be measured with due regard for the tax gap value.

Thus, the formula to measure a region’s taxable capacity is as follows:

\[ H_{Pr} = \sum_{i=1}^{n} (H_{Pi} + H_{P}) \]

where \( H_{Pr} \) is the region’s taxable capacity; \( H_{Pi} \) is the taxable capacity of a particular tax type; \( H_{P} \) is the tax gap for a particular tax type; \( n \) is the amount of taxes received by the region’s budget.

It is impossible to account for the full range of factors that contribute to the development of a tax gap. These factors include the most relevant reasons that affect taxable capacity. For example, a change in the corporate profit tax rate to 1% since 2017, which is transferred to the sub-federal budget, significantly decreased their profit base. The level of the shadow sector of the economy and the sum of tax arrears are also key factors in determining the size of the tax gap. It should be remembered that a shadow sector is shaped by the factors mentioned above (income fraud and shadow financial and economic activities, intentional tax evasion, excessive minimization of tax liabilities to keep enterprises operating, registration of companies in low tax zones, etc.). We should also consider the fact that calculations are based on data from fiscal and other bodies, which may not have the actual picture. We face a challenging task in attempting to identify the level of the shadow sector of the economy, despite numerous methodologies. However, the estimates for taxable capacity cannot ignore the shadow sector of the economy in the Republic of Dagestan because of its scale (some experts believe that the shadow sector of the economy in the Republic of Dagestan represents 40 to 70% of its economy).

We share the opinion of some scientists (Musaeva et al. 2015b) and think that tax gap calculations should account for the primary circumstances:

- measurement against each tax type;
- accounting for different factors and assumptions.

Thus, the size of the tax gap can be shown as follows (Figure 2).

**Indicators of a tax gap**

\[ \text{Size of tax gap} = \text{Predicted sum of tax income from the shadow sector of the economy} + \text{Predicted sum of arrears} \]

In order to measure the taxable capacity of the Republic of Dagestan and then make comparisons we estimate its value by applying different methods found in the literature and used in practice. The methods were selected based on their advantages: widespread application, information available for estimates, an unbiased approach, accuracy in measuring the region’s taxable capacity, the possibility of accounting for the region’s incomes with no regard to the registration place of persons or the location of entities-taxpayers.
The analysis and overview of the methods for measuring taxable capacity justifies the using of one of the following methods:

- a method that uses tax revenues actually collected;
- a method that uses a representative fiscal system; or
- a method that uses gross regional product.

The method that uses tax revenues actually collected and is officially approved for estimates in the Republic of Dagestan states that the amount of taxable capacity (TC) is derived from the taxes actually paid for a particular period (Ta), the change in tax arrears for the same period (Art), and the sum of the allowances for taxes paid to the RF subject budget (Alt), which is presented in the following equation:

$$ TC = Ta +/- \Delta Art + Alt $$

The results presented in Table 2 indicate that the taxable capacity of the Republic of Dagestan for the period in question exceeds the taxes actually collected by 4.1–5.5% on average. In addition, 2013 saw an 18.8% increase in actual tax revenues, and the tax arrears substantially grew by +6.9%, while the allowance dynamics for taxes paid to the RF subject budget are significant, with growth of more than 30%. For the period 2013 to 2016, the taxable capacity in the Republic of Dagestan calculated using the method of tax revenues actually collected grew by 20% compared to the 2013 amount.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2016, % by 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual tax collection, million RU</td>
<td>20,052.1</td>
<td>21,486.8</td>
<td>20,974.0</td>
<td>23,815.3</td>
<td>+18.8</td>
</tr>
<tr>
<td>Changes in the amount of arrears, million RU</td>
<td>+106.8</td>
<td>+121.6</td>
<td>–98.3</td>
<td>+114.2</td>
<td>+6.9</td>
</tr>
<tr>
<td>Allowances for taxes transferred to the RF subject budget, million RU</td>
<td>842.2</td>
<td>1,052.9</td>
<td>964.8</td>
<td>1,095.8</td>
<td>+30.1</td>
</tr>
<tr>
<td>Taxable capacity, million RU</td>
<td>21,001.1</td>
<td>22,661.3</td>
<td>21,840.5</td>
<td>25,025.3</td>
<td>+19.2</td>
</tr>
<tr>
<td>Correlation between taxable capacity and the taxes actually collected index</td>
<td>104.7</td>
<td>105.5</td>
<td>104.1</td>
<td>105.1</td>
<td>+0.4</td>
</tr>
</tbody>
</table>


Thus, the estimates of taxable capacity using the method of tax revenues actually collected identify areas for further expansion of taxable capacity;

- a decrease in the arrears boosts the actual collection of taxes and makes the tax potential of the next time period of a better quality;
- the growth in the allowance sums for taxes paid to the RF subject budget worsens a territory’s taxable capacity.
The method that uses GRP is one of the most popular methods for measuring a territory’s taxable capacity. This method is attractive due to its low labour intensity and a relatively simple calculation procedure. Moreover, the required information is official and available (Popova 2014).

In this approach, taxable capacity is measured using the following indicators:
– the country’s average tax rate;
– GRP in a particular region;
– the country’s total GRP;
– the common tax liabilities of the regions.

The average tax rate is determined based on the correlation between the tax liabilities of all regions in the country and the country’s total gross regional product. Under this method, the tax liabilities of all regions are calculated based on both tax revenues and tax arrears, and their increase, which is added to the tax liabilities.

The regions’ taxable capacity is next defined using the method based on the country’s average tax rate and GRP (Table 3).

Table 3

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2016 in % by 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRP of all regions, billion RU</td>
<td>53,013.6</td>
<td>59,188.3</td>
<td>65,750.6</td>
<td>69,254.1</td>
<td>130.6</td>
</tr>
<tr>
<td>Tax liabilities of all regions, billion RU</td>
<td>5,957.6</td>
<td>6,453.9</td>
<td>10,723.4</td>
<td>13,287.4</td>
<td>223.0</td>
</tr>
<tr>
<td>Arrears of all regions, billion RU</td>
<td>354.2</td>
<td>358.3</td>
<td>827.5</td>
<td>1,031.7</td>
<td>291.2</td>
</tr>
<tr>
<td>Changes in the arrears in tax liabilities, billion RU</td>
<td>+35.5</td>
<td>+4.1</td>
<td>-489.4</td>
<td>-693.2</td>
<td>2,052.6</td>
</tr>
<tr>
<td>Average tax rate, %</td>
<td>11.97</td>
<td>11.52</td>
<td>16.82</td>
<td>19.67</td>
<td>164.3</td>
</tr>
<tr>
<td>GRP in the Republic of Dagestan, billion RU</td>
<td>452.9</td>
<td>528.1</td>
<td>597.1</td>
<td>562.5</td>
<td>124.1</td>
</tr>
<tr>
<td>Taxable capacity, billion RU</td>
<td>5,421.2</td>
<td>6,082.7</td>
<td>9,414.1</td>
<td>11,064.4</td>
<td>204.0</td>
</tr>
</tbody>
</table>


Table 3 shows that the taxable capacity of the Republic of Dagestan doubled between 2013 and 2016 and reached 11064.4 billion RU in 2016. At the same time, the dynamics of the indicators that contribute to taxable capacity illustrate the unequal impact of conditions such as the country’s average tax rate, the GRP in the Republic of Dagestan, the total gross regional product, as well as the common tax liabilities of the regions.

For example, factors such as growth in the tax liabilities of all regions by 123% and growth in the arrears of all regions by 191.2% extensively affect improvement in the taxable capacity of the Republic of Dagestan. At the same time, it should be noted that with significantly low dynamics of the GRP in all regions (+30.6%) and the GRP in the Republic of Dagestan (+24.1%), the dynamics of the average tax
rate seems to be more substantial (+64.3%), which determines the 104% expansion in the taxable capacity of the Republic of Dagestan.

Next, we calculate the basic taxable capacity by tax types and the associated tax rates (Table 4).

### Calculation of the basic taxable capacity in the Republic of Dagestan by tax types

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2016 in % by 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic taxable capacity, million RU, total</strong></td>
<td>15,922.6</td>
<td>18,534.0</td>
<td>19,443.2</td>
<td>23,295.0</td>
<td>146.3</td>
</tr>
<tr>
<td>including</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal income tax</td>
<td>8,076.4</td>
<td>9,987.6</td>
<td>8,708.2</td>
<td>11,013.1</td>
<td>136.3</td>
</tr>
<tr>
<td>Corporate profit tax</td>
<td>850.9</td>
<td>1,056.5</td>
<td>1,891.5</td>
<td>2,166.4</td>
<td>254.6</td>
</tr>
<tr>
<td>Excise taxes</td>
<td>1,603.2</td>
<td>1,536.7</td>
<td>1,642.3</td>
<td>1,705.4</td>
<td>106.3</td>
</tr>
<tr>
<td>Corporate property tax</td>
<td>2,525.0</td>
<td>2,734.9</td>
<td>2,807.2</td>
<td>3,093.7</td>
<td>122.5</td>
</tr>
<tr>
<td>Transport tax</td>
<td>419.4</td>
<td>803.2</td>
<td>1,102.1</td>
<td>1,382.6</td>
<td>329.6</td>
</tr>
<tr>
<td>Mineral tax</td>
<td>18.1</td>
<td>19.3</td>
<td>979.8</td>
<td>30.1</td>
<td>166.2</td>
</tr>
<tr>
<td>Official fee</td>
<td>69.6</td>
<td>99.4</td>
<td>98.3</td>
<td>130.3</td>
<td>187.2</td>
</tr>
<tr>
<td>Personal property tax</td>
<td>128.5</td>
<td>147.1</td>
<td>0.0</td>
<td>236.2</td>
<td>183.8</td>
</tr>
<tr>
<td>Land tax</td>
<td>919.7</td>
<td>842.4</td>
<td>0.0</td>
<td>1,300.6</td>
<td>141.4</td>
</tr>
<tr>
<td>Total income tax</td>
<td>704.6</td>
<td>880.7</td>
<td>1,090.2</td>
<td>1,140.9</td>
<td>161.9</td>
</tr>
<tr>
<td>Other taxes and levies</td>
<td>607.2</td>
<td>426.2</td>
<td>1,123.6</td>
<td>1,095.7</td>
<td>180.4</td>
</tr>
</tbody>
</table>

*Note: Based on data from the Federal Fiscal Service, access mode – https://www.nalog.ru.*

This analysis of the taxable capacity structure in the Republic of Dagestan for 2013–2016 includes the tax gap and shows that taxes such as the personal income tax (41.6–43.9%), corporate property tax (13.1–14.9%), and corporate profit tax (10.0–12.2%) comprise a significant share of the taxable capacity. The total share of these indicators for the period in question ranges from 64.7% to 71.0% (Table 4). Hence, improving the taxable capacity in the Republic of Dagestan requires local tax offices to focus on directing the capacities of taxes such as personal income tax, property tax, and corporate profit tax.

Table 5 compares the results of measuring the taxable capacity for the Republic of Dagestan for 2013–2016 using the different measurement methods. Table 5 clearly shows that the taxable capacity estimated with a tax gap has the highest value. This means that the actual taxable capacity is not fully implemented and there are some reserves for development.
Regional taxable capacity measurement methodology based on factors that determine tax gaps based on the example of the Republic of Dagestan

**Table 5**

Comparative analysis of the taxable capacity of the Republic of Dagestan measured by different methods (million RU)

<table>
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</thead>
<tbody>
<tr>
<td>Tax revenues actually collected</td>
<td>21,001.1</td>
<td>22,661.3</td>
<td>21,840.5</td>
<td>25,025.3</td>
<td>+19.2</td>
</tr>
<tr>
<td>Gross regional product</td>
<td>5,421.2</td>
<td>6,083.7</td>
<td>9,414.1</td>
<td>11,064.4</td>
<td>+104.0</td>
</tr>
<tr>
<td>Tax gap based taxable capacity</td>
<td>28,627.7</td>
<td>34,435.3</td>
<td>33,690.2</td>
<td>39,880.5</td>
<td>+39.3</td>
</tr>
</tbody>
</table>

**Discussion**

The aspects of measuring a region’s taxable capacity, fiscal federalism, and an efficiency increase in fiscal policy are analysed in papers by foreign scholars: Okello (2014), Said–Singini (2014), Saez–Stantcheva (2018), Raezkowski (2015), Rinaudo (2014), Roy–Chowdhury (2017), and Stern (2016). These scholars based their studies on a RTS. This method is the most popular tool for measuring taxable capacity. The method predicts the possible tax revenues in a regional budget with by applying standard or average tax base rates to each type of tax valid for that country. Canada, Germany, and Switzerland are quite experienced in applying this method. In Canada, the concept of fiscal federalism is known for its high degree of regional authority autonomy, and requires a special national template to compare different tax bases, because the territory’s taxable capacity is measured with regard to the cumulative tax bases of 37 regional and local taxes. The method for measuring taxable capacity based on the representative system is also used in Russia (Musaeva et al. 2015a, 2015b, Mironova–Khanafeev 2016, Sinelnikov–Murylev et al. 2011).

The method’s advantage is its reliable identification of a region’s tax revenue capacity. However, frequent cases of tax evasion, a high level of shadow revenues of market subjects, frequent changes in fiscal legislation and other factors, as well as the demotivation of fiscal bodies and regional authorities to show their unbiased taxable capacity, decrease the efficiency of managing taxes and their role in the social and economic development of the region.

The RTS method based on average tax rates for particular tax bases is aimed at predicting the possible tax revenues for the region’s budget. Information about the amount of a region’s tax base is collected in the state’s fiscal system. Under this method, the tax revenue capacity is defined for each tax with regard to the tax base and an average tax rate.

The RTS method sees taxable capacity as the amount of possible tax payments into the region’s budget. In addition, a unified tax structure for the territories and uniform taxation rates in the regions, as well as an average level of regional tax effort, serve as prerequisites for the calculations.
The RTS method requires a wide range of information across the RF regions: the amount of taxes and levies actually collected, tax bases, tax rates, and the level of tax effort.

The following algorithm is applied to each region to identify the territory’s tax revenue capacity:

- the revenue items of local budgets are specified;
- the revenues of particular regions are classified;
- the structure of the standard tax burden and representative taxation rate are identified; and
- the region’s taxable capacity is measured (Pinskaya et al. 2018).

These estimates and application of this method provide the amount of tax revenues that could be collected by the region, provided the region used a representative fiscal system. Overall, the territories’ tax revenue capacity is measured by adding the taxable capacities of separate taxes. The taxable capacity estimates for a particular tax also account for changes in legislation related to this tax. The capacity of tax revenues is measured separately for the following taxes: value added tax, personal income tax, property tax, excise tax, corporate income tax, and natural resource consumption tax. There is also an element of taxable capacity defined by the remaining taxes that is not accounted for in measuring the separate taxable capacities.

Thus, the RTS method evaluates the skills of the region’s authorities in managing the tax returns to the budget based on a fixed taxable base. With a number of advantages (unbiased identification of the taxable capacity amount), the approach also has some drawbacks, with the most crucial one being its high labour intensity.

Many Russian scholars have contributed to the issue of identifying taxable capacity. For example, Aliev et al. (2014, 2015), Igonina, (2016a, 2016b), and Suleymanov et al. (2016, 2018) measure taxable capacity by analysing inter-budget relationships. However, such an approach does not comprehensively cover all the main aspects of taxable capacity, because many other financial and economic parameters are ignored.

The method of classification based on identifying the direct and indirect measurement methods for the region’s taxable capacity turns out to be very popular. Direct methods regard the figures for the collected tax revenues in the RF subjects, while indirect methods are based on the economic parameters that characterize the region’s development.

Igonina’s approach (Aliev et al. 2015) is worth mentioning: it summarizes the measurement methods for the region’s taxable capacity:

- approaches based on economic income figures (per capita income, gross regional product, combined tax resources);
- approaches based on tax base figures (direct account, RTS)
- approaches based on the actual tax payment figures and their updates (actual tax revenues, updated by the actual tax payments) (Aliev et al. 2015).
In their analysis of a region’s taxable capacity, many scholars point out the measurement method that uses a TCC as an independent approach (Fjeldstad 2013).

On the whole, the proposed analysis of the content, advantages, and drawbacks of the existing methods for measuring taxable capacity is a prerequisite for further improvement in the appropriate measurement methodology. In addition, we believe that a RTS, which has minimal measurement errors, should be the starting point for the method used to measure a territory’s taxable capacity.

The methods for measuring taxable capacity described here and in other papers do not update capacity for the value of the shadow turnover and non-activated capacity, which lowers the actual amount of predicted budget revenues.

**Conclusion**

Finding a solution for strengthening the region’s taxable capacity is of theoretical and practical importance for further development of regional economic units and for supporting the RF subjects in their duties to fulfill their social and other obligations. Territorial budget capabilities determine the solutions for all functions and tasks in the controlled areas and ultimately the living standards for the population. It should also be noted that foreign practices are known for their extensive experience in developing taxable capacity, which could benefit the Russian regions.

In general, an analysis of the content, advantages, and disadvantages of existing methods for assessing tax potential is a prerequisite for developing an improved optimal evaluation methodology. At the same time, the starting point for improving the territories’ tax potential evaluation methodology should be, in our opinion, a RTS, the results of which show minimum evaluation errors.

Tax potential evaluation methods presented in the literature as well as above do not primarily provide clarification of the magnitude of the shadow economy and non-activated capacity, which reduces the real amount of potential revenues.

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Regional taxable capacity measurement methodology based on factors that determine tax gaps based on the example of the Republic of Dagestan


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