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Taxpayers' Index

Master's Thesis (30 EAP)

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Foreword

In the modern everyday life the public finance plays the main role in the world of finance and therefore, its efficient management and transparency is becoming a crucial component for the prosperity and well-being of each particular country. In turn, a cornerstone of the public finance is taxation and, therefore, for each individual it is essential to have highly protected not only inborn rights but also fiscal rights, as far as they are taxpayers. Because the public finance stands on the shoulders of the taxpayers there is a fundamental need to have highly protected taxpayers fiscal rights, which mainly consists two parts: 1) How justly and efficiently taxed money is collected and 2) How transparently and efficiently taxed money used to be spent. Therefore, to develop the model that tries to measure how well taxpayers fiscal rights are protected is a big challenge but at the same time, in the case of successful endeavor we will have developed a real model, which could contribute to the great degree a protection of taxpayers fiscal rights in any particular country. Therefore, our aim in this MA thesis will be to develop Taxpayers' Index that measures how well taxpayers fiscal rights are protected from the legal point of view, and also to discuss a particular mathematical model (for analysis), which will help us to analyze the obtained information from the Taxpayers' Index.

“Taxes grow without rain.” – **Jewish Proverb**

1. Calculation of Taxpayers’ Index

1.1 What is Taxpayers’ Index

Taxpayers’ index is a number expressing in what extent the fiscal rights of taxpayers are protected by legal regulations in a given country. In other words, **Taxpayers’ Index** is dedicated to measure how well taxpayers’ **fiscal rights** are protected from the legal point of view and to find correlations between conducted index and different parameters, which are describing important aspects of social-economic development of the country.

Taxpayers’ index consists of several (three) **components** each expressing certain aspect of the problem. The total index is a weighted average of the three components.

Each component of the Taxpayers’ index is, in turn, a weighted average of its **sub-components** or sums of points obtained from answers to a number of questions. The questions are specific to the sub-components under consideration.

1.2 Why do we need Taxpayers’ Index

“The government can’t give to anybody anything that the government does not first take from somebody else.” - **Dr. Adrian Rogers**

It’s well known fact that, in general speaking, a main source of the income for any government is a taxation and therefore, taxpayers have not only the fiscal rights but also a moral obligation to know how justly and effectively their money is mobilized, and how transparently and efficiently taxed money is spent.

By its nature, government tends to waste taxpayers’ money. To argue this will refer to the Milton Friedman’s¹ idea about the four ways money can be spent: “When you spend, you may spend your own money or someone else’s; and you may spend for the benefit of yourself or someone else. Combining these two pairs of alternatives gives four possibilities summarized in the following simple table:

¹ **Milton Friedman** (1912-2006) was an American economist and statistician who taught at the University of Chicago and he was a recipient of the Nobel Memorial Prize in Economic Sciences in 1976.

YOU ARE THE SPENDER

	On Whom Spent	
Whose Money	You	Someone Else
Yours	I	II
Someone Else's	III	IV

Category I in the table refers to your spending your own money on yourself. You shop in a supermarket, for example. You clearly have a strong incentive both to economize and to get as much value as you can for each dollar you do spend.

Category II refers to your spending your own money on someone else. You shop for Christmas or birthday presents. You have the same incentive to economize as in **Category I** but not the same incentive to get full value for your money, at least as judged by the tastes of the recipient. You will, of course, want to get something the recipient will like—provided that it also makes the right impression and does not take too much time and effort. (If, indeed, your main objective were to enable the recipient to get as much value as possible per dollar, you would give him cash, converting your **Category II** spending to **Category I** spending by him.)

Category III refers to your spending someone else's money on yourself—lunching on an expense account, for instance. You have no strong incentive to keep down the cost of the lunch, but you do have a strong incentive to get your money's worth.

Category IV refers to your spending someone else's money on still another person. You are paying for someone else's lunch out of an expense account. You have little incentive either to economize or to try to get your guest the lunch that he will value most highly. However, if you are having lunch with him, so that the lunch is a mixture of **Category III** and **Category IV**, you do have a strong incentive to satisfy your own tastes at the sacrifice of his, if necessary.

All welfare programs (All Government Spending of the Taxed Money)² fall into either **Category III** — for example, Social Security which involves cash payments that the recipient is free to spend as he may wish; or **Category IV**—for example, public housing; except that even **Category IV** programs share one feature of **Category III**, namely, that the bureaucrats administering the

² Givi Kupertadze's comment – Author of the Master Thesis.

program partake of the lunch; and all **Category III** programs have bureaucrats among their recipients.

In our opinion these characteristics of welfare spending (Government Spending of the Taxed Money)³ are the main source of their defects.

Legislators vote to spend someone else's money. The voters who elect the legislators are in one sense voting to spend their own money on themselves, but not in the direct sense of **Category I** spending. The connection between the taxes any individual pays and the spending he votes for is exceedingly loose. In practice, voters, like legislators, are inclined to regard someone else as paying for the programs the legislator votes for directly and the voter votes for indirectly. Bureaucrats who administer the programs are also spending someone else's money. Little wonder that the amount spent explodes.

The bureaucrats spend someone else's money on someone else. Only human kindness, not the much stronger and more dependable spur of self-interest, assures that they will spend the money in the way most beneficial to the recipients. Hence the wastefulness and ineffectiveness of the spending.

But that is not all. The lure of getting someone else's money is strong. Many, including the bureaucrats administering the programs, will try to get it for themselves rather than have it go to someone else. The temptation to engage in corruption, to cheat, is strong and will not always be resisted or frustrated. People who resist the temptation to cheat will use legitimate means to direct the money to themselves. They will lobby for legislation favorable to themselves, for rules from which they can benefit. The bureaucrats administering the programs will press for better pay and perquisites for themselves—an outcome that larger programs will facilitate.

The attempt by people to divert government expenditures to themselves has two consequences that may not be obvious. First, it explains why so many programs tend to benefit middle and upper income groups rather than the poor for whom they are supposedly intended. The poor tend to lack not only the skills valued in the market, but also the skills required to be successful in the political scramble for funds. Indeed, their disadvantage in the political market is likely to be greater than in the economic. Once well-meaning reformers who may have helped to get a welfare measure enacted have gone on to their next reform, the poor are left to fend for themselves and they will almost always be overpowered by the groups that have already demonstrated a greater capacity to take advantage of available opportunities.

The second consequence is that the net gain to the recipients of the transfer will be less than the total amount transferred. If \$100 of somebody else's money is up for grabs, it pays to spend up to \$100 of your own money to get it. The costs incurred to lobby legislators and regulatory authorities, for contributions to political campaigns, and for myriad other items are a pure waste — harming the taxpayer who pays and benefiting no one. They must be subtracted from the gross transfer to get the net gain — and may, of course, at times exceed the gross transfer, leaving a net loss, not gain.

These consequences of subsidy seeking also help to explain the pressure for more and more spending, more and more programs. The initial measures fail to achieve the objectives of the well meaning reformers who sponsored them. They conclude that not enough has been done and seek additional programs. They gain as allies both people who envision careers as bureaucrats administering the programs and people who believe that they can tap the money to be spent.

Category IV spending tends also to corrupt the people involved. All such programs put some people in a position to decide what is good for other people. The effect is to instill in the one group a feeling of almost God-like power; in the other, a feeling of childlike dependence. The capacity of the beneficiaries for independence, for making their own decisions, atrophies through disuse. In addition

³ Givi Kapatadze's comment – Author of the Master Thesis.

to the waste of money, in addition to the failure to achieve the intended objectives, the end result is to rot the moral fabric that holds a decent society together.”⁴

For better argumentation to explain why we need taxpayer’s index, we can take a look for Milton Friedman’s four ways money can be spent from a perspective, which is described in below given matrix:

Whose Money	On Whom Spent	
	You	Someone Else
Yours	Economize and Seek Highest Value	Economize, but don’t Seek Highest Value
Someone Else’s	Don’t Economize, but Seek Highest Value	Don’t Economize and don’t Seek Highest Value

As we have seen, most government programs fall into the **IV category**, where there is no incentive to economize or to seek highest value, as far as, government spends somebody else’s money on someone else. Therefore, it’s quite clear why taxpayers’ money tends to be wasted via taxation and realization of the government programs. After all, we are facing to a very dangerous fact, that a need to fight for taxpayers’ fiscal rights is vital.

1.3 What should be done

As far as, taxpayers are supposed to limit the waste of the taxed money by government, there is the highest need for creation of some valid instrument to measure how justly and effectively taxpayers’ money is mobilized, and how transparently and efficiently taxed money is spent.

Therefore, **Taxpayers’ Index** could be considered as an efficient tool, in general, for civil society and, particularly, for individual taxpayers to make pressure on the public officials in order to achieve justice and effectiveness in a process of the tax administration, as well as, transparency and efficiency during the spending of the taxed money.

“Taxes are powerful mover of people, more than governments either care to admit or realize. Angry taxpayers can be lethal threat to a government that institutes oppressive taxation. Taxpayers instinctively rebel: the first warning phase of rebellion is rampant tax evasion and flight to avoid tax; the second phase produces riots; and the third phase is violence. Life ultimately can be catastrophic for any government that pushes its taxpayers too far.”⁵

Therefore, Taxpayers’ Index, on the one hand, could be used to protect citizens from irresponsible actions of the government officials and, on the other hand, Taxpayers’ Index could be

⁴ **Milton Friedman and Rose Friedman**, Free to Choose (New York and London, 1980), pp. 116-119.

⁵ **Charles Adams**, For Good and for Evil: The Impact of the Taxes on the Course of Civilization (Oxford, 1999), p. xxi.

used by the public officials to see how fiscal rights of the taxpayers are protected. By taking into consideration existing weaknesses of the public policy, which negatively affects on the taxpayers' fiscal rights, bureaucrats can plan their future activity in a way that prevents tax evasion, riots and violence, which potentially could be done by the angry taxpayers.

1.4 How Taxpayers' Index is measured

Taxpayers' Index has three components: 1) Transparency and Efficiency of Tax Policy; 2) Transparency and Efficiency of Budgetary Process; and 3) Transparency and Efficiency of Public Procurements. Each Component has sub-components:

1_Transparency and Efficiency of Tax Policy

1. General Principles for Transparency and Efficiency

This sub-component defines a general framework for transparency and efficiency of the first component of the index. Its main concern is to focus on the principles, which play key roles in transparency and efficiency of the Tax Policy.

2. Tax Burden

This sub-component measures burden of taxes levied on taxpayers.

3. Collection of Tax Data and its Confidentiality

This sub-component measures how justly and transparently taxes are collected and how well a confidentiality of information of taxpayers' tax data is protected.

4. Availability and Accessibility of Tax Data

This sub-component measures how transparently and effectively government provides information about collected taxes.

2_Transparency and Efficiency of Budgetary Process

1. General Principles for Transparency and Efficiency

This sub-component defines a general framework for transparency and efficiency of the second component of the index. Its main concern is to focus on the principles, which play key roles in transparency and efficiency of the budgetary process.

2. Pre-Budget Statement

Transparency of this phase of the budget process determines, at great degree, its efficiency. This document is important for the following purposes:

- To encourage debates about budget's aggregated data and how they interact with the economy and etc.

3. Annual/Executive's Budget

Transparency of this phase of the budget process determines, at great degree, its efficiency. This document is significant because it determines:

- **Revenues** - How much taxpayers' pay in taxes;
- **Expenses** - How collected resources will be distributed among taxpayers/citizens;
- **Debt** - How much of the cost of the government is carried by current or future generations.

4. Citizens' Budget

Transparency of this phase of the budget process determines, at great degree, its efficiency. This document is important for the following purposes:

- Budget should not only be available to the public but it also should be accessible⁶ to the public.

5. Enacted Budget

Transparency of this phase of the budget process determines, at great degree, its efficiency. This document is significant for following reasons:

- It provides basic information for any analysis conducted during the budget year. In other words, it's starting point for monitoring the execution phase of the budget;
- It grows in importance when it significantly differs from annual/executive's budget. The enacted budget allows one to compare, what was proposed by the executive to what the legislature enacted into the law and etc.

6. In-Year Reports

Transparency of this phase of the budget process determines, at great degree, its efficiency. This document is important for the following purposes:

- It provides a periodic measure of trends for gross revenues and expenditures up to date basis;
- The ability to track the trends of revenues and spending can provide regular information to taxpayers, to policy makers, to a press and to civil society organizations whether or not budget plans are going astray and etc.

7. Mid-Year Review

Transparency of this phase of the budget process determines, at great degree, its efficiency. This document is significant for following reasons:

- It represents an opportunity to comprehensively assess fiscal performance of a government against established strategy in the enacted budget;

⁶ **Accessible**, in this context, means easy to understand.

- It indicates whether a budget needs any corrective measures in the allocation of the resources between ministries or in the level of spending for a particular sector and etc.

8. Year-End Report

Transparency of this phase of the budget process determines, at great degree, its efficiency. This document is important for the following purposes:

- It describes the financial performance of entire central government and individual ministries;
- It covers what was actually spent and collected relative to what was planned and etc.

9. Audit Report

Transparency of this phase of the budget process determines, at great degree, its efficiency. This document is significant for following reasons:

- It provides to the public with independent and authoritative report of whether government's reporting how it raised taxes and spent public funds during previous budget year is accurate;
- The audit report indicates whether the government has complied with laws and regulations concerning budget during the budget year and etc.

3_Transparency and Efficiency of Public Procurements

1. General Principles for Transparency and Efficiency

This sub-component defines a general framework for transparency and efficiency of the third component of the index. Its main concern is to focus on the principles, which play key roles in transparency and efficiency of the public procurements.

2. Needs Assessment Phase/Demand Determination

Transparency of this phase of the public procurements cycle determines, at great degree, its efficiency. When information is available on this level of the public procurements, we can avoid such damaging activities as:

- Government purchase or investment, when it is not necessary;
- Economically unjustified and environmentally damaging investments;
- Overestimation of goods and services which are needed to a favour of particular provider and etc.

3. Preparation Phase/Process Design and Bid Documents Preparation

Transparency of this phase of the public procurements cycle determines, at great degree, its efficiency. When information is available on this level of the public procurements, we can avoid such damaging activities as:

- Designing bidding documents to a favour of particular provider so that, in fact, competition will not be possible;

- Use unnecessary complexity of bidding documents to create confusion in order to hide corrupt behavior and to make monitoring difficult;
- Abuse of grounds for direct contracting and etc.

4. Contractor Selection and Award Phase

Transparency of this phase of the public procurements cycle determines, at great degree, its efficiency. When information is available on this level of the public procurements, we can avoid such damaging activities as:

- Involvement of bribes or conflict of interests (biased decision makers);
- Subjective selection criteria which allows biases to play a role and remain undetected and etc.

5. Contract Implementation Phase

Transparency of this phase of the public procurements cycle determines, at great degree, its efficiency. When information is available on this level of the public procurements, we can avoid such damaging activities as:

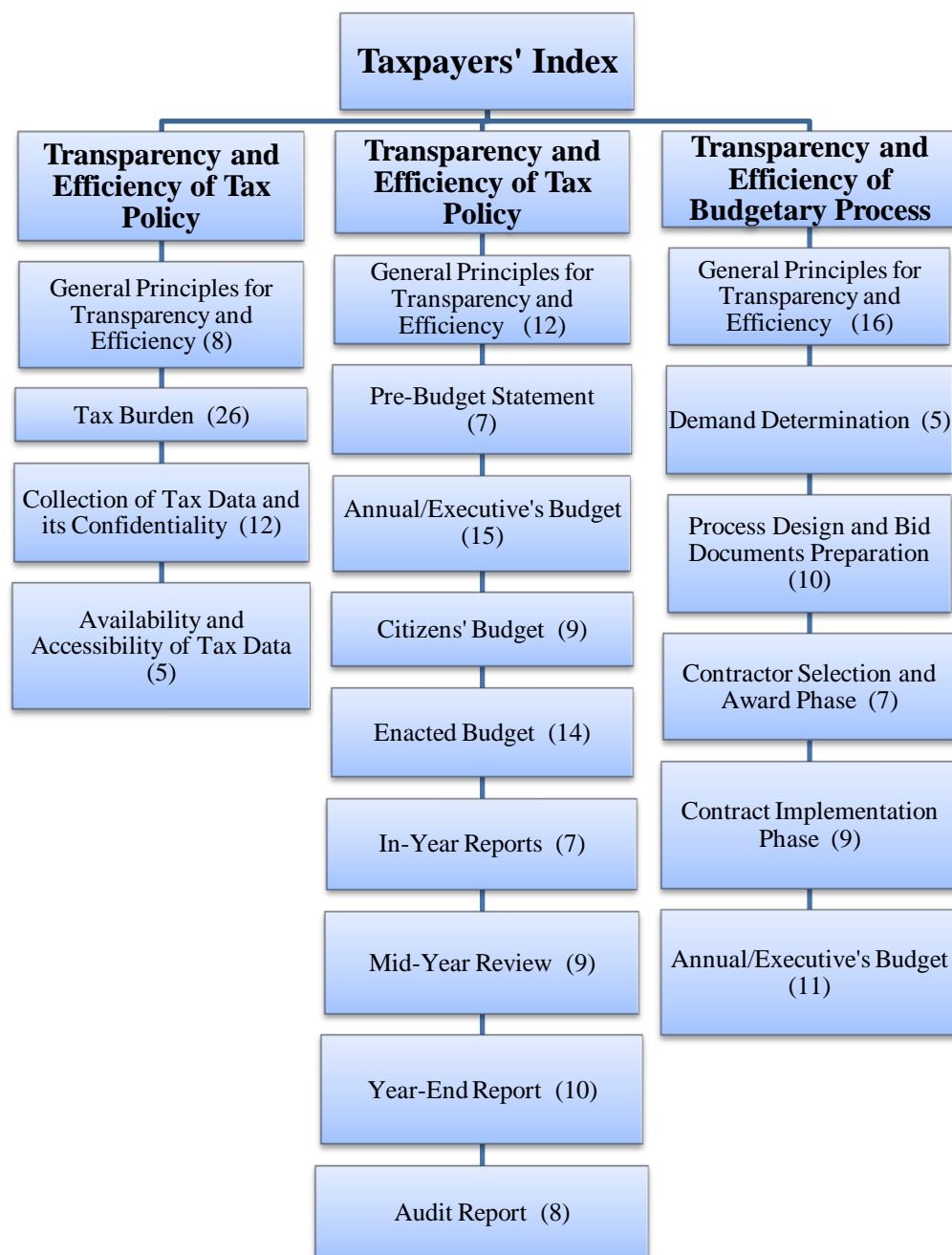
- Compensation of bribes and other extra payments by the winning bidder with poor quality;
- Collusion between corrupt contractor and corrupt control expressed in price increases during execution through “change orders”, reflecting changes in specifications or cost increases and etc.

6. Final Accounting and Audit

Transparency of this phase of the public procurements cycle determines, at great degree, its efficiency. When information is available on this level of the public procurements, we can avoid such damaging activities as:

- Willingness to support false certificates by accountants and auditors who are doing final accounts and audits, as far as, they are biased or “bought” and etc.

Below is given a structure tree for better visualization of the structure of the Taxpayers' Index:



N.B. In the above given structure tree, the numbers in the parenthesis indicates the number of questions in the questionnaire, which are related to the given sub-component.

Each component of the index will be measured on the basis of the following methodology⁷:

As we mentioned above, each component has sub-components, which are consisting comprehensive “yes”, “no” questionnaire and they will be calculated by the following way:

3 points for “Yes” and 0 point for “No” - When the questions **Highly Affects** on the transparency and/or on the efficiency of given component of the Taxpayers Index.

2 points for “Yes” and 0 point for “No” - When the questions **Mostly Affects** on the transparency and/or on the efficiency of given component of the Taxpayers Index.

1 points for “Yes” and 0 point for “No” - When the questions **Basically Affects** on the transparency and/or on the efficiency of given component of the Taxpayers Index.

Total taxpayers’ index will be calculated on the basis of the machinery of the following idea:

Let’s S_{111} be a point of the first question of the first sub-component of the first component, S_{122} be a point of the second question of the first sub-component of the first component and S_{11n} be a point of the n^{th} question of the first sub-component of the first component. Denote total sum of the points of the first sub-component of the first component by S_{11} , then

$$S_{11} = \sum_{i=1}^n S_{11i}$$

Let’s M_{11} be a maximum point of the first sub-component of the first component and r_{11} be a ratio of the first sub-component of the first component, then

$$r_{11} = \frac{S_{11}}{M_{11}}$$

Let’s w_{11} be a weight of the first sub-component of the first component, r_1 be a ratio of the first component of the index and suppose that first component has n sub-component, then

$$r_1 = r_{11} \cdot w_{11} + r_{12} \cdot w_{12} + \cdots + r_{1n} \cdot w_{1n}$$

⁷ **Walter R. Crowe**, Index Numbers: Theory and Applications (USA, Macdonald & Evans LTD, 1965).

We will generate with same way r_2 and r_3 , the ratios of the second and third components accordingly. Let's denote by r

a final ratio of the index. As far as, the index has three components and w_1, w_2, w_3 are the weights of the components accordingly, then

$$r = (r_1 \cdot w_1 + r_2 \cdot w_2 + r_3 \cdot w_3)$$

Let's denote by w

a final weight of the index. As far as, the Taxpayers' Index will be measured on **[0-10]** scale, the final weight will be 10. Therefore,

$$w = 10$$

Now denote a total point of the Index by TI , then

$$TI = r \cdot w$$

1.5 Assessment Criteria of the Taxpayers' Index

(9-10] points - highly protected Taxpayers' Fiscal Rights

If a country gets points between **(9-10]** this means that Taxpayers' Fiscal Rights are highly protected, as far as, transparency and efficiency of all components: Tax Policy, Budgetary Process and Public Procurements are highly achieved in total.

(7-9] points - mostly protected Taxpayers' Fiscal Rights

If a country gets points between **(7-9]** this means that Taxpayers' Fiscal Rights are mostly protected, as far as, transparency and efficiency of all components: Tax Policy, Budgetary Process and Public Procurements are mostly achieved in total, which tells us that there is a need of small improvements to achieve a high level of protection of the taxpayers fiscal rights.

(5-7] points - basically protected Taxpayers' Fiscal Rights

If a country gets points between **(5-7]** this means that Taxpayers' Fiscal Rights are basically protected, as far as, transparency and efficiency of all components: Tax Policy, Budgetary Process and Public Procurements are basically achieved in total, which shows that there is a need of some important improvements to achieve a high level of protection of the taxpayers fiscal rights.

(4-5] points - basically unprotected Taxpayers' Fiscal Rights

If a country gets points between **(4-5]** this means that Taxpayers' Fiscal Rights are basically unprotected, as far as, transparency and efficiency of all components: Tax Policy, Budgetary Process and Public Procurements are basically unachieved in total, which tells us that there is an immediate

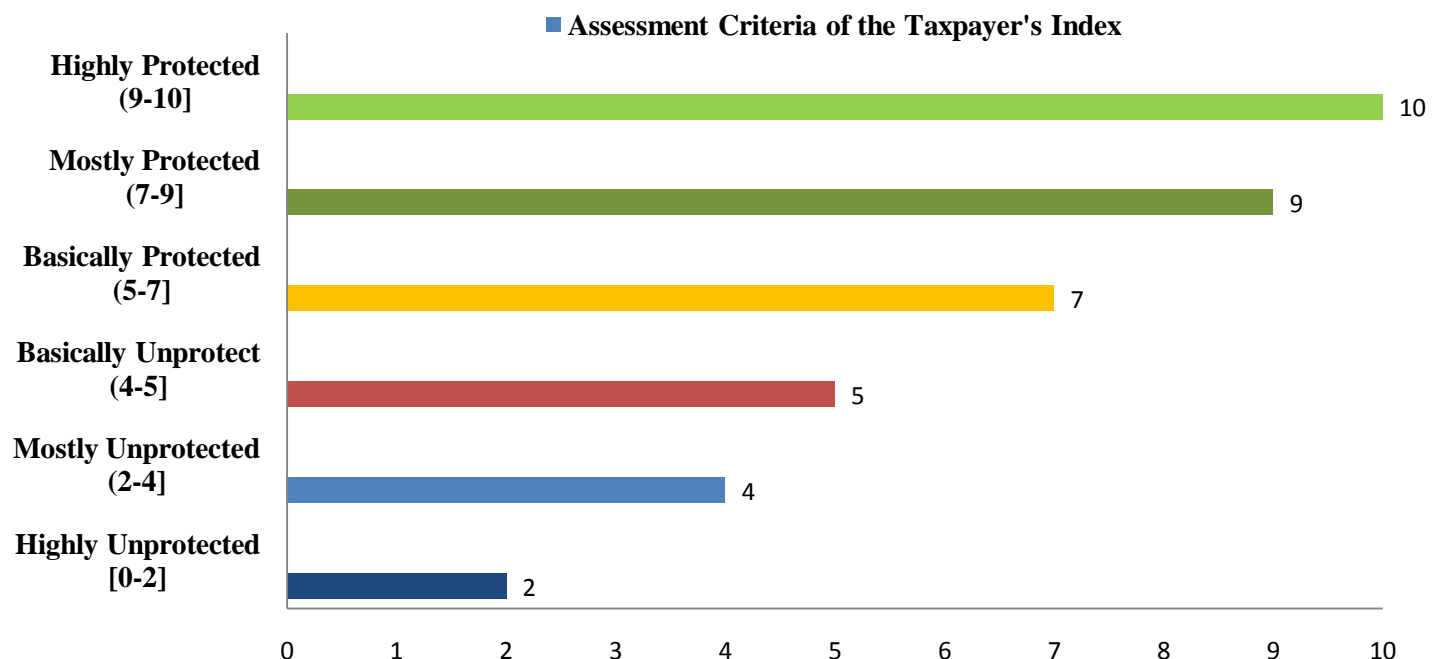
need of systemic improvements in government policy to achieve a high level of protection of the taxpayers fiscal rights.

(2-4] points - mostly unprotected Taxpayers' Fiscal Rights

If a country gets points between (2-4] this means that Taxpayers' Fiscal Rights are mostly unprotected, as far as, transparency and efficiency of all components: Tax Policy, Budgetary Process and Public Procurements are mostly unachieved in total, which shows that there is an urgent need of systemic changes in government policy to achieve a high level of protection of the taxpayers fiscal rights.

[0-2] points - highly unprotected Taxpayers' Fiscal Rights

If a country gets points between [0-2] this means that Taxpayers' Fiscal Rights are highly unprotected, as far as, transparency and efficiency of all components: Tax Policy, Budgetary Process and Public Procurements are highly unachieved in total, which tells us that there is a vital need of systemic changes in government policy to achieve a high level of protection of the taxpayers fiscal rights.



Below is the given a comprehensive questionnaire of the components of the Taxpayers' Index.

1.6 Component №1 – Transparency and Efficiency of Tax Policy⁸

[point – 0.333333333]

⁸ A first component is based on the ideas of the following e-books: 1) A first component is based on the ideas of the following e-books: 1) **OECD (2011)**, Implementing the Tax Transparency Standards: A Handbook for Assessors and Jurisdictions, Second Edition, OECD Publishing;

Sub – Component 1 - General Principles for Transparency and Efficiency

1. Are all laws and regulations concerning taxation published and easily accessible for all interested parties at no or very low cost? **(3 points for “Yes” and 0 point for “No”)**
2. Are defined the number and the rates of all existing taxes by the tax code or by any other laws and regulations concerning taxation? **(3 points for “Yes” and 0 point for “No”)**
3. Are given clear deadlines for payment of each type of taxes by the tax code or by any other laws and regulations concerning taxation? **(3 points for “Yes” and 0 point for “No”)**
4. Are the procedures clearly defined how to pay each type of taxes by the tax code or by any other laws and regulations concerning taxation? **(3 points for “Yes” and 0 point for “No”)**
5. Is defined existence of tax authority, by the tax code or by any other laws and regulations concerning taxation, which would have a judicial power to collect national and/or local taxes? **(3 points for “Yes” and 0 point for “No”)**
6. Is defined existence of independent appeals body for tax disputes by the tax code or by any other laws and regulations concerning taxation? **(3 points for “Yes” and 0 point for “No”)**
7. (If the answer of the 6th question is “yes”) Is defined an obligation, by the tax code or by any other laws and regulations concerning taxation, that an appointment of the head of the appeals body should be approved by the parliament via the support of at least 2/3rd of its members? **(2 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 6th question is “No” then 0 point would be given for current question.
8. (If the answer of the 6th question is “yes”) Is defined an obligation, by the tax code or by any other laws and regulations concerning taxation, to invite at least two independent representatives from civil society organizations in the review process of the tax disputes in the appeals body? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 6th question is “No” then 0 point would be given for current question.

Sub – Component 2 - Tax Burden

9. Are total number of taxes (national and local taxes), defined by the tax code or by any other laws and regulations concerning taxation, less or equal to 7? **(3 points for “Yes” and 0 point for “No”)**
10. Does your country have a flat personal income tax? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don't have any kind of personal income tax, then the answer of this question would be understood as “yes”.
11. Maximum rate of the personal income tax, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 12%? **(3 points for “Yes” and 0**

- point for “No”)** **N.B.** If country don't have any kind of personal income tax, then the answer of this question would be understood as “yes”.
12. Does your country have a flat corporate income tax? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don't have any kind of corporate income tax, then the answer of this question would be understood as “yes”.
13. Maximum rate of the corporate income tax, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 12%? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don't have any kind of corporate income tax, then the answer of this question would be understood as “yes”.
14. Does your country have a flat social security tax? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don't have any kind of social security tax, then the answer of this question would be understood as “yes”.
15. Maximum rate of the social security tax, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 12%? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don't have any kind of social security tax, then the answer of this question would be understood as “yes”.
16. Is your country free from any kind of property tax? **(3 points for “Yes” and 0 point for “No”)**
17. Does your country have a flat value added tax (VAT)? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don't have any kind of value added tax (VAT), then the answer of this question would be understood as “yes”.
18. Maximum rate of the value added tax (VAT), defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 17%? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don't have any kind of value added tax (VAT), then the answer of this question would be understood as “yes”.
19. Maximum rate of the excise duty on 1 liter of all kind of wine, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 0.70 USD or its equivalent in national currency? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country doesn't have any excise duty for any kind of wine, then the answer of this question would be understood as “yes”.
20. Maximum rate of the excise duty on 1 liter of all kind of beer, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 0.20 USD or its equivalent in national currency? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don't have any excise duty for any kind of beer, then the answer of this question would be understood as “yes”.
21. Maximum rate of the excise duty on 1 liter of all kind of vodka, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 0.70 USD or its equivalent in national currency? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don't have any excise duty for any kind of vodka, then the answer of this question would be understood as “yes”.
22. Maximum rate of the excise duty on 1 liter of all kind of alcohol beverages others than mentioned above, defined by the tax code or by any other laws and regulations

- concerning taxation, is less or equal to 1.00 USD or its equivalent in national currency? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don’t have any excise duty for any kind of alcohol beverages others than mentioned above, then the answer of this question would be understood as “yes”.
23. Maximum rate of the excise duty on 20 units of all kind of filtered cigarette, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 0.30 USD or its equivalent in national currency? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don’t have any excise duty for any kind of filtered cigarette, then the answer of this question would be understood as “yes”.
 24. Maximum rate of excise duty on 20 units of all kind of unfiltered cigarette, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 0.10 USD or its equivalent in national currency? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don’t have any excise duty for any kind of unfiltered cigarette, then the answer of this question would be understood as “yes”.
 25. Maximum rate of the excise duty on 1000 cm³ of all kind of gas, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 70.00 USD or its equivalent in national currency? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don’t have any excise duty for any kind of gas, then the answer of this question would be understood as “yes”.
 26. Maximum rate of the excise duty on 1000 liters of all kind of oil, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 100.00 USD or its equivalent in national currency? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If country don’t have any excise duty for any kind of oil, then the answer of this question would be understood as “yes”.
 27. Maximum rate of the excise duty on 1000 liters of all kind of petrol, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 100.00 USD or its equivalent in national currency? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don’t have any excise duty for any kind of petrol, then the answer of this question would be understood as “yes”.
 28. Maximum rate of the excise duty on 1000 liters of all kind of kerosene, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 70.00 USD or its equivalent in national currency? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don’t have any excise duty for any kind of kerosene, then the answer of this question would be understood as “yes”.
 29. Maximum rate of the excise duty on 1000 kilowatt hours electricity, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 3.00 USD or its equivalent in national currency? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If your country don’t have any excise duty on electricity, then the answer of this question would be understood as “yes”.
 30. The maximum rate of excise duty on 1000 kilos any kind of ferrous and/or non-ferrous metals, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 30.00 USD or its equivalent in national currency? **(3 points for “Yes”**

- and 0 point for “No”)** N.B. If your country don’t have any excise duty for any kind of ferrous and/or non-ferrous metals, then the answer of this question would be understood as “yes”.
31. Is your country free from any kind of excise duties others than mentioned above? **(3 points for “Yes” and 0 point for “No”)**
 32. The maximum rate of the custom duty, defined by the tax code or by any other laws and regulations concerning taxation, is less or equal to 12%? **(3 points for “Yes” and 0 point for “No”)** N.B. If your country don’t have any kind of custom duty, then the answer of this question would be understood as “yes”.
 33. Is your country free from any kind of taxes (national and local taxes) others than mentioned above? **(3 points for “Yes” and 0 point for “No”)**
 34. Is it possible in your country to increase the rate of existing taxes or to impose any kind of new taxes on taxpayers without referendum? **(3 points for “Yes” and 0 point for “No”)**

Sub – Component 3 - Collection of Tax Data and its Confidentiality

35. Is defined by the tax code or by any other laws and regulations concerning taxation that a tax authority should collect tax data from taxpayers on the basis of self assessment system? **(2 points for “Yes” and 0 point for “No”)**
36. Do taxpayers have a right, given by the tax code or by any other laws and regulations concerning taxation, to provide all necessary tax data to the tax authority on electronic basis? **(2 points for “Yes” and 0 point for “No”)**
37. Is defined an obligation for tax authority, by the tax code or by any other laws and regulations concerning taxation, to notify a taxpayer about deadline of the tax payment, at least 10 working days earlier, before the deadline of the payment? **(3 points for “Yes” and 0 point for “No”)**
38. Is defined an obligation for tax authority, by the tax code or by any other laws and regulations concerning taxation, to give additional time for a taxpayer without any penalty, in order to provide all necessary tax data to the tax authority, when the taxpayer don’t provide tax data to the tax authority in a timely manner? **(2 points for “Yes” and 0 point for “No”)**
39. Do taxpayers have a right, given by the tax code or by any other laws and regulations concerning taxation, to be notified from the tax authority, at least 10 working days earlier, about assessment or inspection of the taxpayers asset or tax data? **(3 points for “Yes” and 0 point for “No”)**
40. Do taxpayers have a right, given by the tax code or by any other laws and regulations concerning taxation, to be notified from the tax authority about the decision on adjudication? **(3 points for “Yes” and 0 point for “No”)**

41. Do taxpayers have a right, given by the tax code or by any other laws and regulations concerning taxation, of explanation from the tax authority why a tax is being assessed in the way it is? **(2 points for “Yes” and 0 point for “No”)**
42. Do taxpayers have a right, given by the tax code or by any other laws and regulations concerning taxation, of explanation from the tax authority about the reasons of the decision on adjudication? **(3 points for “Yes” and 0 point for “No”)**
43. Do taxpayers have a right, given by the tax code or by any other laws and regulations concerning taxation, of independent administrative and final judgment appeal? **(3 points for “Yes” and 0 point for “No”)**
44. Do taxpayers have a right, given by the tax code or by any other laws and regulations concerning taxation, to have an official representative in the tax authority? **(3 points for “Yes” and 0 point for “No”)**
45. Are banking institutions free from legal obligations, under any circumstances, to provide directly to the tax authority any information about a taxpayer without notice and consent of the taxpayer? **(3 points for “Yes” and 0 point for “No”)**
46. Is confidentiality guaranteed to the taxpayers, by the tax code or by any other laws and regulations concerning taxation, that any tax data which was transmitted to the tax authority would not be publicly available from the tax authority under any circumstances? **(3 points for “Yes” and 0 point for “No”)**

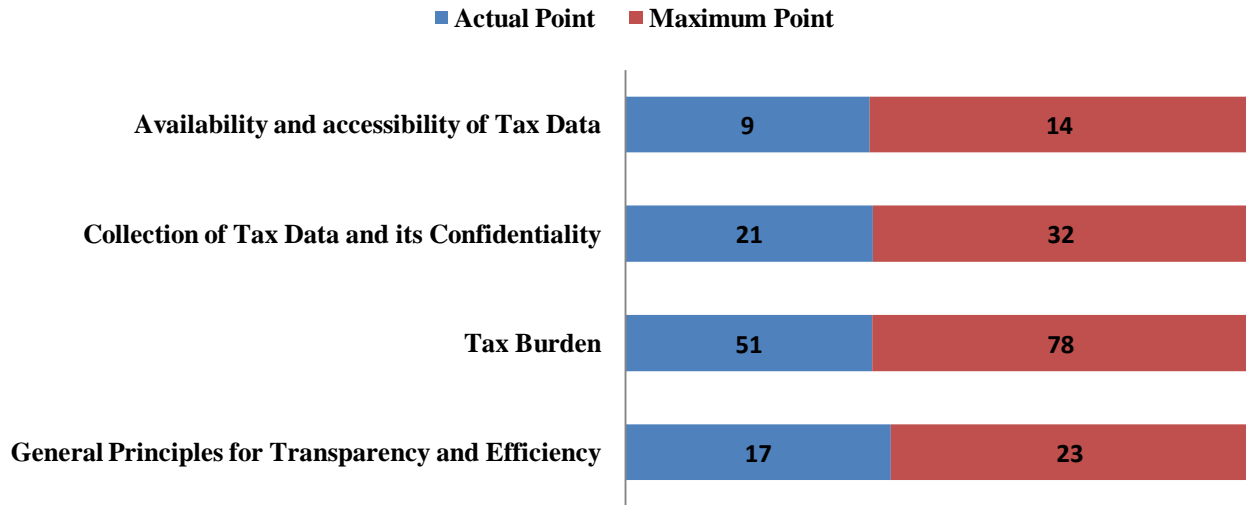
Sub – Component 4 - Availability and Accessibility of Tax Data

47. Do taxpayers have a right, given by the tax code or by any other laws and regulations concerning taxation, to access at any time their personal tax data, which was transmitted to the tax authority? **(3 points for “Yes” and 0 point for “No”)**
48. Is defined an obligation for tax authority, by the tax code or by any other laws and regulations concerning taxation, to prepare a tax handbook or a tax guide for taxpayers, where would be given a short summary of all existing taxes and information about deadlines for their payment? **(3 points for “Yes” and 0 point for “No”)**
49. (If the answer of the 48th question is “yes”) Is defined an obligation for tax authority, by the tax code or by any other laws and regulations concerning taxation, to update the tax handbook or the tax guide on quarterly basis? **(2 points for “Yes” and 0 point for “No”)**
N.B. If the answer of the 48th question is “No” then 0 point would be given for current question.
50. (If the answer of the 48th question is “yes”) Is defined an obligation for tax authority, by the tax code or by any other laws and regulations concerning taxation, to publish prepared and updated tax handbook or tax guide and to make it easily accessible for all interested parties at no or very low cost? **(3 points for “Yes” and 0 point for “No”)**
N.B. If the answer of the 48th question is “No” then 0 point would be given for current question.

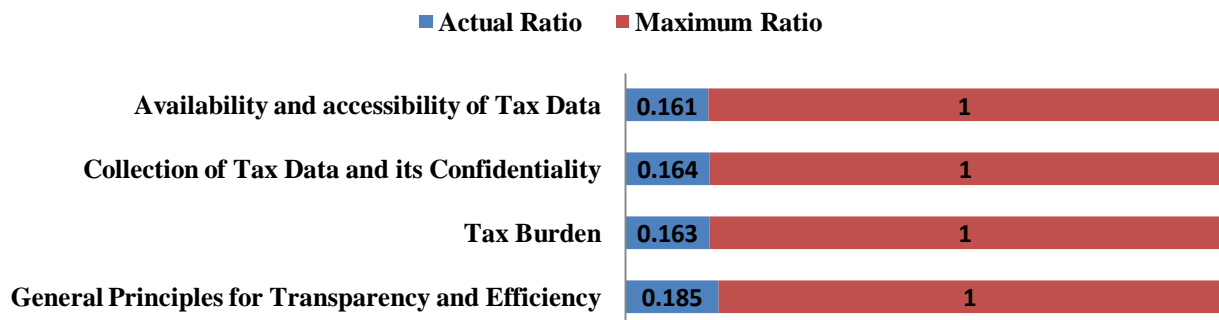
51. Is defined an obligation for tax authority, by the tax code or by any other laws and regulations concerning taxation, to publish information about the gross amount of collected taxes by the type of taxes on quarterly basis and make it easily accessible for all interested parties at no or very low cost? (3 points for “Yes” and 0 point for “No”)

As far as, for objective reasons, we don't have a real data set, we can get following hypothetical data for **country X**:

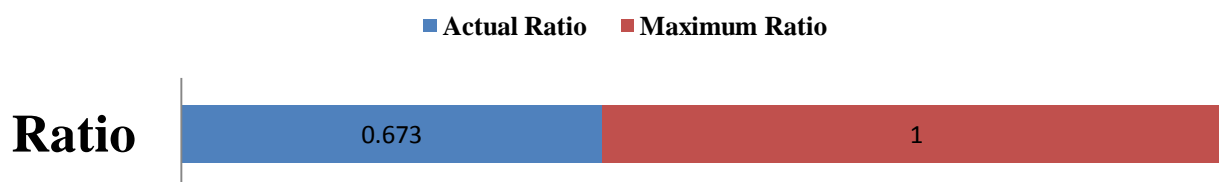
Pointes of the Sub-Components of the First Component



Ratios of the Sub-Components of the First Component



Final Ratio of the First Component



1.7 Component №2–Transparency and Efficiency of Budgetary Process⁹ [point–0.333333333]

Sub – Component 1 - General Principles for Transparency and Efficiency [weight – 0.111111111]

1. Are all laws and regulations concerning budget published and easily accessible for all interested parties at no or very low cost? **(3 points for “Yes” and 0 point for “No”)**
2. Are terms about budget process clearly defined by the laws and regulations concerning budget? **(3 points for “Yes” and 0 point for “No”)**
3. Is a relationship clearly defined, by the laws and regulations concerning budget, between national and sub-national budgets (self-government’s/autonomous republic’s budget)? **(3 points for “Yes” and 0 point for “No”)**
4. Are the formulas clearly defined, by the laws and regulations concerning budget, how money would be transferred from national to sub-national budgets? **(3 points for “Yes” and 0 point for “No”)**
5. Are all institutional entities clearly defined, by the laws and regulations concerning budget, which are responsible for preparation, implementation and reporting of the national/sub-national budgets? **(3 points for “Yes” and 0 point for “No”)**
6. Is clearly defined a list of main information, by the laws and regulations concerning budget, which should be presented in budget documentation during each step of the budget process? **(3 points for “Yes” and 0 point for “No”)**
7. Is clearly defined a way of management of the main treasury account, by the laws and regulations concerning budget, where all main revenues of the government would be collected? **(2 points for “Yes” and 0 point for “No”)**

⁹ A second component is based on the ideas of the following e-books: 1) **International Monetary Fund**, Manual on fiscal transparency (Washington, D.C.: Fiscal Affairs Dept. 2011); 2) **International Budget Partnership**, Open Budget Questionnaire (Washington, D.C. 2011).

8. Is defined a requirement of external independent audit of the budget reports, by the laws and regulations concerning budget, before it would be approved by the legislative body as qualified or disqualified? **(2 points for “Yes” and 0 point for “No”)**
9. Are defined any general limits, by the laws and regulations concerning budget, for gross national debt and deficit? **(3 points for “Yes” and 0 point for “No”)**
10. Is given a detail description of all possible sources of income in the budget by the laws and regulations concerning budget? **(3 points for “Yes” and 0 point for “No”)**
11. Is given a detail description of all possible expenditures from the budget by the laws and regulations concerning budget? **(3 points for “Yes” and 0 point for “No”)**
12. Are the procedures clearly defined, by the laws and regulations concerning budget, for external or internal borrowing? **(2 points for “Yes” and 0 point for “No”)**

Sub – Component 2 - Pre-Budget Statement **[weight – 0.11111111]**

13. Is defined a requirement, by the laws and regulations concerning budget, to prepare pre-budget statement to set out government’s budgetary strategies for coming and at least for two subsequent budget years? **(3 points for “Yes” and 0 point for “No”)**
14. (If the answer of the 13th question is yes) Is defined a requirement of public discussion of the pre-budget statement in the legislature by the laws and regulations concerning budget? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 13th question is “No” then 0 point would be given for current question.
15. (If the answer on the 13th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present an information in the pre-budget statement about main macroeconomic indicators for coming and at least for two subsequent years? **(2 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 13th question is “No” then 0 point would be given for current question.
16. (If the answer on the 13th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present an information in the pre-budget statement about forecasts of gross expenditures by the main categories for coming and at least two subsequent budgetary years? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 13th question is “No” then 0 point would be given for current question.
17. (If the answer on the 13th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present an information in the pre-budget statement about forecasts of gross revenues by the main types for coming and at least two subsequent budgetary years? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 13th question is “No” then 0 point would be given for current question.
18. (If the answer on the 13th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present an information in the pre-budget statement about

country's financial and non-financial assets for coming and at least two subsequent budget years? **(3 points for "Yes" and 0 point for "No")** N.B. If the answer of the 13th question is "No" then 0 point would be given for current question.

19. (If the answer on the 13th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to publish the pre-budget statement no later than the end of 5th months of the current budgetary year? **(3 points for "Yes" and 0 point for "No")** N.B. If the answer of the 13th question is "No" then 0 point would be given for current question.

Sub – Component 3 - Annual/Executive's Budget **[weight – 0.11111111]**

20. Is defined a requirement, by the laws and regulations concerning budget, to present an annual/executive's budget in legislature no later than 3 months before the start of the coming budget year for public discussion? **(3 points for "Yes" and 0 point for "No")**
21. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a detail explanation of the government forecast revenues, by the main revenue types, a contribution they are expected to make on the policy objectives, and their individual estimated fiscal impacts? **(3 points for "Yes" and 0 point for "No")**
22. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a detail explanation of government expenditures by administrative unit, economic classification and functional classification? **(3 points for "Yes" and 0 point for "No")**
23. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation an aggregately presented fiscal data, so that it's possible to look at total values of assets, liabilities and transactions? **(3 points for "Yes" and 0 point for "No")**
24. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a detail information about domestic and external financing of the deficit? **(3 points for "Yes" and 0 point for "No")**
25. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a comprehensive information on the level and structure of the public debt and its servicing? **(3 points for "Yes" and 0 point for "No")**
26. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a detail information on the financial assets by the categories, being held by the government's entities? **(3 points for "Yes" and 0 point for "No")**

27. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a detail information about transfers from the central to the sub-national budgets? **(3 points for "Yes" and 0 point for "No")**
28. Is defined a requirement, by the laws and regulations concerning budget, to present in annual/executive's budget or in any supporting budget documentation a detail information about rate of exploitation of the natural resources and the management of resource revenues? **(3 points for "Yes" and 0 point for "No")**
29. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a detail information about government subsidies to the state-owned corporations? **(3 points for "Yes" and 0 point for "No")**
30. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a detail information about the taxes and dividends paid by the state-owned corporations? **(3 points for "Yes" and 0 point for "No")**
31. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a detail information about the loans and guarantees made by the government to the state-owned corporations? **(3 points for "Yes" and 0 point for "No")**
32. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a detail information about the extra-budgetary¹⁰ funds for at least coming budget year? **(3 points for "Yes" and 0 point for "No")** **N.B.** If your country don't have any extra-budgetary funds, then the answer of this question would be understood as "yes".
33. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a detail information about the quasi fiscal activities¹¹ for at least coming budget year? **(2 points for "Yes" and 0 point for "No")**
34. Is defined a requirement, by the laws and regulations concerning budget, to present in the annual/executive's budget or in any supporting budget documentation a detail information about the contingent liabilities¹² for at least coming budget year? **(2 points for "Yes" and 0 point for "No")**

Sub – Component 4 - Citizens' Budget **[weight – 0.11111111]**

¹⁰**Extra-Budgetary Funds** - refer to general government transactions, often with separate banking and institutional arrangements that are not included in the annual state (federal) budget law and the budgets of sub-national levels of government. Source: Richard Allen and Dimitar Radev: Technical Notes and Manual, International Monetary Fund (June 2010), p.1.

35. Is defined a requirement, by the laws and regulations concerning budget, to prepare a citizens' budget? **(3 points for "Yes" and 0 point for "No")**
36. (If the answer on the 35th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to publish the citizens' budget at the same time when the annual/executive's budget will be published? **(3 points for "Yes" and 0 point for "No")**
N.B. If the answer of the 35th question is "No" then 0 point would be given for current question.
37. (If the answer on the 35th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the citizens' budget a brief description of the reasons why the citizens' budget is prepared? **(1 points for "Yes" and 0 point for "No")**
N.B. If the answer of the 35th question is "No" then 0 point would be given for current question.
38. (If the answer on 35th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the citizens' budget an information about the main macroeconomic indicators for coming and at least for two subsequent years? **(3 points for "Yes" and 0 point for "No")** **N.B.** If the answer of the 35th question is "No" then 0 point would be given for current question.
39. (If the answer on the 35th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the citizens' budget an information about forecasts of the gross expenditures by main categories for coming and at least two subsequent budgetary years? **(3 points for "Yes" and 0 point for "No")** **N.B.** If the answer of the 35th question is "No" then 0 point would be given for current question.
40. (If the answer on the 35th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the citizens' budget an information about forecasts of the gross revenues by main types of the revenues for coming and at least two subsequent budgetary years? **(3 points for "Yes" and 0 point for "No")** **N.B.** If the answer of the 35th question is "No" then 0 point would be given for current question.
41. (If the answer on the 35th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the citizens' budget an information about country's financial and non-financial assets for coming and at least two subsequent budget years? **(3 points for "Yes" and 0 point for "No")** **N.B.** If the answer of the 35th question is "No" then 0 point would be given for current question.
42. (If the answer on the 35th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the citizens' budget an aggregate information on the level and structure of the public debt and its servicing? **(3 points for "Yes" and 0 point for "No")** **N.B.** If the answer of the 35th question is "No" then 0 point would be given for current question.
43. (If the answer on the 35th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the citizens' budget a summary of the main budget initiatives and its impacts on the targeted groups? **(2 points for "Yes" and 0 point**

for “No”) **N.B.** If the answer of the 35th question is “No” then 0 point would be given for current question.

Sub – Component 5 - Enacted Budget
[weight – 0.11111111]

44. Is defined a requirement, by the laws and regulations concerning budget, to present in an enacted budget a detail list of all major revenues and expenditures on the gross basis? **(3 points for “Yes” and 0 point for “No”)**
45. Is defined a requirement, by the laws and regulations concerning budget, to present in the enacted budget a detail information on the expenditures classified by the economic, functional and administrative categories? **(3 points for “Yes” and 0 point for “No”)**
46. Is defined a requirement, by the laws and regulations concerning budget, to present in the enacted budget non-financial and financial performance targets for each expenditure program? **(3 points for “Yes” and 0 point for “No”)**
47. Is defined a requirement, by the laws and regulations concerning budget, to present in the enacted budget a detail information on the revenues by all main revenue types? **(3 points for “Yes” and 0 point for “No”)**
48. Is defined a requirement, by the laws and regulations concerning budget, to present in the enacted budget a detail information about financial assistance of donors by the programs and by the donors? **(3 points for “Yes” and 0 point for “No”)**
49. Is defined a requirement, by the laws and regulations concerning budget, to present in the enacted budget a detail information about domestic and external financing of the deficit? **(3 points for “Yes” and 0 point for “No”)**
50. Is defined a requirement, by the laws and regulations concerning budget, to present in the enacted budget a detail information on the level and structure of the public debt and its servicing? **(3 points for “Yes” and 0 point for “No”)**
51. Is defined a requirement, by the laws and regulations concerning budget, to provide in the enacted budget a comprehensive description about the impact of the enacted budget on the government’s financial and non-financial assets, and liabilities? **(3 points for “Yes” and 0 point for “No”)**
52. Is defined a requirement, by the laws and regulations concerning budget, to provide in the enacted budget a comprehensive information about the extra-budgetary funds? **(3 points for “Yes” and 0 point for “No”)**
53. Is defined a requirement, by the laws and regulations concerning budget, to provide in the enacted budget a comprehensive information about the quasi fiscal activities? **(2 points for “Yes” and 0 point for “No”)**

54. Is defined a requirement, by the laws and regulations concerning budget, to provide in the enacted budget a comprehensive information about the contingent liabilities? **(2 points for “Yes” and 0 point for “No”)**
55. Is defined a requirement, by the laws and regulations concerning budget, to present in the enacted budget a detail information on what percentage of expenditure in the budget year is dedicated to spending on secret items such as military and police? **(3 points for “Yes” and 0 point for “No”)**
56. Is defined a requirement, by the laws and regulations concerning budget, to approve the annual/executive’s budget by the legislature no later than the end of the current budget year? **(3 points for “Yes” and 0 point for “No”)**
57. Is defined a requirement, by the laws and regulations concerning budget, to publish the enacted budget and make it easily accessible for all interested parties at no or very low cost, as soon as it will be approved by the legislature? **(3 points for “Yes” and 0 point for “No”)**

Sub – Component 6 - In-Year Reports **[weight – 0.11111111]**

58. Is defined a requirement, by the laws and regulations concerning budget, to prepare in-year budget reports (monthly or quarterly)? **(3 points for “Yes” and 0 point for “No”)**
59. (if the answer on the 58th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the in-year reports an information about the gross revenue and spending on the monthly basis? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 58th question is “No” then 0 point would be given for current question.
60. (if the answer on the 58th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the in-year reports an information about comparison of factual monthly revenue and spending with their forecasts? **(2 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 58th question is “No” then 0 point would be given for current question.
61. (if the answer on the 58th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the in-year reports a classification of the expenditures by the administrative, economic and functional categories on monthly basis? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 58th question is “No” then 0 point would be given for current question.
62. (if the answer on the 58th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the in-year reports an information about the revenues by main revenue types on monthly basis? **(3 points for “Yes” and 0 point for “No”)**

“No”) **N.B.** If the answer of the 58th question is “No” then 0 point would be given for current question.

63. (if the answer on the 58th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the in-year reports a detail information about the government’s internal and external borrowing on monthly basis? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 58th question is “No” then 0 point would be given for current question.
64. (if the answer on the 58th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to publish the in-year reports and make them easily accessible for all interested parties at no or very low cost on monthly periodicity? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 58th question is “No” then 0 point would be given for current question.

Sub – Component 7 - Mid-Year Review

[weight – 0.11111111]

65. Is defined a requirement, by the laws and regulations concerning budget, to prepare a mid-year budget review? **(3 points for “Yes” and 0 point for “No”)**
66. (if the answer on the 65th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the mid-year budget review an information about any changes in the main macroeconomic assumptions, which were declared in the enacted budget? **(2 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 65th question is “No” then 0 point would be given for current question.
67. (if the answer on the 65th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the mid-year budget review an adjusted information for estimates of the aggregated revenue, expenditure and borrowing if there was made any changes in the main macroeconomic assumptions, which were declared in the enacted budget? **(2 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 65th question is “No” then 0 point would be given for current question.
68. (if the answer on the 65th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the mid-year budget review a detail information about fiscal policy and its effects, which are based on current domestic and international economic conditions? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 65th question is “No” then 0 point would be given for current question.
69. (if the answer on the 65th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the mid-year budget review a detail information about assessment of the mid-year performance of the main objectives of the spending programs by the administrative entities, which were declared in the enacted budget? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 65th question is “No” then 0 point would be given for current question.

70. (if the answer on the 65th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the mid-year budget review a detail information about assessment of the mid-year performance of the debt services, which were declared in the enacted budget? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 65th question is “No” then 0 point would be given for current question.
71. (if the answer on the 65th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the mid-year budget review a detail information about assessment of the mid-year performance of the borrowing policy, which were declared in the enacted budget? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 65th question is “No” then 0 point would be given for current question.
72. (if the answer on the 65th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the mid-year budget review a detail information about the policy decisions, which were taken after enactment of the annual/executive’s budget and its aggregated impacts by the revenue and expenditure types? **(2 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 65th question is “No” then 0 point would be given for current question.
73. (if the answer on the 65th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to publish the mid-year budget review and make it easily accessible for all interested parties at no or very low cost no later than on August 15th of the current budget year? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 65th question is “No” then 0 point would be given for current question.

Sub – Component 8 - Year-End Report **[weight – 0.11111111]**

74. Is defined a requirement, by the laws and regulations concerning budget, to prepare a year-end budget report? **(3 points for “Yes” and 0 point for “No”)**
75. (if the answer on the 74th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the year-end budget report an information about the collected gross revenue by the revenue types? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 74th question is “No” then 0 point would be given for current question.
76. (if the answer on the 74th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the year-end budget report a clear explanation about any significant deviation between the factual collected revenue and its forecasts, which were stated in the enacted budget? **(2 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 74th question is “No” then 0 point would be given for current question.
77. (if the answer on the 74th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the year-end budget report a detail information about the factual gross spending by the economic, functional and administrative categories?

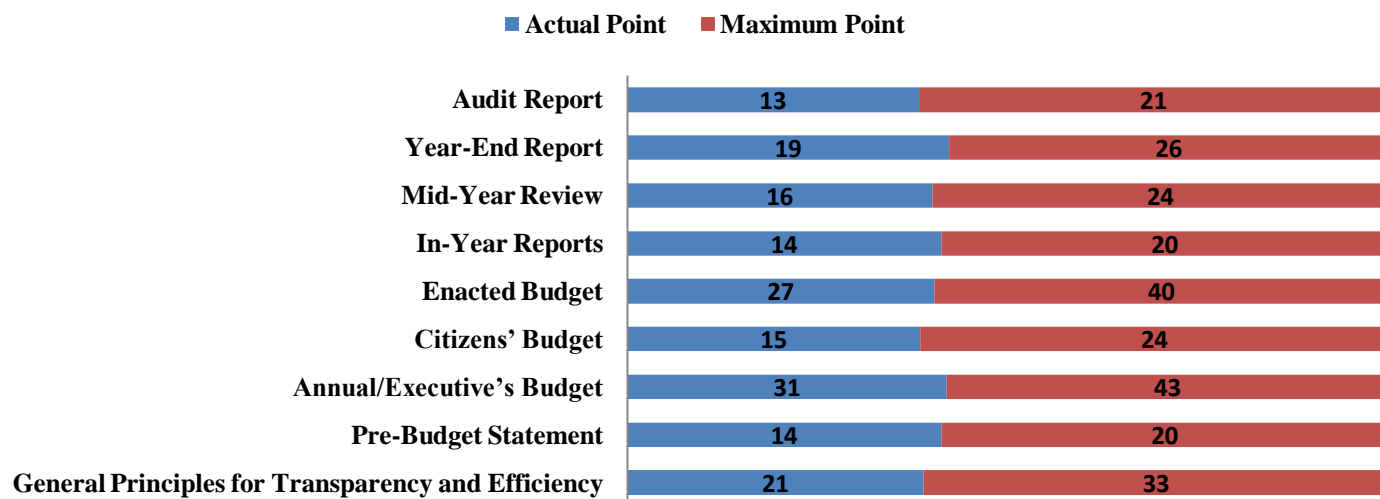
- (3 points for “Yes” and 0 point for “No”) N.B.** If the answer of the 74th question is “No” then 0 point would be given for current question.
78. (if the answer on the 74th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the year-end budget report a clear explanation about any significant deviation between the factual spending and its forecasts, which were stated in the enacted budget? **(2 points for “Yes” and 0 point for “No”) N.B.** If the answer of the 74th question is “No” then 0 point would be given for current question.
79. (if the answer on the 74th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the year-end budget report a detail information about current financial and non-financial assets? **(3 points for “Yes” and 0 point for “No”) N.B.** If the answer of the 74th question is “No” then 0 point would be given for current question.
80. (if the answer on the 74th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the year-end budget report a clear explanation about any significant deviation between the factual financial and non-financial assets and their forecasts, which were stated in the enacted budget? **(2 points for “Yes” and 0 point for “No”) N.B.** If the answer of the 74th question is “No” then 0 point would be given for current question.
81. (if the answer on the 74th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the year-end budget report a detail information on the current level and structure of the public debt and its servicing? **(3 points for “Yes” and 0 point for “No”) N.B.** If the answer of the 74th question is “No” then 0 point would be given for current question.
82. (if the answer on the 74th question is yes) Is defined a requirement, by the laws and regulations concerning budget, to present in the year-end budget report a clear explanation about any significant deviation between the factual level and structure of the public debt and its servicing and their forecasts, which were stated in the enacted budget? **(2 points for “Yes” and 0 point for “No”) N.B.** If the answer of the 74th question is “No” then 0 point would be given for current question.
83. (if the answer on the 74th question is yes) Is defined a requirement, by the laws and regulations concerning budget, the publish the year-end budget report and make it easily accessible for all interested parties at no or very low cost no later than the end of the first month of the subsequent budget year? **(3 points for “Yes” and 0 point for “No”) N.B.** If the answer of the 74th question is “No” then 0 point would be given for current question.

Sub – Component 9 - Audit Report
[weight – 0.11111111]

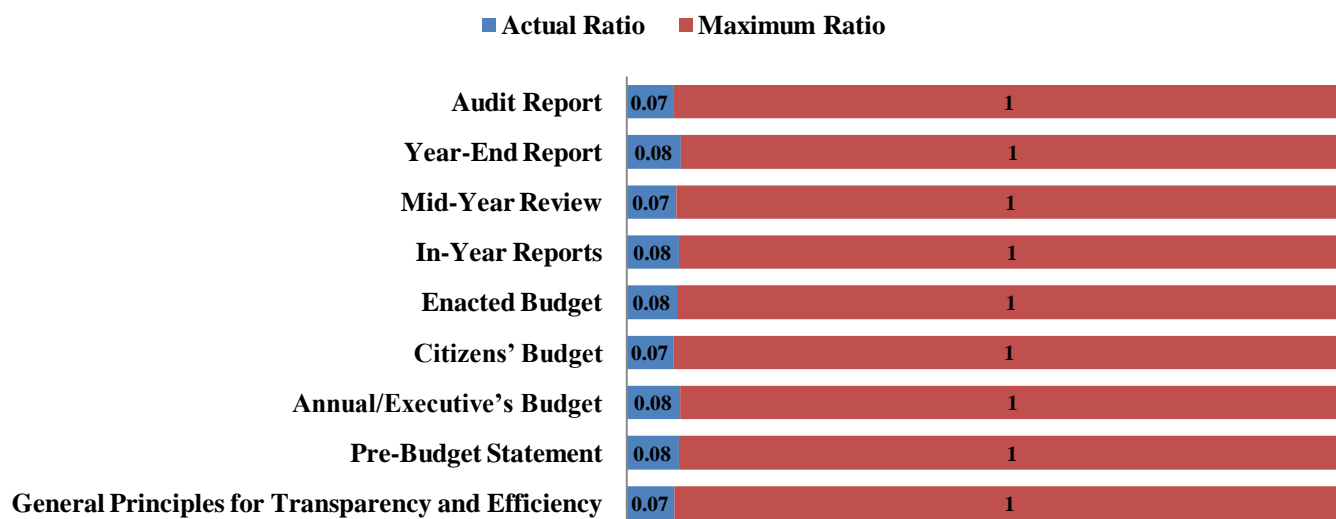
84. Is defined a requirement, by the laws and regulations concerning budget, that final annual expenditures by the administrative units (except for secret programs) be audited and its results would be published and easily accessible for all interested parties at no or very low cost no later than 6 months after the end of budget year? **(3 points for “Yes” and 0 point for “No”)**
85. Is defined a requirement, by the laws and regulations concerning budget, that a branch of the government other than executive (such as the legislature or the judiciary or both together) should give a final consent before the head of supreme audit institution can be removed from office? **(3 points for “Yes” and 0 point for “No”)**
86. Is defined a requirement, by the laws and regulations concerning budget, that the supreme audit institution should publish an information about the audit of the extra-budgetary funds and make it easily accessible for all interested parties at no or very low cost? **(3 points for “Yes” and 0 point for “No”)**
87. Is defined a requirement, by the laws and regulations concerning budget, that the supreme audit institution have discretion in law to undertake those audits it may wish, beyond the established year-end attestation audits? **(3 points for “Yes” and 0 point for “No”)**
88. Is defined a requirement, by the laws and regulations concerning budget, that the budget of the supreme audit institution should be determined by the legislature or by the judiciary or by some other independent body? **(2 points for “Yes” and 0 point for “No”)**
89. Is defined a requirement, by the laws and regulations concerning budget, that the executive branch of the government should publish a report on what steps it has taken to address the audit recommendations and make it easily accessible for all interested parties at no or very low cost? **(2 points for “Yes” and 0 point for “No”)**
90. Is defined a requirement, by the laws and regulations concerning budget, that the supreme audit institution should employ designated staff to undertake the audits of the central governments agencies pertaining to the security sector (military, police)? **(2 points for “Yes” and 0 point for “No”)**
91. Is defined a requirement, by the laws and regulations concerning budget, that the audit reports of the annual accounts of the security sector (military, police) and other secret programs should be provided to the legislature? **(3 points for “Yes” and 0 point for “No”)**

As far as, for objective reasons, we don't have a real data set, we can get following hypothetical data for **country X**:

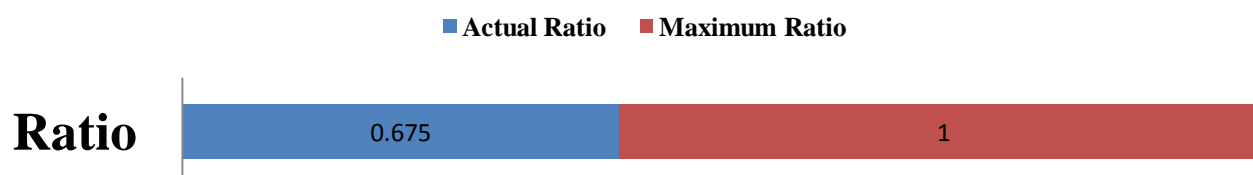
Points of the Sub-Components of the Second Component



Ratios of the Sub-Components of the Second Component



Final Ratio of the Second Component



1.8 Component №3 – Transparency and Efficiency of Public Procurements [point – 0.333333333]

Sub –Component 1 - General Principles for Transparency and Efficiency [weight – 0.166666667]

1. Are all laws and regulations concerning public procurements published and easily accessible for all interested parties at no or very low cost? **(3 points for “Yes” and 0 point for “No”)**
2. Is there any official procuring/regulatory body, defined by the laws and regulations concerning public procurements, which is responsible to lead government procurement procedures around the country? **(3 points for “Yes” and 0 point for “No”)**
3. (If the answer of the 2nd question is “yes”) Is obliged the procuring/regulatory body, by the laws and regulations concerning public procurements, to provide public with all government procurement information, including tender invitations, requests for proposals, and contract/award information to all interested parties at no or very low cost on up-to-date basis? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 2nd question is “No” then 0 point would be given for current question.
4. (If the answer of the 2nd question is “yes”) Is obliged the procuring/regulatory body, by the laws and regulations concerning public procurements, to manage and make available statistical database about government procurements with regular basis for all interested parties at no or very low cost? **(2 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 2nd question is “No” then 0 point would be given for current question.
5. (If the answer of the 2nd question is “yes”) Is obliged the procuring/regulatory body, by the laws and regulations concerning public procurements, to develop and support the implementation of initiatives for improvement of government procurement system? **(1 point for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 2nd question is “No” then 0 point would be given for current question.
6. (If the answer of the 2nd question is “yes”) Is obliged the procuring/regulatory body, by the laws and regulations concerning public procurements, to provide implementation tools and documents to support training and capacity development of government procurement implementing staff? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 2nd question is “No” then 0 point would be given for current question.
7. (If the answer of the 2nd question is “yes”) Are clear procedures defined, by the laws and regulations concerning public procurements, for funding of the procuring/regulatory body? **(3 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 2nd question is “No” then 0 point would be given for current question.
8. Does your country have a requirement, defined by the laws and regulations concerning public procurements, to have an integrated information system for collecting and disseminating all government procurement information? **(3 points for “Yes” and 0 point for “No”)**
9. Does your country have a requirement, defined by the laws and regulations concerning public procurements, to have well-developed e-procurement system for government procurements? **(3 points for “Yes” and 0 point for “No”)**
10. Are defined specific skills and knowledge for government procurement implementing staff by the laws and regulations concerning public procurements? **(1 points for “Yes” and 0 point for “No”)**

11. (If the answer of the 10th question is “yes”)Is government procurement implementing staff required, by the laws and regulations concerning public procurements, to meet defined criteria of the skills and knowledge? **(1 points for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 10th question is “No” then 0 point would be given for current question.
12. Is defined fraud/corruption in government procurement and described individual responsibilities for government employees and private firms or individuals found guilty of fraud/corruption in government procurement by the laws and regulations concerning public procurement? **(2 points for “Yes” and 0 point for “No”)**
13. Does your country have a requirement, defined by the laws and regulations concerning public procurements, to have a secure, accessible and confidential system for public reporting of cases of fraud/corruption in the process of the government procurement? **(1 points for “Yes” and 0 point for “No”)**
14. Does your country have a requirement, defined by the laws and regulations concerning public procurements, to have a code of conduct or ethics with specified provisions for government procurement implementing staff? **(1 points for “Yes” and 0 point for “No”)**
15. Is defined a requirement, by the laws and regulations concerning public procurements, of specific disclosure of personal financial information for government procurement implementing staff? **(1 points for “Yes” and 0 point for “No”)**
16. Is defined a requirement, by the laws and regulations concerning public procurements, to invite in the working process of tender/award committee independent observers from civil society organizations? **(3 points for “Yes” and 0 point for “No”)**

Sub-Component 2 - Needs Assessment Phase/Demand Determination

[weight – 0.166666667]

17. Are clearly defined allowable government procurement methods with an appropriate hierarchical level by the laws and regulations concerning public procurements? **(3 points for “Yes” and 0 point for “No”)**
18. Are all conditions clearly specified, by the laws and regulations concerning public procurements, under which each allowable procurement method could be used? **(3 points for “Yes” and 0 point for “No”)**
19. Is required an invitation of independent observers from civil society organizations, by the laws and regulations concerning public procurements, in the operation of tender/award committee during the process of determining and assessing needs of government procurements? **(3 points for “Yes” and 0 point for “No”)**
20. Is defined any threshold of the monetary amount of the government procurement, by the laws and regulations concerning public procurements, above which a hold of public hearing is required? **(1 points for “Yes” and 0 point for “No”)**
21. Is a requirement defined by the laws and regulations concerning public procurements, that each government agencies and institutions have to prepare annual procurement plan with its associated expenses and present it as a part of the total budget? **(1 points for “Yes” and 0 point for “No”)**

Sub-Component 3 - Preparation Phase/Process design and Bid Documents Preparation
[weight – 0.166666667]

22. Are defined any mandatory clauses or instructions, by the laws and regulations concerning public procurements, which would be used as a draft for developing the documents for competitive tendering of government procurements? **(2 points for “Yes” and 0 point for “No”)**
23. Is required an invitation of independent observers from civil society organizations, by the laws and regulations concerning public procurements, in the operation of tender/award committee during the process of designing and preparing bid documents? **(3 points for “Yes” and 0 point for “No”)**
24. Is defined a requirement by the laws and regulations concerning public procurements to introduce into the bid documents detail criteria, those would be used to decide which bidder would be the winner of the tender among potential suppliers of goods, works and services? **(3 points for “Yes” and 0 point for “No”)**
25. Is a requirement established, by the laws and regulations concerning public procurements, to publish sufficient information about tender requirement for bidders, in order to give them an opportunity to respond the tender requirements? **(3 points for “Yes” and 0 point for “No”)**
26. Is determined an average time, by the laws and regulations concerning public procurements, between the tender notice and submission of participation proposals? **(1 point for “Yes” and 0 point for “No”)**
27. (If the answer of the 26th question is “yes”) Is determined average time, by the laws and regulations concerning public procurements, between tender notice and submission of participation proposals no less than 15 working days? **(1 point for “Yes” and 0 point for “No”)** **N.B.** If the answer of the 26th question is “No” then 0 point would be given for current question.
28. Are clearly determined general qualifications of the potential suppliers of goods, works and services by the laws and regulations concerning public procurement? **(2 points for “Yes” and 0 point for “No”)**
29. Are clearly defined registration procedures to participate in tender by the laws and regulations concerning public procurements? **(3 points for “Yes” and 0 point for “No”)**
30. Is a requirement defined, by the laws and regulations concerning public procurements, to make an information about registration procedures to participate in tender publicly available for all interested parties at no or very low cost? **(3 points for “Yes” and 0 point for “No”)**
31. Are clear procedures defined, by the laws and regulations concerning public procurements, for government owned enterprises how to participate in the tender? **(3 points for “Yes” and 0 point for “No”)**

Sub-Component 4 - Contractor Selection and Award Phase
[weight – 0.166666667]

32. Is required an invitation of independent observers from civil society organizations, by the laws and regulations concerning public procurements, in the operation of tender/award

- committee during the process of selecting the winner of the tender? **(3 points for “Yes” and 0 point for “No”)**
33. Is unambiguously determined by the laws and regulations concerning public procurements, that the criterions of assessment would be evaluated on pass/fail basis if it is not defined in the monetary terms? **(2 points for “Yes” and 0 point for “No”)**
34. Are procedures clearly defined, by the laws and regulations concerning public procurements, how the amendments could be done during decision making process in the tender documentation about the requirements and the criterions of the tender? **(3 points for “Yes” and 0 point for “No”)**
35. Is established a requirement, by the laws and regulations concerning public procurements, to give a right of appeals for bidder about decision of the tender/award committee? **(3 points for “Yes” and 0 point for “No”)**
36. Is defined existence of appeals body other than procuring/regulatory body, by the laws and regulations concerning public procurements, to review the appeals of bidder and issue final enforceable decisions? **(3 points for “Yes” and 0 point for “No”)**
37. (If the answer of the 36th question is “yes”) Is such appeals’ body independent and autonomous from procuring/regulatory body, by the laws and regulations concerning public procurements, with regard to resolving complaints? **(3 points for “Yes” and 0 point for “No”)**
N.B. If the answer of the 36th question is “No” then 0 point would be given for current question.
38. Are clearly defined the procedures and terms for appealing the decision of tender/award committee by the laws and regulations concerning public procurements? **(3 points for “Yes” and 0 point for “No”)**

Sub-Component 5 - Contract Implementation Phase **[weight – 0.166666667]**

39. Is required an invitation of independent observers from civil society organizations, by the laws and regulations concerning public procurements, in the operation of tender/award committee during the monitoring of the contract execution? **(3 points for “Yes” and 0 point for “No”)**
40. Is established a requirement, by the laws and regulations concerning public procurements, to make publically available a detail information about the winner of the tender for all interested parties at no or very low cost? **(3 points for “Yes” and 0 point for “No”)**
41. Is established a requirement, by the laws and regulations concerning public procurements, to make publically available a detail information about bids during the tender after the winner would be announced by the tender/award committee for all interested parties at no or very low cost? **(3 points for “Yes” and 0 point for “No”)**
42. Is established a requirement, by the laws and regulations concerning public procurements, to make publically available a detail information about contract after the winner would be announced by the tender/award committee for all interested parties at no or very low cost? **(3 points for “Yes” and 0 point for “No”)**
43. Are clear procedures defined, by the laws and regulations concerning public procurements, for acceptance of final product and for issuance of contract amendments? **(3 points for “Yes” and 0 point for “No”)**

44. Is established a requirement, by the laws and regulations concerning public procurements, to give a right of appeal in the court to the winner of the tender for fair resolution of disputes during the performance of the contract? **(2 points for “Yes” and 0 point for “No”)**
45. Are specified the procedures, by the laws and regulations concerning public procurements, for submission and review of the complaints and issuing of decisions during contract implementation, which don't delay unduly the contract implementation process. **(3 points for “Yes” and 0 point for “No”)**
46. Are the procedures clearly defined, by the laws and regulations concerning public procurements, which enable the winner in the dispute to seek enforcement of the outcome during contract implementation? **(2 points for “Yes” and 0 point for “No”)**
47. Are the mechanisms clearly defined, by the laws and regulations concerning public procurements, for enforcement of resolution of the complaints? **(2 points for “Yes” and 0 point for “No”)**

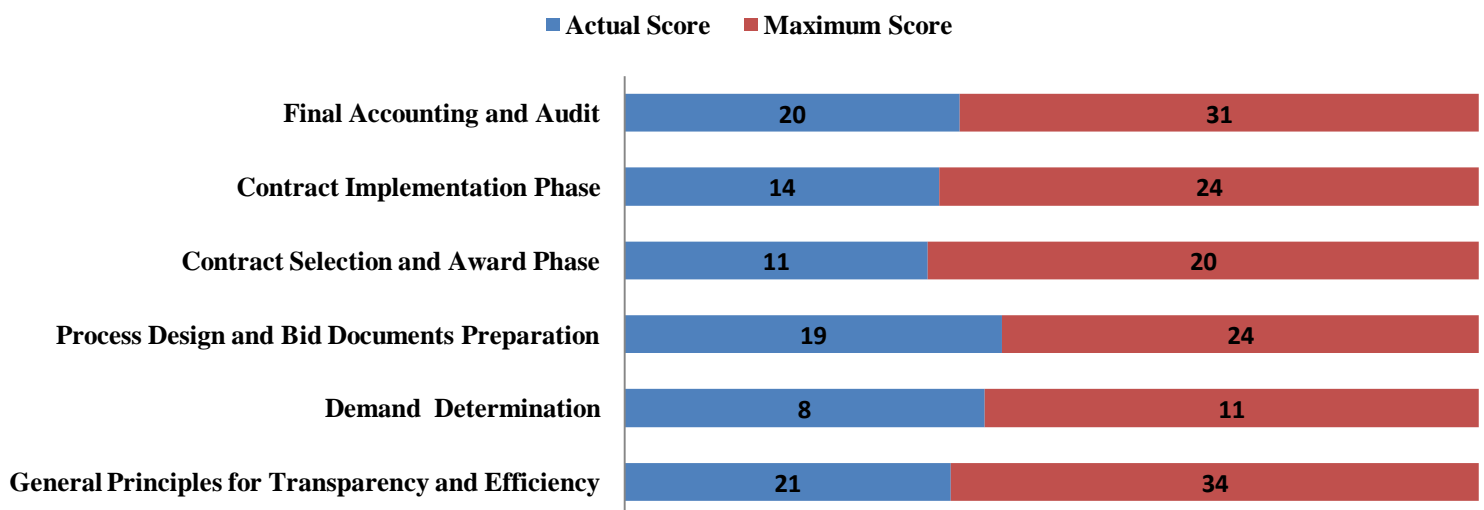
Sub-Component 6 - Final Accounting and Audit **[weight – 0.16666667]**

48. Is defined a requirement, by the laws and regulations concerning public procurements, to keep a record of tender notices for public audit/inspection? **(3 points for “Yes” and 0 point for “No”)**
49. Is defined a requirement, by the laws and regulations concerning public procurements, to keep a record of all bidding documents **(3 points for “Yes” and 0 point for “No”)**
50. Is defined a requirement, by the laws and regulations concerning public procurements, to keep a record of bid opening process for public audit/inspection? **(3 points for “Yes” and 0 point for “No”)**
51. Is defined a requirement by the laws and regulations concerning public procurements to keep a record of evaluation reports for public audit/inspection? **(3 points for “Yes” and 0 point for “No”)**
52. Is defined a requirement, by the laws and regulations concerning public procurements, to keep a record of formal appeals by the bidders and its outcomes for public audit/inspection? **(3 points for “Yes” and 0 point for “No”)**
53. Is defined a requirement, by the laws and regulations concerning public procurements, to keep a record of final signed documents and amendments for public audit/inspection? **(3 points for “Yes” and 0 point for “No”)**
54. Is defined a requirement, by the laws and regulations concerning public procurements, to keep a record of disbursement data for public audit/inspection? **(3 points for “Yes” and 0 point for “No”)**
55. Are established the security procedures, by the laws and regulations concerning public procurements, to protect the records, either physical or electronic, for public audit/inspection? **(3 points for “Yes” and 0 point for “No”)**
56. Are the procedures clearly defined, by the laws and regulations concerning public procurements, for quality control of goods? **(3 points for “Yes” and 0 point for “No”)**
57. Is established a requirement of internal audit of government procurements at least annual basis by the laws and regulations concerning public procurements? **(1 points for “Yes” and 0 point for “No”)**

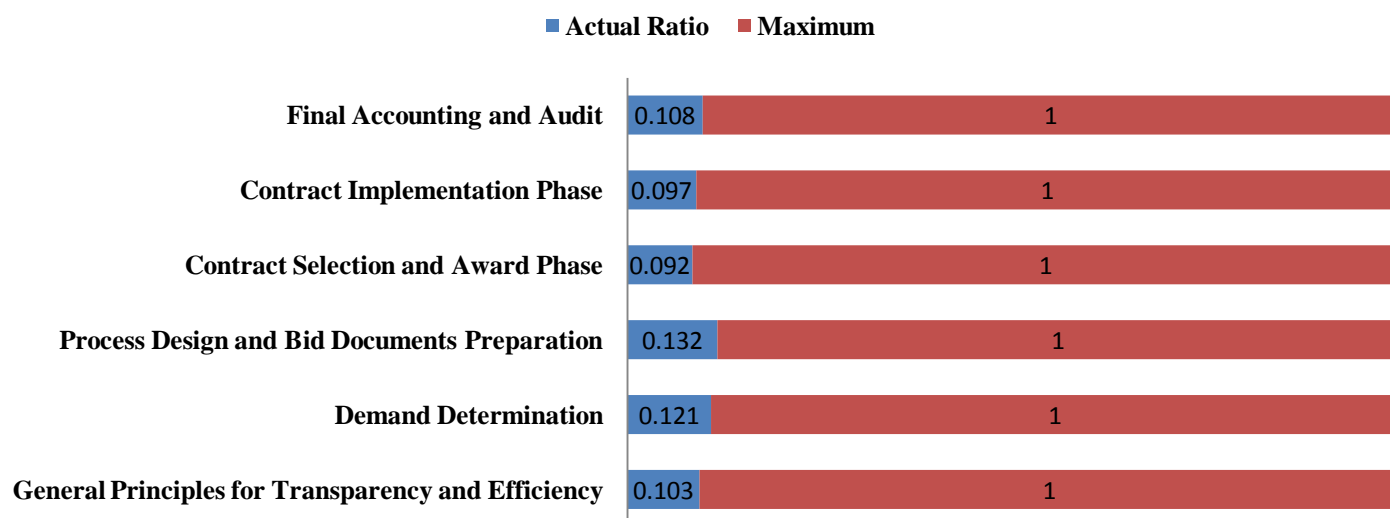
58. Is established a requirement of external audit of government procurements at least annual basis by the laws and regulations concerning public procurements? (2 points for “Yes” and 0 point for “No”)

As far as, for objective reasons, we don’t have a real data set, we can get following hypothetical data for **country X**:

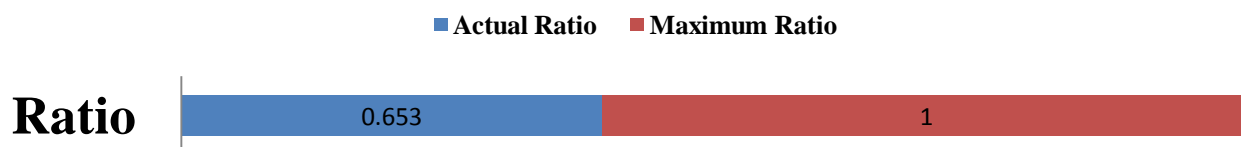
Scores of the Sub-Components of the Third Component



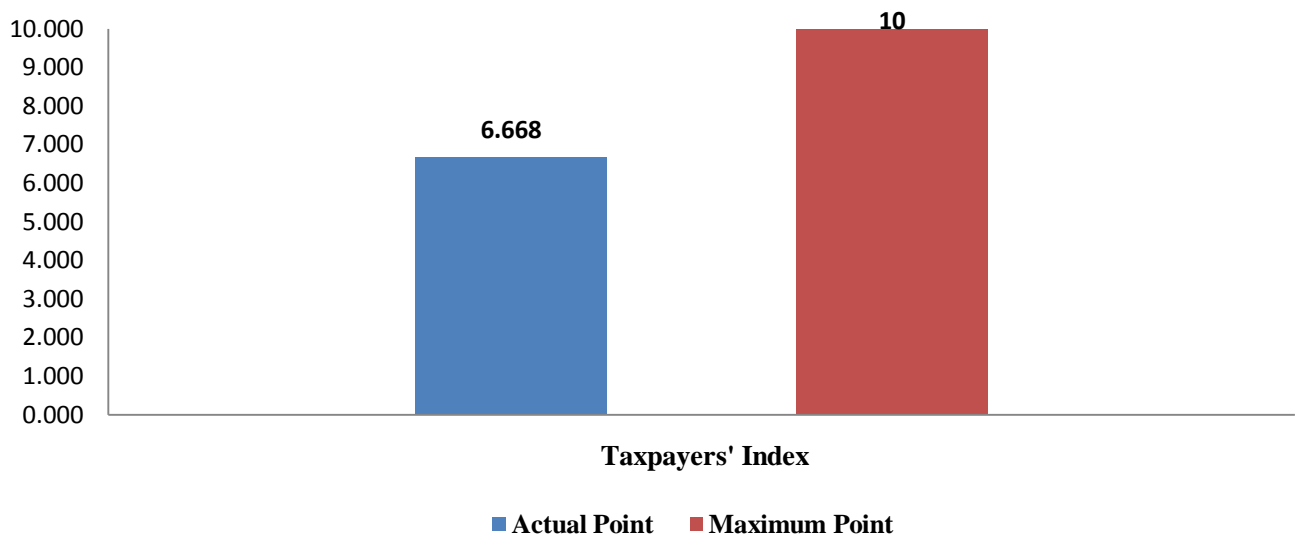
Ratios of the Subcomponents of the Third Component



Final Ratio of the Third Component



After all above-described calculation, in order to get a total point of the index for **country X**, we will multiply the final ration of the Index ***n*** over the final weight of the index - “**10**”. Therefore, below given graph describes the **Total Point of the Taxpayers’ Index**:



As we have seen, in our hypothetical analysis **country X** got **6.668 points** which is between **(5-7)** and it means that Taxpayers' Fiscal Rights are basically protected, as far as, transparency and efficiency of all components: Tax Policy, Budgetary Process and Public Procurements are basically achieved in total which, in turn, shows that there is a need of some important improvements to achieve a high level of protection of taxpayers fiscal rights.

2. Analysis of the Index

2.1 Factor Analysis¹³

Let us consider **possible techniques** to analyze above-given questionnaire. We assume that there is **large data set** consisting of filled-in questionnaires from many countries (**$n_{\text{countries}}$**). The total number of questions in the questionnaire is **m** (In our case **$m = 200$**). There are correlations between different questions, sometimes even strong correlations. We may want to explain these correlations.

Factor analysis is a method for explaining the correlations between the initial variables (questions, in our case). It reveals a small number of latent (=unobservable) variables, called **factors**, which are not directly included in the questionnaire - but are still „there“ as hypothetical questions which characterize the countries and that are correlated with the variables in the questionnaire. Usually each factor is highly correlated with only some questions.

¹³ Based on the following book: **John P. Van de Geer**, Introduction to Multivariate Analysis for the Social Sciences.

Each factor describes some part of correlations between the initial variables. The portion of correlations explained by a specific factor is called the **explanatory power** of the factor. In social sciences, it is a good result if some 3-4 factors together have explanatory power 50-60%.

2.2 Use the Factor Analysis for Hypothetical Data

- 1) We obtain **better understanding** of the structure of the index by seeing its main „dimensions“(intrinsic components).
- 2) We can try to find a small subset of questions (from the initial questionnaire) that make up a **shorter questionnaire** of almost the same quality. How to do this? The idea is to use only those questions from the initial questionnaire that are strongly related with the first 3-4 factors of significant explanatory power.

As we don't have obtained a real data for ***n*** observation units (countries in our case) and as far as, we have quite big number of ***m*** variables, for the simplicity of demonstration purposes of the factor analysis, let us suppose hypothetically that we have **15 countries** and **10 variables**.

Let us suppose that our factor analysis were based on the following questions:

X₁ - Is defined an obligation for tax authority, by the tax code or by any other laws and regulations concerning taxation, to give additional time for a taxpayer without any penalty, in order to provide all necessary tax data to the tax authority, when the taxpayer don't provide tax data to the tax authority in a timely manner?

X₂ - Is defined a requirement, by the laws and regulations concerning budget, to present an annual/executive's budget in legislature no later than 3 months before the start of the coming budget year for public discussion?

X₃ - Are terms about budget process clearly defined by the laws and regulations concerning budget?

X₄ - Is clearly defined a list of main information, by the laws and regulations concerning budget, which should be presented in budget documentation during each step of the budget process?

X₅ - Is defined a requirement, by the laws and regulations concerning budget, to present in an enacted budget a detail list of all major revenues and expenditures on the gross basis?

X₆ - Is defined a requirement, by the laws and regulations concerning budget, to present in the enacted budget a detail information about domestic and external financing of the deficit?

X₇ - Do taxpayers have a right, given by the tax code or by any other laws and regulations concerning taxation, to access at any time their personal tax data, which was transmitted to the tax authority?

X₈ - Is defined a requirement, by the laws and regulations concerning budget, that the supreme audit institution should publish an information about the audit of the extra-budgetary funds and make it easily accessible for all interested parties at no or very low cost?

X₉ - Is defined a requirement, by the laws and regulations concerning budget, that the executive branch of the government should publish a report on what steps it has taken to address the audit recommendations and make it easily accessible for all interested parties at no or very low cost

X₁₀ - Are procedures clearly defined, by the laws and regulations concerning public procurements, how the amendments could be done during decision making process in the tender documentation about the requirements and the criterions of the tender?

The point of departure for factor analysis is a matrix **Z**, a **15 x 10** matrix of observed values on **10** initial variables. Let's suppose that, we get following hypothetical initial data matrix **Z**:

Table 1 Hypothetical initial data matrix

X₁	X₂	X₃	X₄	X₅	X₆	X₇	X₈	X₉	X₁₀
3	2	0	1	0	0	3	0	1	0
0	2	0	1	2	3	0	0	0	3
0	0	1	0	0	3	3	2	1	0
3	0	0	1	2	0	3	2	1	0
3	0	1	0	2	0	3	0	0	3
0	2	1	0	0	3	0	2	1	0
0	2	0	1	0	3	0	2	1	0
3	0	1	0	0	0	3	0	0	0
3	2	0	1	2	0	3	2	0	3
0	0	0	1	2	3	0	0	1	3
0	2	1	0	2	3	3	2	1	0
0	0	1	0	0	3	0	2	1	3
3	0	0	1	2	0	3	0	0	0
3	0	1	0	0	0	3	2	1	0
0	2	0	1	2	3	0	2	0	3

Now lets generate a standardized data matrix **X**. For that purpose, we need to implement following steps: 1) We will find mean values for each column; 2) We will take deviations from the mean for each column; 3) We Will find variances for each column; 4) We will find standard deviations for each column; 5) We will divide the deviation from the mean by the standard deviation for the same column. The result is that values in a column will have zero mean and unit variance.

1) **Mean values for each column:** $\bar{X}_j = \frac{1}{3} \cdot \sum_{i=1}^n X_{ij}$, where $i=1,2, \dots, 15; j=1,2, \dots, 10$
 After simple calculations, we get following mean values for each column:

	X₁	X₂	X₃	X₄	X₅	X₆	X₇	X₈	X₉	X₁₀
43	1.4	0.93	0.47	0.53	1.07	1.6	1.8	1.2	0.6	1.2

2) Deviations from the mean: $X_{ij} - \bar{X}_j$

After simple calculations, we get following deviations from the mean for each column:

X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
1.60	1.07	-0.47	0.47	-1.07	-1.60	1.20	-1.20	0.40	-1.20
-1.40	1.07	-0.47	0.47	0.93	1.40	-1.80	-1.20	-0.60	1.80
-1.40	-0.93	0.53	-0.53	-1.07	1.40	1.20	0.80	0.40	-1.20
1.60	-0.93	-0.47	0.47	0.93	-1.60	1.20	0.80	0.40	-1.20
1.60	-0.93	0.53	-0.53	0.93	-1.60	1.20	-1.20	-0.60	1.80
-1.40	1.07	0.53	-0.53	-1.07	1.40	-1.80	0.80	0.40	-1.20
-1.40	1.07	-0.47	0.47	-1.07	1.40	-1.80	0.80	0.40	-1.20
1.60	-0.93	0.53	-0.53	-1.07	-1.60	1.20	-1.20	-0.60	-1.20
1.60	1.07	-0.47	0.47	0.93	-1.60	1.20	0.80	-0.60	1.80
-1.40	-0.93	-0.47	0.47	0.93	1.40	-1.80	-1.20	0.40	1.80
-1.40	1.07	0.53	-0.53	0.93	1.40	1.20	0.80	0.40	-1.20
-1.40	-0.93	0.53	-0.53	-1.07	1.40	-1.80	0.80	0.40	1.80
1.60	-0.93	-0.47	0.47	0.93	-1.60	1.20	-1.20	-0.60	-1.20
1.60	-0.93	0.53	-0.53	-1.07	-1.60	1.20	0.80	0.40	-1.20
-1.40	1.07	-0.47	0.47	0.93	1.40	-1.80	0.80	-0.60	1.80

We get a data matrix, where columns have zero means and where the numbers in the column represent deviations from the mean.

3) Variance for each column: $S_j^2 = \frac{1}{(n-1)} \cdot \sum_{i=1}^n (X_{ij} - \bar{X}_j)^2$

After simple calculations, we get following values of Variances for each column:

S_1^2	S_2^2	S_3^2	S_4^2	S_5^2	S_6^2	S_7^2	S_8^2	S_9^2	S_{10}^2
2.4	1.07	0.27	0.27	1.07	2.4	2.31	1.03	0.26	2.31

4) Standard deviation for each column: $S_j = \sqrt{S_j^2}$

S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S_{10}
1.55	1.03	0.52	0.52	1.03	1.55	1.52	1.01	0.51	1.52

5) Divide the deviation from the mean by the standard deviation for the same column:

$$\frac{(X_{ij} - \bar{X}_j)}{S_j}$$

After simple calculations, we generate a **Standardized data matrix X**:

X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
1.03	1.03	-0.90	0.90	-1.03	-1.03	0.79	-1.18	0.79	-0.79
-0.90	1.03	-0.90	0.90	0.90	0.90	-1.18	-1.18	-1.18	1.18
-0.90	-0.90	1.03	-1.03	-1.03	0.90	0.79	0.79	0.79	-0.79
1.03	-0.90	-0.90	0.90	0.90	-1.03	0.79	0.79	0.79	-0.79
1.03	-0.90	1.03	-1.03	0.90	-1.03	0.79	-1.18	-1.18	1.18
-0.90	1.03	1.03	-1.03	-1.03	0.90	-1.18	0.79	0.79	-0.79
-0.90	1.03	-0.90	0.90	-1.03	0.90	-1.18	0.79	0.79	-0.79
1.03	-0.90	1.03	-1.03	-1.03	-1.03	0.79	-1.18	-1.18	-0.79
1.03	1.03	-0.90	0.90	0.90	-1.03	0.79	0.79	-1.18	1.18
-0.90	-0.90	-0.90	0.90	0.90	0.90	-1.18	-1.18	0.79	1.18
-0.90	1.03	1.03	-1.03	0.90	0.90	0.79	0.79	0.79	-0.79
-0.90	-0.90	1.03	-1.03	-1.03	0.90	-1.18	0.79	0.79	1.18
1.03	-0.90	-0.90	0.90	0.90	-1.03	0.79	-1.18	-1.18	-0.79
1.03	-0.90	1.03	-1.03	-1.03	-1.03	0.79	0.79	0.79	-0.79
-0.90	1.03	-0.90	0.90	0.90	0.90	-1.18	0.79	-1.18	1.18

Standardized data matrix X is the basis for calculating correlation matrix

$$R = \frac{X'X}{(n-1)}$$

First, let us find a matrix $\mathbf{X}'\mathbf{X}$:

$$\begin{pmatrix} 14.00 & -4.75 & -1.00 & 1.00 & 1.00 & -14.00 & 10.69 & -4.58 & -4.58 & -3.06 \\ -4.75 & 14.00 & -4.75 & 4.75 & 1.00 & 4.75 & -4.58 & 3.06 & -0.76 & 0.76 \\ -1.00 & -4.75 & 14.00 & -14.00 & -6.50 & 1.00 & 3.06 & 3.06 & 3.06 & -3.06 \\ 1.00 & 4.75 & -14.00 & 14.00 & 6.50 & -1.00 & -3.06 & -3.06 & -3.06 & 3.06 \\ 1.00 & 1.00 & -6.50 & 6.50 & 14.00 & -1.00 & 0.76 & -3.06 & -6.87 & 6.87 \\ -14.00 & 4.75 & 1.00 & -1.00 & -1.00 & 14.00 & -10.69 & 4.58 & 4.58 & 3.06 \\ 10.69 & -4.58 & 3.06 & -3.06 & 0.76 & -10.69 & 14.00 & -1.56 & -1.56 & -6.22 \\ -4.58 & 3.06 & 3.06 & -3.06 & -3.06 & 4.58 & -1.56 & 14.00 & 6.22 & -2.33 \\ -4.58 & -0.76 & 3.06 & -3.06 & -6.87 & 4.58 & -1.56 & 6.22 & 14.00 & -6.22 \\ -3.06 & 0.76 & -3.06 & 3.06 & 6.87 & 3.06 & -6.22 & -2.33 & -6.22 & 14.00 \end{pmatrix}$$

Now, we have to multiply a matrix $\mathbf{X}'\mathbf{X}$ by a scalar $\frac{1}{(n-1)}$ and we will get a correlation matrix \mathbf{R} , where in the diagonal of this matrix will be the values equal to unity.

Correlation Matrix \mathbf{R} :

$$\begin{matrix} & \mathbf{X}_1 & \mathbf{X}_2 & \mathbf{X}_3 & \mathbf{X}_4 & \mathbf{X}_5 & \mathbf{X}_6 & \mathbf{X}_7 & \mathbf{X}_8 & \mathbf{X}_9 & \mathbf{X}_{10} \\ \begin{pmatrix} 1 & -0.34 & -0.07 & 0.07 & 0.07 & -1 & 0.76 & -0.33 & -0.33 & -0.22 \\ -0.34 & 1 & -0.34 & 0.34 & 0.07 & 0.34 & -0.33 & 0.22 & -0.05 & 0.05 \\ -0.07 & -0.34 & 1 & -1 & -0.46 & 0.07 & 0.22 & 0.22 & 0.22 & -0.22 \\ 0.07 & 0.34 & -1 & 1 & 0.46 & -0.07 & -0.22 & -0.22 & -0.22 & 0.22 \\ 0.07 & 0.07 & -0.46 & 0.46 & 1 & -0.07 & 0.05 & -0.22 & -0.49 & 0.49 \\ -1 & 0.34 & 0.07 & -0.07 & -0.07 & 1 & -0.76 & 0.33 & 0.33 & 0.22 \\ 0.76 & -0.33 & 0.22 & -0.22 & 0.05 & -0.76 & 1 & -0.11 & -0.11 & -0.44 \\ -0.33 & 0.22 & 0.22 & -0.22 & -0.22 & 0.33 & -0.11 & 1 & 0.44 & -0.17 \\ -0.33 & -0.05 & 0.22 & -0.22 & -0.49 & 0.33 & -0.11 & 0.44 & 1 & -0.44 \\ -0.22 & 0.05 & -0.22 & 0.22 & 0.49 & 0.22 & -0.44 & -0.17 & -0.44 & 1 \end{pmatrix} \end{matrix}$$

First we need to point out that \mathbf{R} is of rank **8**, since it happened that $\mathbf{X}_1, \mathbf{X}_6$ and $\mathbf{X}_3, \mathbf{X}_4$ have negative relation.

On the basis of the correlation matrix \mathbf{R} we will generate a factor matrix \mathbf{F} . A theoretical approach to generate a factor matrix \mathbf{F} is following:

Let us define an $n \times 1$ vector \mathbf{y} in the m dimensional subspace V_m . This condition implies that \mathbf{y} is linearly dependent on the \mathbf{x} vectors, and therefore we can find a vector \mathbf{g} such that $\mathbf{Xg} = \mathbf{y}$. We know the \mathbf{x} vectors have unit length and we want the same to be true for \mathbf{y} , which implies that $\frac{\mathbf{y}'\mathbf{y}}{n} = 1$, or

$$\frac{\mathbf{x}'\mathbf{Xg}}{n} = \mathbf{g}'\mathbf{Rg} = 1. \quad (1)$$

Let projection of \mathbf{X} vector on the \mathbf{y} vector be called \mathbf{f} . Then we have

$$\mathbf{f} = \frac{\mathbf{x}'\mathbf{y}}{n} = \frac{\mathbf{x}'\mathbf{Xg}}{n} = \mathbf{Rg} \quad (2)$$

Our goal is to obtain a maximum for the sum of the squared projections by a suitable choice of \mathbf{g} . Using the method of undetermined multipliers, we can see that we need to take the partial derivatives of the auxiliary function

$$\mathbf{g}'\mathbf{R}^2\mathbf{g} - \lambda(\mathbf{g}'\mathbf{Rg} - 1)$$

and set these equal to zero, which gave us

$$2\mathbf{R}^2\mathbf{g} - 2\lambda\mathbf{Rg} = 0$$

Or, rearranging and dividing by 2,

$$\mathbf{R}^2\mathbf{g} = \lambda\mathbf{Rg}. \quad (3)$$

We know that $\mathbf{Rg} = \mathbf{f}$ and, therefore we can write

$$\mathbf{Rf} = \lambda\mathbf{f}, \quad (4)$$

Which shows that \mathbf{f} is an eigenvector of \mathbf{R} . This eigenvector should be normalized to the eigenvalue λ , for which we need a pre-multiplication of (3) by \mathbf{g}'

$$\mathbf{g}'\mathbf{R}^2\mathbf{g} = \lambda\mathbf{g}'\mathbf{Rg} = 1 \quad (5)$$

However, $\mathbf{g}'\mathbf{R}^2\mathbf{g} = \mathbf{f}'\mathbf{f}$ and therefore,

$$\mathbf{f}'\mathbf{f} = \lambda. \quad (6)$$

It also follows that the eigenvalue λ directly gives the sum of the squared projections. In order to have a maximum for this sum, we should take the solution for the eigenvector with the largest eigenvalue.

The vector \mathbf{g} is eigenvector of \mathbf{R} , but normalized with different eigenvalue. This follows from equation (3) if we write

$$\mathbf{R}^2 \mathbf{g} - \lambda \mathbf{R} \mathbf{g} = \mathbf{0}$$

And therefore,

$$\mathbf{R}(\mathbf{R} \mathbf{g} - \lambda \mathbf{g}) = \mathbf{0}$$

so that $\mathbf{R} \mathbf{g} - \lambda \mathbf{g} = \mathbf{0}$ Since $\mathbf{g}' \mathbf{R} \mathbf{g} = \mathbf{1}$, we have $\mathbf{g}' \mathbf{R} \mathbf{g} = \lambda \mathbf{g}' \mathbf{g} = \mathbf{1}$, and

$$\mathbf{g}' \mathbf{g} = \lambda^{-1}, \quad (7)$$

which means that \mathbf{g} is an eigenvector of \mathbf{R} normalized to the inverse of eigenvalue. Therefore, we can also write

$$\mathbf{g} = \mathbf{f} \lambda^{-1}. \quad (8)$$

However, we need to look at solutions of equation (4). In general, \mathbf{R} will have \mathbf{m} eigenvectors with \mathbf{m} eigenvalues different from zero. Let \mathbf{F} be the $\mathbf{m} \times \mathbf{m}$ matrix of eigenvectors, which means that each column of \mathbf{F} gives an eigenvector and therefore equation (4) can be generalized to

$$\mathbf{R} \mathbf{F} = \mathbf{F} \Lambda. \quad (9)$$

A practical approach to generate a factor matrix \mathbf{F} from the correlation matrix \mathbf{R} is following:

1) We will find the real eigenvectors and real eigenvalues from the correlation matrix \mathbf{R} by using appropriate applications (in our case an online calculator <http://comnuan.com/cmnn01002/>¹⁴). For that purpose, we simply need to enter a data of the correlation matrix \mathbf{R} into the appropriate application. After implementing above described approach, we will get following real eigenvalues and real eigenvectors accordingly:

Real Eigenvalus:

λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
3.180	3.008	1.411	0.830	0.473	0.275	0.126	0.695

¹⁴ Online calculator to compute the real eigenvectors and real eigenvalues from the correlation matrix.

Real Eigenvectors:

$$\begin{pmatrix} -0.7024 & 0.00937 & -0.20036 & 0.03428 & -0.35393 & 0.13255 & 0.32198 & -0.01535 \\ 0.33262 & -0.28741 & -0.56988 & 0.29906 & 0.11454 & 0.34949 & 0.0829 & -0.39348 \\ 0.0153 & 0.68652 & 0.65055 & 0.11411 & 0.10761 & 0.09473 & 0.18717 & -0.08939 \\ -0.0153 & -0.68652 & -0.65055 & -0.11411 & -0.10761 & -0.09473 & -0.18717 & 0.08939 \\ -0.12344 & -0.57955 & 0.32202 & 0.21257 & 0.64784 & 0.06427 & 0.44789 & 0.29693 \\ 0.7024 & -0.00937 & 0.20036 & -0.03428 & 0.35393 & -0.13255 & -0.32198 & 0.01535 \\ -0.60311 & 0.25427 & -0.19994 & 0.1823 & 0.38859 & 0.1316 & -0.79915 & 0.07746 \\ 0.34176 & 0.3058 & -0.4093 & 0.37939 & -0.5052 & -0.24274 & 0.00903 & 0.28277 \\ 0.30453 & 0.45457 & -0.60432 & -0.18566 & 0.11229 & 0.56211 & 0.13155 & 0.27396 \\ 0.15216 & -0.48218 & 0.86262 & 0.05423 & -0.56387 & 0.4347 & -0.33395 & 0.10096 \end{pmatrix}$$

2) We will normalize above given real eigenvectors with respect to the real eigenvalues in order to generate normalized eigenvectors. For that purpose we need to find a ration ρ between square root from the real eigenvalues and square root from the squared sum of the real eigenvectors, which will be given by the following formula

$$\rho = \frac{\sqrt{\lambda_j}}{\sqrt{\sum_{i=1}^{10} f_{ij}}}.$$

After that we will multiply ρ to the real eigenvectors of the correlation matrix \mathbf{R} and we will generate a factor matrix \mathbf{F} . According to our hypothetical data, we will get following factor matrix \mathbf{F}

	f_1	f_2	f_3	f_4	f_5	f_6	f_7	f_8
X_1	0.958	-0.012	0.146	-0.051	0.203	-0.080	-0.102	0.020
X_2	-0.454	0.356	0.414	-0.443	-0.066	-0.210	-0.026	0.500
X_3	-0.021	-0.851	-0.473	-0.169	-0.062	-0.057	-0.059	0.114
X_4	0.021	0.851	0.473	0.169	0.062	0.057	0.059	-0.114
X_5	0.168	0.718	-0.234	-0.315	-0.371	-0.039	-0.142	-0.377
X_6	-0.958	0.012	-0.146	0.051	-0.203	0.080	0.102	-0.020
X_7	0.823	-0.315	0.145	-0.270	-0.223	-0.079	0.254	-0.098
X_8	-0.466	-0.379	0.297	-0.563	0.289	0.146	-0.003	-0.359
X_9	-0.415	-0.563	0.439	0.275	-0.064	-0.338	-0.042	-0.348
X_{10}	-0.208	0.598	-0.627	-0.080	0.323	-0.262	0.106	-0.128

Real Eigenvalues:

λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
3.180	3.008	1.411	0.830	0.473	0.275	0.126	0.695

In the obtained data **0.62** variation is described by the first two factors $\frac{\lambda_1 + \lambda_2}{10}$ and **0.76** variation is described by the first 3 factors $\frac{\lambda_1 + \lambda_2 + \lambda_3}{10}$

If we take a look at obtained factor matrix F , then we can make some useful conclusions. In particular, as far as we have seen that X_1, X_6 and X_3, X_4 are in strong negative relation, we can throw out one question out of both pairs and, this way we will decrease the number of questions from **10** to **8**. Also, it is visible in the first factor that **1st** and **7th** questions are in very strong positive correlation, which allow us to throw out **7th** question and now we will have **7** questions instead of **8**. In the second factor we saw that **4th** question is in very strong positive correlation with questions **5th** and **10th** and also **4th** question is in quite strong negative correlation with question **9th** which allows us to throw out **5th**, **9th** and **10th** questions and we will have left **4** questions out of **7** questions.

According to the first factor, a strong positive correlation between **1st** and **7th** questions gives us very useful information that if in a given country a legal framework allows taxpayers to provide all necessary tax data to the tax authority after the deadline without any penalty, then almost surely, taxpayers are also allowed to access at any time their personal tax data, which was transmitted to the tax authority

According to the second factor, a strong positive correlation between **4th** and **5th** questions tells us that if in a given country there is clearly defined list of the information by the legal regulations, which should be presented in the budget documentations, then almost surely in the enacted budget there will be presented all major revenues and expenditures on the gross basis.

So, the usefulness of the factor analysis is quite clear according to the above described hypothetical example of our factor matrix F , which allowed us to decrease the total number of questions out of **10** to **4**.

Summary

Throughout the thesis we have developed a comprehensive questionnaire, which is a basis to calculate Taxpayers' Index and thus, we have composed a model that measures how well taxpayers fiscal rights are protected from the legal point of view. As we have seen, the index has three components: 1) Transparency and Efficiency of Tax Policy, 2) Transparency and Efficiency of Budgetary Process, and 3) Transparency and Efficiency of Public Procurements. Therefore, Taxpayers' Index could be considered as a very sensitive instrument that measures, in its full sense, how well taxpayers fiscal rights are protected.

In the given work we have discussed one mathematical method to analyze the Index. Such method according to the thesis is Factor Analysis, which helps to gain a better understanding of the structure of the index and also it provides a sound tool to generate a short questionnaire out of initial comprehensive questionnaire, which will lead us to the result with almost same quality as in the case of the initial questionnaire.

The last words, that can be said about the Index are that Taxpayers' Index could be used as an influential instrument by the countries in order to move into the right directions toward more just and efficient tax administration and more transparent and efficient government spending.

Maksumaksja indeks

Givi Kupatadze

Magistritöö finants- ja kindlustusmatemaatika erialal

Kokkuvõte

Magistritöös on välja töötatud küsmustik, mis on aluseks Maksumaksja Indeksile. Maksumaksja Indeks mõõdab, kui hästi on seaduste abil kaitstud maksumaksjate rahalised õigused ühes või teises riigis. Maksumaksja Indeks koosneb kolmest komponendist:

- 1) maksupoliitika läbipaistvus ja efektiivsus,
- 2) eelarvepoliitika läbipaistvus ja efektiivsus,
- 3) riigihangete läbipaistvus ja efektiivsus.

Seega on Maksumaksja Indeks väga tundlik mõõtevahend, mis mõõdab maksumaksjate fiskaalsete õiguste kaitstust kõikidest aspektidest lähtuvalt.

Maksumaksja Indeksi komponendid jagunevad omakorda alamkomponentideks, mida mõõdetakse rea küsimuste abil. Küsimuste koguarv Maksumaksja Indeksi ankeedis on 200, kusjuures kõik küsimused on dihhotoomilised. Küsimuste erinevat tähtsust väljendab "Jah"-vastuse eest antav punktide arv, mis võib olla kas 1, 2 või 3. Maksumaksja Indeksi väärtus kujuneb üksikküsimuste eest saadud punktide kaalutud keskmisena, mis on skaleeritud 10-palli süsteemi.

Maksumaksja Indeksi ankeedi küsimuste omavaheliste statistiliste seoste uurimiseks ja ankeedi mahu võimalikuks vähendamiseks on sobiv kasutada faktoranalüüsi meetodit. Magistritöös on toodud faktoranalüüsi meetodi kirjeldus ning on esitatud illustreeriv näide selle meetodi kasutamise kohta.

Maksumaksja Indeksit võib kasutada riikide poolt tõhusa abivahendina liikumisel õiglasema ja efektiivsema maksupoliitika ning läbipaistvamate valitsuskulude poole.

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