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DEVELOPMENT OF A FINANCIAL FRAMEWORK FOR THE NATIONAL PLAN FOR REGIONAL DEVELOPMENT: THE EVIDENCE FROM SERBIA¹

The aim of this paper is to examine the development of a financial framework for assessing the effectiveness of interventions. The research is based on the evidence from Serbia. In terms of methods applied, we used econometric and scenario analysis. We presented – as individual separate items – the issues such as “who” – Government budget (Ministry, specific program, loan, donor, etc.), “how much” – the amount spent, “where” (NUTS 2 region), and on “what” (type of initiative). In our model, each of the interventions applied to one of the regional development priorities is linked and evaluated by its effectiveness observing the performance of the group of indicators associated with each of the priorities. All data obtained from 8 sectors were categorized under 4 priorities, i.e. “People, Place, Productive Capacity, and Institutional Capacity”. Accordingly, we evaluate the effectiveness by observing the performance of a group of indicators related to each of the priorities. Our recommendations for optimizing the distribution structure of regional policies and regions are determined by the analysis of the performance of the group of indicators and their relative rankings per NUTS 2 region. The results are significant for further theoretical and applied research, as well as decision-making in the field of government financial policy. Our results confirmed that calculations of funds for regional development in strategic areas appear to be slightly problematic because, in the past, there was no strategic distribution based on established facts, which could be measured in terms of performance.

Keywords: financial framework, government policy, intervention, budget, regional development, region, regional inequality, Serbia, transition economy, non-EU countries

1. Introduction

Regional development policy in Serbia has almost never stood among the priority development objectives of the country (both Serbia and the former Yugoslavia) [1, 2]. A non-comprehensive development policy, which marked the second half of the 20th century in Serbia, resulted in the creation of large regional disparities. A policy of socio-economic development focused solely on economic development dimension of Serbia, ignoring social, spatial, and other dimensions of regional policy is supporting mostly sectoral development. The trend of regionalization was ignored [1]. This kind of policy concurred

with the difficult situation in the 1990s as well as the emergence of new economic and commercial devastated areas during the transition period 2001–2008 and the world economic crisis (2008–2009). The economic and political transformation in Eastern Europe at the end of the last century is unparalleled in history in its scope, peaceful nature, and transformation speed [3]. However, it was the speed of changes that caused a great number of social and economic problems such as unemployment, falling incomes, and growing inequality. One of the most challenging problems faced by Governments of the Eastern European countries were disparities of regional development. That is why the issue of regional inequality has attracted the attention of researchers since the 90s of the 20th century. This problem is a consequence of the structural imbalances

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set by planned economy; so, the phenomenon is present in the economies of almost all countries in Eastern Europe, Russia, India, China, and the CIS countries (The Commonwealth of the Independent States, a regional organization including most countries of the former Soviet Union). On the one hand, the planned economic system, which existed before the beginning of the 1990s, caused an uneven distribution of production facilities; on the other hand, migration and unequal distribution of investments in the 1990s-2000s strengthened regional disparities. The trend of uneven distribution of population, income, GRP, social indicators in most developing and transition economies is increasing [4]. At the same time, it should be noted that regionalization is a relevant European trend of the 21st century, which is reflected both in research [5–9] and in policy documents¹.

One of the directions in reforming the financial system, e.g., in China, was the decentralization of fiscal policy or fiscal federalism [10, 11]. However, some authors pointed out that this approach had only increased inequality, as the tax base in industrial and agricultural areas is not comparable [12]. Wu and Xu [13] addressed the problem of the impact of local government spending on R&D on technological progress, which is a key factor in the local production function. The problem is that in times of crisis, funding for projects, technological development, and economic restructuring is decreasing in parallel with the fall of GDP and government expenditures [14]. In turn, the current decline of this group of expenditures leads to a decrease in the forecast for the regional economy. An equally important challenge, the Government is facing, is to evaluate the efficiency of the use of allocated funds since under conditions of limited funding only the most effective projects should be financed.

Issues of regional development and determination of its priorities are extremely relevant both for Russia and for Serbia, as well as for other countries with transitional processes in the economy. Priorities of regional development have been repeatedly elucidated at the theoretical and methodological level [2, 15, 16]. The main purpose of our paper is to develop a tool to analyze funding efficiency based on the case of Serbian

regions. We are able to show — as individual separate items and not in any combination thereof — the issues such as “who” — Government budget (Ministry, specific programme, loan, donor, etc.), “how much” — the amount spent, “where” (NUTS 2 region), and “what” (type of initiative). These additional cross-references are something the Government may consider recording and monitoring in the future to enable identification and decision-making for prioritized spending. Regarding current and future expenditure, our task will start with estimating the funds available for regional policy-driven interventions in Serbia for the period 2014–2020. This will be based on the estimate of the loan and budget-based commitments already made, projections of fiscal capacities of the government and the external financial support programs based on the capacity. In brief, the judgement on optimal allocation of funds will be made in the following way: grounding on the dataset we have from the Serbian Business Registers Agency (SBRA)², we will be able to identify the geographical distribution of the scope, type and source of interventions made in each particular NUTS 2 (Nomenclature of Territorial Units for Statistics — level 2) region. We will link each of the interventions made to one of the regional development priorities and evaluate the effectiveness by observing the performance of the group of indicators associated with each of the priorities. Our recommendations vis-à-vis the optimization of the structure of distribution of regional policy and regions will be driven by analyses of the performance of the group of indicators and their relative rankings per NUTS 2 region.

2. Methodology

2.1. Data and Empirical Setup

The available data categorized in 20 sectors identified in the SBRA was allocated to 8 sectors. This allocation can be modified into other corresponding sectors if this changes from the Government perspective (as mooted in various meetings). The data from 8 sectors were categorized under 4 priorities of the NARD³ — “People, Place, Productive Capacity, and Institutional Capacity”. This was done on a “read across” basis so the link can also be directly shown with the 20 source sectors from the SBRA.

¹ Assembly of European Regions. (1996). Declaration on Regionalism in Europe. Strasbourg: Assembly of European Regions. Retrieved from: <https://aer.eu/aer-declaration-regionalism/> (date of access: 10.06.2017); Committee of the Regions. (2009). Mission Statement. Brussels. Retrieved from: <http://cor.europa.eu/en/about/Documents/Mission%20statement/EN.pdf> (date of access: 10.06.2017).

² Serbian Business Registers Agency (SBRA). Retrieved from: <http://www.apr.gov.rs/eng/Home.aspx> (date of access: 10.06.2017).

³ National Agency for Regional Development.

Source sectors

SBRA "Purpose"	Sector	NARD Priority
01. Employment incentives	HRD*	Productive Capacity
02. Strengthening human resources	HRD	People
03. Export incentives	Competitiveness	Productive Capacity
04. Production incentives	Competitiveness	Productive Capacity
05. Agriculture incentives	Agriculture & RD	Productive Capacity
06. Science & research, R&D incentives	Competitiveness	Productive Capacity
07. Spatial planning and building construction	Environment & Energy	Place
08. Restructuring of companies	Competitiveness	Productive Capacity
09. Environmental protection	Environment & Energy	Place
10. Investments in environmental infrastructure	Environment & Energy	Place
11. Investments in transport infrastructure	Transport	Place
12. Investments in public utility infrastructure	Environment & Energy	Place
13. Investments in energy infrastructure	Environment & Energy	Place
14. Investments in economic infrastructure	Competitiveness	Place
15. Investments in infrastructure — other	all	Place
16. Public health investments	HRD	People
17. Investments in education, science, culture and sport	Civil Society, Media, Culture	People
18. Investments in social protection	Competitiveness	People
19. Institution building & strengthening	Public Admin. Reform	Institutional Capacity
20. Other incentives of importance for regional development	Competitiveness	n/a

* Human Resources Development.

Source: Authors' own preparation.

The amount of assistance that could be shown to be spent on each priority in each region was tabulated, and we can show the distribution per priority nationally and by NUTS II region. It is our understanding that the priorities of the regional development are based on a comprehensive and wide-ranging socio-economic analysis, review of national strategies and a reflection of regionally

identified needs. As we can see from the charts (Fig. 1), this is not reflected in previous and current development spending patterns.

Having identified and reviewed regional development interventions over the preceding period and having established what we could call the "status quo" position, we then needed to look at how this could be seen as future expenditure and

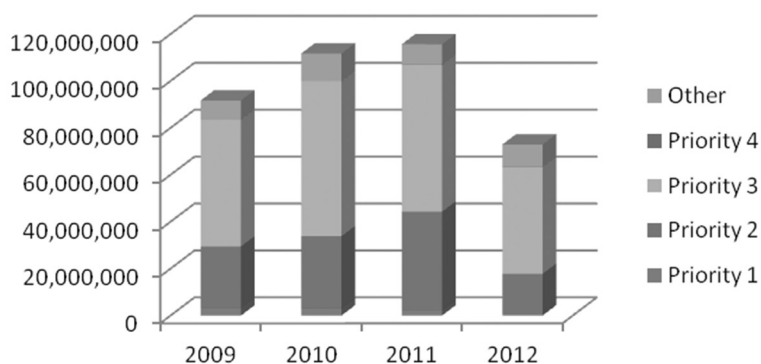


Fig. 1. National spending in the period 2009 — 2012.

Priority 1 — People are barely registered at the bottom of the columns.

Priority 2 — Place refers primarily to transport, energy, environment, and infrastructure and shows somewhat lower than anticipated investment. It should be noted that 2012 Transport figures for Belgrade are not included nor is investment/expenditure by the Ministry of Transport for any of the years. The addition of these amounts would increase expenditure in this priority area and would result in somewhat of a balance with the Productive Capacity priority (but reducing already small share of "people" and "Institutional Capacity").

Priority 3 — Productive Capacity could also include "other" and makes by far the largest spending area.

Priority 4 — Institutional Capacity is statistically insignificant.

Source: Authors' own preparation based on SBRA

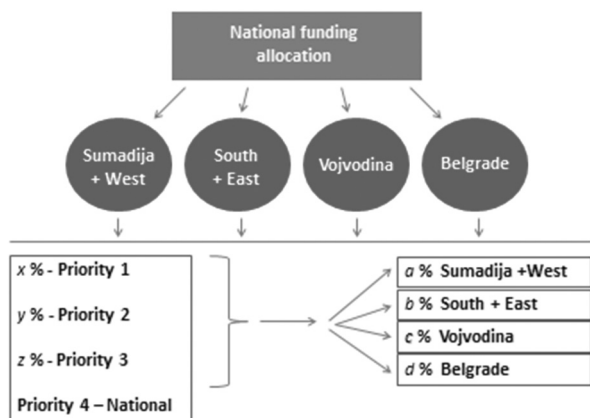


Fig. 2. Theoretical model for allocation of funding to sectors/priorities/regions. Source: Authors' own illustration

what options were open to the policy makers. The total funding envelope can be predicted from the national budget, EU Programming and where relevant, IFI commitments. There were a number of methods for the allocation of funding to sectors/priorities/regions. We observed four options based on common and current practice (Fig. 2). For the Financial Framework, there were two main variables:

1. Priority/sector distribution.
2. Regional allocation.

When deciding on an approach and proposing a funding model, they must be robust, defensible/justifiable, appropriate, and effective.

The Table 2 shows examples of the priority-level distribution adopted by other European states of a similar size and economic level to address their needs based on their analyses.

Some of more obvious anomalies are:

– Ireland’s Intuitional Capacity has always been high. Nevertheless, its investment in the institutional capacity building has been 50 times greater than has happened to date in Serbia.

– Elsewhere, on the average, public investment in Place has been two times greater than the investment in Productive Capacity, while in Serbia the reverse has been the case.

– Serbia’s investment in people to date has been less than 12 % of the average of the other example countries.

This seems to suggest that a changed approach (possibly based on a combination of Options 3 & 4 set out below) is needed for Sectoral Prioritisation. The total budget is allocated to priorities based upon past expenditure pattern. Equally, regional allocations per priority are also as per past spending patterns. This is a position where no change in policy or programs should result in the same behavior as before.

It is clear from the socio-economic analysis of the regional planning processes and the regional development priorities that this priority distribution should not be maintained. The headline indicators also indicate the ineffectiveness of this approach. The Regional Distribution may also have historically occurred on an ad hoc or random basis and this could be difficult to defend. As it stands, no changes in policy will result in this remaining the default position. This can be based on “across the board” distribution and is sometimes used for new programs and initiatives where baseline information, capacity to implement and absorb, time constraints or political consensus makes it difficult to make a more scientific distribution. In simple terms, this can be:

Table 2

Examples of the priority-level distribution adopted by other European States

Country	Population (mln inh.)	Area (km ²)	Pop Density (Inh. per km ²)	GDP (EUR per capita, PPP)	Priorities			
					People, %	Place, %	Productive Capacity, %	Institutional Capacity, %
Portugal	10.6	92,931	114	23,363	29	37	34	Inc.
Czech Republic	10.3	78,866	131	27,063	8	58	30	4
Slovakia	5.5	48,845	113	23,304	12	62	22	4
Hungary	9.9	93,030	106	19,591	28	45	20	7
Bulgaria	7.3	110,912	66	13,789	12	63	15	10
Ireland	4	70,280	57	40,838	45	22	31	2
Romania	22.3	238,391	94	12,493	15	59	19	5
Greece	10.6	131,940	80	26,258	20	58	19	3
Average	10.1	108,149	95	23,338	21	51	24	5
Serbia	7.2	88,361	92	10,409	2.42	29.5	58.29	0.04

Source: Authors' own preparation.

N. B. For Serbia, there is also 'Other' category (most likely P3 — Productive Capacity) 9.75 %.

Table 3

Proportional budget allocation to priorities based on past expenditure pattern and regional allocations per priority as per past spending pattern

Priority Distribution		Regional Allocation	
Priority 1 — People	2.42 %	Belgrade	23.90 %
Priority 2 — Place	29.50 %	Vojvodina	30.17 %
Priority 3 — Productive Capacity	58.29 %	Sumadija & West	29.38 %
Priority 4 — Institutional Capacity	0.04 %	South & East	16.61 %
Other (Also Priority 3 “Productive Capacity”)	9.75 %		

Source: Authors' own preparation.

— Completely “balanced” — 25 % per priority and per region

— Per capita “balanced” — 25 % per priority, per capita base per region.

Other variations can include balanced distribution of regional interventions with a horizontal or national priority “top-sliced”, for example, 10 % nationally for capacity building with the remainder distributed in a balanced manner. With proper monitoring systems, it is possible to start a program from this position and revise distribution based on results and the desire to modulate or target once the program is running. Allocation is based on “expert group(s)”, regional partnerships, technical staff (civil servants or consultants) and/or political determination of need. This is often a subjective opinion of what is “thought” to be right or needed. It is a common approach used when there is knowledge of a sector or region but there is either no time to collect the supporting data and evidence or the data and evidence do not exist or are inconclusive.

This approach will enable the allocation by priority based on evidenced results, studies, and trend analysis. This is the most sophisticated approach to the indicative distribution per priority and requires a substantial capacity to collect data and analyze results. There is a number of levels at which this approach could be adopted, and it is often done in combination with some other options. At the level of “intervention area”, this method can target types of activities that have proved to be effective or achieved the best results or the areas where the most capacity to absorb or effectively manage may lie. Allocations to regions are based on weighting (need/opportunity related) and capacity to absorb/use effectively. Within Serbia, one approach to this allocation could be the modification of methodology to identify “devastated

municipalities” scaled up to provide a NUTS II weighting against a National “norm”. In a number of other countries indicative financial allocations are made at the regional level by targeting more underdeveloped regions through a financial allocation mechanism indirectly proportional to their GDP per capita level amended with the population density index, so that the less developed Regions are to proportionally receive higher amounts of financial allocations within the framework of nationally agreed priority axes. As mentioned before, this approach requires effective monitoring systems, but it is the level that all strategic planning and policy-making should aim for.

2.2. The Financial Framework

The amount of funds available for regional policy interventions in the period 2014–2020 was determined in a two-step procedure where we first estimated the total government expenditure for the corresponding period¹. The second step con-

¹ The ‘Financial Envelope’ estimation has three elements: capital expenditure and subsidies, IPA funds and unconsolidated sources of capital expenditure controlled by the government at all levels.

First, the amount of capital expenditure and subsidies is derived from the current and future projected General Government (i.e. consolidated) revenues and expenditures. We estimated the future revenues of the General Government by analyzing how the GDP and revenues moved together in the past and used the official MFE GDP projections to arrive at the final revenues projections. From there, we added the official MFE target deficit figures to build projections of the total expenditure. The share of the total expenditure belonging to capital expenditure and subsidies is estimated by applying their 10-year average on the projected figures. It is important to note, however, that the calculation of the average values can be biased due to the fact that the scope of the General Government varied slightly from year to year in the observed period.

Besides capital expenditure and subsidies, the final annual figures for the ‘Financial Envelope’ include the projected IPA funds available as well as the projected budget of the Development Fund of Serbia (DFS) which is identified as the only unconsolidated ‘source’ of capital expenditure. DFS is not formally a part of the General Government but its interventions do officially fall under the scope of the government-programmed regional development interventions. Since DFS is essentially a revolving fund, we assumed no additional capitalization in the future period, and assumed it to grow at an average rate of 5 % annually (i.e. at the average interest rate).

The General Government figures used to arrive at the estimated “Financial Envelope” include revenues and expenditures from all sources of all government levels (Central government, social security funds, Belgrade, Vojvodina and all local self-governments) as well as all other government-controlled non-market capital expenditure “centers” such as: Fund for Capital Investments of Vojvodina, PE “Putevi Srbije”, PE “Koridori Srbije” and PE “Zeleznice Srbije”. The Development Fund of Vojvodina has recently been merged with the Development Bank of Vojvodina which is a commercial (i.e. market-oriented)

Table 4

The key variables required for completion of the estimate of the Financial Envelope in RSD million

Year	GDP (current prices), RSD** mil	GDP real growth*	Inflation*	General Government Revenues	General Government Fiscal Result	General Government Expenditure
2011	3.175.024,7					
2012	3.508.942,0	-1,5 %	12,2 %	1.343.333,3		
2013	3.976.403,3	2,0 %	11,1 %	1.527.179,1		
2014	4.313.125,1	3,5 %	4,8 %	1.659.603,2	-1,9 %	1.741.552,5
2015	4.687.504,4	4,0 %	4,5 %	1.806.977,5	-1,0 %	1.853.852,5
2016	5.070.004,8	4,0 %	4,0 %	1.957.999,9	0,0 %	1.957.999,9
2017	5.483.717,1	4,0 %	4,0 %	2.121.644,4	0,4 %	2.099.709,5
2018	5.931.188,5	4,0 %	4,0 %	2.298.965,8	0,8 %	2.251.516,3
2019	6.415.173,4	4,0 %	4,0 %	2.491.107,3	1,0 %	2.426.955,6
2020	6.938.651,6	4,0 %	4,0 %	2.699.307,5	1,1 %	2.622.982,3

* MFE projections from the Government of Serbia Fiscal Strategy Source: Statistical Office of Republic of Serbia, Multiannual Financial Framework, National Bank of Serbia and authors calculations. ** Serbian dinar. Source: Authors' own preparation.

Table 5

Key variables to arrive at annual envelope per year 2014–2020 in Euro million

Year	General Government Capital Expenditure	General Government Subsidies	Development Fund Budget	IPA	Total «Envelope»
2014	1413.7	963.4	111.2	260.0	2.748,3
2015	1470.3	1002.0	114.0	260.0	2.846,3
2016	1517.4	1034.1	117.0	260.0	2.928.4
2017	1590.5	1083.9	120.1	260.0	3.054.5
2018	1666.2	1135.5	123.2	260.0	3.184.8
2019	1754.4	1195.6	126.3	260.0	3.336.3
2020	1852.1	1262.1	129.6	260.0	3.503.8

Source: MFE, Development Fund of Serbia and authors calculations.

sisted of estimating the amount of capital expenditure, subsidies, unconsolidated capital expenditure sources as well as the amount of average annual IPA¹ funds available per new EU Multiannual Financial Framework (MFE) for the period 2014–2020. Table 4 below contains the key variables required for completion of step one.

Nominal GDP figures are estimated based on the MFE projections of the real GDP growth and projected inflation trajectory in the next period. We regressed the historical values of general government revenues over GDP in current prices to obtain the elasticity relationship. Results of the specified equation, as expected, yielded a constant term of close to zero and almost unit elasticity re-

flected in the coefficient value of 1,04. From the estimated general government revenues, we proceeded by adding the targeted fiscal result which, by definition, includes the debt/GDP target, to arrive at the estimate of the total general government expenditure in the final column of Table 4.

Table 5 given below contains the key variables required for completion of the step two².

Capital expenditure and subsidies figures are estimated by applying their 10-year average share in the total expenditure figures to the estimated value of the total general government expenditure. The values are 9.4 % and 6.4 %, respectively. The annual budget of the Development Fund of Serbia, as the only identified unconsolidated source of capital expenditure, is estimated by using an assumed increase of 5 % annually starting from its stated annual budget of RSD 12.2 billion in 2012. This value corresponds to the average loan interest rate charged by the Fund. The total IPA budget

institution with retail consumer banking products and as such cannot be considered to be under the scope of the NPRD in the future. In case of the Vojvodina Fund for Capital Investments which is financed by the 7 % transfer from the Central government budget, these funds are treated as a transfer (i.e. current expenditure) in the Central government budget, while they are treated as capital expenditure in the Vojvodina budget. Thus, the double-counting is avoided in the consolidation process.

¹ Instrument for Pre-accession Assistance.

² Final RSD/EUR exchange rate projections applied to the RSD figures obtained in the previous step are derived from MC simulation of the AR (1) process generated projections.

for Serbia of slightly over EUR 1.8 billion was split into equal annual amounts. Finally, the last column is the sum of estimated figures and corresponds to the total amount of funds available for regional policy interventions in Serbia for the period 2014–2020.

2.3. Regional Distribution

An example of Option 4, the international method of regional GDP per capita and population density criterion to develop a NUTS 2 ‘needs’ coefficient to generate a notional¹ allocation for each region, is given as an example intended for comparative purposes in Table 6 below.

The possible “notional” allocation is arrived at when correcting the historic allocation with the NUTS 2 ‘needs’ coefficient in the way described below. First, we calculated separate coefficients based on ‘national-average’ values for regional GDP/capita and Population density. Equation 1 and Equation 2 correspond to each of them respectively².

Equation 1

$$\text{CoeffGDP}_i = \frac{\text{NGDP}_{cap}}{\text{RegGDPcap}_i \times \sum_j \frac{\text{NGDP}_{cap}}{\text{RegGDPcap}_j}}, \quad (1)$$

¹ Notional Allocation would not have a legal basis for budgetary purposes but would be for the Government of Serbia’s planning monitoring and evaluation of the sectoral implementation of Regional Policy and annual budget adjustments as needed. Ministry of Finance could consider retaining a 20 % ‘Regional Policy Reserve’ for allocation to sectors or regions demonstrating good results against agreed indicators.

² Further simplification of the equations is avoided on purpose.

where is the national GDP per capita is the GDP per capita of the region for which the coefficient is calculated and $j = 1, 2, 3, 4$.

Equation 2

$$\text{CoeffDensity}_i = \frac{\text{NDensity}}{\text{RegDensity}_i \times \sum_{j=1}^4 \frac{\text{NDensity}}{\text{RegDensity}_j}}, \quad (2)$$

where the national population density is the population density of the region for which the coefficient is calculated and $j = 1, 2, 3, 4$.

In order to assign an equal weight to each of the coefficients, the final ‘needs’ coefficient for each region is calculated based on the sum of each individual coefficient’s value divided by the number of coefficients — in our case 2. Box 1 below illustrates the process conducted for the region of Belgrade. Table 7 below contains the key data for calculation of the coefficients.

According to the Equations 1 and 2, the value of $\text{CoeffGDP}_{\text{BoI}}$ and $\text{CoeffDensity}_{\text{BoI}}$ is calculated in the following way:

$$\begin{aligned} \text{CoeffGDP}_{\text{BoI}} &= \frac{445.864}{765.320 \left[\left(\frac{445.864}{765.320} \right) + \left(\frac{445.864}{445.489} \right) + \left(\frac{445.864}{299.913} \right) + \left(\frac{445.864}{298.200} \right) \right]} \\ &= 0.128 \end{aligned} \quad (4)$$

$$\begin{aligned} \text{CoeffDensity}_{\text{BoI}} &= \frac{93}{518 \times \left[\left(\frac{93}{518} \right) + \left(\frac{93}{90} \right) + \left(\frac{93}{77} \right) + \left(\frac{93}{60} \right) \right]} \\ &= 0.045 \end{aligned} \quad (5)$$

Table 6

Calculated Allocation by Region based on the application of simple ‘Needs Coefficient’

NUTS 2 Region	Historic Allocation	NUTS 2 ‘Needs’ Coefficient	Adjusted	Possible ‘Notional’ Allocation
Belgrade	23.90 %	0.086	2.06 %	8.40 %
Vojvodina	30.17 %	0.240	7.23 %	29.51 %
Sumadija & West	29.38 %	0.315	9.25 %	37.76 %
South & East	16.62 %	0.359	5.96 %	24.33 %

Source: SBRA and authors’ calculations.

Table 7

‘Needs’ coefficient calculation for Belgrade Region

	GDP	Population	GDP per capita	Area	Density
Belgrade	1,270,003,000,000	1,659,440	765,320	3,205	518
Vojvodina	858,667,000,000	1,931,809	444,489	21,506	90
Sumadija & West	609,333,000,000	2,031,697	299,913	26,483	77
South & East	466,359,000,000	1,563,916	298,200	26,195	60
Serbia	3,204,362,000,000	7,186,862	445,864	77,389	93

Source: Statistical Office of the Republic of Serbia (2017) (in: Statistical Office of the Republic of Serbia. (2017). Retrieved from: <http://www.stat.gov.rs/WebSite/Default.aspx> (date of access: 10.06.2017)).

Table 8

Calculated Allocation by Region based on the application of the ED level method

NUTS 2 Region	Historic Allocation	NUTS 2 'Needs' Coefficient	Adjusted	Possible 'Notional' Allocation
Belgrade	23.90 %	0.138	3.30 %	13.48 %
Vojvodina	30.17 %	0.226	6.80 %	27.78 %
Sumadija & West	29.38 %	0.299	8.80 %	35.93 %
South & East	16.62 %	0.337	5.59 %	22.81 %

Source: SBRA and authors' calculations.

Table 9

NUTS 2 regions' economic development level

	Basic ED level (% of national average)	Unemployment Adjustment	Population Adjustment	Density Adjustment	Final ED level (% of national average)
Belgrade Region	141.48	0	15	10	166.48
Vojvodina Region	102.20	0	0	0	102.20
Sumadija & West	81.99	-5	0	0	76.99
South & East	78.49	-3	-5	-2	68.49

Source: Statistical Office of the Republic of Serbia (2017).

Table 10

Allocations per Priority in peer-group countries

Country	Priority 1 People, %	Priority 2 Place, %	Priority 3 Productive Capacity, %	Priority 4 Institutional Capacity
Czech Republic	8	58	30	4
Slovakia	12	62	22	4
Bulgaria	12	63	15	10
Romania	15	59	19	5
Average	12	61	22	6

Source: Statistical Office of the Republic of Serbia (2017).

Finally, we calculate the value of the 'Needs' coefficient for Belgrade region, as follows:

$$Coeff_{Bel} = \frac{0.128 + 0.045}{2} = 0.086 \quad (6)$$

After the historical allocations are multiplied by the corresponding coefficients, these values, taken from column 4 of the Table 6 above are normalized by their share in the total value to arrive at the possible 'notional' allocation given in column 5. Similarly to the first method, we calculated the 'needs coefficients' for each of the regions based on their relative economic development levels. Table 8 shows the allocations suggested by this method.

The needs coefficients from the column 3 in Table 8 above are calculated based on the ED level of NUTS 2 regions expressed as the national average. It was derived from the NUTS 4 ED levels kindly supplied by the MRDLS. According to the official methodology prescribed by the corresponding Government Directive, the ED level of each municipality is determined by the sum of per capita total revenues of the local self-government excluding its 'own-source' revenues and natural

disaster recovery transfers from the central government, the total amount of pensions and salaries paid in the territory. This amount is then corrected for the migration balance compared to the 1971 census, unemployment rate, and population density. Table 9 shows the values of the regional ED level.

This procedure had the aim to identify optimal percentage distribution of funds per each of the priorities for each region. We started with the observed distribution at the national level for a peer group of countries — Czech Republic, Slovakia, Romania, and Bulgaria — extracted from Table 2. Table 10 shows the values per priority.

We proceeded to analyzing and ranking the performance indicators associated with each of the priorities¹ and ranking the region's performance according to their values. Table 11 below presents the values of each of them. The overall region's performance per priority is estimated by taking the average value of its rankings in each of the three indicators' category. Based on the overall ranking per priority, the regions will re-weight

¹ Except Priority 4 — Institutional Capacity.

Performance Indicators

Region	Priority1			Priority2			Priority3		
	unemployment rate	registered vacancies/# of unemployed 15-64	LT unemployment/# of unemployed 15-64	# of households on water system/total # of households	# of households on sewage system/total # of households	overnight stays (% of total)	New firms (% of total)	Higher education R&D/population	Business R&D/total # of firms
Belgrade	20,00 %	10,51 %	47,55 %	100,00 %	79,28 %	20,12 %	31,2 %	4,20	97,50
Vojvodina	23,90 %	7,79 %	67,90 %	98,80 %	43,96 %	11,38 %	26,7 %	1,93	2,96
Sumadija & West	23,80 %	9,24 %	87,57 %	76,82 %	53,52 %	48,16 %	25,1 %	0,33	21,59
South & East	26,70 %	6,34 %	78,41 %	68,01 %	46,72 %	20,33 %	17,0 %	0,29	12,34
<i>Rankings</i>									
Belgrade	1	1	1	1	1	3	1	1	1
Vojvodina	3	3	2	2	4	4	2	2	4
Sumadija & West	2	2	4	3	2	1	3	3	2
South & East	4	4	3	4	3	2	4	4	3

Source: LFS, NES, SORS (other) and authors' calculation.

their initial distribution based on the peer-group average presented in the bottom row of Table 11. We illustrated the process of re-weighting (i.e. adjusting) the distribution in the case of Belgrade region in Box 2 which can be found in Table 12 above.

Average rank per priority is determined as an average value of the ranks for the priority.

In the case of Priority 2, the calculation is the following:

$$\begin{aligned}
 \text{average rank}_{p_2} &= \\
 &= \frac{\text{Rank}_{\text{coeff}1} + \text{Rank}_{\text{coeff}2} + \text{Rank}_{\text{coeff}3}}{N_{\text{coeff}}} = \\
 &= \frac{1+1+3}{3} = 1.67. \quad (7)
 \end{aligned}$$

The priority rank is the value of the average rank per priority relative to the sum of all values of average ranks per priority. Since P2 indicators underperformed the others, its relative priority rank is higher than that of the other two priorities. Hence, more funds should be allocated to it. In case of Priority 2, the calculation is as follows:

$$\begin{aligned}
 \text{priority rank}_{p_2} &= \\
 &= \frac{\text{average rank}_{p_2}}{\text{average rank}_{p_1} + \text{average rank}_{p_2} + \text{average rank}_{p_3}} = \\
 &= \frac{1.67}{1+1.67+1} = 0.45. \quad (8)
 \end{aligned}$$

Priority rank \times priority share is an intermediate step in re-weighting. Dividing its value for Priority 2 by the sum of all values will normalize the new

Table 12

Re-weighting the priority distribution for the region of Belgrade

	P1	P2	P3
«peer group» average share	12,0 %	61,0 %	22,0 %
average rank	1,00	1,67	1,00
priority rank (relative)	0,27	0,45	0,27
priority rank \times priority share	0,03	0,28	0,06
adjusted priority distribution	8,3 %	70,4 %	15,2 %

Source: Authors' own calculations.

distribution and give us the adjusted priority distribution. The procedure has to be adjusted for the pre-allocated 6 % to the Priority 4. The calculation for Priority 2 is as follows:

$$\begin{aligned}
 \text{adjusted priority distribution}_{p_2} &= \\
 &= \frac{P2_{\text{rank}} \times P2_{\text{share}}}{P1_{\text{rank}} \times P1_{\text{share}} + P2_{\text{rank}} \times P2_{\text{share}} + P3_{\text{rank}} \times P3_{\text{share}}} \times \\
 &\times (1 - 0.06) = \frac{0.28}{0.03 + 0.28 + 0.06} \times (1 - 0.06) = \\
 &= 70.44\% \quad (9)
 \end{aligned}$$

The result of re-weighting the priorities' distribution suggested by the peer average is shown in Table 13.

3. Results and discussion

3.1. "Notional Regional Distribution" – Scenario Analysis

"Regional GDP and population density" method. The base scenario distribution in the case of the GDP & density criterion was calculated in

Table 13

Adjusted distribution per priority per region

Region		P1	P2	P3	P4
	«peer group» distribution	12,00 %	61,00 %	22,00 %	6,00 %
	«notional» distribution				
Belgrade	8,40 %	0,70 %	5,92 %	1,28 %	0,50 %
Vojvodina	29,51 %	3,02 %	19,18 %	5,54 %	1,77 %
Sumadija & West	37,76 %	5,34 %	20,36 %	9,79 %	2,27 %
South & East	24,33 %	3,27 %	13,60 %	6,00 %	1,46 %

Source: Authors' own calculations.

Table 14

'Notional Regional Distribution' — Options 1.1-1.4

Option 1.1					Option 1.3			
Region	GDP 'Needs' Coeff	Density 'Needs' Coeff	Current Allocation	'Notional' Allocation	Region	GDP 'Needs' Coeff	Density 'Needs' Coeff	'Notional' Allocation
Belgrade	0.128	0.045	23.84 %	8.40 %	Belgrade	0.128	0.045	8.63 %
Vojvodina	0.220	0.260	30.17 %	29.51 %	Vojvodina	0.220	0.260	23.97 %
Sumadija West	0.325	0.304	29.39 %	37.76 %	Sumadija West	0.325	0.304	31.48 %
South East	0.327	0.391	16.60 %	24.33 %	South East	0.327	0.391	35.91 %
Option 1.2					Option 1.4			
Region	GDP 'Needs' Coeff	Density 'Needs' Coeff	Current Allocation	'Notional' Allocation	Region	GDP 'Needs' Coeff	Density 'Needs' Coeff	'Notional' Allocation
Belgrade	0.128	0.045	23.84 %	9.19 %	Belgrade	0.128	0.045	9.46 %
Vojvodina	0.220	0.260	30.17 %	28.98 %	Vojvodina	0.220	0.260	23.57 %
Sumadija West	0.325	0.304	29.39 %	37.97 %	Sumadija West	0.325	0.304	31.70 %
South East	0.327	0.391	16.60 %	23.87 %	South East	0.327	0.391	35.28 %

Source: Authors' calculations.

the following way. Initially, we derived the 'need' coefficients out of the regional GDP and population density data by assuming equal importance (i.e. weights) of both indicators. In the second step, we used the relative values of 'need' coefficients and adjusted the current regional distribution¹ to arrive at the 'notional regional distribution'. The four scenarios (i.e. notional distribution options) extracted from this methodology are derived based on varying the bolded parts of the procedure in both steps. Namely, Option 1.1 assumes equal weights of indicators and adjustment of the current regional distribution (base scenario). Option 1.2 assumes the higher weight of the regional GDP indicator versus the population density (in 3:2 proportion) and adjustment of the current regional distribution. Option 1.3 assumes equal weights of indicators and disregards the current regional distribution but instead builds the 'notional regional allocation' based on the regional GDP and population density implied 'need coefficients' only. Option 1.4 assumes the higher

weight of the regional GDP indicator versus the population density (in 3:2 proportion) and disregards the current regional distribution. Table 14 contains 4 scenarios (i.e. options) based on the GDP & density criterion, and presents the priority distribution per region resulting from each of the scenarios.

As we can see from the Table 14, varying the weights of the indicators, while keeping the other part of the procedure unchanged, changes the 'notional allocations' only slightly (from Option 1.1 to Option 1.2 and from Option 1.3 to Option 1.4). For example, the region of Vojvodina is allocated 29.51 % in the Option 1.1 and the new allocation in the Option 1.2 when the regional GDP gets higher weight is 28.98 %. On the other hand, varying the adjustment of current distribution, while keeping the indicators' weights constant, changes the allocations more intensively (from Option 1.1 to Option 1.3 and from Option 1.2 to Option 1.4). The largest variation is identified in the region of Southern and Eastern Serbia where the distribution from the base scenario in Option 1.1 of 24.33 % goes to 35.91 % in the Option 1.3.

¹ Obtained from the SBRA data.

Priority distribution per region — per Option (1.1–1.4)

Option 1.1					Option 1.3				
Region	P1	P2	P3	P4	Region	P1	P2	P3	P4
Belgrade	0.70 %	5.92 %	1.28 %	0.50 %	Belgrade	0.72 %	6.08 %	1.32 %	0.52 %
Vojvodina	3.02 %	19.19 %	5.54 %	1.77 %	Vojvodina	2.45 %	15.58 %	4.50 %	1.44 %
Sumadija West	5.34 %	20.36 %	9.79 %	2.27 %	Sumadija West	4.45 %	16.98 %	8.16 %	1.89 %
South East	3.27 %	13.60 %	6.00 %	1.46 %	South East	4.83 %	20.08 %	8.85 %	2.15 %
Option 1.2					Option 1.4				
Region	P1	P2	P3	P4	Region	P1	P2	P3	P4
Belgrade	0.76 %	6.47 %	1.40 %	0.55 %	Belgrade	0.79 %	6.66 %	1.44 %	0.57 %
Vojvodina	2.97 %	18.84 %	5.44 %	1.74 %	Vojvodina	2.41 %	15.32 %	4.42 %	1.41 %
Sumadija West	5.37 %	20.47 %	9.85 %	2.28 %	Sumadija West	4.48 %	17.09 %	8.22 %	1.90 %
South East	3.21 %	13.34 %	5.88 %	1.43 %	South East	4.74 %	19.72 %	8.69 %	2.12 %

Source: Authors' own calculations.

This is because the current allocations do not correspond to the needs expressed by the regional GDP and population density. Thus, this region is currently allocated the lowest share (16.6 %), whereas its needs coefficient is convincingly the highest among four regions. This disproportion results in this region not getting the highest share of funds when we adjusted the current distribution, while it is allocated the most (35.91 %) in the Option 1.3 when the current distribution is disregarded and the 'notional distribution' is determined solely based on the 'need coefficients' from the regional GDP and population density. In Table 15, we can see how this is reflected in the priority distribution per region in each of the Options.

"Official Economic Development Level" criterion. The base scenario using the economic development methodology was determined by calculating the 'need coefficients' based on the relative values of regions' adjusted economic development level as prescribed by the Government Directive¹. The 'notional allocations' are calculated by adjusting the current regional distribution by these coefficients. As in the case of GDP & density criterion, we alter the two bolded parts of the procedure and present 4 different scenarios. In Option 2.1 we take the adjusted ED level and determine the 'notional distribution' by adjusting the current distribution (base scenario). In Option 2.2 we take the ED levels which are unadjusted for the factors of migration balance, unemployment, and population density and we adjust the current regional

distribution to get the 'notional regional allocation'. In Option 2.3 we take the adjusted ED level and disregard the current regional distribution and build the 'notional regional allocation' based on the ED implied 'need coefficients'. Finally, in Option 2.4 we take unadjusted ED levels and build the notional allocations based on the 'need coefficients' determined by the relative unadjusted ED levels. Table 16 and 17 represent 4 scenarios (i.e. options) and the resulting priority distribution per region, respectively.

Please note the significant difference in the base case 'notional allocations' between the two methods. The second method, based on the ED levels, shows less deviation than the one based on GDP and population density. This is because the value added is created predominantly in Belgrade (i.e. Belgrade-based companies) — method one. The greater uniformity in the method two is achieved by the fact that the value added is then taxed in various forms and transferred to other regions in the form of transfers to local governments and pensions.

As with the GDP & density criterion, calculating the 'notional regional allocation' based on adjusting current distribution versus calculating it based on the ED implied 'needs coefficients' brings higher changes than when varying the other factor — relative ED level calculation. Again, the fact that the current allocation does not correspond to the calculated needs is reflected the most in the case of the region of Southern and Eastern Serbia. When we adjusted the current distribution based on the adjusted ED level needs coefficients (Option 2.1) we got 22.81 % allocated to this region, whereas when we disregarded the cur-

¹ The implementation of methodology starts with calculating the ED level based on current income criteria (personal income, pensions, and fiscal revenues). This ED level is then adjusted for the migration balance, unemployment, and population density.

Table 16

“Notional Regional Distribution” — Options 2.1–2.4

Option 2.1					Option 2.3			
Region	Adjusted ED level	Relative ‘Needs’ Coefficient	Current Allocation	‘Notional’ Allocation	Region	Adjusted ED level	Relative ‘Needs’ Coefficient	‘Notional’ Allocation
Belgrade	166.48	0.138	23.84 %	13.48 %	Belgrade	166.48	0.138	13.85 %
Vojvodina	102.20	0.226	30.17 %	27.78 %	Vojvodina	102.20	0.226	22.56 %
Sumadija West	76.99	0.299	29.39 %	35.93 %	Sumadija West	76.99	0.299	29.94 %
South East	68.49	0.337	16.60 %	22.81 %	South East	68.49	0.337	33.66 %
Option 2.2					Option 2.4			
Region	Unadjusted ED level	relative ‘Needs’ Coefficient	Current Allocation	‘Notional’ Allocation	Region	Unadjusted ED level	relative ‘Needs’ Coefficient	‘Notional’ Allocation
Belgrade	141.48	0.169	23.84 %	16.30 %	Belgrade	141.48	0.169	16.91 %
Vojvodina	102.20	0.234	30.17 %	28.56 %	Vojvodina	102.20	0.234	23.41 %
Sumadija West	81.99	0.292	29.39 %	34.68 %	Sumadija West	81.99	0.292	29.18 %
South East	78.49	0.305	16.60 %	20.46 %	South East	78.49	0.305	30.49 %

Source: Authors’ own calculations.

Table 17

Priority distribution per region — per Option (2.1–2.4)

Option 2.1					Option 2.3				
Region	P1	P2	P3	P4	Region	P1	P2	P3	P4
Belgrade	1.12 %	9.49 %	2.05 %	0.81 %	Belgrade	1.15 %	9.75 %	2.11 %	0.83 %
Vojvodina	2.84 %	18.06 %	5.21 %	1.67 %	Vojvodina	2.31 %	14.66 %	4.23 %	1.35 %
Sumadija West	5.08 %	19.37 %	9.32 %	2.16 %	Sumadija West	4.23 %	16.15 %	7.76 %	1.80 %
South East	3.07 %	12.75 %	5.62 %	1.37 %	South East	4.52 %	18.82 %	8.30 %	2.02 %
Option 2.2					Option 2.4				
Region	P1	P2	P3	P4	Region	P1	P2	P3	P4
Belgrade	1.36 %	11.48 %	2.48 %	0.98 %	Belgrade	1.41 %	11.91 %	2.58 %	1.01 %
Vojvodina	2.92 %	18.57 %	5.36 %	1.71 %	Vojvodina	2.40 %	15.22 %	4.39 %	1.40 %
Sumadija West	4.90 %	18.70 %	8.99 %	2.08 %	Sumadija West	4.13 %	15.74 %	7.57 %	1.75 %
South East	2.75 %	11.44 %	5.04 %	1.23 %	South East	4.10 %	17.05 %	7.51 %	1.83 %

Source: Authors’ own calculations.

rent distribution and developed the ‘notional allocations’ based on ‘need coefficients’ only (Option 2.3) the region got as much as 33.66 %. This, however, is not true for each region. The allocation to the region of Belgrade deviates more from varying the ED level factor and keeping the other factor constant (Option 2.1 versus Option 2.2 and Option 2.3 versus Option 2.4) while all other regional allocations change very slightly. This is because the adjusted ED level is much higher than the unadjusted ED level for Belgrade. It is the region with the lowest unemployment, population density is the highest; at the same time, this is the only region in Serbia that recorded positive migration trend in the previous 30 years. Hence, all the adjustments are adding (versus subtracting for other regions) to its economic development.

“Absorption Capacity” — Scenario Analysis. One of the issues that will arise in the implementation phase of the NPRD is the absorption capacity of the NUTS 2 regions in Serbia. The larger the difference between the share of funds that will be allocated to a particular region and its current allocation the more prominent the issue will

Table 18

Change in allocations per NUTS 2 region

Region	METHOD	
	GDP & density, %	ED level, %
Belgrade	-15.44	-10.36
Vojvodina	-0.66	-2.39
Sumadija West	8.37	6.54
South East	7.73	6.21

Source: Authors’ own calculations.

“Notional Allocation” alternative accounting for the absorption capacity issue

Method	Region	total, %	P1, %	P2, %	P3, %	P4, %
GDP and population density	Belgrade	8.40	0.70	5.92	1.28	0.50
	Vojvodina	29.51	3.02	19.18	5.54	1.77
	Sumadija West	37.76	4.71	17.96	8.64	6.45
	South East	24.33	2.72	11.30	4.98	5.32
ED Level	Belgrade	13.48	1.12	9.49	2.05	0.81
	Vojvodina	27.78	2.84	18.06	5.21	1.67
	Sumadija West	35.93	4.59	17.50	8.41	5.42
	South East	22.81	2.62	10.91	4.81	4.47

Source: Authors' own calculations.

be. If we suppose that the base case options derived from both methods will be the two final allocation choices for the government, we can see that, as shown in Table 18, certain regions would obtain dramatically more funds than before. Specifically, the regions of Sumadija and Western Serbia and Southern and Eastern Serbia would be allocated 8.37 % and 7.73 % more of the total amount of funds in the base option of the GDP & density method, while they would get 6.54 % and 6.21 % of it in the ED level method. In general, these changes represent, in both cases, major shifts from Belgrade allocations to these two regions. The increases constitute growth of 28.48 % and 22.24 % in the case of Sumadija and Western Serbia and as much as 46.57 % and 37.42 % for the region of Southern and Eastern Serbia.

We suggest a distribution alternative which will account for these large and sudden shifts in the regional allocations. This will include primarily a shift larger than planned to the P4 – institutional capacity¹, where one-third of the total increase in allocations in each of the two regions would be allocated to it. The amount would be taken off of the other three priorities, proportionally, so that the total allocations per region remain unchanged. Table 19 shows new allocations by each of the two methods.

4. Conclusions

Lack of information on the percentage of the total budget, which has a regional development perspective, was a limiting factor for the creation of precise financial allocations in this research. Because of that, we consulted key ministries in Serbia and estimated that this percentage was 30 %. The analysis of existing national

¹ Instead of the assumed 6 % at the national level which was proportionally distributed down to the NUTS 2 level such that the regions that got more funds allocated received more money in the P4.

documents and socio-economic profile of Serbia led to the establishment of two main variables of sustainability and four socio-economic «priority axes» for financial allocations. In accordance with the best practice of EU countries, sustainability topics are «embedded» into socio-economic «axes» in the same manner as regional policy is integrated into sectoral policies for implementation. Based on that, their importance is not diminished. On the contrary, it increased. This reduces the possibility of the core issues being «marginalized». This new strategic approach to regional policy demands that national funding for regional development is distributed spatially (by NUTS 2 regions), and thematically (by priorities) in the most effective manner possible.

Calculating the funds for regional development in the strategic areas turned out to be slightly problematic because in the past there had been no strategic distribution based on established facts, which could be measured in terms of performance. However, an analysis of expenditure in the last four years showed the following:

- a. over 60 % of funds allocated to ‘regional development’ have focused on the direct stimulation of economic activity (Priority 3)
- b. about 30 % have been spent on the improvement of the public infrastructure in order to create conditions for growth, (Priority 2), and
- c. less than 10 % of the funds have been spent on the creation of more balanced labor market and capacity building of institutions in Serbia for more efficient management of activities in the field of Regional Development (Priorities 1 and 4).

We have analyzed the data for four «similar» countries (Czech Republic, Slovakia, Bulgaria, and Romania) with similar economies and population density. We found that the average distribution per thematic policy areas is very different:

- Priority 1 and Priority 4 – a much stronger emphasis on the creation of more balanced labor

market and capacity building of institutions than what is the case in Serbia;

— Priority 2 and Priority 3 — the balance between direct state support to economic growth and investment in public infrastructure in order to create conditions for economic growth is completely opposite to what has been the case in Serbia in the past four years.

Also, the analysis showed that despite the lack of factual data (measurable results) on activities in the field of regional development in Serbia (in the last several years), it is evident that significant expenditure (over 6 billion) aimed at regional development had no visible effect on the number of unemployed persons (what is now considered to be a key strategic indicator of success) during this period. Next, the distribution of funds among NUTS2 regions was random and that is why the same amount is spent in each region (even if needs are

greater in Southern Serbia). In order to solve this problem, we propose distribution by region, based on the population (coefficient needs to be based equally (50:50) on the density and GDP per capita). Distribution of funds among the four strategic priorities indicates that the financing of development institutional capacity amounts spent are statistically equal to zero, while the amounts spent on human resources are less than 3 % of the total. About 10 % of the activities are related to «production capacity». Nonetheless, the remaining funds (approximately 88 % of the total available) are focused on the creation of wealth and employment (two-thirds), and other on creating the conditions for sustainable economic growth (one-third). Data used in the methodology assume that the proportionate distribution will remain the same from year to year and that it will grow with the projected increase in the budget.

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