ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ

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N. Yu. Rekova, Doctor of Economics,
Professor,
I. L. Dolozina, Candidate of Economic
Sciences, Associate Professor,
A. O. Pinchuk, Candidate of Economic
Sciences

BUDGETARY REVENUE BREAKDOWN AT REGIONAL LEVEL OF PUBLIC ADMINISTRATION IN THE FEDERAL COUNTRIES

Urgency of the research. *Process of democratization of public administration assumes redistribution of powers down within hierarchy of governance. Nevertheless, despite increase in a role of regional level of governance, financial resources of regional bodies are limited.*

Target setting. *Regions in the most of federal countries have no full financial self-sufficiency. The truth is also that in the federal countries there is no uniform model of distribution of public incomes between the central and regional authorities. The specified circumstances induce to carry out the comparative analysis of regional budgets' revenues breakdown in these countries.*

Actual scientific researches and issues analysis. *Nowadays more and more researches are devoted to studying of experience of various countries in formation of local budgets' resource base: Foremny D. et al., Bobáková V., Malikká L., Reznichenko D. S. et al., Muzyka O, Volokhova I. and some other are the most noticeable.*

Uninvestigated parts of general matters defining. *At the same time, more careful comparative analysis is necessary for understanding of an overall picture and regularities of fixing of certain financial resources to regional budgets.*

The research objective. *To identify structural features and the directions of transformation of budgetary revenue breakdown at regional level of public administration in the federal states from 2000 till 2015.*

The statement of basic materials. *Statistical materials for assessment of budgetary revenue breakdown is processed. Dynamics of revenue's structural changes for budgets of regional level of public governance at federal states as well as similarity and distinctions of revenue's breakdowns of regional budgets in federal countries are analyzed.*

Conclusions. *A tendency to reduction of own tax revenues and increase the interbudgetary transfers share was revealed as well as two clusters (with domination of interbudgetary transfers in regional budgets' revenue breakdown and with relatively higher of financial autonomy) were described. There is no strong evidence for real dependence between autonomy of the regional power and federal type of state system.*

Keywords: budget; revenue; breakdown; regional level; federal countries; structural change; comparative analysis.

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Н. Ю. Рекова, д. е. н.,
професор,
І. Л. Долозіна, к. е. н.,
доцент,
А. О. Пінчук, к. е. н.

СТРУКТУРА ДОХОДІВ БЮДЖЕТІВ НА РЕГІОНАЛЬНОМУ РІВНІ ДЕРЖАВНОГО УПРАВЛІННЯ У ФЕДЕРАТИВНИХ КРАЇНАХ

Актуальність теми дослідження. *Процес демократизації державного управління передбачає перерозподіл повноважень в межах ієрархії управління. Проте, незважаючи на збільшення ролі регіонального рівня управління, фінансові ресурси регіональних органів обмежені.*

Постановка проблеми. *Регіони в більшості федеративних держав не мають повної фінансової самодостатності. Правда також, що в федеративних країнах немає єдиної моделі розподілу державних доходів між центральними та регіональними владами. Зазначені обставини спонукають провести порівняльний аналіз розподілу доходів регіональних бюджетів у цих країнах.*

Аналіз останніх досліджень і публікацій. *В даний час все більше досліджень присвячено вивченню досвіду різних країн у формуванні ресурсної бази місцевих бюджетів: Форемний Д. та ін., Бобакова В., Малікка Л., Резніченко Д. С. та співавт., Музика О, Волохова І. і деякі інші є найбільш помітними.*

Виділення недосліджених частин загальної проблеми. *У той же час, більш ретельний порівняльний аналіз необхідний для розуміння загальної картини та закономірностей фіксації певних фінансових ресурсів у регіональних бюджетах.*

Постановка завдання. *Визначити структурні особливості та напрямки трансформації структури бюджетних надходжень на регіональному рівні державного управління у федеральних державах з 2000 до 2015 року.*

Викладення основного матеріалу. *Опрацьовано статистичні матеріали для оцінки бюджетних надходжень. Проаналізовано динаміку структурних змін доходів бюджетів регіонального рівня державного управління федеративних держав, а також подібність та відмінності розподілу доходів регіональних бюджетів у федеративних державах.*

Висновки. *Виявлено тенденцію до зменшення власних податкових надходжень та збільшення частки міжбюджетних трансфертів, а також було охарактеризовано два кластери (з домінуванням міжбюджетних трансфертів у розподілі надходжень до бюджетів та з відносно вищою фінансовою автономією). Не знайдено суттєвих доказів реальної залежності між автономією регіональної влади та федеративним типом державної системи.*

Ключові слова: бюджет; доходи; розподіл; регіональний рівень; федеративні країни; структурні зміни; порівняльний аналіз.

ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ

Urgency of the research. Process of democratization of public administration, which is a tendency in many countries today, assumes redistribution of powers down within hierarchy of governance for the purpose of providing rather higher opportunities of the operational solution of local problems. However resource base of the lowest level of local government (various kinds of communities) is objectively limited. It increases the importance of coordination of administrative actions at the mesolevel and a role of regional bodies of public administration. The specified changes obviously have to influence mechanisms of formation and execution of regional budgets that results in need of studying how financial resources for realization of public administration at the regional level are exactly formed.

Target setting. Federal state by the nature is an ideal option for consideration of features of providing financial autonomy of the regional power. It is fair as in their regions (states, lands, cantons) a considerable part of the state powers in the sphere of social and economic policy is concentrated. However except Switzerland in which the model of confederation (the highest level of decentralization of regions) is realized regions in the most of federal countries have no full financial self-sufficiency. The truth is also that in the federal countries there is no uniform model of distribution of public incomes between the central and regional authorities. The specified circumstances induce to carry out the comparative analysis of regional budgets' revenues breakdown in these countries.

Actual scientific researches and issues analysis. Nowadays more and more researches are devoted to studying of experience of various countries in formation of local budgets' resource base. Among the last it is necessary to pay an attention to works of Foremny D. et al. [1], Bobáková V. [2], Malikká L. [3], Reznichenko D. et al. [4], Ermasova, N. [5]. This issues also draws attention of Ukrainian scientists among whom the works of Muzyka O [6], Volokhova I. [7], Sokolovskaya A et al. [8] are the most noticeable.

Uninvestigated parts of general matters defining. At the same time, more careful comparative analysis is necessary for understanding of an overall picture and regularities of fixing of certain financial resources to regional budgets.

The research objective. To identify structural features and the directions of transformation of budgetary revenue breakdown at regional level of public administration in the federal states from 2000 till 2015.

For achievement of this purpose the following tasks have been set and solved as follow:

1) to process statistical material for assessment of budgetary revenue breakdown. As a statistical basis of the research data of the IMF on public finance of a number of the federal countries (Austria, Germany, Belgium, Canada, the USA, India, the Russian Federation, Switzerland, Argentina, Brazil, Mexico, Bosnia and Herzegovina, Malaysia) were used. Data on absolute values of revenue of regional budgets in national currencies were processed that allowed calculation of the corresponding budgets' breakdown indicators in 2000, 2005, 2010, 2015. Five-year intervals were chosen randomly, but owing to similarity of electoral cycles of change of governments, and respectively, possible changes of the principles of the budgetary policy, such approach quite allows monitoring of any transformations in breakdown of budgetary revenue categories. Unfortunately, owing to lack of data, not all selections formed as identical by the size, however their addition with information of national statistics was not done proceeding from need to provide comparability of basic data. It is also necessary to pay attention to the fact that in tables given below the main categories (taxes, grants, other revenue) are not always disclosed in categories of lower order, i.e. basic data are not always classified completely that influences results of assessment of structural changes dynamics;

2) to analyze dynamics of revenue's structural changes for budgets of regional level of public governance at federal states. Assessment of breakdown's transformation was done with use of the Ryabtsev index (Ryabtsev V., Chudilin G., 2011). Let $(s_1^1, s_2^1, \dots s_n^1)$ и $(s_1^0, s_2^0, \dots s_n^0)$ are vectors of shares of each analyzed category of revenue in the budget respectively during the studied and basic period. Then extent of structural changes can be estimated as:

$$I_R = \sqrt{\frac{\sum_{i=1}^{n}(s_i^1 - s_i^0)^2}{\sum_{i=1}^{n}(s_i^1 + s_i^0)^2}}$$

ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ

The choice of the Ryabtsev index among other quadratic indexes (The Gallagher Index, The Monroe index, The Gatev index, The Szalai index, The Aleskerov-Platonov index) was caused by two circumstances – its sensitivity to small selections and existence of a scale of assessment of structural distinctions (Tab. 1) that allowed interpreting the received coefficients without use of the comparative analysis.

Table 1

Scale of assessment of structural distinctions by the Ryabtsev index

Levels	Characteristic of breakdown similiarity
0.000 – 0.030	Identity of breakdowns
0.031 – 0.070	Very low level of distinction of breakdowns
0.071 – 0.150	Low level of distinction of breakdowns
0.151 – 0.300	Essential level of distinction of breakdowns
0.301 – 0.500	Considerable level of distinction of breakdowns
0.501 – 0.700	Very considerable level of distinctions of breakdowns
0.701 – 0.900	Opposite type of breakdowns
0.901 and more	Complete antithesis of breakdowns

Source: Ryabtsev V., Chudilin G., 2001 [9]

3) to analyze similarity and distinctions of revenue's breakdowns of regional budgets. As not only categories of budgetary revenues (tax revenues, transfers, own non-tax income) but also their subcategories are of great importance for assessment of distinction of breakdowns, the hierarchical cluster analysis (a method of single-linkage clustering with Euclidean distances) according to the recommendations of Jain A. et al. (1999) [10], Berkhin P. (2006) [11] in a Statistica 10 package was applied to the solution of this task.

The statement of basic materials. As it is shown, the average level of tax receipts to regional budgets was 42.3% in 2000, however level of variability of the sample presented by shares of own tax revenues was very high – 54,6% (Tab. 2).

Table 2

Regional (state) budgets' revenue breakdown in 2000, %

Categories / Countries	AUT	BEL	DEU	AUS	CAN	CHE	USA	IND	MYS	ARG	MEX
1	2	3	4	5	6	7	8	9	10	11	12
Revenue	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Taxes	5.3	8.7	69.3	39.7	61.2	49.3	45.2	50.9	19.1	75.1	41.2
on income, profits, and capital gains	3.4	0.0	37.2	0.0	31.0	38.0	19.0	0.0	0.0	20.7	0.0
on payroll and workforce	0.8	0.0	0.0	9.4	3.4	0.0	0.0	0.0	0.0	0.0	0.0
on property	0.2	3.8	1.6	2.6	0.0	7.6	1.9	0.0	12.4	0.0	0.0
on goods and services	1.0	4.9	28.6	27.8	0.0	3.6	24.2	46.5	6.7	0.0	0.0
other taxes	0.1	0.1	1.9	0.0	0.0	0.1	0.0	3.8	0.0	0.0	3.1
Social contributions	5.8	7.3	6.0	0.0	2.6	0.6	2.3	0.0	0.0	0.0	0.0
Grants	84.0	77.5	16.7	37.2	14.2	25.5	21.7	38.9	25.6	15.2	51.0
from foreign gov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
from international organizations	0.4	0.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Rekova N. Yu., Dolozina I. L., Pinchuk A. O. Budgetary revenue breakdown
at regional level of public administration in the federal countries

ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ

Continuation of Table 2

1	2	3	4	5	6	7	8	9	10	11	12
from other government units	83.7	77.3	15.5	37.2	0.0	25.5	21.7	38.9	25.6	15.2	51.0
Other revenue	4.8	6.5	8.0	23.0	22.0	24.6	30.7	10.2	55.3	9.7	7.8
property income	2.0	1.2	0.7	8.3	0.0	4.7	21.8	5.4	22.9	0.0	1.4
fines, penalties, and forfeits	0.0	0.0	0.7	0.7	0.0	0.5	0.0	0.0	0.0	0.0	0.0
transfers not elsewhere classified	-4.5	0.0	1.1	4.0	0.0	0.7	2.2	0.0	24.5	0.0	2.8

* hereinafter: grey colored cells contain values that are more than 0; ** hereinafter: AUT – Austria; BEL – Belgium; DEU – Germany; AUS – Australia; CAN – Canada, CHE – Switzerland, USA – United States, IND – India, MYS – Malaysia, RUS – Russian Federation, ARG – Argentina, BRA – Brazil, MEX – Mexico
   Source: calculated on the basis of IMF data [12]

Among the countries with high rates of tax revenues in regional budgets breakdown (Germany, Canada, India, and Argentina) taxes on income and taxes on internal operations with goods and services became the main budget forming taxes. Some countries used taxes on property as a source of income of budgets of states, however only in Switzerland and Malaysia these taxes played an essential role in the budget. It is also worth noting that in a several countries (first of all, the members of the EU, Canada, Switzerland and the USA) some powers on social security were assigned to the level of the state governments that caused receipts for social support as a budgetary revenue source.

If to discuss on budgets of states revenue breakdown in 2005, it is necessary to pay an attention that cardinal changes happened only in the USA and Australia (Tab. 3).

Table 3

Regional (state) budgets' revenue breakdown in 2005, %

Categories / Countries	AUT	BEL	DEU	AUS	CAN	CHE	USA	IND	US
Revenue	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Taxes	5.3	15.9	65.0	31.9	55.5	50.2	57.3	53.5	71.6
on income, profits, and capital gains	3.3	0.0	33.1	0.0	26.9	39.4	15.0	0.0	59.0
on payroll and workforce	0.7	0.0	0.0	9.2	3.0	0.0	0.0	0.0	0.0
on property	0.2	4.5	2.0	3.4	0.0	7.1	17.8	0.5	6.8
on goods and services	1.0	11.3	28.2	19.3	0.0	3.6	24.6	42.6	5.9
other taxes	0.1	0.2	1.8	0.0	0.0	0.1	0.0	10.4	0.0
Social contributions	5.6	8.1	6.8	0.0	2.9	0.4	0.0	0.0	0.0
Grants	80.8	68.5	16.6	46.1	18.9	25.4	19.2	34.8	18.1
from foreign gov	0.1	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0
from international organizations	80.7	68.3	15.6	46.1	0.0	25.4	19.2	34.8	18.1
Other revenue	8.4	7.4	11.7	22.0	22.7	24.0	23.4	11.7	10.2
property income	3.3	0.9	1.0	9.6	0.0	5.4	3.7	6.8	3.3
fines, penalties, and forfeits	0.0	0.0	0.7	0.8	0.0	0.5	1.4	0.0	0.1
transfers not elsewhere classified	-2.0	0.0	2.6	2.8	0.0	0.6	3.4	0.0	2.7

   Source: calculated on the basis of IMF data [12]

Share of receipts from property taxes had considerably grown in the USA that had increased the level of own tax income by 12.1 percentage points. In Australia on the contrary – the importance of the inter-

ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ

budgetary transfers at the expense of own tax revenues had increased. Separately it is worth regarding the Russian Federation as data for 2000 on it were absent. Own tax revenues of subjects of the federation in 2005 made the most part of their income (71.6%) that together with significant own non-tax income had determined the high level of financial independence of regional budgets in this country.

In 2010 (Tab. 4) it is possible to note a further tendency to reduction of own tax income and increase in the importance of the interbudgetary transfers in formation of revenues of authorities at the regional level. Among essential changes reduction of specific weight of tax income of regional budgets in Russia (by 15.1 percentage points) is noticeable.

Table 4

Regional (state) budgets' revenue breakdown in 2010, %

Categories / Countries	AUT	BEL	DEU	AUS	CAN	CHE	USA	IND	RUS	BRA
Revenue	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Taxes	5.6	15.6	62.4	28.7	53.6	49.2	53.7	55.0	59.5	65.3
on income, profits, and capital gains	3.5	0.0	32.1	0.0	26.3	38.8	12.9	0.0	46.4	3.4
on payroll and workforce	0.7	0.0	0.0	8.8	3.0	0.0	0.0	0.0	0.0	0.0
on property	0.2	4.8	1.8	3.7	0.0	6.9	18.3	0.7	6.7	5.1
on goods and services	1.2	10.7	26.8	16.2	0.0	3.5	22.5	43.3	6.4	56.7
other taxes	0.1	0.1	1.7	0.0	0.0	0.1	0.0	11.0	0.0	0.0
Social contributions	4.5	9.0	6.6	0.0	3.0	0.4	0.0	0.0	0.0	5.7
Grants	80.4	67.1	18.4	50.5	22.4	26.0	23.7	37.0	25.0	22.5
from foreign governments	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
from international organizations	0.0	0.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
from other government units	80.4	66.6	17.2	50.5	0.0	25.9	23.7	37.	25.0	22.5
Other revenue	9.5	8.2	12.6	20.8	21.0	24.5	22.7	8.0	15.5	6.5
property income	3.0	1.0	1.5	7.8	0.0	5.3	2.4	3.8	1.4	1.6
fines, penalties, and forfeits	0.0	0.0	0.7	0.8	0.0	0.7	1.3	0.0	0.2	0.9
transfers not elsewhere classified	-1.0	0.0	1.6	2.8	0.0	0.3	3.1	0.0	10.6	1.6

    Source: calculated on the basis of IMF data [12]

In 2015 (Tab. 5) growth of a share of own tax income to the detriment of the importance of grants from budgets of other levels can be on the contrary noted.

Table 5

Regional (state) budgets' revenue breakdown in 2015, %

Categories / Countries	AUT	BEL	DEU	AUS	CAN	CHE	USA	RUS	ARE	BRA
1	2	3	4	5	6	7	8	9	10	11
Revenue	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Taxes	5.2	19.7	66.6	31.7	58.1	49.1	55.6	49.0	67.7	65.4
Taxes on income, profits, and capital gains	3.3	6.1	34.4	0.0	29.2	38.5	15.3	37.8	4.5	4.5
Taxes on payroll and workforce	0.6	0.0	0.0	9.6	3.1	0.0	0.0	0.0	0.0	0.0

ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ

Continuation of Table 5

1	2	3	4	5	6	7	8	9	10	11
Taxes on property	0.1	4.6	1.9	4.0	0.0	7.1	16.6	6.1	0.0	6.0
Taxes on goods and services	1.1	8.9	27.4	18.2	0.0	3.3	23.7	5.1	58.5	54.9
Taxes on international trade and transactions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0
Other taxes	0.0	0.1	2.8	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Social contributions	3.5	7.6	5.6	0.0	3.1	0.2	0.0	0.0	0.0	7.0
Grants	81.2	65.2	15.7	44.5	18.9	25.7	21.1	30.1	0.0	19.0
From foreign governments	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
From international organizations	0.1	0.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grants from other general government units	81.1	64.7	14.6	44.5	0.0	25.6	21.1	30.1	0.0	19.0
Other revenue	10.1	7.6	12.1	23.8	19.9	24.9	23.4	20.8	32.3	8.5
Property income	2.2	1.1	1.1	10.3	0.0	4.5	2.2	1.7	13.3	1.5
Fines, penalties, and forfeits	0.0	0.0	0.5	0.9	0.0	0.7	1.3	0.7	1.9	1.0
Transfers not elsewhere classified	0.9	0.0	1.6	2.8	0.0	0.4	3.9	5.7	1.7	3.4

Source: calculated on the basis of IMF data [12]

As well as in 2010 the greatest changes had happened in the budgetary system of Russia: the volume of tax revenues as opposed to the general tendency reduced by 10.5 percentage points while the specific weight of the interbudgetary transfers has increased by 5.1 percentage points.

The analysis of the countries on the basis of revenue breakdown of regional budgets in 2000 (Fig. 1a) gave the opportunity to allocate several groups.

a)

b)

Rekova N. Yu., Dolozina I. L., Pinchuk A. O. Budgetary revenue breakdown
at regional level of public administration in the federal countries

ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ

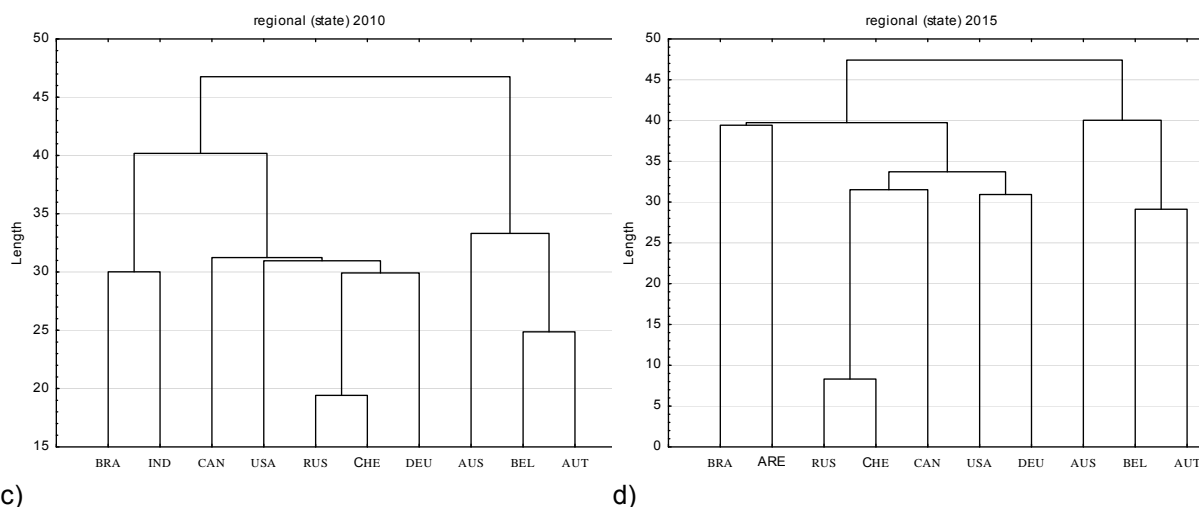c)   d)
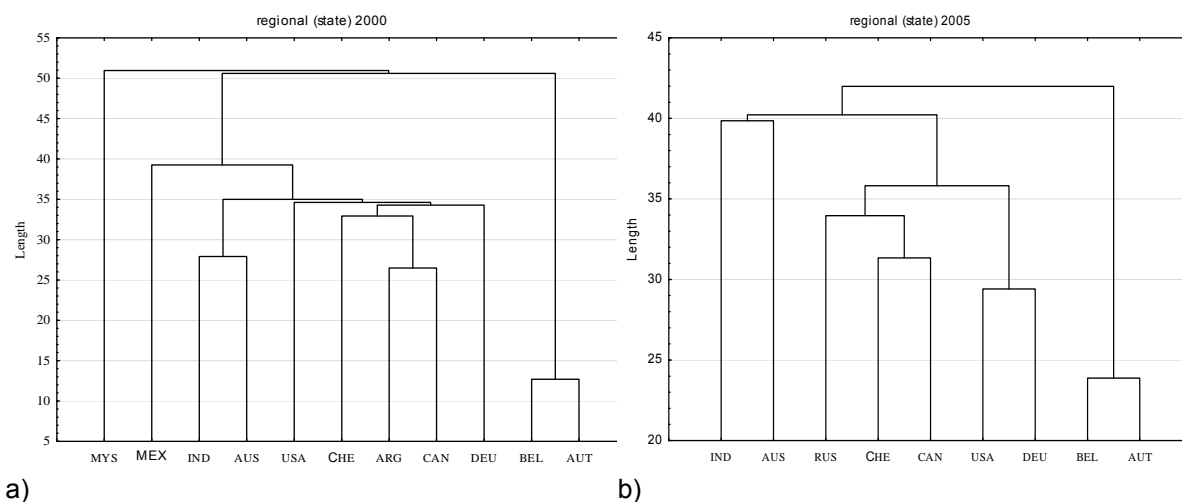
Fig. 1. Clusters of countries by regional (state) budgets' revenue breakdown in: a) 2000; b) 2005; c) 2010; d) 2015

Group 1 – Malaysia – distinctive feature of this country was the highest level of own non-tax incomes in structure of receipts in budgets of states (55.3%), at the same time a quarter of income was provided at the expense of the interbudgetary transfers while the level of own tax incomes was less than 20% and was formed by receipts from the property tax; group 2.1 – Belgium and Austria – the countries with very low level of own tax incomes of regional budgets (8.7% and 5.3% respectively) and the highest level of the interbudgetary transfers (77.3% and 83.7%); group 2.2.1 – Mexico – the country with almost equivalent contribution of own tax revenues and the interbudgetary transfers to formation of revenues of regional governments; group 2.2.2 – the countries in which the shares of own tax and non-tax receipts in sum were more than a share of transfers from budgets of other levels.

Level of differences between the countries in formation of revenues of regional budgets in 2005 in comparison with 2000 had decreased a little (Fig. 1b). Group consisting of Belgium and Austria in which extent of centralization of distribution of budget revenues continued to remain very high was steady. Structures of formation of income of regional budgets in the USA and Germany became more similar (because of approximately identical share of receipts from taxes on goods and services and rather low share of the interbudgetary transfers in sources of revenues). Proximity was noted in structure of regional budgets' revenues in Canada and Switzerland (as for tax revenues in general and taxes on income and profits). Besides approximately identical levels of the interbudgetary transfers and also own non-tax receipts were in these countries.

In 2010 (fig. 1c) in comparison with 2005 variety of regional budgets structures of revenues increased but this result should be connected with addition of the new countries in the analysis. Least structural changes had concerned Belgium and Austria. The truth is also that revenue breakdowns of budgets of regions in Russia, Canada, Switzerland, the USA and Germany had leveled, but it is worth paying attention to decrease in level of financial independence of regional authorities in Russia. The same factor has caused similarity of revenue sources and their shares in Australia and India.

At the end of the analyzed period (2015, fig. 1d), two rather various clusters had remained as well as in 2010 though they are very non-uniform inside. The countries with the largest level of the interbudgetary transfers in formation of income of regional budgets (Austria – 81,1%, Belgium – 64,7%, Australia – 44,5%) were at the first whereas the second group consisted of the countries in which financial autonomy of regional budgets was higher.

In aspect of regional budgets' revenues breakdown the USA (increase in the importance of own tax revenues at the expense of the property taxes' share and also insignificant increase in a share of the interbudgetary transfers) and Russia (obviously traced reduction of financial autonomy of regional budgets) were among leaders of structural transformations (Tab. 6).

ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ

Table 6

Ryabtsev indexes of change of regional budgets' revenue breakdown

Countries	2005/2000	2010/2005	2015/2010	2015/2000
Austria	0.025	0.030	0.011	0.037
Belgium	0.073	0.013	0.036	0.102
Germany	0.045	0.028	0.039	0.042
Australia	0.126	0.070	0.073	0.121
Canada	0.060	0.032	0.046	0.044
Switzerland	0.060	0.032	0.046	0.044
USA	0.231	0.058	0.037	0.235
Russian Federation	-	0.125	0.116	0.222*

* - 2015 to 2005

Lower level of distinction of structures was observed in Australia (reduction of own tax revenues of state budgets though in much smaller scales) and Belgium (the opposite phenomenon).

Conclusions. The research has shown as the following:

1) the average level of tax receipts to regional budgets was 42.3% in 2000, however level of variability was very high further structural changes displayed a tendency to reduction of a role of own tax revenues and increase in the importance of the interbudgetary transfers; it demonstrates an increase in central control of regional authorities' financial capacities;

2) as a result two rather various clusters may be differentiated in 2015: the first consists of the countries with the largest level of the interbudgetary transfers in formation of income of regional budgets (Austria – 81,1%, Belgium – 64,7%, Australia – 44,5%) whereas the second consists of the countries in which financial autonomy of regional budgets was higher;

3) the USA (increase in the importance of own tax revenues at the expense of the property taxes' share and also insignificant increase in a share of the interbudgetary transfers) and Russia (obviously traced reduction of financial autonomy of regional budgets) have to be considered as contrasts in change of financial autonomy of regional budgets

At the end it is critical to accent that the accuracy of the received results in essential measure depends on completeness and structuration of basic data that raises requirements to formation of government financial statistics internationally (for example Swiss experience would be very interesting and useful). It will also be expedient to develop the studied issue in line with a research of compliance between quantitative indices of budgets and features of institutional structure of the budgetary system in each of the analysed countries.

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Рекова Наталія Юріївна	доктор економічних наук, професор, професор кафедри економіки підприємства, головний науковий співробітник НДС, Донбаська державна машинобудівна академія МОН України; https://orcid.org/0000-0003-0956-6564; E-mail: natarekova@gmail.com;
Rekova Nataliia Yuriyivna	Doctor of Economics, Professor, Professor at the Department of Enterprise Economics, Senior Researcher, Donbass State Engineering Academy of the Ministry of Education and Science of Ukraine
Долозіна Ірина Леонідівна	кандидат економічних наук, доцент кафедри обліку, фінансів та економічної безпеки, Донецький національний технічний університет; https://orcid.org/0000-0002-5350-2835; E-mail: dolozirina@gmail.com;
Dolozina Irina Leonidivna	Candidate of Economic Sciences, Associate Professor at the Department of Accounting, Finance and Economic Security, Donetsk National Technical University
Пінчук Аліна Олександрівна	кандидат економічних наук, доцент кафедри маркетингу PR-технологій та логістики, Чернігівський національний технологічний університет; https://orcid.org/0000-0002-4999-6369; Researcher ID: H-2619-2014; SPIN-код: 2154-0409; E-mail: allpina.2013@gmail.com;
Pinchuk Alina Aleksandrovna	Candidate of Economic Sciences, Associate Professor at the Department of Marketing of PR-technologies and logistics, Chernihiv National Technological University

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