РЕГІОНАЛЬНА ЕКОНОМІКА

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ECONOMIC SIMULATION ANALYSIS OF THE REGIONS OF UKRAINE DEVELOPMENT BASED ON TAX BURDEN OPTIMIZATION

Urgency of the research. *Difficulties in the macroeconomic environment and budgetary issues intensify within the volatile environment of Ukrainian economy. The causes include excessive tax burden.*

Target setting. *Thus tax burden issues analysis taking into consideration resource potential particularities of the economy of the various regions of the country is the priority for their economic growth facilitation.*

Actual scientific researches and issues analysis. *Theoretical and applied framework of tax burden effect on the economy analysis has been started by Arthur Laffer. Valuable contributions into theory and methodology have been done by the following prominent scientists: Yu. Ananiashvili, Ye. Balatskyi, A. Gusev, M. Kakaulina, V. Fedosova, V. O. parina, V. Sutormina, N. Riazanova, O. Girna, O. Sydorovych.*

Uninvestigated parts of general matters defining. *The need in research work at named field still remains, especially taking into account specific features of regions and national economy development in the context of transition economy.*

The research objective. *Laffer's theory special aspects investigation in tax burden optimization of regions sphere, methodological approach extension in terms of tax management based on the principles of the rational use of of resources, optimal tax burden priority directions substantiation with the objective of to provide economic growth.*

The statement of basic materials. *This paper presents specific features of the tax burden in the regions of Ukraine. Methodological approach is proposed which provides means to optimize tax burden of the regions, increase economic feasibility level when making decisions concerning priority ranking of the regions development.*

Conclusions. *Undertaken study allows to claim that regions of Ukraine are featured with different effect of the tax burden on economic system.*

Assessment of Ukrainian regions tax burden optimization pattern to the level facilitating economic growth has shown that even slight increase in output can allow to increase substantially tax revenue level.

Keywords: *tax burden; Laffer points; gross regional product; taxes.*

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ЕКОНОМІЧНЕ МОДЕЛЮВАННЯ РОЗВИТКУ РЕГІОНІВ УКРАЇНИ НА ОСНОВІ ОПТИМІЗАЦІЇ ПОДАТКОВОГО НАВАНТАЖЕННЯ

Актуальність теми дослідження. *В умовах нестабільності економіки України загострюються макроекономічні і бюджетні проблеми. Серед причин - занадто високий рівень податкового навантаження.*

Постановка проблеми. *Тому, дослідження питань податкового навантаження з врахуванням особливостей ресурсного потенціалу економіки регіонів країни для забезпечення економічного зростання є пріоритетною.*

Аналіз останніх досліджень і публікацій. *Теоретичні та прикладні основи впливу податкового навантаження на економку започаткував Артур Лаффер. Значний внесок у розвиток теорії та методології зробили відомі вчені: Ю. Ананіашвілі, Є. Балацький, А. Гусев, М. Какауліна, В. Федосова, В. Опаріна, В. Суторміна, Н. Рязанова, О. Гірна, О.Сидорович.*

Виділення недосліджених частин загальної проблеми. *Залишається потреба в дослідженнях даного напряму, особливо з врахуванням особливостей розвитку економіки регіонів і країни в умовах трансформаційної економіки.*

Постановка завдання. *Дослідження особливостей теорії Лаффера в сфері оптимізації податкового навантаження регіонів, поглиблення методичних підходів щодо управління податками на принципах забезпечення раціонального використання ресурсів, обґрунтування пріоритетних напрямів оптимального податкового навантаження з метою забезпечення економічного зростання.*

Виклад основного матеріалу. *У статті розглянуто особливості податкового навантаження регіонів України. Запропоновано методичний підхід, який дає можливість оптимізувати податкове навантаження регіонів, підвищити ступінь економічної обґрунтованості прийняття рішення відносно пріоритетності розвитку регіонів.*

Висновки. *Проведене дослідження дозволяє стверджувати, що регіони України мають різний впливу податкового навантаження на економічну систему.*

Прогноз моделі оптимізації податкового навантаження регіонів України до рівня, що сприяє економічному розвитку, показав, що є можливість навіть при незначному збільшенню обсягів виробництва, значно збільшувати обсяги податкових надходжень.

Ключові слова: *податкове навантаження; точки Лаффера; валовий регіональний продукт; податки.*

Urgency of the reserach. Under conditions of macroeconomic recession and crisis phenomena in Ukrainian economy, imbalances in the regional development are extending, budgetary problems intensify and aggravate. Among various causes of such tendency the issue of non-optimal tax burden can be highlighted, meaning such tax burden which creates conditions for restraint rather than stimulation of economy. In its turn shortages of scientific substantiation along with imperfect and non-adapted to particularities of the state methods of public production pattern generation in conjunction with the

tax burden do not allow for introduce sophisticated scientific development in fast and predicted effect manner. The urgency of the named issue, its theoretical and practical importance have determined the choice of the topic of research.

Target setting. Up-to-date tax concept views taxes as social regulator, a tool of reforms, means to control the economy, sustainable economic growth instrument. Tax system performance effectiveness and economic growth of the regions and state as a whole are featured with both direct and inverse correlation. These correlations reflect tax functions. Core fiscal function of the taxes is certain portion of gross domestic product seizure by state in favor of society. Tax fiscal function stability is of importance when tax revenue to budget is of continuous, sufficient and sustainable nature. Other, regulating function of taxes is equally important. It is featured with complicated mechanism, which involves benefits provision to specific branches of industry or producers, tax pressure, advantages for one or another business activity, profit margins, etc.

Both functions (fiscal and regulating) of taxes and interdependent and reflect the effect on economic processes, make appropriate stimulating or retraining effect in one or another sphere of the public activity.

Taking into consideration the fact that Ukraine is featured with substantial differentiation of regions by economic, social, natural resource and a number of other indicators, studying optimal tax burden issues taking into account resource potential of the economy of Ukrainian Region to provide for economic growth is of priority importance.

Actual scientific researches and issues analysis. Researches and publications analysis allows to contend that optimal tax level matters considering resource provision to taxable businesses have become of interest for scientists only a while ago. At the same time, despite of the limited term of studies of the issue, sound results have been accumulated which have been obtained by national and foreign scientists. The research of theoretical and practical grounds of tax burden effect on economy and tax revenue size has been started by Arthur Betz Laffer) [1]. The following scientists are worth noting amount the foreign ones: Yu. Sh. Ananiashvili [2], Ye. V. Balatskyi [3], A. B. Gusev [4], M. O. Kakaulina [5]. These researchers have improved terminology, developed pattern types of Laffer's curve, performed calculations and analysis of Laffer points' value of specific countries.

Sound researches of tax system effect issues as state development effect sphere have been done by the following national scientists: V. M. Fedosova, V. M. Oparina [6], V. M. Sutormina, N. S. Riazanova [7]. The following Ukrainian scientists have paid attention to taxes impact on economic development reserach: O. Y. Girna [8], O. Yu. Sydorovych [9], etc.

Uninvestigated parts of general matters defining. In the meantime, the demand for research in the named field remains pending especially taking into account regions' and state's developmental challenges under transformation economy conditions, Laffer concept adapting and its use expediency substantiation in the context of Ukrainian economic system.

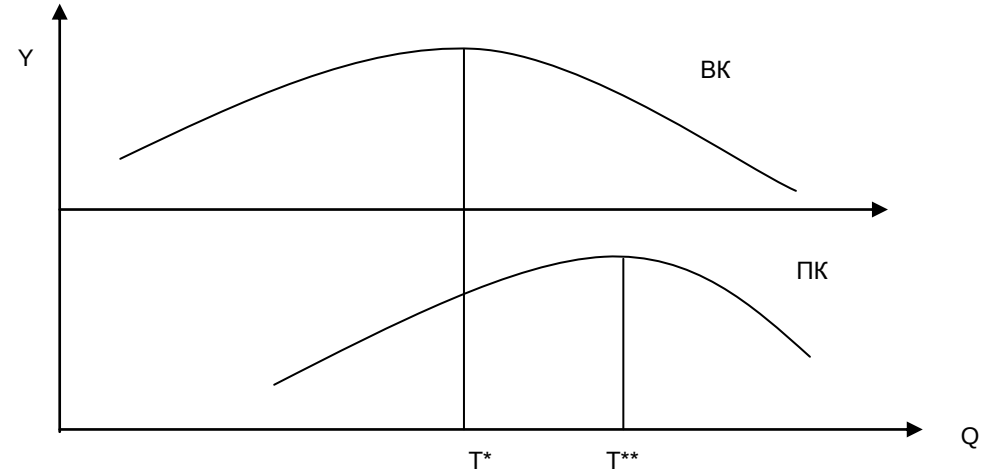
The research objective. Laffer's theory special aspects study in regions' tax burden optimization field, deepening methodological approaches to tax management based on rational use of resources, priority direction of optimal tax burden substantiation with a view to ensure economic growth.

The statement of basic materials. Present-day scientific thought in taxation issues uses thesis stating that tax burden level shall correspond to the level of regions' resource potential development and take into consideration each aspect of social and economic field. As our national economy is featured with substantial differentiation of the regions with regards to developmental level, the value is not of contemplative static nature establishing tax burden scope, however it is an assessment of the effectiveness of the whole tax policy in the region, considering economic system development dynamics along with tax revenue level for certain period of time.

This objective can be solved using the method based on effectiveness parameters identification within A. Laffer concept framework. This approach provides that production scope and tax revenue depend on tax pressure level presented with parabolic curve with peak point (Fig. 1).

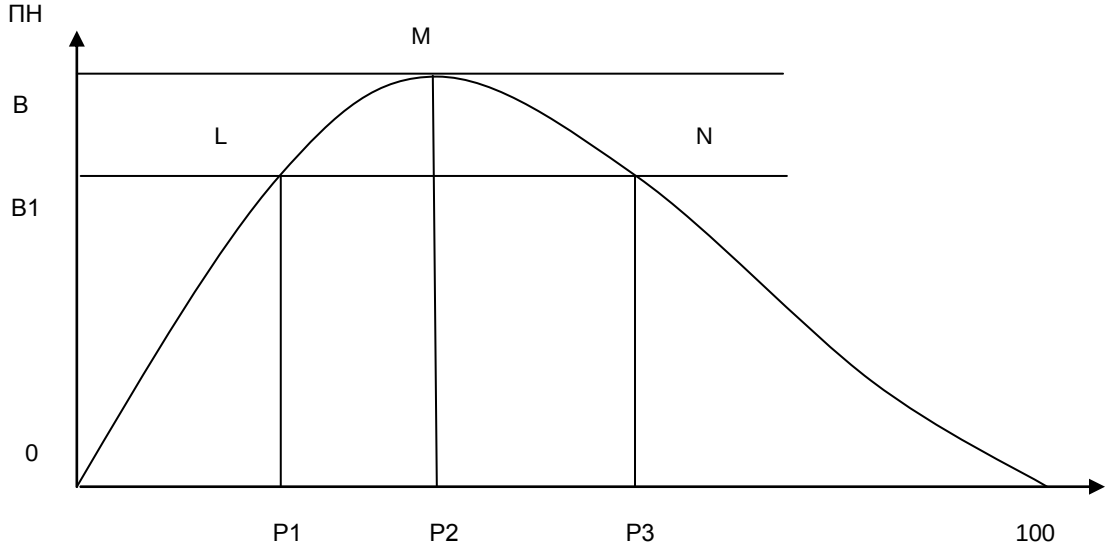
Fig. 1 shows two curves – production and tax ones, as well as 1st order Laffer points (T*) and 2nd order Laffer points (T**). Each of the curves has its own peak point corresponding to certain value of gross regional product (Y) and tax revenue (Q). In case actual tax revenue is less 1st order Laffer point

(T*), that is (Tф<T*), it can make stimulating effect on economic growth. In such circumstances producing sector will attempt to increase output to compensate loss of profit. In case actual tax burden is on T*<Tф<T** interval, business entities start to cut down the activity as it is impossible to compensate loss of profit on the account of the additional output in such circumstances. However it can be seen on the diagram that tax revenue proceed to increase on the named interval (T* - T**). It happens due to high tax rates.



Y – gross regional product, Q – tax revenue, T* ,T** - Laffer points, ВК – production curve, ПК – tax curve.
Fig. 1. Laffer points position on production and tax curves
Source: **[10; 11]**

Thus even under conditions of the initial decrease of business activity over limited time period possibility of gross regional product growth and sufficient amount of tax revenue still remains. This trend is depicted by Laffer curve (Fig. 2).



ПН – tax revenue; ПС – tax rate; B – tax revenue under M tax rate; B1 – tax revenue under L and N tax rates; P1, P2, P3 – tax burden.
Fig. 2. Laffer's curve
Source: [10; 11]

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Fig. 2 shows that higher tax rates indicative of tax burden restrain economic activity, thus taxation base, national output and yield are short falling. It is seen in the terminal point when tax rate amounts 100 %. Tax revenue here drop down to zero. In L point of Laffer curve tax burden decrease causes tax revenue reduction. At the same time tax burden reduction from N point causes tax revenue increase however to M point only. Following tax burden reduction over M point, tax revenue are decreasing.

Laffer point also shows that tax revenue amount in L and N points are the same notwithstanding the fact that tax burden is different, more specifically P1< P2<P3. Well then tax revenue under N point and L point conditions are identical. Herewith tax burden reduction will stimulate economic growth. In the meantime transfer from N point to M point will increase tax revenue even with certain reduction of the tax burden. Lower tax rates create incentives for activity extension, investments, savings, innovations, which facilitate revenue increase. Widened tax base is able to maintain tax revenue at the previous level even though tax rates will be lower. As a rule under such conditions the macro level shows decrease in tax evasion events and expansion of employable population employment.

We've studied all 22 regions of Ukraine for the period 2004 – 2016 in order to identify correlation between the actual gross regional product and tax burden in first and second order Laffer points and to observe based on them economic growth parameters. In order to solve this task we've developed four-factor production-institutional function. This function computation includes the resources being traditional for similar researches – capital and number of employed as well as land resources and expenses for innovative capacity formation.

In order to construct four factor production function statistic data of the regions in runtime has been used for 10 – 13 years period depending on its resource potential composition. Fragment of production-institutional function computation is given as exemplified by Kharkiv Region (Tab. 1, 2).

Table 1

Source information to develop Kharkiv Region functioning matrix

Years	ВРП (Y) taking into account inflation	Salary (L) taking into account inflation	Capital investment (K) taking into account inflation	Agricultural lands area (G)	Innovating spendings (I) taking into account inflation	Tax payments (Q) taking into account inflation	Actual tax burden (T) taking into account inflation
2004	17831	6239	5017	1932	492	3476	0,214
2005	20560	7620	4635	1932	548	4298	0,226
2006	27870	10551	6925	1932	701	5872	0,211
2007	35723	13218	9814	1907	818	6904	0,193
2008	46414	16713	9190	1903	998	8774	0,189
2009	52058	18978	7352	1896	1164	11268	0,216
2010	57375	22905	7085	1889	1409	14309	0,249
2011	67248	26803	11404	1886	1515	16499	0,245
2012	76274	32019	13691	1874	1827	19199	0,232
2013	81798	34404	9006	1872	1860	9873	0,121
2014	83344	32519	6930	1863	1686	10783	0,122
2015	89880	30695	8097	1841	1446	17336	0,159
2016	92937	44588	13407	1842	1702	27625	0,297

Source: Computations have been done by author using "Regions of Ukraine, 2017" statistical digest

Table 2

Econometric parameters of Kharkiv Region economic system's production-institutional function

t	nY	T*lnL	T2*lnL	T*lnK	T2*lnK	T*lnM	T2*lnM	T*lnI	T2*lnI
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	9,7887	1,8701	0,4002	1,8234	0,3902	1,6192	0,3465	1,3035	0,2790
2	9,9311	2,0201	0,4565	1,9078	0,4312	1,7100	0,3865	1,4252	0,3221
3	10,2353	1,9547	0,4124	1,8659	0,3937	1,5965	0,3369	1,3826	0,2917
4	10,4836	1,8314	0,3535	1,7740	0,3424	1,4578	0,2814	1,2944	0,2498
5	10,7454	1,8378	0,3473	1,7248	0,3260	1,4272	0,2697	1,3052	0,2467

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Continuation of Table 2

1	2	3	4	5	6	7	8	9	10
6	10,8601	2,1278	0,4596	1,9230	0,4154	1,6303	0,3521	1,5249	0,3294
7	10,9574	2,4997	0,6224	2,2076	0,5497	1,8784	0,4677	1,8054	0,4495
8	11,1161	2,4981	0,6120	2,2887	0,5607	1,8478	0,4527	1,7942	0,4396
9	11,2421	2,4068	0,5584	2,2097	0,5126	1,7483	0,4056	1,7424	0,4042
10	11,3120	1,2640	0,1529	1,1018	0,1333	0,9117	0,1103	0,9109	0,1102
11	11,3307	1,2675	0,1546	1,0789	0,1316	0,9187	0,1121	0,9065	0,1106
12	11,4062	1,6428	0,2612	1,4309	0,2275	1,1954	0,1901	1,1570	0,1840
13	11,4397	3,1795	0,9443	2,8381	0,8429	2,2330	0,6632	1,5549	0,3250
Multipliers	B	a	b	c	d	m	n	i	k
Values	21,23	12,56	-12,45	-1,62	3,27	-4,29	7,05	-6,32	13.27
Statistic parameters	R^2 = 0,985; F = 46,35; N = 13								

Source: Computations have been done by author based on Tab.1

Region's production function estimated econometric parameters *a, b, c, d, m, n, i, k, B* represent indicators of production volume (Y), salary (L), capital investments (K), land resources (M), expenses effect on innovative activity (I). *B* multiplier value is of particular importance for volume of production and tax revenue formation. As a matter of fact this multiplier reflects process output of region's resource potential, and as further estimates show it is the core factor influencing volume of gross national product and tax revenue. Based on the methods shown above, we have estimated econometric parameters of economic systems functioning for all 22 regions of Ukraine (Tab. 3).

Table 3

Econometric parameters of Ukrainian regions' economic system functioning

Regions	Region's econometric parameter values								
	B	a	b	c	d	m	n	i	k
Vinnyts'ka	49,67	5,86	0,37	2,56	-40,38	22,50	-115,7	0,39	42, 76
Volyns'ka	14,61	-6,77	156,53	28,72	-264,0	-14,68	96,52	17,21	-165,1
Dnipropetrovska	12,60	31,80	-120,9	-2,30	76,79	-20,44	32,18	-12,14	-0,47
Zhytomyrs'ka	48,41	-21,51	118,65	27,70	-105,8	-41,75	319,19	47,43	-257,2
Zakarpats'ka	15,19	1,38	35,1	4,09	-66,21	4,98	1,86	1,77	-6,68
Zaporiz'ka	38,18	23,31	-89,14	3,44	-29,76	-10,51	94,84	-16,12	17,95
Ivano-Frankivska	58,04	24,26	-105,34	-12,12	98,52	-1,53	-53,45	-6,28	53,39
Kyivska	52,98	8,79	-22,77	2,05	6,53	0,27	2,15	-0,11	0,38
Kirovogradska	21,75	63,24	-508,9	-80,62	831,1	118,45	-874,8	-56,2	565,35
L'vivska	73,41	38,13	-209,2	40,62	-292,6	-5,57	628,09	2,45	-0,57
Mykolayivska	7,45	39,92	-118,4	-22,41	85,88	-5,53	-98,11	-22,34	184,22
Odes'ka	55,27	13,29	0,83	2,31	80,28	-25,81	-61,83	-36,47	288,71
Poltavs'ka	54,15	-1,64	10,91	2,82	-16,79	16,97	-44,16	2,34	17,91
Rivnens'ka	10,94	12,49	-45,51	11,37	-84,94	-31,96	171,34	3,17	-28,79
Sums'ka	24,53	29,20	-100,8	-23,02	99,46	3,11	-26,90	-15,88	60,34
Ternopils'ka	30,33	28,12	-172,2	-2,74	19,60	-15,76	160,56	-2,99	4,40
Kharkivs'ka	21,23	12,56	-12,45	-1,62	3,27	-4,29	7,05	-6,32	7,05
Khersons'ka	16,80	12,74	-26,52	40,86	-388,0	-43,60	-364,6	-5,75	60,06
Khmelnyts'ka	6,98	14,12	18.55	-3,04	-29,79	-14,06	40,36	-17,61	-6,35
Cherkas'ka	4,19	12,96	35,72	-8,39	73,79	11,02	-187,2	-14,95	-7,12
Chernivets'ka	8,12	-2,57	66,45	5,89	-85,51	2,28	-7,17	-0,20	-0,05
Chernigivs'ka	19,97	6,00	12,93	-0,39	-22,03	-5,72	17,67	13,71	-48,73

Source: It has been developed by author based on computations given in the Tab. 2

Based on econometric parameters of the regions given in the Table 3, 1st order Laffer points (T*) and 2nd order Laffer points (T**) are calculated using the following formulas:

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$$T^* = -\frac{1}{2}\cdot\frac{a\ln L + c\ln K + m\ln M + i\ln I}{b\ln L + d\ln K + n\ln M + k\ln I} \quad (1)$$

$$T^{**} = \frac{+}{-}\frac{\sqrt{(aL + cK + mM + iI)2 - 3(bL + dK + nM + kI)B} - (aL + cK + mM + iI)}{3(bL + dK + nM + kI)} \quad (2)$$

whereas
T*, T** - 1st order and 2nd order Laffer points;
L - salary;
K – capital investments;
M – land resources;
I – expenses for innovative activity;
a, b, c, d, m, n, i, k, B – econometric parameters of the regions' production function.

Estimate of potential gross regional product (Y) and tax revenue volume (Q) have been done as per formulas applied by scientists – Laffer concept researchers [3; 4; 5], however we've adapted them to four factor production function conditions:

$$Y = (a + bT)TL + (c + dT)TK + (m + nT)TM + (i + kT)TI + B \quad (3)$$

$$Q = (a + bT)T^2L + (c + dT)T^2K + (m + nT)T^2M + (i + kT)T^2I + BT \quad (4)$$

whereas
Y – computed gross regional product;
a, b, c, d, m, n, i, k, B - econometric parameters of the regions' production function;
T – tax burden;
L - salary;
K – capital investments;
M – land resources;
I – expenses for innovative activity;
Q – computed tax burden.

Econometric parameters of regions' economic systems functioning allow to calculate 1st and 2nd order Laffer points using (1), (2) formulas, and calculate gross regional product and tax revenue volumes under tax burden conditions corresponding to 1st and 2nd order Laffer points, using (3), (4) formulas. Following said estimate it has been found that regions of Ukraine can be divided into four groups by tax burden effect on Ukrainian regions' tax revenue (Tab. 4).

Table 4

Economic mechanism of the regions functioning under tax burden conditions on Laffer curves

Regions and groups of regions by tax burden										
First group of regions	Тф<T*<T** tax burden scheme									
	B	Тф	T*	T**	Yф	Y*	Y**	Qф	Q*	Q**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Kharkivs'ka	21,23	0,297	0,309	0,404	92,9	114,8	154,7	27,6	40,8	59,8
Dnipropetrovs'ka	12,60	0,112	0,135	0,147	208,8	188,6	193,8	23,5	25,4	28,7
Poltavs'ka	54,15	0,308	0,468	0,540	71,1	73,9	90,9	21,9	23,5	19,8
Kyivs'ka	53,0	0,138	0,371	0,473	109,8	103,8	89,6	15,2	35,7	36,7
Odes'ka	55,27	0,126	0,130	0,132	102,3	122,2	94,9	12,9	13,7	18,3
Lvivs'ka	73,41	0,137	0,152	0,160	98,1	103,5	103,5	13,4	15,8	13,4
Ivano-Frankivs'ka	58,04	0,132	0,148	0,160	43,9	77,0	77,5	5,8	11,4	12,2
Zhytomyrs'ka	48,41	0,129	0,171	0,267	40,9	54,9	57,0	5,3	9,2	16,4
Vinnyts'ka	49,67	0,112	0,326	0,331	45,2	65,6	91,0	5,5	21,4	21,8
Cherkaska	16,8	0,147	0,149	0,154	28,3	34,6	24,4	4,2	3,4	3,8

Continuation of Table 4

1	2	3	4	5	6	7	8	9	10	11
Ternopils'ka	30,3	0,12	0,193	0,252	26,5	23,7	22,5	3,2	4,5	2,4
Khmelnyts'ka	6,98	0,142	0,185	0,196	41,7	21,8	45,0	5,0	2,6	8,8
Chernigiv'ska	17,5	0,147	0,378	0,447	30,0	40,2	44,2	5,4	7,8	20,1
Zakarpats'ka	15,2	0,142	0,161	0,203	27,7	21,9	24,2	3,9	3,5	2,5
Khersons'ka	4,19	0,144	0,167	0,219	44,0	51,2	74,1	6,3	6,7	8,4
Mykolayivs'ka	7,45	0,123	0,132	0,218	49,4	53,2	40,0	6,1	6,4	7,6
Rivenens'ka	10,94	0,142	0,138	0,186	29,6	22,7	18,2	4,2	3,3	3,1
Total in group					1090,2	1173,6	1245,5	169,4	235,4	329,8
Second group of regions	B	Тф	T*	T**	Yф	Y*	Y**	Qф	Q*	Q**
	T*< Тф<T** tax burden scheme									
Sums'ka	24,5	0,166	0,146	0,148	39,5	52,1	44,1	6,6	6,4	5,2
Kirovograds'ka	12,2	0,142	0,139	0,163	35,7	34,6	24,5	5,1	3,8	3,8
Volyns'ka	14,61	0,138	0,109	0,177	30,5	33,4	27,0	4,2	2,5	4,8
Total in group					105,7	120,1	95,6	15,9	12,7	13,8
Third group of regions	B	Тф	T*	T**	Yф	Y*	Y**	Qф	Q*	Q**
	Тф<T*>T** tax burden scheme									
Zaporiz'ka	38,18	0,099	0,131	0,122	89,1	86.3	86,8	8,9	11,3	6,6
Fourth group of regions	B	Тф	T*	T**	Yф	Y*	Y**	Qф	Q*	Q**
	Тф>T*>T** tax burden scheme									
Chernivets'ka	8,12	0,148	0,135	0,137	18,1	24,6	16,4	2,7	2,0	1,9
Total in Ukraine					1303,1	1404,6	1357,5	196,9	261,4	345,5

B – multiplier expressing process output of region's resource potential;
Тф - actual tax burden;
T*, T** - 1st and 2nd order Laffer points;
Yф - actual gross regional product;
Y*, Y** - computed gross regional product under conditions of 1st order and 2nd order Laffer points;
Qф – actual tax burden;
Q* Q** - computed tax burden under 1st order and 2nd order Laffer point parameters conditions.
Sources: It has been developed by author based on Table 3 data and (3), (4) formulas

First group of regions features economy functioning mechanism when Тф<T*<T**, that is actual tax burden (Тф), is lower than 1st order Laffer points, and tax burden over 1st order Laffer points is lower than 2nd order Laffer point indicator. Moderate increase of gross regional product (GRP) and tax revenue take place under these conditions. Such mechanism completely complies with the concept of A. Laffer and a number of researchers [1; 2; 3; 5]. However this regularity has specific features in certain regions. In particular in Poltavs'ka, Lvivs'ka and Ternopils'ka regions while tax burden increase to 2nd order Laffer point tax revenue volume goes down. And Khmelnits'ka, Zakarpats'ka and Rivnens'ka regions show tax revenue volume reduction as early as tax burden exceeds 1st order Laffer point level. At the same time gross regional product growth slowdown is observed. In Ternopils'ka and Rivnens'ka regions tax revenue volume reduction takes place even under tax burden level higher than 1st order Laffer point level.

Second group (Sums'ka, Kirovograds'ka and Volyns'ka regions) is characterized by economic situation when actual tax burden (Тф) is higher than 1st order Laffer point value, that create tendency for tax revenue decrease. In Zaporiz'ka Region actual tax burden is lower than 1st and 2nd order Laffer points, however tax burden of the 1st order point is higher than 2nd order point. It means that economy of the region can develop on condition that tax burden does not exceed 1st order Laffer point.

In Chernigivs'ka Region economy develops on condition of tax burden lower than 1st and 2nd order Laffer point.

From economic point of view the the most advanced is situation emerged in Kharkivs'ka, Dnipropetrovs'ka, Kyivs'ka and Poltavs'ka regions, where tax burden on their economic system corresponds to Тф<T*<T** scheme, put in other words actual tax burden on economy is less than maximum on production and tax curves (Fig. 1). Providing that these conditions will be maintained further on, true perspective of economic growth exists, that is increase of gross regional product and tax revenue.

РЕГІОНАЛЬНА ЕКОНОМІКА

As it is seen from analysis data (Table 4), in Kharkivs'ka Region tax burden increase from actual value of 29,7 % to 2nd order point of 40,4 %, that is 10,7 %, causes about 1,5 times gross regional product and tax revenue growth. Under similar situation in Dnipropetrovs'ka Region gross regional product cuts down 10 %, however at the same time tax revenue reduction is not observed. This is evidence to the fact that each region shall be treated individually with regards to its favorable tax burden.

In order to ensure efficient use of the regions' economic resources and prevent economy shrinking in particular regional of the country it is necessary to create such economic situation which will provide tax burden correspondence to effective influence of resource potential on economic and tax process. It can be done through introducing to tax management practice Laffer theory concept [1; 2; 3; 12] in accordance to which tax burden optimization gives push to production ramp-up and tax revenue volume growth. Tax burden shaping at the optimal level meaning the level which will facilitate economic development of regions becomes possible on the account of efficient use of the available economic resources. Herewith we have maximum volume of the gross regional product (GRP) and tax revenue (Tab. 5).

Table 5

Econometric indices of the regions on condition of maximum GRP and tax revenue receipt

Regions	Multiplier (B)	Actually in 2016			Maximum value of indices		
		Тф	Qф	Yф	T	Q	Y
Kharkivs'ka	21,23	0,297	27,6	92,9	0,404	59,8	154, 7
Dnipropetrovs'ka	12,60	0,112	23,5	208,6	0,147	28,7	193,8
Poltavs'ka	54,15	0,308	21,9	71,1	0,540	23,5	90,9
Kyivs'ka	53,0	0,138	15,2	109,8	0,473	36,7	109,8
Odes'ka	55,27	0,126	12,9	102,3	0,132	18,3	122,2
Lvivs'ka	73,41	0,137	13,4	103,5	0,160	15,8	103,5
Ivano-Frankivs'ka	58,04	0,132	5,8	77,0	0,160	12,2	77,5
Zhytomyrs'ka	48,41	0,129	5,3	40,9	0,267	9,2	54,9
Vinnyts'ka	49,67	0,112	5,5	45,2	0,326	3,4	65,6
Cherkaska	16,8	0,147	4,2	28,3	0,149	3,4	34,6
Ternopils'ka	30,3	0,120	3,2	26,5	0,193	4,5	23,7
Khmelnyts'ka	6,98	0,142	5,0	41,7	0,142	5,0	41,7
Chernigiv'ska	17,5	0,147	5,4	30,0	0,378	7,8	40,2
Zakarpats'ka	15,2	0,142	3,9	21,9	0,142	3,9	21,9
Khersons'ka	14,19	0,144	6,3	44,0	0,219	8,4	74,1
Mykolayivs'ka	7,45	0,123	6,1	49,4	0,132	6,4	53,2
Rivenens'ka	10,94	0,142	4,2	29,6	0,142	4,2	29,6
Sums'ka	24,50	0,166	6,6	39,5	0,146	6,4	52,1
Kirovograds'ka	12,20	0,142	5,1	35,7	0,142	5,1	35,7
Volyns'ka	14,61	0,138	4,2	30,5	0,138	4,2	30,5
Zaporiz'ka	38,18	0,099	8,9	89,1	0,131	11,3	86,3
Chernivets'ka	8,12	0,148	2,7	30,5	0,109	2,5	33,4
Total		0,146	196,9	1348,0	0,204	280,7	1375,2

Source: Composed by author based on Tab. 4 data

As it is seen from the values given in the Tab. 5, tax burden reducing to level of burden creating conditions for economic growth allows to increase tax revenue volume even under insufficient increase of the gross regional product (GRP). At the same time salary size increases (Tab. 6) facilitating population consumer demand and further production ramp-up.

Salary size growth in the regions under tax burden optimization condition evidences that in the current context population as represented by households has mastered not only high level of independence but also sufficient volume of financial resources involved in economic growth of the region and state.

Tax revenue and salary growth creates additional source for funding of education and science, public health and other social spheres which positively effects on social-economic level of regions and state as a whole advancement.

Table 6

Salary growth under tax burden optimization conditions

Regions	GRP volume			Salary size			
	Actual in 2016	Maximum at Laffer point	GRP index, %	Actually 2016	% to до GRP	Size at Laffer point	Index to 2016, %
Kharkivs'ka	92,9	154, 7	166,5	44,6	48,0	72,3	162,1
Dnipropetrovs'ka	208,6	193,8	93,0	73,5	35,2	68,2	92,8
Poltavs'ka	71,1	90,9	127,8	24,5	34,4	31,3	127,8
Kyivs'ka	109,8	103,8	94,4	33,7	31,0	31,8	94,4
Odes'ka	102,3	139,1	136,0	38,2	37,3	51,6	135,1
Lvivs'ka	98,1	101,4	103,4	37,8	38,5	39,1	101,6
Ivano-Frankivs'ka	43,9	77,5	176,5	14,1	32,1	34,1	241,8
Zhytomyrs'ka	40,9	54,9	134,2	15,7	38,4	21,1	134,4
Vinnyts'ka	45,2	65,6	145,1	16,4	36,3	23,7	144,5
Cherkaska	28,3	34,6	122,3	16,1	56,9	27,1	168,3
Ternopils'ka	26,5	23,7	89,4	10,5	39,6	10,5	100,0
Khmelnyts'ka	41,7	45,0	107,9	15,5	37,2	16,7	107,7
Chernigiv'ska	30,0	40,2	134,0	13,9	46,3	15,1	108,6
Zakarpats'ka	27,7	21,9	79,1	12,4	44,8	12,4	100,0
Khersons'ka	28,4	27,7	97,5	11,8	41,5	11,8	100,0
Mykolayivs'ka	49,4	45,7	92,5	17,8	36,0	17,8	100.0
Rivenens'ka	29,6	19,5	65,9	13,8	46,6	13,8	100,0
Sums'ka	39,5	52,1	131,9	16,0	40,5	21,0	131,2
Kirovograds'ka	35,7	34,4	96,4	12,2	34,2	12,2	100,0
Volyns'ka	30,5	34,4	112,8	11,6	38,0	13,1	112,9
Zaporiz'ka	89,1	86,8	97,4	32,3	36,2	32,3	100,0
Chernivets'ka	18,1	16,4	85,9	8,2	45,3	8,2	100,0
	1348,0	1375,2	102,0	490,6	36,4	587,1	119,7

Source: Composed by author based on Tab. 5 data

Conclusion. In summary, undertaken study of tax burden effect on economic system of the regions of Ukraine in A. Laffer concept has shown as follows. The state has various groups of regions with regards to tax burden effect on economic system. In the largest group (Kharkivs'ka, Dnipropetrovs'ka, Poltavs'ka, Kyivs'ka, Odes'ka, Lvivs'ka, etc.) of regions economic conditions have been formed under which actual level of tax burden facilitates year-to-year growth of production. It allows the economies of named regions to function with sustainable stable growth of production and tax revenue to all budget levels. For the time being these regions are the major generators of economic growth and in perspective they can become the key of national economy stability.

Economies of Sumska, Kirovogradska, Volynska and Chernivetska regions can successfully grow under conditions of actual tax burden decrease to the lowest level of 1st order Laffer point.

In Zaporizka Region economic system functioning mechanism has been formed under which tax revenue volume grows at 1st order Laffer point tax burden and decreases sharply under 2nd order Laffer point tax burden.

Thus tax burden optimization of the regions of Ukraine to the level facilitating economic growth will allow to ramp up tax revenue volume even at insufficient production increase. At the same time salary size of employable population is growing which stimulates consumer demand and further growth of public production.

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