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The Application of Tax on Means of Transport in Local Tax Policy in Poland. Evidence of City Counties

ABSTRACT

Tax on means of transport is one of the own revenues of city counties in Poland. They may affect its construction within the scope defined by the legislator. The authors of the article examined and evaluated the volume, stability and diversification of the significance of revenues achieved by city counties on account of tax on means of transport and discussed the significance of certain factors determining their level. Among these factors the local tax policy deserves a special attention. Therefore, the authors examined the scale of application of instruments of the local tax policy as well as their practical effectiveness reflected by the budget revenue growth in the subsequent periods. The following methods were used: descriptive statistics, correlation analysis, classical Pearson's independence test or Spearman's *rho* correlation test. The article also presents econometric models illustrating the effects of tax policy in relation to particular categories of tax payers of tax on means of transport.

1. Introduction

The tax on means of transport (referred to as TMT) is a revenue of communes (and consequently also city counties) included in these entities' own revenues. It is an example of taxation on movable property used in some areas of business pursuit. It belongs to the group of levies which local governments may use to follow their own tax policies as their competences in this area mean the right to reduce the rates of the tax in question and to apply other tax preferences. The role it plays as a source of revenue of local entities is determined on the one hand by the scale of application of commune competence and on the other by the scope of tax authority and other regulations, included in the Act on tax and local charges, as well as a number of factors connected with local determinants including, for example, the infrastructure, commune transport closeness and accessibility, the quality of traffic routes, customer closeness and easiness of implementation of business functions. The aforementioned factors, in the first place the scale of independently pursued tax policy by the local authorities as well as local determinants diversify the level of TMT revenues generated by particular entities and its fiscal significance in the whole country.

The article is aimed at the examination and evaluation of the volume, stability and diversification of the significance of revenues achieved by city counties on account of tax on means of transport and also at the indication of the significance of certain factors determining their level. It was assumed that a special attention should be paid to the local tax policy among all those factors. In order to measure the impact of city counties TMT tax policy on the volume of TMT revenues generated by them, the analysis covers a fairly long period of 2007–2014. The article makes use of the Rb-27s report data from all city counties.

The research of city county transport tax policy accounts for different relations, i.e. fiscal diversification of effects of tax policy with regard to all tax payers, and also separately with regard to natural and legal persons. In order to achieve the goals of the article several research methods were used, first of all descriptive statistics (structure and dynamics indicators), also correlation analysis, classical Pearson's independence test, or Spearman's *rho* correlation. The article also presents econometric models

illustrating the effects of tax policy in relation to particular categories of tax payers of tax on means of transport.

The choice of the subject of the present article results primarily from the fact that in Poland the empirical research on local tax policy, its diversification and effects is extremely rare[1]. Primarily, there is a real shortage of research in the area of corporate movable property tax. Therefore, we focus our attention in this article exclusively on the tax on means of transport, which is interesting not due to the scale of revenues (the tax efficiency is lower than in the case of property tax), but to a relatively big tax base mobility, which is decisively bigger than in the case of other wealth taxes. It is the only tax, from among local taxes in Poland, in the case of which we deal with the tax base mobility in the literal meaning of the word.

2. Legal Regulations and Economic Content of Tax on Means of Transport in the Context of Tax Authority of Communes

Tax on means of transport is regulated in the Act on local taxes and charges[2]. It is connected with the possession and use of means of transport specified by the legislator[3]. This tax is, then, a typical example of direct wealth taxation. However, there are different opinions according to which tax on means of transport should be classified as an income tax. The income character of TMT, as the followers of this stance claim, results from the economic character of means of transport, the subject scope of the tax and a normative construction of the tax rates assigned to particular vehicles[4]. When discussing in this section of the article the rights in the area of tax authority given to communes, a competent tax institution with regard to TMT should be pointed to. With regard to the matters of tax on means of transport, a competent tax authority is the one whose competence covers the tax payer's registered office (in relation to legal persons or possibly entities with no legal personality) or the place

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[1] Up-to-date and in-depth studies of local tax policy are found in a few monographs only, for example in: J. Łukomska, P. Swianiewicz, *Polityka podatkowa władz lokalnych w Polsce*, MUNICIPIUM SA, Warsaw 2015; P. Felis, *Podatki od nieruchomości a polityka podatkowa gmin w Polsce,* SGH, Warsaw 2015.

[2] Act of 12 January 1991 on local taxes and charges, Journal of Laws 2014 item 849, as amended.

[3] According to Article 8 of the Act on local taxes and charges, tax on means of transport is levied on lorries with a maximum permissible weight above 3.5 tons; tractors units and ballast tractors adapted for the use with a semi-trailer or trailer with a maximum permissible weight of a vehicle combination from 3.5 tons and more; trailers and more, excluding those that are used solely in connection with agricultural activities carried out by an agricultural tax payer; buses.

[4] *Źródła finansowania samorządu terytorialnego,* ed. A. Hanusz, Wolters Kluwer, Warsaw 2015, pp. 140–141.

of residence (criterion for natural persons)[5]. In the case of a multiple-plant enterprise, the tax should be paid in favour of the authority whose competence covers the plant's location, i.e. to the account of the commune on whose area the plant possessing the vehicles is registered.

The tax base is the number of transport means owned by the tax payer or registered in his name. The assumption that the tax base is uniform for the whole tax is a certain simplification as in the case of this tax the kind of the means of transport is significant (a lorry, a tractor unit, a ballast tractor, trailers and semi-trailers or buses) and its characteristics (maximum permissible weight, the number of axles, kind of suspension or the number of seats). An important element of the TMT subject scope, affecting also the height of tax rates, is the maximum permissible weight[6]. In the case of lorries it should not pose any difficulty as it results from the registration card. However, setting the maximum permissible weight of a vehicle unit includes the curb weight of the tractor unit and the permissible trailer weight. It should be potentially largest trailer or semi-trailer the tractor can pull. On the other hand when setting the maximum permissible weight of a trailer and semi-trailer together with the motor vehicle the tax payer sums up the maximum weight of the lorry and trailer or semi-trailer. The parameters determined in this way are not always treated as a correct solution. It appears that the motor vehicle considered in the setting of this kind of maximum permissible weight cannot be identified only with the vehicle pulling the trailer or semi-trailer at this very moment. What matters is a potential motor vehicle that may be used to pull the trailer. Thus, a tax payer declares the maximum permissible weight of the trailer and semi-trailer together with the motor vehicle, which means: the semi-trailer maximum permissible weight and the smallest possible weight of the tractor able to pull the semi-trailer or the permissible maximum weight of trailer and the smallest possible maximum permissible weight of a potential ballast tractor (lorry) able to pull the trailer. It is important that each of these means of transport is subject to tax irrespective of being a part of a vehicle unit (motor vehicle with a trailer or semi-trailer) or being used independently by an entrepreneur.

The aforementioned factors affect the level of highly diversified amount rates of tax. Their height depends on the so called external features, which may have an impact on the size of business activity pursued. Tax on means of transport has features of taxes

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[5] *Ustawa o podatkach i opłatach lokalnych. Komentarz*, ed. W. Morawski, ODDK, Warsaw 2013, p. 419.

[6] Detailed information on this subject is to be found in: R. Dowgier, B. Pahl, M. Popławski, *Podatek od środków transportowych, 141 pytań i odpowiedzi, orzecznictwo, wyjaśnienia Ministerstwa Finansów, ustawa, akty wykonawcze, skorowidz*, Dom Wydawniczy ABC, Warsaw 2006.

connected with the use of environment as the vehicles of higher weight and higher number of axles, being more environmentally undesirable, are levied with higher tax rates. Thus, the legislator takes care of the public interest diversifying tax rates[7].

The height of rates of tax on means of transport applied in a commune is determined by the commune council; however they have to be included in between the minimum[8] and maximum rates[9]. Importantly, a commune council must not set any rate at the level of 0 zlotys. In an economic sense it would mean the exemption of the vehicles from taxes, and this is settled by the legislator in Article 12 (tax exemptions). Moreover, what the doctrine indicates, a zero rate cannot be included in the idea of tax rate in the understanding of the analysed act of law because no tax amount may be calculated when applying a zero rate, and setting a rate at this level is identical to the lack of rate[10]. The literature also emphasises that the diversification of indexation methods of minimum and maximum rates cannot be rationally justified and in the extreme cases it could give rise to a paradoxical situation in which minimum rates could be higher than maximum rates[11]. In such a situation, in accordance with the content of Article 10 Section 3 the maximum rate is not taken into account and a commune council is obliged to accept the rate of tax on means of transport for all the types of vehicles at the level of a respective rate specified in Annexes 1–3 to the Act (i.e. the minimum rate). Let us emphasise that these regulations mean that commune councils lose their right to set tax rates. Only the minimum rate is valid then (higher than maximum rate), and a commune council can neither increase nor decrease it. In this way a constitutionally protected commune council competence to set tax rates within an appropriate scope has been limited[12].

The rights on the part of a commune council with regard to tax rates do not concern only their determination but also the diversification of their height. When determining the rates for different kinds of taxed objects, the commune council takes into account in particular the impact of the means of transport on the natural environment, the year of production or the number of seats. The criteria indicated

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[7] *Źródła finansowania…*, op. cit., p. 152.

[8] Minimum rates included in Annexes 1–3 to the Act on local taxes and charges refer to: lorries, tractors units and ballast tractors as well as trailers and semi-trailers with respective maximum permissible weights equal to or higher than 12 tons. Minimum rates are indexed according to the exchange rate of the euro on 1 October of a given year in relation to the year preceding the given fiscal year.

[9] In Article 10 the legislator defined the height of maximum annual rates for all the groups of means of transport which are subject to tax. The indicator uprating the maximum rates is the retail price growth index.

[10] *Podatek od środków transportowych…*, op. cit., p. 131.

[11] L. Etel, S. Presnarowicz, G. Dudar, *Podatki i opłaty lokalne, podatek rolny, podatek leśny – komentarz*, Wolters Kluwer Polska, Warsaw 2008, p. 396.

[12] *Źródła finansowania…*, op. cit., p. 154.

by the legislator should be treated as an example, and commune councils may adopt completely different criteria to diversify tax rates. But, let us enumerate evidence to prove that the procedure of tax rate diversification is partly limited. First, tax rates cannot be diversified on the subject basis. Diversification may only be effected with regard to the object criteria. Second, when diversifying taxes, the commune council cannot interfere in the statutory categories of the vehicles taxed. It is possible to introduce sub-divisions in addition to the statutory divisions. Third, the rates determined in the new classification cannot exceed maximum rates. Fourth, it is impossible to diversify rates with regard to the means of transport in the case of which minimum rates have been set.

The current preferences in tax on means of transport may be classified in the following groups:

1. Preferences of a systemic character, including:
    -   means of transport in possession of diplomatic representations,
    -   means of transport that constitute reserves for the purpose of military mobilisation and special-purpose vehicles
    -   vintage vehicles within the meaning of road traffic regulations,
    -   means of transport used in the so-called combined transport[13].
2. Preferences introduced by commune councils in other forms than statutory tax exemptions. While considering the commune council exemption competences, one should focus on their scope. The legislator assumed in Article 12 Section 4 that a potential exemption enacted by a commune council may not refer to the means of transport covered by minimum rates. In an attempt to indicate the aim of such a regulation, it should be observed that since the legislator assumed such a solution (minimum rates), a commune council cannot introduce exemptions for these means of transport. An important problem refers also to the assessment of freedom given to a commune council in the exemption application. The statement that the only limitation in the implementation of exemptions by commune councils is the catalogue of exemptions of the aforementioned means of transport is fairly disputable. It is worth noting that the phrase used by the legislator: "A commune council has the right to introduce other object exemptions than those defined in Section 1", means the right to introduce only overall exemptions. If communes introduced on their territories a construction of a partial tax exemption or tax relief, it would be contrary to the content of Article 12 Section 4, as well as its

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[13] In the case of this solution, the tax payer may receive a tax return depending on the number of runs with or without the load. The reduction in the tax amount is diversified and fluctuates from 25% of annual tax amount (in the case of 20 to 49 runs inclusive by a means of transport in railway transport in a fiscal year) to 100% of annual tax amount (in the case of 100 runs and more).

systemic interpretation[14]. In this situation another issue should be considered, i.e. giving more rights to commune councils to let them make resolutions on other preferences, e.g. tax reliefs. The following arguments may be mentioned in favour of the proposal of granting commune councils the right to enact reliefs in tax on means of transport[15]:

- making use of non-fiscal tax functions to affect economic and social phenomena in the area (enacting tax reliefs communes may influence tax payers' decisions encouraging them to install equipment limiting fumes emission into the atmosphere),
- giving communes complete tax authority within their own revenues,
- adoption of uniform principles on the competence of commune councils in all local taxes[16].

The current preferences mean that the legislator has resigned from the solutions thanks to which priority used to be given to certain kinds of business pursuit and tax payers' conduct. Some symptoms of the application of a stimulative policy may be observed only within the procedure of tax return on account of combined transport. This solution is to be positively assessed as combined transport is used in Poland, in relation to the West European countries, unsatisfactorily (developing gradually though). The literature emphasises that the application of this solution should be particularly promoted due to the way means of transport are used to benefit the minimising of negative impact on the environment and road surface condition[17].

To recapitulate this section of the article, it may be assumed that a desired feature of local taxes is an opportunity to affect the regional tax policy through their construction. Therefore, the idea of diversifying tax rates by commune councils is right. Thanks to it, tax payers may be encouraged to renew the possessed means of transport and to acquire vehicles in favour of the natural environment protection. In the context of enhancement of non-fiscal tax functions it would be well-founded to expand the rights of local entities and allow them to make resolutions not only with regard to non-statutory object exemptions but also tax reliefs[18].

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[14] The stance on this issue was expressed by the Supreme Administrative Court (NSA) in its verdict of 10 June 1997, stating that communes had no right to introduce tax reliefs in tax on means of transport and to make resolutions on partial tax exemptions. (File ref.no. I SA/Wr 654/97, "Wspólnota" 1998, no. 19, p. 22).

[15] Based on: R. Dowgier, L. Etel, T. Kurzynka, G. Liszewski, M. Popławski, E. Wróblewski, *Reforma podatków majątkowych*, Dom Wydawniczy ABC, Warsaw 2004, pp. 178–180.

[16] For example in the Act on agricultural tax the legislator included delegations for the commune councils to enact tax reliefs.

[17] J. Ickiewicz, *Obciążenia fiskalne przedsiębiorstw*, PWE, Warsaw 2009, p. 223.

[18] The fact must not be ignored that in the current state of law communes may preferentially treat tax payers who install equipment in their vehicles to reduce environmental pollution through enacting separate lower tax rates for the means of transport provided with this kind of equipment.

3. The Analysis and Evaluation of Tax on Means of Transport as a Source of Income of City Counties

Tables 1 and 2 illustrate the 2007–2014 budget revenues of city counties on account of certain categories of their own sources of revenue[19], with indication of these revenues that showed a yearly downward trend (darker areas in Table 2). Analysing the presented data, it should be observed that:

– the volume of own budget revenues as well as an integral part, i.e. tax revenues generally show an upward trend: own revenues of nearly 28.5% from the level of 23 279.36 million zlotys to 29 909.31 million zlotys; local taxes of over 24% from the level of 7 403.55 million zlotys to 9 205.98 million zlotys; local taxes with active tax authority of 47.5% from the level of 5 448.81 million zlotys to 8 037.49 million zlotys. Only in the case of tax on means of transport there is a considerable decline in its impact on the budgets of city counties, from the level of 324.45 million zlotys to 307.35 million zlotys (decline of over 5%). It is commonly known that individual elements of local tax systems are characterised by different sensitivity to the course of the business cycle. Most local government revenues are highly sensitive to cyclical fluctuations in the economy: primarily the shares of local governments in income taxes, tax on civil law transactions or tax on means of transport[20]. Revenues from the aforementioned levies paid by entrepreneurs undoubtedly show close interdependence with their active business pursuit undertaken on the local markets. Property tax is less sensitive to business cycle fluctuations as its dues depend not on the value but on the property area[21]. Property tax is the most important source of own revenues of local governments from among all local taxes, providing local government budgets with high revenues also in the period of recession or economic slowdown (high growth dynamics).

– tax on means of transport is not at present a stable source of city county revenue, and its significance in creating budgets of these entities has considerably decreased in comparison with 2007, when revenues as well as the share in their own revenues

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[19] The article makes use of department 756 of the Rb-27s report which is most important for local entities. To simplify, it may be assumed that the data resulting from this department refer to commune own revenues. Own revenues may be also registered in other departments. Importantly, revenues from all taxes are exclusively included in department 756.

[20] Vide etiam: M. Poniatowicz, *Kryzys a zmiany dochodów i polityki podatkowej jednostek samorządu terytorialnego (na przykładzie miast Unii Metropolii Polskich)*, in: *Konsekwencje zmiany obciążeń podatkowych w Polsce*, eds. J. Głuchowski, K. Piotrowska-Marczak, J. Fila, Difin, Warsaw 2013, pp. 174–175.

[21] Vide i.a.: P. Felis, *Funkcja fiskalna i społeczna w powierzchniowym systemie opodatkowania nieruchomości na przykładzie gmin w Polsce*, "Gospodarka Narodowa" 2015, no. 3.

and in revenues from local taxes achieved a maximum level in the analysed period. Already 2008 saw a very clear decline in the local government revenues, and in the subsequent years this decline went even further. This phenomenon was, to a certain extent, caused by an economic slowdown, unfavourable factors typical of this sector (e.g. a decline in eastward freight in the international transport), as a result of which there was a rise in the number of corporate bankruptcies. In the years 2011–2014 revenues from tax on means of transport showed a definite upward trend. Thus, 2014 saw 307 million zloty worth of city county revenue from tax on means of transport, which amounted to only 1.03% of their own revenues, 3.34% of revenues from local taxes and only 3.82% of revenues from local taxes with active commune tax authority.

Table 1. City counties revenue potential from tax on means of transport in relation to other revenues

Specification	2007	2008	2009	2010	2011	2012	2013	2014
in millions zlotys								
Own revenues (dw)	23 279.36	24 742.54	23 613.33	23 616.24	24 929.87	25 542.04	27 596.65	29 909.31
Local taxes (pl)	7 403.55	7 392.64	7 256.30	7 692.85	7 998.20	8 323.24	8 857.62	9 205.98
Local taxes – active authority (plwa)	5 448.81	5 767.37	6 035.01	6 374.80	6 788.55	7 318.28	7 753.68	8 037.49
Tax on means of transport (pst)	324.45	312.08	308.50	296.31	287.86	292.39	302.36	307.35
in %								
pst/dw	1.39	1.26	1.31	1.25	1.15	1.14	1.10	1.03
pst/pl	4.38	4.22	4.25	3.85	3.60	3.51	3.41	3.34
pst/plwa	5.95	5.41	5.11	4.65	4.24	4.00	3.90	3.82

Source: authors' own materials based on the RB-27s Report data.

Table 2. Dynamics of changes in budget revenues of city counties (in %; the previous year = 100%)

Specification	2008	2009	2010	2011	2012	2013	2014
Own revenues	106.29	95.44	100.01	105.56	102.46	108.04	108.38
Local taxes	99.86	98.16	106.02	103.97	104.06	106.42	103.93
Local taxes – active authority	105.85	104.64	105.63	106.49	107.80	105.95	103.66
Tax on means of transport	91.13	98.85	96.05	97.15	101.57	103.41	101.65

Source: authors' own materials based on the RB-27s Report data.

The research conducted in city counties confirms that tax on means of transport is primarily incurred by legal persons. To generalise, as much as 70% of the tax paid came from legal persons, and only 30% from natural persons (Table 3).

Table 3. City counties revenues from tax on means of transport by tax payers

Specification	2007	2008	2009	2010	2011	2012	2013	2014
in millions zlotys								
Total revenues from legal and natural persons	324.45	312.08	308.50	296.31	287.86	292.39	302.36	307.35
Revenues from legal persons	234.34	227.21	222.15	209.27	197.07	200.96	208.09	213.18
Revenues from natural persons	90.10	84.87	86.35	87.04	90.79	91.43	94.27	94.17
in%								
Revenues from legal persons	72.23	72.81	72.01	70.63	68.46	68.73	68.82	69.36
Revenues from natural persons	27.77	27.19	27.99	29.37	31.54	31.27	31.18	30.64

Source: authors' own materials based on the RB-27s Report data.

The volume of revenue which city counties acquire from tax on means of transport is determined by many diversified factors. Firstly, primarily by the ones beyond their control, for example the business cycle, the situation of the market of means of transport, level of prices, number of entrepreneurs, accessibility of credits and leases or the regulations included in the Act on local taxes and charges. Secondly, whether or not and to which extent they exercise their tax authority.

In order to illustrate the scale of application of competence of city authorities in the area of creation of revenue from tax on means of transport, a comparison was made of the effects of application of tax authority instruments with the total revenues from this tax totally, and also separately with regard to the tax paid by legal and natural persons (see Table 4). The rights exercised by cities in the analysed period had a diversified effect on revenues from TMT. In 2007 the fiscal effects of application of tax authority instruments in relation to TMT in city counties amounted to 88.15 million zlotys, which accounted for 27.2% of revenues from this tax. In 2014 the amount was more than twice as high – nearly 182 million zlotys, which accounted for more than 59% of revenues from TMT. The competence to set tax rates was of the greatest significance in revenue reduction. Lower rates gave rise to a financial effect from nearly 83 million zlotys in 2007 to nearly 180 million zlotys in 2014. No wonder that a rising tendency recorded on absolute data occurred also in the relation of financial effects of upper rates reduction to tax revenues. The lost revenues rose from 25.5% in 2007 to over 58% in 2014 of revenues from TMT.

It is worth commenting on the scale of application of tax authority instruments by city counties with regard to individual groups of tax payers. In the years 2007–2014 legal persons had their share of 68% in them on the average and natural persons only 32%. Preferences given to legal persons rose more quickly – the rise in current prices of 117.95%, while preferences given to natural persons rose by 83.22%. Taking into account the relation of the financial effects of application of tax authority instruments to TMT revenues, we can see that the size of the financial loss was similar: on average nearly 44% in the case of legal persons and nearly 48% in the case of natural persons. The effects of application of tax authority instruments in TMT with regard to legal and natural persons using in their business pursuit certain means of transport were considerable, which means that town authorities willingly used their competences, primarily, as remarked, in the area of reduction in the upper TMT rates and their diversification. And the application of non-statutory reliefs and exemptions affected the level of revenues from tax on means of transport to a much lesser degree.

So far, our attention has been primarily paid to the fiscal effects of city county tax authority. However, one cannot ignore the fact that thanks to the reduction in maximum tax rates and also thanks to the diversification of their height it is possible to achieve certain goals, which are important from the perspective of the policy of socio-economic development of the local entity. They are, for example: more interest of the local entity on the part of transport sector companies, improvement in the natural environment or a better quality of the corporate transport base[22]. Hence, city counties, when diversifying TMT, used criteria mentioned in the Act, i.e. the impact of the vehicle on the environment or its year of production. The research conducted by J. Dziuba indicates that city counties often referred to the EURO norms, defining permissible fume emissions in the vehicles sold in the EU, they preferred vehicles possessing equipment reducing fume emissions, gas installation, electric drive or biofuel, as well as newer vehicles[23].

Undeniably, lower local tax rates create more favourable conditions for companies to operate, but according to a lot of research conducted, they do not have a decisive significance in the selection of location for registration and business pursuit[24].

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[22] A. Krzemińska, *Dysfunkcje w zakresie stanowienia podatków i opłat lokalnych w gminach,* in: *Konsekwencje zmiany obciążeń podatkowych w Polsce,* eds. J. Głuchowski, K. Piotrowska-Marczak, J. Fila, Difin, Warsaw 2013, pp. 210–211.

[23] J. Dziuba, *Dochody z podatku od środków transportowych w miastach na prawach powiatu w kontekście zasady samodzielności finansowej,* "Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach", no. 198/1, pp. 139–140.

[24] T. Skica, A. Kiebała, T. Wołowiec, *Stymulowanie lokalnej konkurencyjności gmin na przykładzie podatku od środków transportowych,* "Studia Regionalne i Lokalne" 2011, no. 2(44).

It appears that for companies it is not the height of tax rate that matters, but the stability, predictability and transparency of the commune tax policy[25].

Table 4. The application of tax authority instruments in tax on means of transport in city counties in relation to legal and natural persons

Specification	2007	2008	2009	2010	2011	2012	2013	2014
Total revenue from tax on means of transport (in millions zlotys)	324.45	312.08	308.50	296.31	287.86	292.39	302.36	307.35
Lost revenue amount (in millions zlotys), including	88.15	113.43	123.58	122.41	135.58	153.67	168.23	181.74
– upper rates reduction	82.80	108.72	118.04	118.98	132.72	151.29	165.73	179.42
– reliefs and others	5.35	4.71	5.54	3.43	2.86	2.37	2.50	2.32
Lost revenues/revenues from tax on means of transport (in %)	27.17	36.35	40.06	41.31	47.10	52.56	55.64	59.13
Revenues from tax on means of transport from legal persons (in millions zlotys)	234.34	227.21	222.15	209.27	197.07	200.96	208.09	213.18
Lost revenue amount (in millions zlotys), including	58.23	78.93	85.77	81.83	89.98	103.83	114.85	126.91
– upper rates reduction	56.29	77.82	84.03	81.11	89.01	102.90	114.42	126.63
– reliefs and others	1.94	1.10	1.74	0.72	0.97	0.93	0.43	0.28
Lost revenues/revenues from tax on means of transport (in %)	24.85	34.74	38.61	39.10	45.66	51.67	55.19	59.53
Revenues from tax on means of transport from natural persons (in millions zlotys)	90.10	84.87	86.35	87.04	90.79	91.43	94.27	94.17
Lost revenue amount (in million zlotys), including	29.92	34.50	37.82	40.58	45.60	49.84	53.38	54.82
– upper rates reduction	26.50	30.90	34.01	37.87	43.71	48.40	51.30	52.79
– reliefs and others	3.41	3.60	3.81	2.71	1.89	1.44	2.07	2.03
Lost revenues/revenues from tax on means of transport (in %)	33.21	40.65	43.80	46.62	50.23	54.51	56.62	58.21

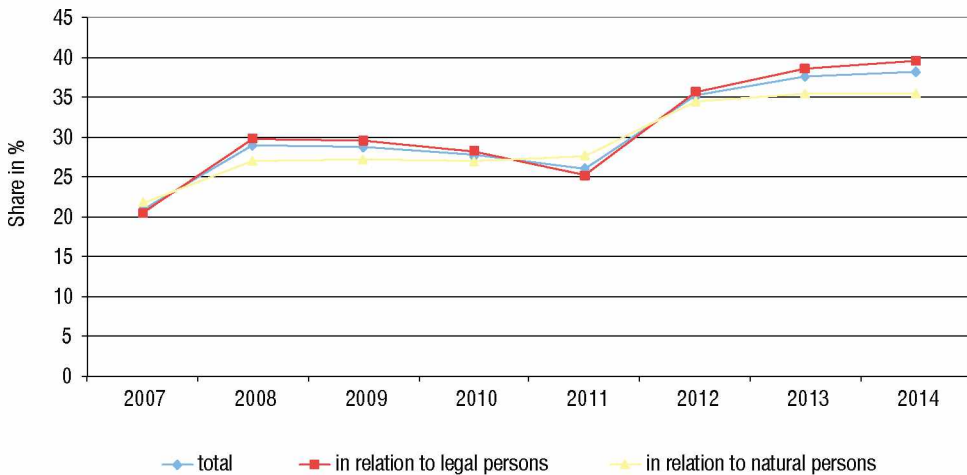Source: authors' own materials based on the RB-27s Report data.

It is also worth looking at Figure 1, which shows the significance of the tax policy pursued through tax rates in tax on means of transport in comparison with the decisions about all local taxes covered by city counties tax authority as defined by the Act. The presented chart indicates that in the analysed period the share of revenue losses on account of maximum rates reduction in TMT in the amount of loss of revenue on account of the application of this instrument of tax authority in all local taxes rose considerably (by more than 17 percentage points in relation to all tax payers,

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[25] M. Bończak-Kucharczyk, K. Herbst, K. Chmura, *Jak władze lokalne mogą wspierać przedsiębiorczość*, Polska Fundacja Promocji Małych i Średnich Przedsiębiorstw, Fundacja Inicjatyw Społeczno--Ekonomicznych, Warsaw 1998, p. 22.

by more than 19 percentage points in relation to legal persons and by 14 percentage points in the case of natural persons).

The research indicates then that city counties as a whole group present an attitude consisting in expansive tax policy in the area of tax on means of transport. It may be expected that cities could see more effectiveness in the application of tax policy instruments, in particular in the case of TMT, where the tax base is more mobile than in the case of taxes on immovable property, generally more significant for communes. It cannot be forgotten that we deal, as proven, with a tax of small efficiency. A potential decline in revenue connected with the application of tax authority instruments by city counties is not generally too severe for their budgets. Hence, it cannot be excluded that TMT rates reduction may be treated by politicians as an action allowing them to demonstrate their openness to the support for local undertakings[26].

Figure 1. The significance of tax policy of city counties in tax on means of transport in relation to all local taxes with active tax authority (in%)

Source: authors' own materials based on the RB-27s Report data.

4. The Impact of Application of Tax Authority Instruments on the Level of Budget Revenues of City Counties

Asking about possible effects of financial policy of city counties in tax on means of transport, the authors scrutinised at the beginning on the classical correlation of

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[26] J. Łukomska, P. Swianiewicz, *Polityka podatkowa…*, op. cit., p. 39.

share growth of amounts due to the reduction in the upper tax rates in city counties revenues on account of transport tax (variable PU expressed in %) and a quotient of variable showing an inflation accounted relative growth of revenues on this account over the previous year (variable PD, expressed in %). A possible impact of PU on PD in a given year and in the next year was analysed. The correlation tables presented below show clearly that variable PU is generally negatively correlated with variable PD in a given year, which was to be expected as more tax preferences in the form of lower tax rates had to result in the decline in revenue growth. However, if one considers the impact of variable PU from a given year on variable PD in the next year, a positive correlation is seen, i.e. to cut it short: the tax policy works. The increase in tax preferences (enacting lower rates) gives rise to positive financial effects in transport tax collection in the following year. Let us assume though that it is only a preliminary observation.

A simple correlation analysis may be distorted even by single errors or outliers. In order to minimise the influence of such data on the analysis of the impact of PU on PD the authors processed the data. Firstly, dichotomisation of variables PU and PD was made to dichotomic variables u and d – if $PU_R < 0$, then we assume $u_R = 0$, and otherwise $u_R = 1$. The same – when variable $PD_R < 0$, then we assume $d_R = 0$, and otherwise $d_R = 1$. We join bit variables from two consecutive years (R – 1, R) obtaining variable U_R and variable D_R. These variables may assume values 0(00), 1(01), 2(10) or 3(11). We will show later that there is a significant correlation between U_R and D_{R+1}. The obtained contingency tables were used to complete a classical Pearson's independence test and also to calculate Spearman's *rho* correlation, useful here due to the type of variables.

In the next section of the article we show examples of models of the impact of PU in a given year R (PU_R, R = 2008,..., 2013) on PD in the following year (PD_{R+1}), primarily with regard to the tax policy addressed to natural persons, where it seems to have the greatest influence. A possible impact of tax policy "accompanies" the impact of dynamics of growth in transport tax revenues and the share of transport tax in total tax collection– the impact of both these variables is "negative" – the one that "rose" in transport tax collection "stronger" and had a higher transport share in all taxes and charges collected by the commune, had lower indicators of the dynamics of growth in the collection of this tax in the following year.

The analyses were carried out separately for the tax on means of transport paid by legal and natural persons. First, we present the correlations for TMT from legal persons. The statistical analysis shows that the completion of missing and potentially erroneous data gives unexpected results. Therefore, the authors decided to remove such data from the analysis in order to deal with the values for which a sensible

processing is possible, for example we resigned from the indicators that would have to be divided by 0. If data *PU*, *PD* from all the years are treated as cross-sectional time data, there is a positive correlation of *PU* with *PD* from the same year ($r = 0.1506$, significance test value $t = 2.563$, $p < 0.01$, Student's t-distribution with $df = 283$ degrees of freedom) and insignificant (!) correlation with *PD* from the following year ($r = -0.0839$, significance test value $t = -1.416$, $df = 283$, $p = 0.158$). If these data are to be considered with regard to subsequent years separately (see Table 5), it is seen even more clearly that certain correlations, from among those specified in the correlation table, are not significant.

Table 5. Correlations for TMT from legal persons. Border correlation insignificant $r^* = 0.2609$ (for $\alpha = 0.05$)

PU\PD	2009	2010	2011	2012	2013	2014
2008	0.2267	0.2611	−0.1103	−0.0254	−0.0025	−0.2319
2009	0.0175	0.0607	−0.0324	0.1385	−0.0189	−0.0945
2010	−0.0363	−0.1689	0.0721	0.0299	−0.0359	0.1030
2011	0.1020	0.1129	−0.5069	0.7229	−0.0706	0.2095
2012	−0.2334	−0.1282	0.0739	−0.1544	0.0119	0.0574
2013	−0.1919	−0.3674	0.2353	0.0915	−0.0889	0.8141
2014	−0.1861	0.0751	−0.0912	−0.0878	0.0227	−0.5760

Source: authors' own materials based on the RB-27s Report data.

Table 6. Correlations for TMT from natural persons. Border correlation insignificant $r^* = 0.2632$ (for $\alpha = 0.05$)

PU\PD	2009	2010	2011	2012	2013	2014
2008	0.3368	−0.1538	0.3106	−0.2466	0.0599	0.0133
2009	−0.0938	0.1820	−0.1360	0.1761	−0.0993	0.0261
2010	0.0861	−0.2945	0.2440	−0.0714	−0.0642	0.1013
2011	−0.0871	0.0506	−0.4873	0.6613	−0.2510	0.1533
2012	−0.0204	0.0432	0.0081	−0.4187	0.4398	0.0043
2013	−0.0583	0.0058	−0.0351	0.1000	−0.4395	0.4718
2014	−0.1032	−0.1565	0.3347	−0.2681	0.4064	−0.4489

Source: authors' own materials based on the RB-27s Report data.

For TMT from natural persons the calculated corrections indicate a clearer impact of tax policy on tax collection, though there are single outliers seen from the general "pattern" (see Table 6). If *PU*, *PD* data from all the years are considered

as cross-sectional time data, there is a strong correlation of PU with PD from the same year ($r = 0.3944$, significance test value $t = 7.155$, Student's t-distribution with $df = 278$ degrees of freedom) and a negative correlation with PD from the following year ($r = -0.3646$, significance test value $t = -6.528$, $df = 278$).

The correlations of variables PU with PD for natural persons are on average stronger and more stable over time than for legal persons (for the evaluation of effectiveness of tax policy pursued in year R the value of correlation of variable PU_R with variable PD_{R+1} is significant here).

Additionally, the behaviour of variable PD_R is shown in the following tables (Tables 7 and 8).

Table 7. Mutual correlations of variables PD_R for TMT from legal persons

PD/PD	2009	2010	2011	2012	2013	2014
2009	1.0000	0.1846	−0.2516	0.2069	−0.1465	0.0342
2010	0.1846	1.0000	−0.5502	0.1775	−0.1658	−0.3038
2011	−0.2516	−0.5502	1.0000	−0.6300	0.3166	0.1087
2012	0.2069	0.1775	−0.6300	1.0000	−0.5329	0.2045
2013	−0.1465	−0.1658	0.3166	−0.5329	1.0000	−0.2190
2014	0.0342	−0.3038	0.1087	0.2045	−0.2190	1.0000

Source: authors' own materials based on the RB-27s Report data.

Table 8. Mutual correlations of variables PD_R for TMT from natural persons

PD/PD	2009	2010	2011	2012	2013	2014
2009	1.0000	−0.3836	0.1758	−0.0292	−0.1332	0.1093
2010	−0.3836	1.0000	−0.4895	0.0070	0.3017	−0.0554
2011	0.1758	−0.4895	1.0000	−0.6356	0.1091	−0.1870
2012	−0.0292	0.0070	−0.6356	1.0000	−0.5507	0.2005
2013	−0.1332	0.3017	0.1091	−0.5507	1.0000	−0.6224
2014	0.1093	−0.0554	−0.1870	0.2005	−0.6224	1.0000

Source: authors' own materials based on the RB-27s Report data.

Apart from one outlier (for TMT from natural persons), a negative correlation is clearly seen. There is a negative dependence of PD_{R+1} on PD_R – i.e. a positive tendency in growth in tax in a given year stimulates the occurrence of a negative tendency in the following year. On the contrary, if the growth in revenue from tax is on the decline in a given year, in the following year a stronger growth in revenues from tax is more likely to occur. It is as if the situation of fiscal effects of tax authority stabilised all by

itself and in a sense averaged itself – an increasing growth is followed by a declining growth, and a declining one is followed by an increasing one.

As remarked before, in order to minimise the impact of outliers on the analysis of impact of tax policy on the size of tax collection, the data were subject to processing, described in detail at the beginning of the article. Thus, we will show now convergence tables worked out for variables U_R and D_{R+1} for years $R = 2009, 2010,\ldots, 2013$ (resulting from processing of original variables PU, PD from years $R = 2008, 2009,\ldots, 2013$). Let us begin with such a table for TMT for legal persons and year $R = 2009$ – we will describe in a greater detail what was calculated and what the significance of the accompanying numbers is. So in Table 9 we examine the dependence of D_{2010} on U_{2009}.

Table 9. Convergence table for TMT from legal persons (R = 2009)

U\D	0	1	2	3	
0	6	2	4	0	12
1	7	1	1	3	12
2	4	3	4	1	12
3	9	8	6	6	29
	26	14	15	10	65

Source: authors' own materials based on the RB-27s Report data.

Table 10. Convergence table for TMT from legal persons (R = 2010). $\chi^2 = 23.51$ (p = 0,005), *rho* = – 0.1328 (t = –1.064, p = 0.29). Pearson's independence test shows a significant dependence, but Spearman's *rho* correlation test does not confirm it

U\D	0	1	2	3	
0	3	2	2	1	8
1	9	4	0	3	16
2	1	2	9	1	13
3	10	10	4	4	28
	23	18	15	9	65

Source: authors' own materials based on the RB-27s Report data.

The value of Pearson's independence $\chi^2 = 9.47$, which gives a probability of improper rejection of hypothesis of independence at the level p = 0.39 (distribution χ^2 with 9 degrees of freedom). The value of Spearman's *rho* correlation coefficient amounts to –0.1174, and the value of a respective significance test amounts to t = –0.938, p = 0.35 (Student's t-distribution with 63 degrees of freedom). The results of both these tests indicate an insignificant dependence between U_{2009} and D_{2010}. The next

tables, for the next years, will be completed with the values whose sense we described with the first convergence table (no. 9).

Table 11. Convergence table for TMT from legal persons (R = 2011). χ^2 = 18.52 (p = 0.03), *rho* = 0.0128 (t = 0.102, p = 0'92). Pearson's independence test shows a significant dependence, but Spearman's *rho* correlation test does not confirm it

U\D	0	1	2	3	
0	3	3	1	2	9
1	1	8	2	1	12
2	1	1	7	3	12
3	5	16	4	7	32
	10	28	14	13	65

Source: authors' own materials based on the RB-27s Report data.

Table 12. Convergence table for TMT from legal persons (R = 2012). χ^2 = 22.24 (p = 0,008), *rho* = 0.1955 (t = 1.582, p = 0.12). Pearson's independence test shows significant dependence, but Spearman's *rho* correlation test does not confirm it

U\D	0	1	2	3	
0	1	3	2	2	8
1	0	8	2	3	13
2	2	1	11	4	18
3	0	9	5	12	26
	3	21	20	21	65

Source: authors' own materials based on the RB-27s Report data.

Table 13. Convergence table for TMT from legal persons (R = 2013). χ^2 = 42.73 (p = 0.000002), *rho* = 0.5234 (t = 4.876, p = 0.000008). The dependence is significant

U\D	0	1	2	3	
0	3	0	7	0	10
1	3	10	2	1	16
2	0	0	6	1	7
3	2	5	9	16	32
	8	15	24	18	65

Source: authors' own materials based on the RB-27s Report data.

Next, there are convergence tables presented for tax on means of transport paid by natural persons, R = 2009,…, 2013.

Table 14. Convergence table for TMT from natural persons (R = 2009). $\chi^2 = 18.79$ (p = 0.027), *rho* = 0.1974 (t = 1.598, p = 0.115). Pearson's independence test shows significant dependence, but Spearman's *rho* correlation test does not confirm it

U\D	0	1	2	3	
0	1	1	6	2	10
1	4	3	3	2	12
2	1	3	8	2	14
3	0	7	9	13	29
	6	14	26	19	65

Source: authors' own materials based on the RB-27s Report data.

Table 15. Convergence table for TMT from natural persons (R = 2010). $\chi^2 = 11.80$ (p = 0.22), *rho* = 0.1385 (t = 1.110, p = 0.27). The dependence is insignificant

U\D	0	1	2	3	
0	2	3	3	0	8
1	2	9	1	4	16
2	1	2	3	1	7
3	1	12	13	8	34
	6	26	20	13	65

Source: authors' own materials based on the RB-27s Report data.

Table 16. Convergence table for TMT from natural persons (R = 2011). $\chi^2 = 21.52$ (p = 0.01), *rho* = 0.0130 (t = 0.103, p = 0.92). Pearson's independence test shows significant dependence, but Spearman's *rho* correlation test does not confirm it

U\D	0	1	2	3	
0	0	4	4	0	8
1	3	2	1	1	7
2	2	2	16	0	20
3	4	9	11	6	30
	9	17	32	7	65

Source: authors' own materials based on the RB-27s Report data.

Table 17. Convergence table for TMT from natural persons (R = 2012). χ² = 14.65 (p = 0.1), *rho* = 0.1572 (t = 1.264, p = 0.21). The dependence is insignificant

U\D	0	1	2	3	
0	2	5	1	2	10
1	1	14	1	2	18
2	1	2	6	2	11
3	3	13	7	3	26

Source: authors' own materials based on the RB-27s Report data.

Table 18. Convergence table for TMT from natural persons (R = 2012). χ² = 16.86 (p = 0.05), *rho* = 0.1843 (t = 1.489, p = 0.14). The dependence is weak or insignificant

U\D	0	1	2	3	
0	2	1	7	0	10
1	1	6	3	1	11
2	1	1	6	5	13
3	2	8	10	11	31
	6	16	26	17	65

Source: authors' own materials based on the RB-27s Report data.

We have already said that the correlations of variables PU_R with PD_{R+1} for tax collected from legal persons do not indicate any significant "pattern" of dependence, if considered separately for every year. When considering these data as cross-sectional and time data, some weak dependences of this kind are seen. The situation is better in the case of tax collected from natural persons. The correlation dependence here is clearer and more stable – growing PU_R affects a decline in variable PD_R, and the same growing variable PU_R affects a rise in variable PD_{R+1}. This first dependence is a natural consequence of financial arithmetic – if communes increase the scale of application of their competence in a certain year, reducing the upper tax rates, the tax revenues in the same year will fall. The second dependence means that an increase in financial effects of commune tax authority will influence a positive tendency in tax collection in the following year. Thus, it may be stated that preferences given to tax payers in the form of lower tax rates in one year have a stimulative effect on the tax collection in the following year. TMT collection from natural persons brings about 3 times less revenue than from legal persons. There have to be other mechanisms here thanks to which the policy seems to bring positive effects in the case of natural persons, while in the case of legal persons it does not.

Recapitulating: for the collection of tax on means of transport from legal persons no regular "pattern" of dependence was found – there is no uniform, positive reaction of business entities to city counties tax policy. It is not much better in the case of collection of tax from natural persons. Pearson's independence test indicated a weak dependence of variable U_R (a rise in the share of preferences in the form of lower rates in tax collection in year R) on variable D_{R+1} (tendency of rise in tax collection in year R+1). Spearman's *rho* correlation test did not confirm that. The size of the data set does not favour the application of Pearson's independence test and Spearman's *rho* correlation test. However, if we aggregate convergence tables from all the years (from 2009 to 2013), then for a 5 time bigger data set now, we will obtain new tables (Tables 19–21).

Table 19. Convergence table for TMT totally from legal and natural persons. $\chi^2 = 58.45$ ($p < 0.000001$), *rho* = 0.1409 ($t = 2.557$, $p = 0.011$). Significant dependence

U\D	0	1	2	3	
0	13	11	18	4	46
1	17	30	12	7	66
2	6	7	36	12	61
3	18	51	37	46	152
	54	99	103	69	325

Source: authors' own materials based on the RB-27s Report data.

Table 20. Convergence table for TMT from legal persons. $\chi^2 = 68.32$ ($p < 0.000001$), *rho* = 0.1350 ($t = 2.449$, $p = 0.015$). Significant dependence

U\D	0	1	2	3	
0	16	10	16	5	47
1	20	31	7	11	69
2	8	7	37	10	62
3	26	48	28	45	147
	70	96	88	71	325

Source: authors' own materials based on the RB-27s Report data.

The presented tables indicate that the dependence is not very strong but significant. Pearson's independence test indicates a little stronger dependence for legal persons, while Spearman's rho correlation test indicates stronger dependence for natural persons. The latter, as shown in Tables 9–18, is less inclined to show a significant dependence, so the indication of Spearman's *rho* correlation for natural persons may

be considered more significant. The indications of the classical Pearson's correlation test shown in Tables 5–6 may be used as an additional argument. They point to a more stable correlation dependence in the case of natural than legal persons.

Table 21. Convergence table for TMT from natural persons. $\chi^2 = 48.36$ (p < 0.000001), $rho = 0.1529$ (t = 2.780, p = 0.006). Significant dependence

U\D	0	1	2	3	
0	7	14	21	4	46
1	11	34	9	10	64
2	6	10	39	10	65
3	10	49	50	41	150
	34	107	119	65	325

Source: authors' own materials based on the RB-27s Report data.

The authors also analysed many econometric models to find possible dependences of variables for year R, including PU_R, with variable PD_{R+1}. For TMT collection from legal persons a "pattern" of dependence was sought, with independent variables UD_R and PD_R, and dependent variable PD_{R+1}. In the models obtained for the following years a logical "pattern" of dependences could hardly be seen. If the 2009–2013 data are aggregated into one data series, then for independent variables PU and PD from a given year and variable PD_{next} from the next year as a dependent variable the following model was obtained:

$$PD_{next} = 2.84\% + 0.6264 {}^* PU - 0.1256 {}^* PD$$

indicating an averaged impact of PU and PD on PD_{next} for all the analysed years. If this model is completed by variables values:

- UD_R – % share of revenues from tax on means of transport in year R to all revenues received in year R

for the period 2009–2013, then after combining this value from the years 2009–2013 (in cross-sectional time data) into variable UD we obtain an extended, also coincident, model:

$$PD_{next} = 15.82\% - 13.7243 {}^* UD + 0.5971 {}^* PU - 0.1393 {}^* PD$$

And for the collection of tax on means of transport from natural persons, year on year, the following models were obtained:

$$PD_{2010} = 4.63\% + 0.1906^*PU_{2009} - 0.3314^*PD_{2009}$$

$$PD_{2011} = 7.38\% + 0.2555^*PU_{2010} - 0.7441^*PD_{2010}$$

$$PD_{2012} = -4.05\% + 0.6307^*PU_{2011} - 0.2945^*PD_{2011}$$

$$PD_{2013} = 2.43\% + 0.3533^*PU_{2012} - 0.4249^*PD_{2012}$$

$$PD_{2014} = 1.27\% + 0.2478^*PU_{2013} - 0.5121^*PD_{2013}$$

Here, also regression coefficients at variables PU_R are positive, and regression coefficient at variables PD_R, are negative. The former means a positive reaction to tax policy in relation to the tax paid by natural persons. The latter means that after a negative tendency in the growth in the tax from natural persons, in the following year there is a better chance for the occurrence of positive tendency. Moreover, it should be observed that the model is coincident, i.e. the signs of regression coefficients are compliant with the signs of respective correlation coefficients. If the 2009–2013 data are combined in one cross-sectional time data series, then for independent variables PU and PD from a given year and variable PD_{next} from the next year as a dependent variable the following model is obtained:

$$PD_{next} = 2.35\% + 0.3380^*PU - 0.4464^*PD$$

confirming the way PU and PD affect PD_{next} analysed longer than year on year. If two variables are added to this model:
- VU_R – % share of effects of reduction in upper rates in tax collection in year R in the collection of this tax in year R,
- UD_R – % share of revenue from tax on means of transport in year R in all the received revenues in year R,

then after combining them (in a cross-sectional time series) for the period 2009–2013 into variables VU and UD we obtain an extended, also coincident, model:

$$PD_{next} = 1.25\% + 0.1134^*VU - 8.8508^*UD + 0.2610^*PU - 0.4681^*PD$$

What does this model show in comparison with the former one? Firstly, a bigger % share of effects of reduction in upper rates in collection of tax on means of transport stimulates positive response to tax policy. Secondly, the bigger the % share of revenues is on account of tax on means of transport in the own revenues of city counties, the less effective their tax policy seems to be. Variables PU and PD work in the same way as in the model, in which only these variables were used as independent variables. It is a very interesting general question – in which communes (due to the value of

a specific economic variable) tax policy works better, and in which ones it works worse. One of such definite answers is included in the above model – variables *VU*, *UD* are then a possibility of differentiating local entities with regard to the expected impact of tax policy on the volume of revenues in future periods. After removing variable *VU* from the set of independent variables we obtain the model:

$$PD_{next} = 6.68\% - 7.5378*UD + 0.3261*PU - 0.4523*PD$$

If this model is compared with a respective model for tax on means of transport from legal persons presented before, it can be seen that:

- A negative impact of variable *UD* is lower than for legal persons (increased share of tax on means of transport in total revenues of city counties in a given year more weakly affects the downward tendency in revenues from means of transport in the following year).
- A positive impact of *PU* is also smaller than for legal persons (see a remark below). However, it should be considered here that variables *PU* and *PD* are generally negatively correlated every year; thus, *PU* growth causes the growth in PD_{next} (which results from the model), but *PU* growth is directly correlated with the *PD* decline, which also causes PD_{next} growth due to a negative correlation coefficient at *PD*.
- A negative impact of variable *PD* is stronger than for legal persons (growth dynamics/decline in collection of tax on means of transport in a given year is subject to faster compensation in the following year; thus a relative growth in collection of tax on means of transport self-restricts itself more strongly).

5. Conclusion

Recapitulating the conducted research, we may state that tax on means of transport is not a significant and stable source of income of city counties in Poland. In the course of analysed years the volume of revenues feeding their budgets on this account was only slightly reduced. The best year from the point of view of the effects of tax on means of transport in city counties budgets was definitely 2007, the first year of our analysis and at the same time the last pre-crisis year. Only in the last years of the research period was there a certain improvement, a growth in revenues received by city counties on account of TMT. The significance of this tax as a source of budget revenues of these entities decisively declined (minimum TMT share in own revenues and revenues on account of local taxes).

On the one hand, this phenomenon was caused by objective factors (macro-economic), beyond any control of city counties. It should be emphasised that the regulations included in the Act on local taxes and charges were an important but permanent factor. In the analysed period the legislator unfortunately did not modify the laws regulating TMT. The most important changes, as a result of which the object scope of tax was narrowed and which seriously limited its role and at the same time its significance as an instrument of socio-economic policy of communes, were introduced much earlier.

On the other hand however, it was caused by the application of certain instruments by city authorities (reduction in upper tax rates or introducing non-statutory reliefs and exemptions) in the framework of the local tax policy pursued. The research proves that city counties quite commonly used the rights given to them (a high and constantly growing share of effects of the use of tax authority in tax revenues, and also the growth in the significance of tax policy in TMT in comparison with tax policy in all local taxes). In particular, it dealt with the possibility of enacting lower tax rates than maximum rates defined in the Act, which as a result gave rise to a considerable decline in revenues on this account. Being aware however, of a small revenue potential of city counties from this tax (it has brought only 1% of city counties own revenues in recent years), we may record a marginal impact of the height of TMT rates on the revenue situation in city counties. The article also indicates that the diversification of rates, on the basis of the assumed criteria, might be in favour of rational activity stimulating the achievement of desired economic and social effects (improved natural environment thanks to lower fume emissions and reduced noise intensity or improvement in the transport base of companies operating in the commune). A substantive assessment of the effects of the outlined motivational function requires some separate in-depth research though.

Tax on means of transport is, as remarked, a local tax characterised by the greatest mobility of the tax base. Do the effects of upper rates reductions, particularly conspicuous in this tax, confirm tax competition between large cities? The article does not present strong evidence of tax competition in the area of tax on means of transport. It may only be speculated that in the case of tax whose tax base is more mobile than that of other local taxes, and also with regard to a tax of low efficiency (low risk for the revenue level), tax competition becomes more probable.

It was a very important issue for the authors to examine not only the use of instruments of the local tax policy, but also their practical effectiveness manifested in the budget revenue growth in the subsequent periods. The general conclusion from this part of analysis is as follows: the reduction in the upper rates of tax on means of transport gives rise to diversified effects in different periods. It more often

leads to a decline in budget revenues. Thanks to the constructed correlation tables we managed to observe certain statistical dependences. A correlation has been confirmed between tax policy, primarily in the case of tax paid by natural persons, and a growing tendency in revenues from this tax. The authors made an attempt to create some models explaining the effectiveness of city counties tax policy in the area of tax on means of transport.

References

1. Act of 12 January 1991 on local taxes and charges, Journal of Laws 2014, item 849, as amended.

2. Bończak-Kucharczyk M., Herbst K., Chmura K., *Jak władze lokalne mogą wspierać przedsiębiorczość*, Polska Fundacja Promocji Małych i Średnich Przedsiębiorstw, Fundacja Inicjatyw Społeczno-Ekonomicznych, Warsaw 1998.

3. Dowgier R., Etel L., Kurzynka T., Liszewski G., Popławski M., Wróblewski E., *Reforma podatków majątkowych*, Dom Wydawniczy ABC, Warsaw 2004.

4. Dowgier R., Pahl B., Popławski M., *Podatek od środków transportowych, 141 pytań i odpowiedzi, orzecznictwo, wyjaśnienia Ministerstwa Finansów, ustawa, akty wykonawcze, skorowidz*, Dom Wydawniczy ABC, Warsaw 2006.

5. Dziuba J., *Dochody z podatku od środków transportowych w miastach na prawach powiatu w kontekście zasady samodzielności finansowej*, "Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach", no. 198/1.

6. Etel L., Presnarowicz S., Dudar G., *Podatki i opłaty lokalne, podatek rolny, podatek leśny – komentarz*, Wolters Kluwer Polska, Warsaw 2008.

7. Felis P., *Funkcja fiskalna i społeczna w powierzchniowym systemie opodatkowania nieruchomości na przykładzie gmin w Polsce*, "Gospodarka Narodowa" 2015, no. 3.

8. Felis P., *Podatki od nieruchomości a polityka podatkowa gmin w Polsce*, SGH, Warsaw 2015.

9. Ickiewicz J., *Obciążenia fiskalne przedsiębiorstw*, PWE, Warsaw 2009.

10. Krzemińska A., *Dysfunkcje w zakresie stanowienia podatków i opłat lokalnych w gminach*, in: *Konsekwencje zmiany obciążeń podatkowych w Polsce*, eds. J. Głuchowski, K. Piotrowska-Marczak, J. Fila, Difin, Warsaw 2013.

11. Łukomska J., Swianiewicz P., *Polityka podatkowa władz lokalnych w Polsce*, MUNICIPIUM SA, Warsaw 2015.

12. Poniatowicz M., *Kryzys a zmiany dochodów i polityki podatkowej jednostek samorządu terytorialnego (na przykładzie miast Unii Metropolii Polskich)*, in: *Konsekwencje zmiany obciążeń podatkowych w Polsce*, eds. J. Głuchowski, K. Piotrowska-Marczak, J. Fila, Difin, Warsaw 2013.

13. Skica T., Kiebała A., Wołowiec T., *Stymulowanie lokalnej konkurencyjności gmin na przykładzie podatku od środków transportowych*, "Studia Regionalne i Lokalne" 2011, no. 2(44).

14. *Ustawa o podatkach i opłatach lokalnych. Komentarz*, ed. W. Morawski, ODDK, Warsaw 2013.

15. *Źródła finansowania samorządu terytorialnego*, ed. A. Hanusz, Wolters Kluwer, Warsaw 2015.