Sensitivity of Polish System of Municipal Revenue from Real Estate Market to Changes in Economic Situation

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Abstract. The paper discusses the local government revenue from the real estate market, focusing mainly on assessing the sensitivity of the income of municipalities from the real estate market to changes in an economic situation. The study covered all communes (gminas) in Poland, excluding voivodeship capitals: municipalities, urban-rural communities, rural communities. The temporal scope of the analysis was a decade between 2005 and 2015. The analyses focused on the following three groups of revenue from a real estate market: recurrent property taxes, revenue from municipal assets and taxes in respect of ownership right transfer. The main research hypothesis was made that the system of revenue from the real estate market in urban communities was more sensitive to changes in an economic situation than in urban-rural and rural communities. The analyses were conducted for the country in general and in regional sections. The data came from the Local Data Bank of the Polish Central Statistical Office. The data analysis was conducted by means of statistical and econometric methods.

1. Introduction
The global economic crisis, triggered by the 2007 property bubble burst in the US, had a hard impact on EU economies [1, 2, 3, 4]. Strong decrease of GDP along with plunging asset prices in the financial and real estate markets resulted in considerable decline of tax revenue. The slowdown on the real estate market was not without effect on the revenues of local governments throughout the European Union [5]. The effect on the Polish GDP turned out to be considerably less severe than in other EU countries. Poland was the only EU member state where GDP did not fall in 2009. On the contrary, it rose by 1.6% YOY. Unfortunately, despite its relatively good economic performance in comparison to the rest of the EU, Poland did not eventually avoid the deterioration of public finances [6, 7]. In 2009 the Polish real estate market saw a 24.8% decline in the number of closed transactions: from 277 013 in 2008 to 208 190 in 2009. The trend was accompanied by volumes decreased by 32%: from PLN 46 933 493 in 2008 to PLN 31 901 619 in 2009 [8]. In the same period of time the revenue from property tax fell from 1.5% PKB in 2008 to 1.4% PKB in 2009 [9]. The major beneficiaries of this type of revenue are gminas (elementary units of local government) whose budgets are mostly endowed with public-law taxes and charges obtained from the real estate market1.

1 In 2016 the gmina revenues coming from the real estate market taxes reached PLN 32.225 billion, i.e. 35.08% of their total revenue (Local Data Bank of the Polish Central Statistical Office).
The above correlation was the rationale behind this study which was aimed at assessing the effect of the global economic crisis (that broke out in August 2008) on the revenues from real estate market in communes in Poland. The study covered all communes in Poland, excluding voivodeship cities (2,462). The main research hypothesis was made that the system of revenue from the real estate market in urban communities was more sensitive to changes in an economic situation than in urban-rural and rural communities. The analyses focused on the following three groups of revenue from a real estate market: recurrent property taxes, revenue from municipal assets and taxes in respect of ownership right transfer. The analyses were conducted for the country in general and in regional sections. The temporal scope of the analysis was a decade between 2005 and 2015. The data came from the Local Data Bank of the Polish Central Statistical Office. The data analysis was conducted by means of statistical and econometric methods.

2. The municipal income system of the real estate market in Poland

The provisions of the Polish Constitution [10] guarantee to gminas their legal (legal personality, the right to own municipal property), organizational (freedom in executing public functions in their own name and under their own responsibility) and financial autonomy (their share in public revenues, right to set their own rates of local taxes and charges). The primary act of law regulating the Polish local governments ‘sources of income is the Act on income of local government units of 13 November 2003 [11]. The Polish gmina revenue system, similarly to its EU counterparts, is mixed, which means that it is based on gminas’ own revenue (coming mainly from local charges and taxes and their own assets) as well as on funds transferred from the state budget in a form of general subsidies, targeted subsidies and a share in personal and corporate income taxes [12]. A considerable part of the gminas’ own revenue is represented by income from real estate market that falls into four categories [13, 14]:

   a) recurrent property taxes – property taxes related to ownership rights but unrelated with any economic event or administrative-law procedure (property, agricultural or forestry taxes);
   b) revenue from municipal assets – civil-law charges collected on account of a property sale or lease (income from property sale, letting, leasing or perpetual usufruct);
   c) taxes in respect of ownership right transfer payable when transferring property rights in a form of market and non-market transactions (civil-law action tax, inheritance and gift tax);
   d) income taxes levied on income from property sale, letting, leasing, etc. (personal income tax and corporate income tax);
   e) charges levied on an increased property value due to a local government activity –changes in the local land use plan (planning fees), land division, re-parcelling, upgrading (impact fees).

The real estate market is closely correlated with the economy, being its essential element. On the one hand, the processes taking place in the economy may drive up or slow down the growth of the property market [15]. On the other hand, it influences macroeconomic variables by participating in the generation of the gross domestic product, creating jobs or providing tax revenue [16].

Local government revenue is conditioned by economic, demographic, political and technological factors [17]. Taking into account the correlation of the revenue volume with the economic trends, there are three types of revenue [18]: directly dependent on the economic situation, indirectly dependent on the economic situation and temporarily independent from the economic situation (Table 1).

It is important to note that such a classification is only true in a short-term perspective. When considering the gminas’ own revenues in a long term, over crises lasting several years, it is justified to say that their every budget line is reliant on the regional and national economic situation. Any long-lasting slowdown has a negative effect on people’s incomes and material resources. That in turn affects the gmina budgets, including decreased revenues from the property tax as a consequence of business failures and the resulting fall in demand for real estate, which leads to lower rental prices.
Table 1. Classification of gmina revenues from real estate market – a criterion of sensitivity to economic trends

| Revenue directly dependent on economic situation | Revenue indirectly dependent on economic situation | Revenue independent from economic situation |
|-------------------------------------------------|-----------------------------------------------|---------------------------------------------|
| - participation in personal income tax,         | - revenue from municipal assets,               | - property tax,                             |
| - participation in corporate income tax          | - civil-law action tax,                       | - agricultural tax,                         |
|                                                 | - inheritance and gift tax,                   | - forestry tax,                             |
|                                                 | - stamp duty,                                 |                                             |
|                                                 | - planning fee,                               |                                             |
|                                                 | - impact fee,                                 |                                             |

Source: own study based on [18].

3. Sensitivity of the municipal income system of the real estate market to changes in economic situation

The analyses covered the revenue from a real estate market in all gminas in Poland, excluding voivodeship cities\(^2\) (2,462), including: 288 municipalities, 611 urban-rural communities and 1563 rural communities, between 2005 and 2015. The main research hypothesis was made that the system of revenue from the real estate market in urban communities was more sensitive to changes in an economic situation than in urban-rural and rural communities. The analyses were conducted for the country and in regional sections. The data came from the Local Data Bank of the Polish Central Statistical Office.

The analyses focused on the following three groups of revenue from a real estate market:

1) recurrent property taxes – a property tax, an agricultural tax and a forestry tax;
2) revenue from municipal assets – income from property sale, letting, leasing and from perpetual usufruct;
3) taxes in respect of ownership right transfer – a civil-law action tax, an inheritance and gift tax).

The revenue from income tax related to the real estate market was excluded from the analysis due to the absence of relevant data – the part of income taxes levied on gains from the sale, rental and lease of properties is not separated from the total envelope of income taxes in the Tax Office records. Additionally, the analysis did not include gains from charges in respect of increased property value due to their marginal importance as they do not exceed 1% of the cities’ own revenue.

Throughout the whole period of time covered by the study the total revenue from the real estate market in Polish gminas reached PLN 203,352 billion, which accounted for 38.64% of their own income. Out of that amount 44.89% was collected by urban gminas, 27.80% by rural and 27.31% by urban-rural ones (Figure 1).

In the analysed period, the revenue from the real estate market rose in all types of gminas. Until 2007 the upward dynamics was similar throughout Poland. In 2008 the urban-rural communities took over a leading position with the upward trend more dynamic than in other types of gminas. That tendency prevailed by the end of the period of analysis\(^3\) (Figure 2).

\(^2\) The analyses did not include voivodeship capitals (16 cities) because they differed considerably from other gminas due to central character of their public functions.

\(^3\) Over the analyzed period of time (2005-2015) the revenues from the real estate market in urban-rural gminas rose by 81% compared to 2005. In rural and urban gminas the increase was 78% and 68% respectively.
In 2009 the upward trend in the revenues from the real estate market slowed down in all types of gminas. In the following years the trend picked up again and since 2013 rural gminas have sped ahead of the urban ones.
The revenue from recurrent property taxes accounted for 73.93% of total gmina revenues from the real estate market. The property tax itself provided 66.24% of the revenue (PLN 134 704 million). The revenue from municipal assets (PLN 39 834 million) accounted for almost 1/5 of the total income from the real estate market, while taxes levied in respect of ownership right transfer brought only PLN 13 180 million, i.e. 6.48% (Figure 3).

Figure 3. The structure of revenue from real estate market in gminas in 2005-2015

Source: own study based on GUS Local Data Bank of Central Statistical Office.

When analysing the value of the revenue from the real estate market per capita, we can see a considerable growth in all types of gminas. In the period of analysis, the highest revenue from the real estate market per capita was reported by urban gminas. The urban communities generated the lowest revenue (see Figure 4).

Figure 4. Per capita revenue from real estate market in gminas over 2005-2015

Source: own study based on GUS Local Data Bank of Central Statistical Office
The highest dynamics of growth in the revenue from the real estate market was seen in rural gminas where it was rising at the annual average rate of 5.96%. In the remaining types of gminas the rates were similar at 5.92% in urban-rural gminas and 5.66% in the urban ones.

In order to determine the relationship between the economic situation and the gminas revenue from the real estate market the Pearson correlation coefficient was used:

\[ \rho_{x,y} = \frac{cov(x,y)}{\sigma_x \sigma_y}, \]  

where:
- \(cov(x,y)\) – the covariance of variables \(x\) and \(y\),
- \(\sigma_x\) and \(\sigma_y\) – the standard deviation of variables \(x\) and \(y\).

The analyses were conducted on the following levels:
- general – seeking the relationship between the GDP per capita on the voivodship level and the revenue from the real estate market in gminas;
- detailed – seeking the relationship between the GDP per capita on the voivodship level and three identified above groups of revenue sources.

In all types of gminas in all voivodships the Pearson correlation coefficients computed for the GDP and for the revenue from the real estate market were higher than 0.7956, which confirms a marked correlation between these categories. The highest values of the coefficient within the interval <0.9344; 0.9848> were seen in urban-rural gminas, the average for 16 voivodships being 0.9692. The coefficient was slightly lower in urban gminas ranging between <0.956; 0.9904> with the voivodship average at 0.9381 and the lowest in rural gminas at <0.8116; 0.9750>, with the voivodship average at 0.9370 (Figure 5).

**Figure 5.** Pearson correlation coefficient between GDP per capita in voivodships and per capita revenue from real estate market in gminas in individual voivodship over 2005-2015

Source: own study based on GUS Local Data Bank of Central Statistical Office.
Interesting phenomena can be observed when we analyse the correlation coefficient values obtained for the GDP and for the three identified groups of revenue sources related to the real estate market (Table 2).

**Table 2.** Pearson coefficient of correlation between GDP per capita in a given voivodship and revenue from real estate market in gminas over 2005-2015

| Types of gminas          | Group I. Recurrent property taxes | Group II. Revenue from municipal assets | Group III. Taxes in respect of ownership right transfer | Revenue from real estate market |
|-------------------------|---------------------------------|----------------------------------------|------------------------------------------------------|--------------------------------|
| municipalities          | 0.9645                          | 0.6190                                 | 0.2904                                               | 0.9381                         |
| urban-rural communities | 0.9549                          | 0.6022                                 | 0.3173                                               | 0.9692                         |
| rural communities       | 0.9413                          | 0.4073                                 | 0.3365                                               | 0.9370                         |

Source: own study based on GUS Local Data Bank of Central Statistical Office.

The revenues from Group 1 (property, agricultural and forestry taxes) were strongly dependent on the GDP, with the Pearson correlation coefficient within the range of <0.9110 ; 0.9886>. The strongest correlation could be seen in urban gminas where the coefficient ranged between <0.9230 ; 0.9886> with the voivodship average at 0.9645. The correlation was slightly weaker in urban-rural communities where the average was 0.9549. The weakest correlation coefficient at 0.9413 was seen in rural gminas (Figure 6).

**Figure 6.** Pearson correlation coefficient between GDP per capita in voivodships and per capita revenue from recurrent property taxes in gminas over 2005-2015

Source: own study based on GUS Local Data Bank of Central Statistical Office.
When analysing the relationship between GDP per capita and per capita revenue from municipal assets, we can see a strong correlation in urban and urban-rural gminas, with the Pearson correlation coefficient at 0.6190 and 0.6022, respectively. This means that there was a strong positive correlation. In rural gminas the correlation power was considerably weaker with the Pearson correlation coefficient at 0.4073, which suggests a definitely less powerful relationship. It is worth noting that in several cases (in rural gminas in Pomorskie, Dolnośląskie and Małopolskie voivodships as well as in urban gminas in Lubuskie voivodship) the correlation coefficient was negative at -0.4031, - 0.3291, - 0.0412 and - 0.3306 respectively, which reflects the fact that there was a weak negative correlation between GDP per capita and per capita revenue from municipal assets (Figure 7).

Figure 7. Pearson correlation coefficient between GDP per capita in voivodships and per capita revenue from municipal assets in gminas over 2005-2015
Source: own study based on GUS Local Data Bank of Central Statistical Office.

Equally interesting results come from the analysis of correlation with the last group of gmina revenues from the real estate market, namely with the gmina revenues from taxes in respect of ownership right transfer. It seems obvious that there must a strong correlation between the economic situation in a given region (measured by GDP per capita) and the gmina revenues from taxes in respect of ownership right transfer (particularly from the civil law action tax) because together with an acceleration/slowdown in economic growth the number of sold properties rises/falls and, consequently, the gmina revenue from transaction taxes grows/shrinks. However, the analyses results have proved the contrary – in the period under study gminas of all types saw a weak correlation between GDP per capita in voivodships and per capita revenue from taxes in respect of ownership right transfer. Pearson correlation coefficient amounted to 0.2904 in municipalities, 0.3173 in urban-rural communities and 0.3365 in rural communities. On the other hand, what must be emphasised is a considerable disparity among coefficients in gminas in individual voivodships (Figure 8).
Figure 8. Pearson correlation coefficient between GDP per capita in voivodships and per capita revenue from taxes in respect of ownership right transfer in gminas over 2005-2015
Source: own study based on GUS Local Data Bank of Central Statistical Office.

A voivodship that was clearly distinguishable from others was Pomorskie where the correlation coefficient in all types of gminas fell below 0.082, which indicates the lack of strong relationship between GDP per capita in voivodships and per capita revenue from taxes in respect of ownership right transfer in gminas.

The reasons for that phenomenon can be found in the changes in the income from the inheritance and gift tax that were caused in 2007-2009 by factors of legal and social rather than economic nature. In 2007 there was a sudden rise in the gmina revenue from inheritance and gift tax per capita by 222% from PLN 44.35 in 2006 to PLN 142.99 in 2007 (Figure 9).

Figure 9. GDP per capita and per capita revenue from inheritance and gift tax - dynamics year on year
Source: own study based on GUS Local Data Bank of Central Statistical Office.
There were several reasons for that situation. First, a tax relief ‘trap’ in the legal regulations concerning the inheritance and gift tax that was introduced on January 1, 2007. According to that provision, the next of kin who inherited a property were relieved of the tax. The unclear provisions resulted in the obligation to pay the tax because many people reported the inheritance acquisition, counting on the relief that was in fact undue. Other reasons of increased revenues from the inheritance and gift tax includes the growth in the number of deaths in that time - in 2007 analysed gminas saw the death rate rise by 2.12% (6 319) in comparison to 2006. Another factor that brought an effect of increased revenue from the inheritance and gift tax was the upward trend in property prices, on which the tax is based. On the other hand, the rural gminas in Podlaskie, Podkarpackie, Lubelskie, Świętokrzyskie and Wielkopolskie voivodships and the urban-rural gminas in Zachodniopomorskie saw a strong correlation in this respect with the Pearson coefficient exceeding 0.577, which reflects a positive correlation.

4. Conclusions
The analysis results confirmed that in the decade of 2005-2015 there was a correlation between the gminas revenues from the real estate market and the economic situation. The obtained results only partially verify the research hypothesis that the system of revenue from the real estate market in urban communities was more sensitive to changes in an economic situation than in urban-rural and rural communities. Only in two groups of revenues from the real estate market: Group I (recurrent property taxes) and Group II (revenue from municipal assets) the computed Pearson correlation coefficients confirmed a strong (and stronger than in urban-rural and rural gminas) correspondence between gmina revenues per capita and GDP per capita in voivodships (the Pearson correlation coefficient in urban gminas was at 0.9645 in Group I and 0.6190 in Group II). The hypothesis was not proved to be true for Group III, i.e. taxes in respect of ownership right transfer, where the Pearson correlation coefficient in urban gminas was the lowest at 0.2904, which corroborates the absence of correlation between the revenue from from taxes in respect of ownership right transfer and the economic situation in the region. The values of the coefficient in the remaining types of gminas also indicate the lack of such relation.

References
[1] B. McSweeney, “The roles of financial asset market failure denial and the economic crisis: Reflections on accounting and financial theories and practices,” Accounting, Organizations and Society., vol. 34, (6-7), pp. 835-848, 2012, [Online] Available from: http://www.sciencedirect.com/ [Accessed 14 July 2017].
[2] A. Smith, A. Swain, “The Global Economic Crisis, Eastern Europe, and the Former Soviet Union: Models of Development and the Contradictions of Internationalization,” EURASIAN GEOGRAPHY AND ECONOMICS., vol. 51 (1), pp. 1-34, 2010.
[3] G. A. Dymski “The global financial customer and the spatiality of exclusion after the ‘end of geography,” Cambridge Journal of Regions, Economy and Society, vol. 2 (2), pp. 267-285, 2009.
[4] R. S. Grossman, C. M. Meissner, “International aspects of the Great Depression and the crisis of 2007: similarities, differences, and lessons,” OXFORD REVIEW OF ECONOMIC POLICY., vol. 26 (3), pp. 318-338, 2010.
[5] K. Davey (ed.), “LOCAL GOVERNMENT IN CRITICAL TIMES. Policies for Crisis, Recovery and a Sustainable Future,” Council of Europe Centre of Expertise for Local Government Reform, Strasbourg: Council of Europe, 2011.
[6] „Public finances in Poland during the crisis,” Polska, Ministerstwo Finansów, Warszawa. 2012
[7] „Poland in the face of the global crisis,” Narodowy Bank Polski, Warszawa: NBP, 2009.
[8] „Real estate market in 2009,” Polska, Główny Urząd Statystyczny, Warszawa: GUS. 2010.
[9] European Union (2017), Taxation Trends in the European Union. Luxembourg: Publications Office of the European Union.
[10] Constitution of the Republic of Poland of April 2, 1997 (Journal of Laws 1997, number 78, item 483 as amended).
[11] Act on Income of Local Government Units of 13 November 2003 (Journal of Laws 2017, item 1453 as amended).

[12] J. Gliniecka, „The rules of the Polish law of local self-government income,” Bydgoszcz: Wydawnictwo Branta, ISBN 838-66-057-90, 2001.

[13] J. Cymerman, „Active real estate management in the commune. Right. Instruments. Municipal income,” Koszalin: Wydawnictwo Uczelniane Politechniki Koszalińskiej, ISBN: 978-83-7365-249-1, 2011.

[14] M. Głuszak, B. Marona, „Cadastral tax. Economic determinants of the real estate tax reform,” Warszawa: Wydawnictwo Poltex, ISBN: 978-83-7561-497-8, 2015.

[15] W. C. Wheaton, “Realestate "cycles": Some fundamentals,” REAL ESTATE ECONOMICS., vol. 27 (2), pp. 209-230, 1999.

[16] A. Haila, “Real estate in global cities: Singapore and Hong Kong as property states,” URBAN STUDIES., vol. 37 (12), pp. 2241-2256, 2010.

[17] J. R. Bartle, K. A. Kriz and B. Morozov, “Local government revenue structure: trends and challenges,” Journal of Public Budgeting, Accounting & Financial Management., vol. 23 (2), pp. 268-287, 2011.

[18] M. Czyż, „The impact of the economic crisis on the communes' own revenues,” Zeszyty Naukowe Wyższej Szkoły Bankowej w Poznaniu., vol. 41, pp. 23-36, 2012.