Identification of Statistical Relations between Tax Policies in Voivodship Capitals and Local Housing Market Development

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Abstract

The authors seek the correlations between local council policies concerning residential property taxation and the growth of local housing markets in voivodship capitals in 2007–2013. The first part of the paper contains the analysis of the dynamics of changes in local property taxes followed by the evaluation of the development levels of local housing markets and their linear ordering by means of the property market development indicator. Then, in order to capture the similarities and identify trends on the local housing markets, the cities were classified into homogenous clusters. In the last stage of the analysis the authors evaluated the relevance of property tax rates adopted locally on the growth of local housing markets. The study results showed no statistically relevant correlation between the analysed phenomena — i.e., no effect of the local property tax rates on the decisons made by investors on the local housing markets.

Keywords: real property tax, housing market, voivodship capitals, clustering, correlations

Background

The primary assumption of the Polish local government model is a leading role of a commune (a principal unit of administrative division) as an active local management body whose actions support local social and economic development which is targeted at satisfying the needs of its community (Kłosiewicz-Górecka and Słomińska 2001, 22). The commune's mission is to create the best possible living conditions for its residents (Domański 2006, 142). The living conditions are determined by four groups of factors: social infrastructure, housing and communal infrastructure, physical environment, as well as such a level of income in the local population that is considered sufficient to meet social needs. A detailed list of the commune's statutory tasks is laid down in Article 7(2) of the Polish Act on Local Government.[1] A guiding principle of the local government's development policy is a question of the administrative impact on the local real estate market, which has been regulated by Polish law. According to the Act of 21 June 2001 on the protection of the rights of tenants, municipal residential resources and on amending the Civil Code the commune statutory tasks include creating supportive conditions to meet the housing needs of the local community.[2] Communes can influence the housing market on two levels:
- civil-law (in its proprietary capacity) — a commune, as an owner of its housing stock, under the rules and in cases provided for in the Act, provides social and substitute housing, and meets the housing needs of households with low income;

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1. See: Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 11 marca 2013 r. w sprawie ogłoszenia jednolitego tekstu ustawy o samorządzie gminnym. DzU z 2013 r. poz. 594 ze zm.

2. See: Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 6 grudnia 2013 r. w sprawie ogłoszenia jednolitego tekstu ustawy o ochronie praw lokatorów, mieszkaniowym zasobie gminy i o zmianie Kodeksu cywilnego. DzU z 2014 r. poz. 150 ze zm.

- administrative-legal (in its sovereign capacity) — a commune, as a public entity, in a sovereign way shapes its residents' living standards mainly by means of: its autonomous land use and tax policies or by its property management.

Some authors point to the importance of tax instruments due to their direct and sovereign character (Miszczuk 2009, 18; Patrzałek 1994, 22). A tax policy is an indispenable instrument of the local government's strategy for local socio-economic development (Chojna-Duch 2007, 167). In the modern world taxes play not only a fiscal role. They are also vital for socio-economic and land use spheres as they determine the shape and course of social processes and phenomena, thus influencing people's behaviour on the real property markets. The real property tax is a basic revenue for local governmental budgets. It is the most popular levy in the world, being a part of tax systems in over 130 countries. In Germany, Austria, Spain, the Netherlands, Greece, Finland, Luxemburg, Portugal and Italy it is assigned to local governments' budgets, while in the United Kingdom, Belgium, Denmark, France and Ireland it is divided between local and central budgets. In Poland, as stated in the Act of 12 January 1991 on local taxes and charges,[3] the real property tax is levied on: land excluding utilised agricultural areas subject to agricultural tax and forests subject to forestry tax (except for forested areas linked to running a business activity); buildings or their parts and structures or their parts linked to running a business activity other than agricultural or forestry business activity.

Bearing in mind that property taxes not only constitute a significant part of a commune's own income but can also have an impact on the social and economic development of local communities, we attempt to determine the effect of residential property taxation on the growth of local housing markets. Another reason for this article's thematic focus is the fact that no other exhaustive studies have been conducted so far in this area. The aim of this article is to establish the extent and direction of the correlation between the residential property tax policy adopted by local authorities and the growth of housing markets in voivodship capitals in the period 2007–2013. Consequently, two research hypotheses have been formulated:

- H_1: The residentail property tax policy implemented by the authorities of voivodship capitals has an impact on the growth of local housing markets.
- H_2: It is possible to discern homogeneous clusters of voivodship capitals in which the tax policy implemented by local authorities in the period 2007–2013 has a uniform effect on the growth of local housing markets.

The analysis covered 16 voivodship capitals and two towns being important regional centres (Toruń in the Kujawsko-Pomorskie Voivodship and Zielona Góra in the Lubuskie Voivodship). The analyses were based on the GUS (Central Statistical Office o Poland) data,[4] the GUS and NBP (National Polish Bank) analyses and reports,[5] data published on the BIP (Public Information Office) websites of individual voivodship capitals[6] and the local governments' resolutions on their real property tax in 2007–2013.

1 Tax policy as a tool of local government interventionism

The consequence of the empowerment of local governments in Poland was their constitutionally guaranteed autonomy encompassing, besides the legal identity and the title to real property, their vast financial powers, such as participation in public revenue accordingly to their statutory tasks; revenue in a form of the commune's own income, general purpose and specific purpose transfers from the central budget as well as the right to set their own rates of local charges and taxes to the extent defined in the Act (article 168 of the Polish Constitution 1997).[7] The latter power is one of

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3. See: Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 14 maja 2014 r. w sprawie ogłoszenia jednolitego tekstu ustawy o podatkach i opłatach lokalnych. DzU z 2014 r. poz. 849 ze zm.

4. Available at http://stat.gov.pl/en/.

5. Available at http://www.nbp.pl/homen.aspx?f=/srodeken.htm.

6. Availabla from the main web page at https://www.bip.gov.pl/.

7. See: Konstytucja Rzeczypospolitej Polskiej z dnia 2 kwietnia 1997 r. uchwalona przez Zgromadzenie Narodowe w dniu 2 kwietnia 1997 r., przyjęta przez Naród w referendum konstytucyjnym w dniu 25 maja 1997 r., podpisana przez Prezydenta Rzeczypospolitej Polskiej w dniu 16 lipca 1997 r. DzU z 1997 r. nr 78 poz. 483.

the standards of the European Charter of Local Self-Government established in 1985 in Strasburg by the Council of Europe and ratified by Poland in 1994. The communes' access to tax revenue is a result of the distribution of public tasks between the central and local governments as well as of the decentralised public spending, which means transferring to local governments a part of tax autonomy understood as a legally defined set of powers to decide on tax matters (Kornberger-Sokołowska 2001, 18). Just like in other European countries, in Poland this tax autonomy is not complete as it does not include the authority to levy taxes and to define their structural elements (the subject and the object of taxation, tax base, tax rates, the rules for tax relief and tax cancellation), which is a constitutional obligation of the state (Owsiak 1997, 154). The widest scope of tax autonomy, comprising the right to levy their own local taxes, has been given to local governments in the USA (Hyman 1999, 628).

The communes' tax revenues largely depend on the level of their urbanisation. Big cities generate the highest tax revenues, the real property tax and the share in income tax being their largest part. Rural communes are in the most disadvantageous situation, this is why the main source of their income are agricultural and forestry taxes (Etel 2008, 74).

The Polish legislative system encompasses many public tributes linked to the real property market, including its housing segment. With a few exceptions, they go to communes' budgets, being a statutory source of their own revenue (fig. 1 on next page). The scope of the communes' tax autonomy in terms of individual taxes and public law charges is well diversified (tab. 1).

Tab. 1. Classification of taxes and public law charges with reference to the scope of communes' tax autonomy

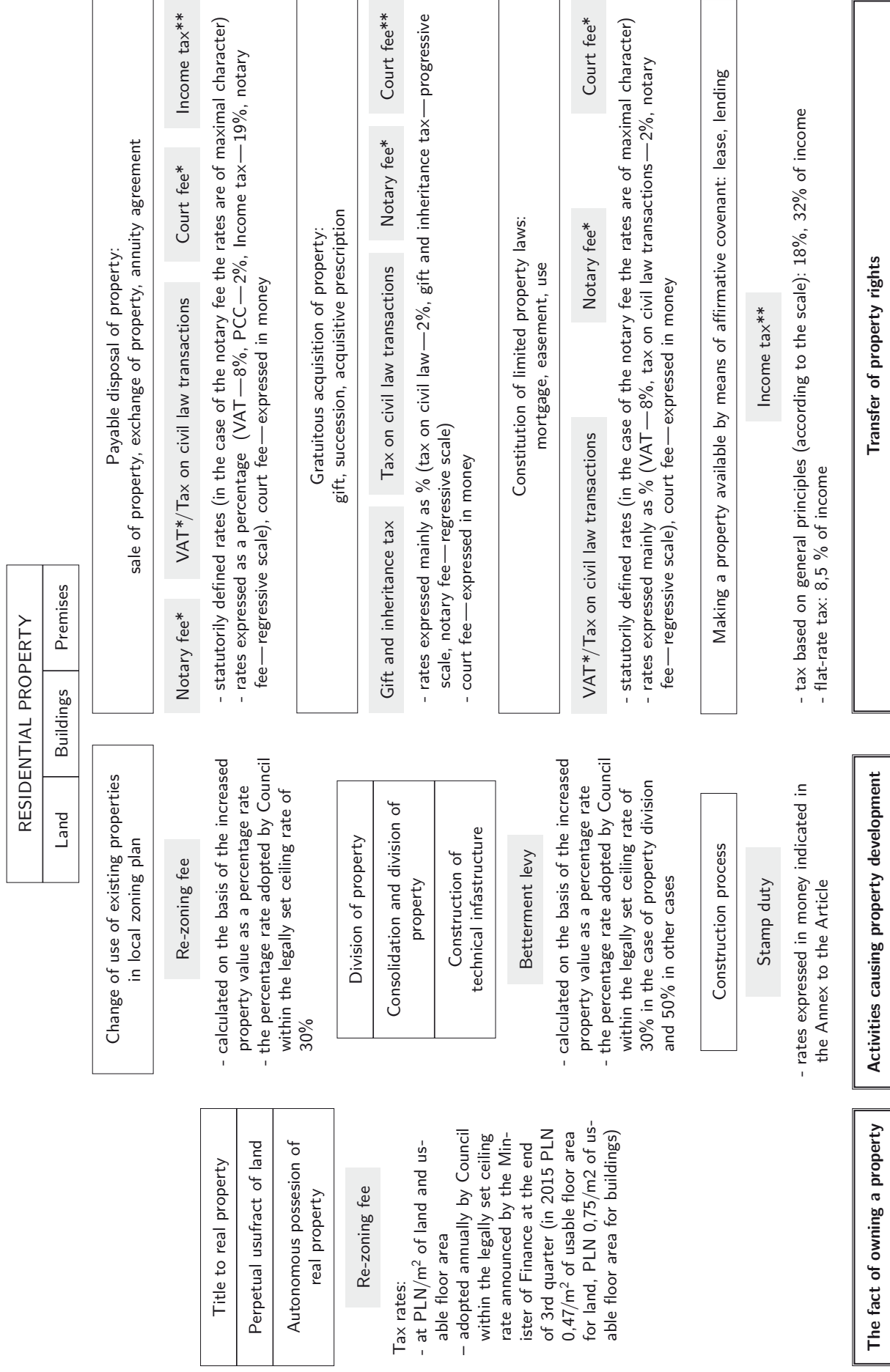| Narrow gminas' tax autonomy	Limited gminas' tax autonomy	Absence of gminas' tax autonomy
• real property tax	• tax on civil law transactions	• income tax
• agricultural tax	• gift and inheritance tax	• stamp duty
• forestry tax		• notary fee
• betterment levy		• court fees
• re-zoning fee		• VAT

Source: Own study based on tax legislation

The first group includes the fees collected by communes and being the source of communes' own income. In this respect the local governments' tax autonomy is narrow—i.e., they can adopt the tax and charge rates as well as grant tax reliefs and exemptions but within the limits set by the state legislation. The second group comprises the fees that also contribute to the commune budgets, but are collected by the national tax administration. In this case local tax autonomy is limited because it is not at the communes' discretion to set the rates of these taxes because they are regulated on the national level. The heads of local governments can merely consent to the tax authority request to write off, defer or agree to payment of due taxes by instalments. The third group are the fees which are excluded from the communes' tax autonomy as they are solely at the national government discretion. These taxes go directly to the central budget. However, as far as the income tax is concerned communes have their share in the national tax revenue.

## 2 Property tax burden borne by residents of voivodship capitals in 2007–2013

For the majority of Polish communes the property tax is the most important of the local taxes. In their statutory capacity concerning the residential property tax rates, in the period of 2007–2013 the local authorities of the cities analysed in this paper implemented diverse tax policies adopting different tax rates on land and residential buildings. The lowest tax rates levied on land used for residential purposes were adopted in Olsztyn, particularly in 2009 when the tax rate was at PLN $0,12/\text{m}^2$ (i.e., lower by 70% than the ceiling rate of PLN $0,41/\text{m}^2$).[8] Other cities with relatively low tax rates (the average of PLN $0,20$–$0,21/\text{m}^2$ over the 7 years of observation) were Rzeszów,

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8. [In the journal European practice of number notation is followed—for example, 36 333,33 (European style) = 36 333.33 (Canadian style) = 36,333.33 (US and British style).—Ed.]

RESIDENTIAL PROPERTY

Land	Buildings	Premises

The fact of owning a property

Title to real property

Perpetual usufract of land

Autonomous possesion of real property

Re-zoning fee

Tax rates:
- at PLN/m^2 of land and usable floor area
- adopted annually by Council within the legally set ceiling rate announced by the Minister of Finance at the end of 3rd quarter (in 2015 PLN 0,47/m^2 of usable floor area for land, PLN 0,75/m2 of usable floor area for buildings)

Activities causing property development

Change of use of existing properties in local zoning plan

Re-zoning fee
- calculated on the basis of the increased property value as a percentage rate
- the percentage rate adopted by Council within the legally set ceiling rate of 30%

Division of property

Consolidation and division of property
Construction of technical infastructure

Betterment levy
- calculated on the basis of the increased property value as a percentage rate
- the percentage rate adopted by Council within the legally set ceiling rate of 30% in the case of property division and 50% in other cases

Construction process

Stamp duty
- rates expressed in money indicated in the Annex to the Article

Transfer of property rights

Payable disposal of property:
sale of property, exchange of property, annuity agreement

Notary fee*	VAT*/Tax on civil law transactions	Court fee*	Income tax**

- statutorily defined rates (in the case of the notary fee the rates are of maximal character)
- rates expressed as a percentage (VAT—8%, PCC—2%, Income tax—19%, notary fee—regressive scale), court fee—expressed in money

Gratuitous acquisition of property:
gift, succession, acquisitive prescription

Gift and inheritance tax	Tax on civil law transactions	Notary fee*	Court fee**

- rates expressed mainly as % (tax on civil law—2%, gift and inheritance tax—progressive scale, notary fee—regressive scale)
- court fee—expressed in money

Constitution of limited property laws:
mortgage, easement, use

VAT*/Tax on civil law transactions	Notary fee*	Court fee*

- statutorily defined rates (in the case of the notary fee the rates are of maximal character)
- rates expressed mainly as % (VAT—8%, tax on civil law transactions—2%, notary fee—regressive scale), court fee—expressed in money

Making a property available by means of affirmative covenant: lease, lending

Income tax**

- tax based on general principles (according to the scale): 18%, 32% of income
- flat-rate tax: 8,5 % of income

* Tributes that are not the source of commune's income. ** The share in PIT (39.87%) and CIT (6.71%) revenue available to communes

Fig. 1. Polish system of real property taxation. *Source:* Own study based on tax legislation

Zielona Góra, Toruń and Opole. Notably, only two cities: Bydgoszcz and Kielce differentiated their tax on land used for residential purposes, granting reduced rates to pensioners (Bydgoszcz) or to the owners of land located in water protection zones (Kielce). But when we analysed the taxation policies of local councils in voivodship capitals, we found out that over the years the disparity among individual cities was gradually shrinking (fig. 2).
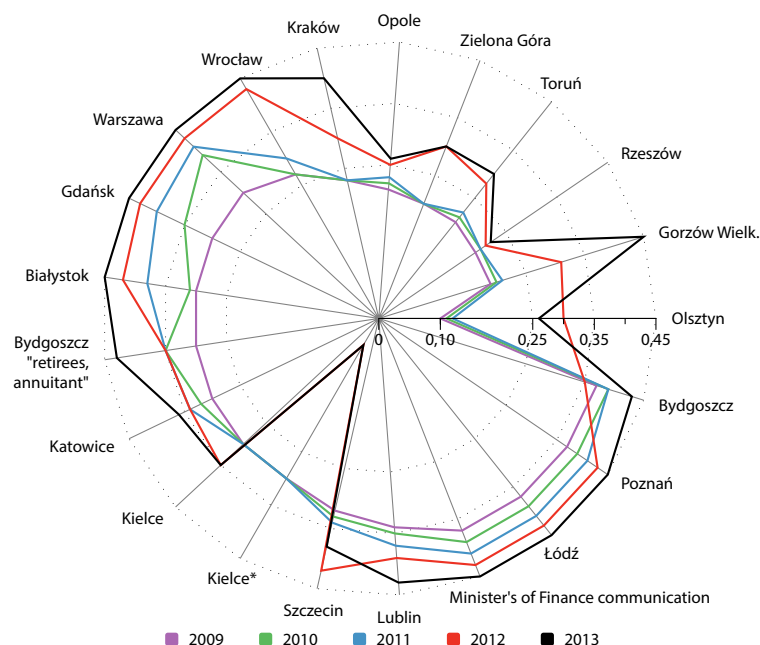
*the area of water intake protection

Fig. 2. Real property tax rates in 2009–2013 levied in voivodship capitals on land used for residential purposes in relation to the ceiling rates (PLN/m^2)

Source: Own study based on the city council's resolutions about the real property tax and on the Minister's of Finance communications about the ceiling rates Of local taxes and charges announced between 2009–2013
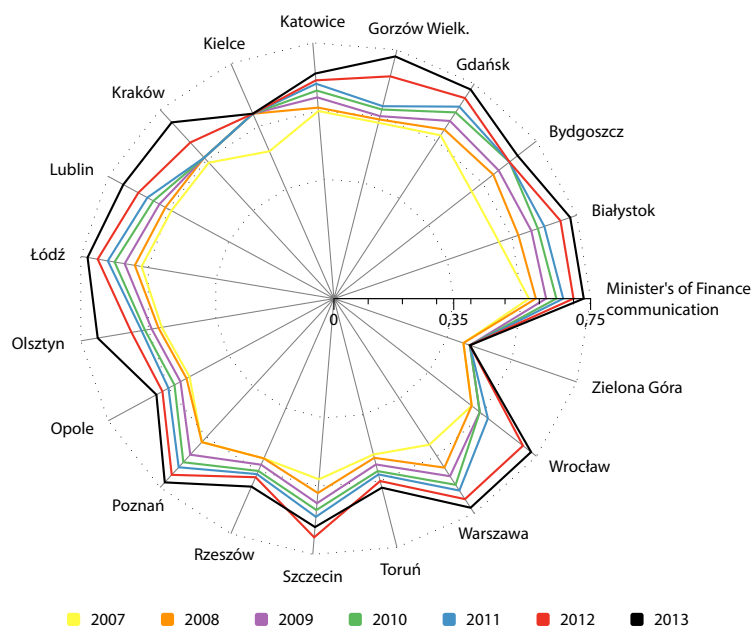
Fig. 3. Real property tax rates in 2007–2013 levied in voivodship capitals on residential buildings and their parts (flats) in relation to ceiling rates (PLN/m^2)

Source: Own study based on the city council's resolutions about the real property tax and on the Minister's of Finance communications about the ceiling rates of local taxes and charges announced between 2007–2013

The average tax rates for residential buildings and their parts (flats) were as follows: in the cities that adopted the ceiling rates (Łódź, Poznań, Gdańsk) — PLN 0,65/m^2, while in the city with the lowest rates (Zielona Góra) it was at PLN 0,41/m^2 (i.e., 36% lower than the ceiling rate). Also in Warsaw the ceiling rates were adopted, except for the year of 2007 (fig. 3).
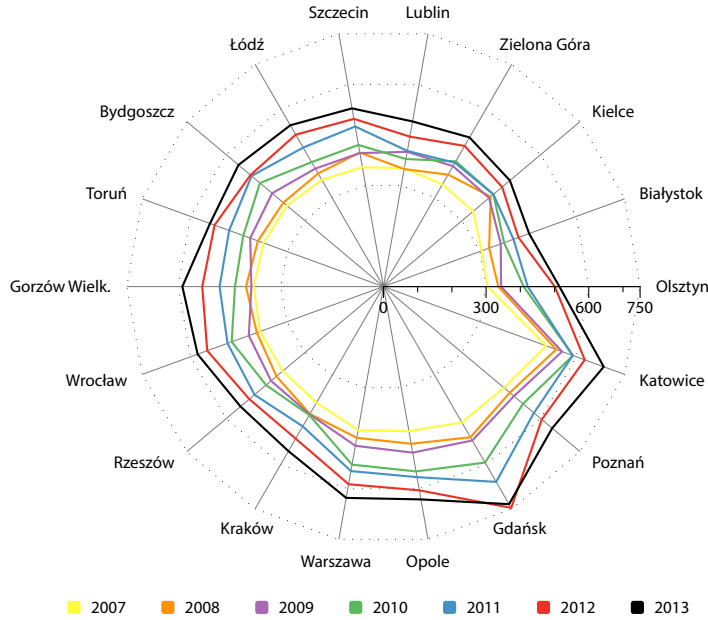

Fig. 4. Real property tax revenue per capita in the surveyed cities in 2007–2013 (PLN).

Source: Own study based on the GUS database
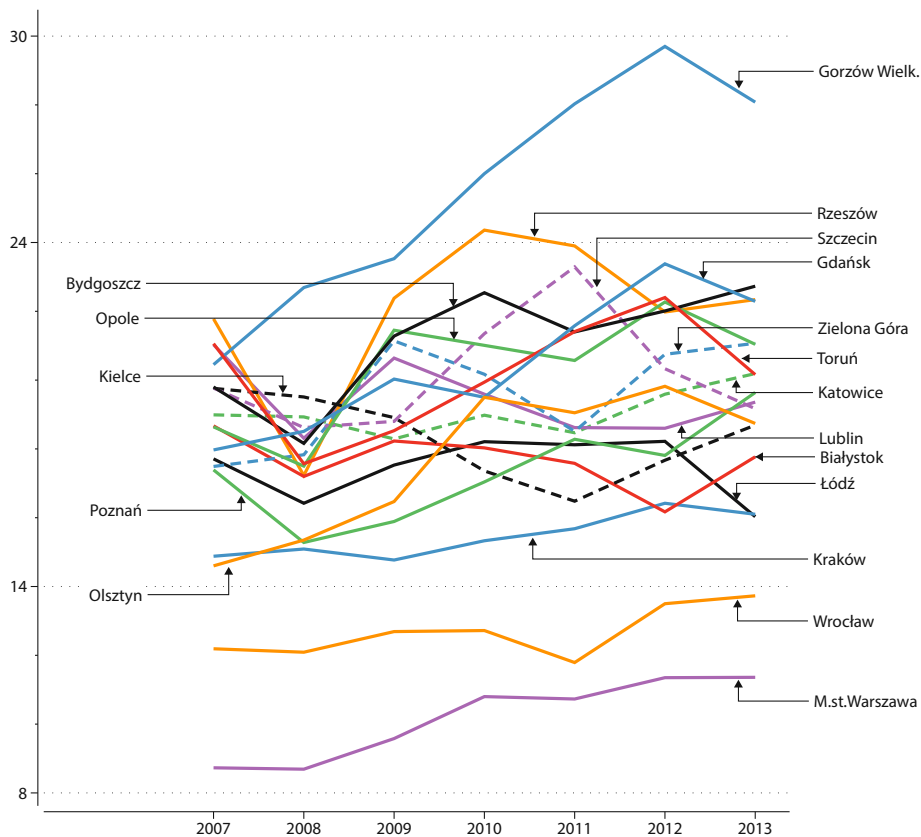
Fig. 5. Share of real property tax revenue in own revenues in 2007–2013 (%)

Source: Own study based on the GUS database

The group of cities that adopted tax rates close to the ceiling values included Białystok, Szczecin, Bydgoszcz, Lublin and Katowice. The lowest rates were used in Zielona Góra, with the most striking difference seen in 2013 when the local property tax rate on residential buildings fell to PLN 0,42/m^2, which accounted for 42% of the ceiling rate of PLN 0,73/m^2. Toruń, Opole and Rzeszów also adopted relatively low tax rates (with the mean value throughout the examined 7 years between PLN 0,52–0,55/m^2). When analysing tax policies in the cities of interest, we can see that over time the disproportions among their tax policies concerning residential buildings were growing deeper, in contrast to those concerning land used for residential purposes.

The above trends in the local tax policies in the surveyed communes resulted in their increased real property tax revenue per capita: from the average of PLN 390,83 in 2007 to 566,44 in 2013, which meant a 45% jump. Their mean real property tax revenue per capita in 2007–2013 was PLN 470,79, which was higher by 17% than the index for the Polish communes in general (PLN 402,18) and by 0,18% more than the index for the Polish urban communes (PLN 469,93). In 2007–2013 the highest average real property tax revenue of PLN 602,82 was reported in Gdańsk (fig. 4). The lowest mean real property tax revenue of PLN 378,80 per capita was observed in Białystok, followed by Lublin and Kielce with PLN 402,27 and 404,30, respectively.

The changing levels of the real property tax revenues in relation to the cities' own revenues are presented in figure 5. When analysing the share of real property tax revenues in the surveyed cities' own revenues we can see how diversified this index was over the 7 years of survey: from 10% in Warsaw to 25% in Gorzów Wielkopolski. In eight of the cities the average real property tax revenues ranged from 20% to 25% of their own revenue (for example, Gdańsk, Szczecin and Toruń). In Warsaw, Wrocław and Krakow the index was lower than 15%. Throughout the period of study the average index grew by one percentage point from 18% in 2007 to 19% in 2013.

3 Development of housing markets in voivodship capitals in 2007–2013

The communes' powers and obligations encompass not only the management of their housing stock, but also the establishment of favourable conditions for the growth of their housing markets. The situation on these markets depends on numerous factors. According to Kałkowski (2001, 159) the housing market is influenced by factors which are shaping the quality of such its elements as "demographic features of a local community, the affluence of local residents and businesses, the system of legal regulations and the set of economic instruments in common usage." Many authors (e.g., Foryś 2011; Gdakowicz and Hozer 2012; Kucharska-Stasiak 2006; Lis 2012; Siemińska and Rymarzak 2015; Załęczna 2004) point to the factors having a positive effect on the housing market dynamics. These comprise high economic activity, falling unemployment rate, low inflation and the availability of loans. In research papers the requirements for the growth of this particular market are often considered from the angle of market mechanisms with a focus on tensions between supply and demand (Belniak 2008, 7; Gawron 2011, 12–14; Łaszek, Augustyniak, and Widłak 2009, 15–21). The very presence of factors that contribute or pose obastacles to the growth of residential property markets may either encourage investment decisions or hinder the development of these markets.

Regarding the research objective adopted hereby, we decided to concentrate on the principal factors that determined the growth of the observed housing markets. Each surveyed city was described by means of the following variables:

x_1—the number of flats per 1000 population

x_2—the average flat size (m^2) per person

x_3—the average number of tenants per flat

x_4—the number of completed flats per 1000 population

x_5—the number of completed flats per 1000 of marriages

x_6—the average usable floor area of a completed flat (m^2)

x_7—income availability measured with the ratio of average gross monthly remuneration in enterprises sector to average price of usable floor area in m^2 on primary market,

x_8—the number of transactions per 100 completed flats

x_9 — the effect of residential construction sector as the percentage of total housing stock
x_{10} — the share of the registered unemployed in the number of the working age population (%)
x_{11} — building permits for new residential buildings in total per 1000 population
x_{12} — internal migration balance
x_{13} — natural growth per 1000 population
x_{14} — total working age population share: 15–59 aged women, 15–64 aged men

In 2007–2013 Warsaw and Łódź had the largest housing stock per 1000 population, while the smallest was reported in Rzeszów. Warsaw also enjoyed the biggest number of newly-built flats whereas the fewest flats were completed in Rzeszów. In 2013 all the voivodship capitals saw the deepest drop in the number of new flats offered on the primary market. The reasons for that included the end of the governmental programme "Rodzina na Swoim" (Family on Its Own, by 31 December 2012) — the new programme "Mieszkanie dla Młodych" (Flats for the Young) had not been launched yet (to be in effect from 1 January 2014 to 30 September 2018). The average usable floor area of flats offered on the market rose slightly by 1 to 4 m^2. Moreover, the newly completed flats had increasingly smaller floor area with the exception of Wrocław where the average usable floor area grew by 10,7 m^2. The shrinking size of new flats was the effect of changing market demand. Between 2007 and 2013 the majority of building permits (75%) was given to individual investors. The biggest number of permits for family houses were issued in Łódź, Rzeszów, Opole, Toruń, Olsztyn, Kielce and Zielona Góra. Also, these cities reported the lowest average prices of usable floor area in m2 and the lowest gross monthly remuneration. In the same period of time, most of the voivodship capitals saw a systematical worsening of their demographic situation signalled by the slowdown of natural growth per 1000 population. The most dramatic slump was observed in Łódź, where there was a fivefold (in 2013 — sixfold) increase in the negative value of the natural growth rate per 1000 population in comparison to other surveyed cities. Lublin, Rzeszów, Białystok, Zielona Góra and Olsztyn saw a positive natural growth, but it was still significantly lower than in 2009. Other negative demographic trends included the growing share of people in retirement age, which signalled gradual ageing of the population in the voivodship capitals. At the same time the percentage of people of working age had fallen (with the sharpest decline of almost 7% in Kielce). Since 2009 the majority of the cities saw the deteriorating rate of marriages per 1000 population. What is more, as a consequence of the economic slowdown, the situation on the job market worsened and the unemployment rates went up. On the other hand, the income availability of housing improved as in the period of 2010–2013 the average gross monthly salary went up while the average price of 1 m2 of usable floor area went down, thus improving the income availability index. The sharpest increase by 16% was reported in Katowice and Bydgoszcz. At that time Katowice enjoyed a high average gross monthly salary and low flat prices by a square meter. The downward trends in the income availability of flats were observed in Rzeszów and Poznań (a 5% decrease each) and in Gdańsk (a 10% decrease).

When summing up the above presented dynamics of factors illustrating the situation on the observed housing markets, it seems justified to say that in the analysed period of time the scale of development of the residential construction sector was diversified. The markets were strongly affected by local demographic and economic factors.

4 Voivodship capital cities ordered according to the development level of local housing markets

In pursuance of linear ordering of the surveyed cities by the size of their residential propert markets in 2007–2013 we determined the values of the relative development level indicator. In order to do that we identified the features that were destimulant and those that were stimulant for the evaluation of a given phenomenon. The features that described the unemployment rate were regarded as the destimulants, while the remaining features — as stimulants. For the sake of the comparability of features, we conducted a process of standardisation (Strahl and Walesiak 1997, 71). The value of the relative property market development indicator was calculated as an unweighted average of the standardised features multiplied by 100. The resulting indicator values are shown below (fig. 6).
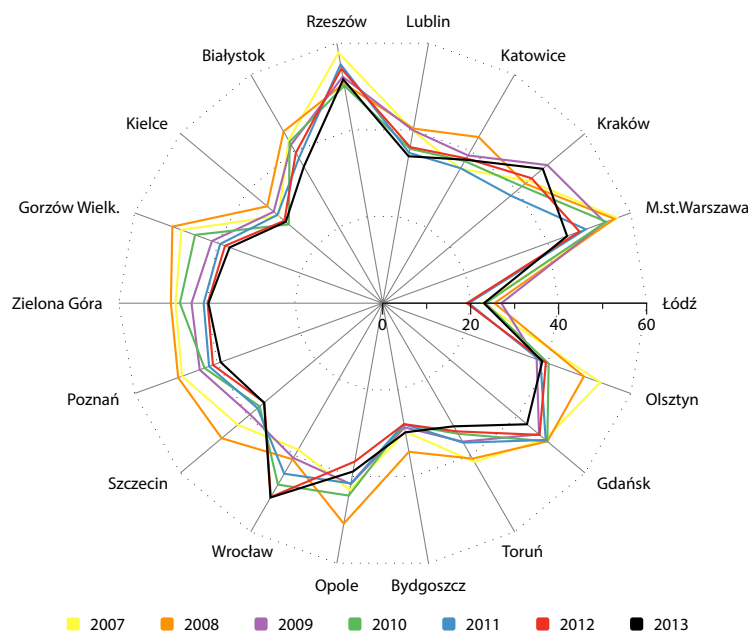
Fig. 6. Indicator of relative property market development in 2007–2013

Throughout the whole period of study the best situation on the housing markets was observed in Warsaw and Rzeszów, joined by Wrocław in 2011 and 2012. The city with the lowest rate of housing market development was Łódź outscored by Kielce and Toruń.

In the subsequent stage of the study, we looked for the cities with similar characteristics and indentical trends on local housing markets. With this view, we conducted a cluster analysis by means of the Statistica package. As the agglomeration method we applied Ward's method using the squared Euclidean distance. Even though we used the same set of variables for each of the analysed years, the obtained classification was not homogenous. After segregation, in each year we distinuished two clusters. Nevertheless, there was a minimum likelihood of classifying the cities to the same clusters. A more accurate characteristics of the clusters was obtained after the analysis of variance. At $p = 0,05$ the results of the analysis of variance indicated the variables that significantly diversified the clusters of cities. On the basis of the mean variable values the obtained clusters were characterised (tab. 2).

Tab. 2. Characteristics of city clusters

2007		
Cluster 1	Olsztyn, Poznań, Gdańsk, Kraków, Warsszawa	cities at a higher level of housing market development, with a larger number of completed flats in total and per 1000 married couples
Cluster 2	Rzeszów, Opole, Bydgoszcz, Kielce, Wrocław, Toruń, Gorzów Wielkopolski, Białystok, Szczecin, Zielona Góra, Lublin, Katowice, Łódź	cities at a lower level of housing market development, with a larger working-age population and a higher share of the registered unemployed members in this population group
2008		
Cluster 1	Olsztyn, Gorzów Wielkopolski, Gdańsk, Toruń, Wrocław, Kraków, Warsszawa	cities at a lower level of housing market development, with a larger average floor area in completed flats and where the average gross monthly salary could buy more floor area
Cluster 2	Opole, Szczecin, Rzeszów, Bydgoszcz, Kielce, Zielona Góra, Białystok, Poznań, Katowice, Łódź	cities at a higher level of housing market development, with more completed flats per 1000 population and per 1000 married couples

Tab. 2. (continued)

	2009	
Cluster 1	Kraków, Warszawa	cities at a higher level of housing market development, with a larger housing stock per 1000 population; more completed flats per 1000 population and 1000 married couples; more building permits and sold flats per 100 completed flats; and a higher positive migration rate
Cluster 2	Gdańsk, Wrocław, Poznań, Rzeszów, Bydgoszcz, Olsztyn, Toruń, Zielona Góra, Gorzów Wielkopolski, Kielce, Białystok, szczecin, Lublin, Katowice, Łódź	cities at a lower level of housing market development, with a higher average number of tenants per flat and with a higher unemployment rate in the working-age population group
	2010	
Cluster 1	Wrocław, Gdańsk, Poznań, Kraków, Warszawa	cities at a lower level of housing market development, with a higher average number of tenants per flat, with more completed flats with floor area larger than average and with a higher unemployment rate in the working-age population group
Cluster 2	Rzeszów, Olsztyn, Opole, Zielona Góra, Białystok, Toruń, Bydgoszcz, Szczecin, Kielce, Lublin, Gorzów Wielkopolski, Katowice, Łódź	cities at a higher level of housing market development, with more completed flats per 1000 population and 1000 married couples
	2011	
Cluster 1	Rzeszów, Bydgoszcz, Opole, Szczecin, Zielona Góra, Gorzów Wielkopolski, Białystok, Kielce, Lublin, Wrocław, Poznań, Gdańsk, Olsztyn, Toruń, Kraków	cities at a higher level of housing market development, with the largest population in working age, a positive natural increase rate and with a higher average number of tenants per flat
Cluster 2	Warszawa, Katowice, Łódź	cities at a lower level of housing market development, with larger housing stock per 1000 population and a negative natural increase rate
	2012	
Cluster 1	Poznań, Wrocław, Gdańsk, Kraków, Warszawa	cities at a higher level of housing market development, with larger housing stock per 1000 population, more completed flats per 1000 population and 1000 married couples, and more sold flats per 100 completed flats
Cluster 2	Rzeszów, Olsztyn, Toruń, Białystok, Opole, Zielona Góra, Gorzów Wielkopolski, Bydgoszcz, Kielce, Szczecin, Lublin, Katowice, Łódź	cities at a lower level of housing market development, with the largest working-age population with the highest unemployment rate, and with a higher average number of tenants per flat
	2013	
Cluster 1	Wrocław, Poznań, Gdańsk, Kraków, Warszawa	cities at a higher level of housing market development, with larger housing stock per 1000 population, more completed flats per 1000 population and 1000 married couples, more sold flats per 100 completed flats, and a positive migration rate
Cluster 2	Rzeszów, Opole, Szczecin, Bydgoszcz, Zielona Góra, Gorzów Wielkopolski, Kielce, Toruń, Białystok, Olsztyn, Lublin, Katowice, Łódź	cities at a lower level of housing market development, with a higher share of the registered unemployed in the working-age population group, a negative migration rate, and a higher average number of tenants per flat; prices of m^2 of floor lower than in other cities translated to a higher income availability of accommodation

5 Study into the Correlations Between Tax Policies and the Situation on Local Housing Markets

Due to the local character of housing markets resulting from the fact that a property is permanently tied to the land it stands on, in the last stage of this analysis we determined the effect of residential property tax policies implemented by city councils in the voivodship capitals on the development of local housing markets. Therefore, we looked for correlations between the residential property tax rates adopted by the city councils in 2007–2013 (for residential buildings (sb) and for plots of land used for residential purposes (sg)), and the relative property market development indicators. In order to visualise the interrelations between the variables (sb/sg and wr) we used spread plots. The plots showed that in each of the observed years there was no correlation between the relative property market development indicators and the residential property tax rates. What indicates the absence of relationships between the above variables are the positions of points corresponding to individual values of the pair of variables. The points form an irregularly shaped "cloud". Since in each of the analysed years no correlation was reported, we hereby present the examples of spread plots for the first and the last year of the period under study (i.e., for 2007 and 2013) (fig. 7).

The absence of linear correlation between the variables under study (sg/sb and wr), was confirmed by the Pearson linear correlation coefficients and the Spearman rank correlation coefficients. The correlation coefficients were calculated for the significance level at $p = 0,05$. Throughout the whole period of observation the Pearson correlation coefficients ranged between $-0,303$ and $0,042$, which meant no linear correlation between sg/sb and wr. Only once the significant correlation between sg and wr was observed in 2008 when the Pearson coefficient was at $-0,502$, which indicated a moderate negative correlation—i.e., when the rate of property tax on plots of land used for residential purposes was going up, the growth of local housing market was slowing down. The lack
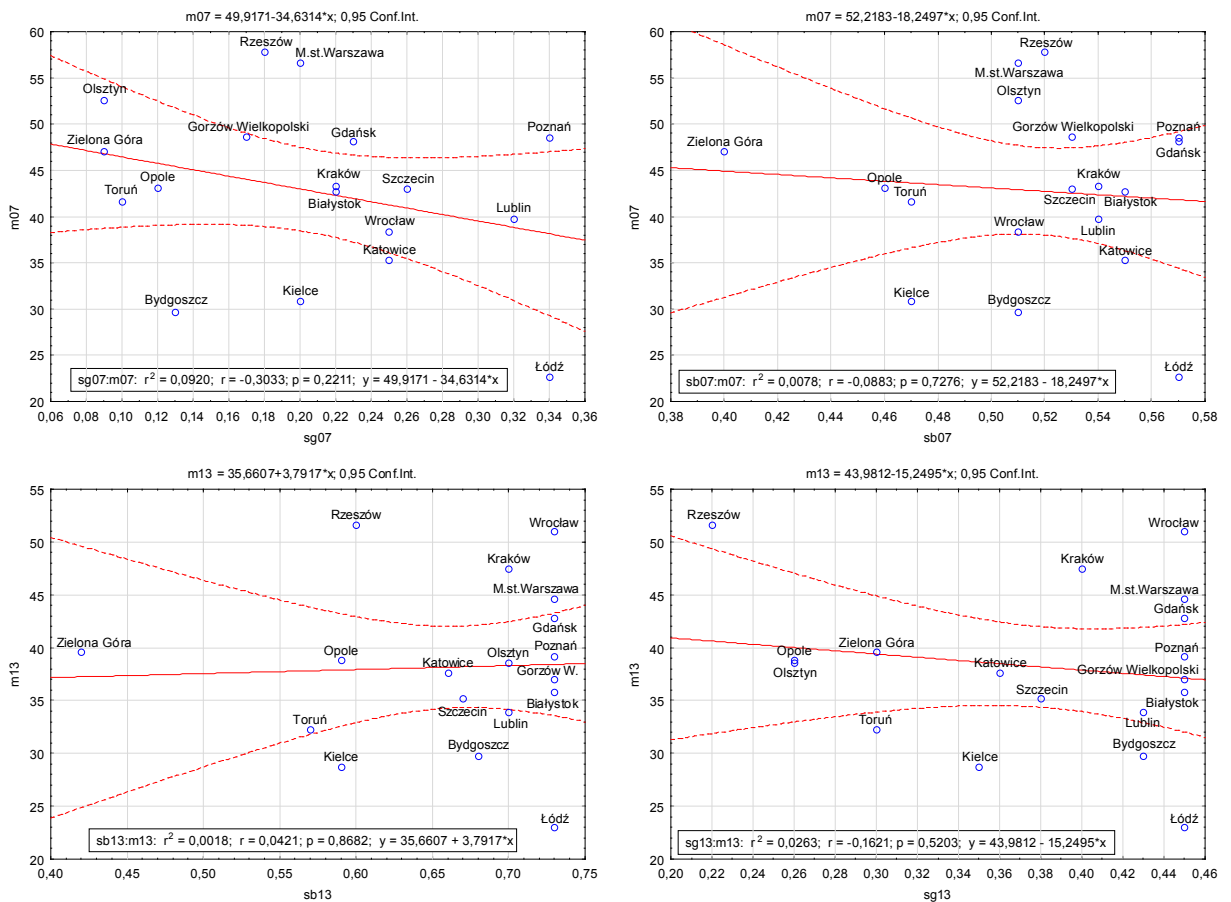

Fig. 7. Spread plots illustrating the correlation between residential property tax rates for residential buildings (sb) and for plots of land used for residential purposes (sg), and a relative property market development indicator (wr) in voivodship capitals in 2007 and 2013

of that relationship was also confirmed by the values of the Spearman rank correlation coefficients. In all the years of interest their values ranged between −0,320 and 0,154. The only exception was the year of 2008 when there was a significant correlation between sg and wr. The Spearman coefficient was at −0,493, which meant that the increased property tax on land used for residential properties inhibited the growth of local housing markets. The above situation should be regarded as incidental because it did not recur in the subsequent years.

The obtained results allow for the conclusion that the property tax policies adopted by local councils in the Polish voivodship capitals between 2001–2013 did not have any effect on the development of their housing markets.

Summary

Polish legislature has assigned the mission to satisfy local housing needs to local councils (i.e., to communes). Their responsibility is not only to administer their housing stock, but also to create a supportive environment for the development of diverse forms of housing construction. An important tool given to local governments to encourage the growth of local housing markets is their capacity to implement their own tax policies. Their partial tax autonomy offers them an opportunity to influence the behaviour of the local housing market participants. The outcome of the above statistical analyses did not show any statistically significant effect of the rates of local taxes levied by communes on residential buildings (sb) and on the plots of land used for residential purposes (sg) on the relative indicators of housing market growth in the voivodship capitals in 2007–2013. The above finding was confirmed by the Pearson and Spearman correlation coefficients calculated for all the voivodship capitals throughout the period of 7 years between 2007 and 2013. Additionally, the statistical analyses conducted here have not demonstrated the existence of homogenous clusters of voivodship capitals where the taxation policies adopted by the local authorities in 2007–2013 would have identical effects on the growth of local housing markets. Thus, the obtained results give grounds to reject the research hypothesis suggesting a correlation between the studied phenomena and lead to conclusion that the residential property tax rates adopted by city councils did not impact the decisions made by investors on the housing market. The statutory method employed to calculate the residential property tax rate is neither used by city authorities to impact the growth of local housing market nor constitutes a hindrance to the market's development. Hence the proposed changes to the property tax structure so widely discussed in academic circles might have a significant influence on the growth of local housing markets.

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