



OVERCOMING COMPARISON PROBLEMS AFTER ADMINISTRATIVE TERRITORIAL REFORM IN LATVIA: MUNICIPALITY BUDGET ANALYSIS

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Abstract. This research focuses on period from 2001 to 2011. During this time in 2009 Latvia experienced administrative territorial reform. Before that there were more than 500 first level municipalities (*pagasts* and towns), later – 119 county municipalities (*novads*). This reform creates difficulties in analysing long term regional data as before and after reform territorial borders differ. The goal of this paper is to offer methodology how to compare data about rural territories before administrative territorial reform in Latvia and later formed municipalities.

To test the accuracy of this method of comparison, data about budgets are used to evaluate which factors influence municipality budget expenditures in different years. As influencing factors are tested expenditures in previous years, budget revenue, municipality and parliament elections and others. While assessing data comparison possibilities, calculations are made for full period as well as those periods before and after the reform in such a way analysing variable influence changes and evaluating their strength and stability.

Main novelty of this research is elaborated simple, easy to use system for territory comparison in Latvia before and after administrative territorial reform. It includes summary of main principles for comparison of territories before and after territorial reform that could be used also for other countries. This method is applied to enable budget expenditure comparison by using panel data fixed effects models.

Key words: *administrative territorial reform, local budgets, fixed effects models, panel data*

JEL code: H61, C23

Introduction

In 2009 Latvia finished administrative territorial reform and as a result new regional split was created. Most statistics about municipalities after the reform now is available for three years (2009-2011), some for four years (till 2012), but that is too little for long term analysis. Furthermore, if one wants to compare situation before and after the reform, that is inconvenient as the territorial units has changed.

The aim of this research is to offer methods for comparing data about first level municipalities (*pagasts* and towns) before the reform and the county municipalities after the administrative territorial reform in Latvia. An example of municipalities budgets and information about municipalities' leading parties' connections to parties represented in Saeima and in government is used to illustrate offered methodology.

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To test the validity of the methods offered, data with modified municipality structure are used in a model describing relations of budget expenditures, budget revenue and data from municipality and parliament elections. This example demonstrates of long term panel data usefulness.

Firstly, based on literature review and specific conditions of Latvian data, principles of data modification are chosen and applied for local municipality data before and after the reform. Secondly, modified database is used in panel data fixed effect model analysis for municipalities' budgets.

The main novelty of this research is elaborated simple system for territory data comparison in Latvia before and after administrative territorial reform. Still, when analysing results, caution should be kept as there are many exceptions that applied for particular municipalities. For example, some of them carried out the municipality unification before the set date in 2009 and there were some minor changes in territory pattern also after the reform.

Research results and discussion

To apprehend the topicality of this question, situation with municipality data in Latvia will be described, explaining the need for long term comparison possibilities. Other researches are used in literature analysis to note previous studies and to choose the most appropriate principles that could be applied also for the case of Latvia.

1. Problem description

According to the Law on Local Governments, municipality in Latvia is defined as local administration, which through the citizen elected representation and its established institutions and establishments provides execution of the functions granted to them and those undertaken voluntarily. In this paper by the name "municipality" it will be referred to first level municipalities (*pagasts* and towns) before administrative territorial reform and later – after the reform to county municipalities (*novads*) as well as republic cities, i.e. all will be called in the same name as municipalities. Competencies of municipalities and principles for making their budgets are described in Law on Local Governments and in Law on Budget and Financial Management, and in particularly in the Law on Budgets of Municipalities.

Before the territorial reform in Latvia competences of counties, district cities and municipalities didn't differ and all of them were called municipalities. Districts (*rajons*) had regional self-government status (or regional level local government) status, but republic cities in the same time had both competences. As districts after the reform covers territories of several municipalities, they are excluded from the analysis.

Before the administrative territorial reform territorial division in Latvia was fragmented and it had quite many municipality types. That was one of the reasons for the administrative territorial reform in Latvia. More about the situation in Latvia is discussed in Vanags & Vilka (2005), Vanags et al. (2005) and Pukis (2010). Also taking into account that the number of municipalities was quite large (more than 500), local governance was quite expensive. Pukis (2009) notes that the objectives of the reform in Latvia were to create local and regional governments capable of development, as this idea was supported by the belief in scale economy; another thought that was mentioned was comparison to other EU countries, but the author notes that these benefits can be doubted.

Administrative territorial reform in Latvia was a long term project that finished in 2009 as the fully changed municipality structure was formed in July 2009 and newly elected local governments started their work. Minor reforms with some municipality separation and merging continued, but the base was formed with 118 (later 119) municipalities (including 9 republic cities).



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This reform limits the possibility for long term municipality data analysis as the structure of municipalities changed. Most data before the reform is available at municipality (*pagasts*) levels, but after – in county level (*novads*).

Small municipalities allowed their governance to be close to voters and better understood their preferences. Though there might be positive aspects of small municipalities, therefore for them it was harder to find finance for fulfilling their functions.

Budgets are the best indicator of the decisions made by politicians. As in the municipality level information is available both about revenue and expenditure and expenditure positions that gives opportunities to make in depth analysis looking both at overall tendencies, as well as testing results for particular budget positions, for example, social expenditure.

This analysis uses data on municipality basic budgets published by the Treasury of Latvia and in the reports of State Regional Development Agency of Latvia. Data are available for the period 2001-2011. As the number of observation (municipalities) is larger than the time period, short data panel is formed.

During the analysed time frame there have been three local government elections (in years 2001, 2005 and 2009) and four Saeima (parliament) elections (in 2002, 2006, 2010 and 2011). Local government elections in Latvia usually take place in spring, but Saeima elections in autumn, though there might be exceptions. As the 11th Saeima elections in 2011 was held on the ground of the results of the National Referendum on dissolution of previous parliament and was not from the usual Saeima election cycle, it will be tested separately. In the models there will be included proxies indicating the years of local government elections and Saeima elections.

Data about the results of local government elections and Saeima elections are from the Central Election Commission of Latvia; information about the structure of government is from The Cabinet of Ministers of the Republic of Latvia information about the history of government structure. As there is no information exactly which parties formed coalitions in each local government in each period, it is assumed that the leading party in municipality is the same that received the most seats during the local elections.

In local government elections often winning party is some small regional or local party that does not participate in Saeima elections. After the administrative reform situation changes a bit and more of the parties that win in local elections are also those that are represented in parliament.

There is made separate proxy variable also indicating if the leading party in local government also has position in central government assuming that this could increase their ability to influence decision making, therefore this influence will be tested. As the share of municipalities with leading parties also in Saeima or government is low, influence of particular party statistically cannot be tested.

After the reform several municipalities are combined in a single county municipality. Not to lose information about the party connections with Saeima and government, in case if the leading party of any of the previous local municipalities is represented in Saeima or government, this combined observation will indicate connection.

After combination of data on average 41.0% of combined municipalities has at least partial connection to Saeima parties and 33.8% – some connection to government parties. The share of both of these indicators are increasing with time, for example, in 2001 only 9.2% of combined municipalities had connections in Saeima, but after 2011 elections, the share was already 59.7%.

To exclude the influence of inflation, all budget data are deflated (according to Consumer Price Index provided by the Central Statistical Bureau) so they are in the same year prices, also logarithms for revenue and expenditure data are used.

2. Experience in other countries and offered solution

The structure of new administrative territories is described in the Law on Administrative Territories and Populated Areas. It shows which previous municipalities form new county municipalities.



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There have been researches looking for best principles in data modification in case of the changes and in case some data are missing or are assumed to be faulty. Blum (2006) suggests several rules for selecting the best value:

- 1) the majority rule – the selection of the value that most files carry independently;
- 2) the qualitative file rule – testing file and choosing the variable value from the file that is the most reliable;
- 3) the corroborated variable rule – selection of values of variables that on empirical tests are confirmed to be true.

Blum (2006) argues that administrative files support data editing and imputation processes. Author notes that detecting possible errors in data file requires the implementation of logical rules within or between data sets. Also other authors (Barcaroli & D'Aurizio, 1997; Di Zio et al, 2002) note that administrative information can be used to edit data so after this process files are comparable.

There are elaborated three main mechanisms in administrative record editing and imputation (Blum, 2006):

- 1) Enrichment of the relevant information (Roos and Roos, 2001),
- 2) Expansion of the ability to create a relatively accurate reference file,
- 3) Continuous quality assurance performed throughout the statistical production process.

It is noted that all these editing and imputation processes should be done carefully (Holt and Jones, 1998) and data can be linked with information from other sources if available and if they share common characters and involve the same units (Poulsen 1997). Taking into account these guidelines for data editing, few basic rules are offered for Latvian municipality data modification, so that they would be comparable for the longer period of time.

2.1. First principle: previous data summarizing

According to the manual for creating county municipalities (RAPLM, 2009), budgets of the new municipalities is made by summing up budgets of previous municipalities in their territory. Based on the structure how municipalities were combined in new territorial units (available in the Law on Administrative Territories and Populated Areas), local municipality data for the period before the administrative territorial reform is combined. According to this rule author of this paper offers to sum up also previous' years budgets therefore receiving longer term data series that could be used for further analysis.

For example, Jaunpils county (*Jaunpils novads*) was formed from Jaunpils local municipality (*Jaunpils pagasts*) and Viesatu local municipality (*Viesatu pagasts*). From years starting from 2009 there is information about budgets at the level of county municipality. For the years till the administrative territorial reform budgets of Jaunpils and Viesatu local municipalities are combined and analysed together. This data combination extends time period available for analysis to 11 years (not just 3 years of data that are after the reform). Similar modifications are made for budget revenue and expenditures also for other municipalities.

2.2. Second principle: proxy variable combination

There are some variables that cannot be simply summarized as offered in the first point. First of all, those are not-numeric variables. In the case of the example mentioned in this paper these variables are proxies indicating if the leading party of municipality is one of those represented also in Saeima or in government. So this variable can take two values (“Yes” and “No”), that cannot simply be combined by summing them up.

There could be several choices how to combine multiple municipality information in one proxy variable. In this case it is chosen to indicate connection to parties in Saeima or in government if this connection was at least in one of the municipalities that formed county municipality. That could make connection variables less pronounced but at least no information would be lost.



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An example of this proxy information summarization is shown in Table 1. It shows example of municipalities that after the reform form single county (*Kocēnu novads*). There are shown parties that had the maximum seats in these municipalities on a set date (year 2008) and if the same parties were represented in parliament and government. In this case only in one of these municipalities (in *Dikļu pagasts*) winning party is represented also both in parliament and government. In other municipalities winning parties are small regional parties. According to the abovementioned rule, if any of these municipalities has “connections” to parliament or government parties, then also for the combined municipality (*Kocēnu novads*) for year 2008 it is indicated that it has party that is represented in parliament and similarly also in government.

Table 1

Proxy variable combination example. Results for later Koceni county (*Kocēnu novads*) in year 2008

Municipality (<i>pagasts</i>)	Winning party in local government elections	Party represented in parliament	Party represented in government
Bērzaines	“ <i>Par saimniecisko rosību</i> ”	no	no
Dikļu	<i>Apvienība “Tēvzemei un Brīvībai/LNNK”</i>	yes	yes
Kocēnu	“ <i>Kocēni</i> ”	no	no
Vaidavas	“ <i>Jumis</i> ”	no	no
Zilākalna	“ <i>Savam pagastam</i> ”	no	no
Combination results:			
Kocēnu novads	–	yes	yes

Source: author's calculations based on data on results of local government elections (in 2005), government elections (in 2006) from Central Election Commission of Latvia and Cabinet of Ministers of the Republic of Latvia history information.

This illustrative example of specific municipality approves also that as for small municipalities before administrative territorial reform only small share had connections to Saeima or government, alternative principles of showing the connections if all municipalities that form county municipality have these connections, is not reasonable at least for the case of Latvia.

3. Method application in municipality budget analysis

As after modification data covers already 11 periods, that gives a longer time for analysing changes in local municipalities' budgets in Latvia. To show the usefulness of this methodology of combining municipality data into new county level data, panel data fixed effect model describing changes in social expenditures is created. In this article focus is on panel data models described by Greene (2008) and Wooldridge (2010). Methodology of political business cycle theory application in case of Latvia was previously described in Brauksa (2012).

Data about municipality budgets are from reports of Treasury of Latvia. Data are deflated based on consumer price indexes provided by Central Statistical Bureau of Latvia, so to exclude the effect of inflation. For budget revenue and expenditure logarithms are taken. Results of the calculations are shown in Table 2.

Both models include also constant and fixed effect coefficients for each municipality (they are not shown in the table as there are more than 100 municipalities). Model 2 includes also variables showing if leading party in municipality is represented in parliament or in government, though these coefficients are not statistically significant. There are also time fixed coefficients for each year (compared to year 2001 which is taken as a base). As the coefficient for the year dummy is larger, the larger are social expenditure in particular year.



Table 2

Panel data fixed effect model results, impact on budget expenditure

Description	Variable	Model 1 coefficients	Model 2 coefficients
Budget revenue	ln(revenue)	0.511***	0.511***
Dummy variables for years compared to expenditures in year 2001	year 2002	0.006	0.010
	year 2003	0.002	0.006
	year 2004	0.142***	0.145***
	year 2005	0.155***	0.157***
	year 2006	0.208**	0.211**
	year 2007	0.113	0.116
	year 2008	0.043	0.046
	year 2009	0.525***	0.532***
	year 2010	0.818***	0.822***
year 2011	0.843***	0.855***	
Local municipality effects (coefficient for each municipality)		(included)	(included)
Party represented in parliament		(not included)	-0.044
Party represented in government		(not included)	0.035
Constant	const	4.106**	4.103**
Number of observations		1307	1307
R square		0.81	0.80

Source: author's calculations based on data on municipality budgets and elections. Model coefficients statistically significant with (*) 90%, (**) 95% and (***) 99% probability.

According to GDP growth rates (from Central Statistical Bureau of Latvia), negative year-over-year growth (as the signal of crisis) hit Latvia on 3rd quarter of 2008 and these rates remained negative till 2nd quarter of 2010. Unemployment rate increased rapidly (from around 10% before the boom period, 7% in boom years to almost 19% during the crisis. That is reflected also in the results of social expenditure analysis. As the number of unemployed rose, also the need for social expenditure increased and during years 2009-2011 they formed much larger share from total municipality expenditures.

Results confirm political business cycles in Latvia as before local municipality elections (which in Latvia took place in years 2001, 2005 and 2009) and parliament elections (in years 2002, 2006, 2010, 2011) social expenditures increase relatively more than in other years. These results are in line with previous findings of similar models (like in Brauksa, 2012) which were calculated based on unmodified data for the period before the administrative territorial reform. Therefore we can conclude that summing up municipalities' budgets in order to create equivalent of those municipalities that were created after the reform is possible and gives opportunities for longer term analysis.

Conclusions

The two main principles offered for Latvian municipality data comparison before and after administrative territorial reform are (1) previous data summarizing and (2) proxy variable combination. Previous data summarizing are made for budget revenue and expenditure data as similar principle was



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used in changing region and budget structure. As there are also some variables that cannot be summed (like for example, if the variables are not numeric, but logical), principle of proxy variable combination is offered. Avoiding majority rule that could cause the loss of valuable information, this paper offers proxy variable creation if even one of the previous territorial units have particular characteristic.

Results are tested by applying panel data fixed effect models that estimates changes in social expenditures in municipalities depending on budget revenues, year of the expenditure and local municipality effects. Also the effects of local municipalities leading party representation in the parliament and in the government are tested.

Models confirms that expenditures for social aims were higher not just during the crisis years (when the need for these expenditures increased as the number of unemployed and people requiring social help increased), but also during the years before municipality and government elections. That suggests that in Latvia these municipality budget expenditure are influenced not just because overall business cycles, but also so called political business cycles.

Results are in line with previous findings of similar models that were made on raw, unmodified data for shorter time period (before the reform). That allows concluding that offered data modifications allows increasing analysis period and do not cause result distraction. Similar principles as are offered in this paper could be applied also in other countries when analysing data before and after regional reforms.

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