
Creative Accounting in Poland's Sub-Sector of Local Governments

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Abstract:

Purpose: With regard to the import and currency of problems associated with assessing local governmental units' indebtedness, efforts to identify conditions shaping acceptable levels of debt are justified through application of accounting policy instruments. With the above in mind, the primary intentions of this article are to test whether Poland's local governmental units adjust acceptable levels of debt through the use of goals and instruments of accounting policy and to indicate the determinants for applying instruments of accounting policy to adjust allowable levels of debt by local governmental units.

Approach/Methodology/Design: The econometric analysis linked data in time periods with cross-referenced data, creating a cross reference/time attempt. Estimated econometric models based on such data create a group called 'panel data models'. The panel of data for the 130 government units, organized into 6 periods after identifying outliers produced a study sample of N = 678. All calculations for the study were done using the GRETL 2020b program.

Findings: The performed literature review and empirical studies confirmed the primary hypothesis, and as such declare that goals and instruments of accounting policy influence the measure and adjustment of allowable levels of indebtedness by local governmental units.

Practical Implications: The research should be considered in light of the global pandemic. The corona virus pandemic critically burdens the finances of local governments world-wide. Local governments frequently stand 'on the front' in the battle with the corona virus. There is no doubt that there will be subsequent research regarding 'camouflaging' of debt in the financial reporting of local governmental units as long as the pandemic continues.

Originality/Value: This study has shown significant relationship between local indebtedness and accounting policy of these entities.

Keywords: Local governmental units, public accounting policy, public debt.

JEL classification: H63, H74, M41.

Paper Type: Research article.

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1. Introduction

Net assets determine the financial condition of an active entity in the private sector; whereas in the case of a local governmental unit whose primary source of revenue are public levies, one of the deciding factors is maintaining budgetary balance. The objective of private sector entities is based on profits as opposed to local governmental units where the objective(s) is the public interest – delivering public goods and services which establishes the essential differences between public and private sectors. Therefore, the functional effectiveness of local governmental units is not assessed in the categories of profits and losses.

Poland's local governmental units cannot fall under the classification of bankruptcy even though they may have lost solvency. In this case said unit suspends local authority activity and trustee administration is introduced. In order to preclude such eventuality, the state legislature imposes onto local governmental units statutory limits regarding indebtedness. Restricting local government indebtedness prevents excessive liability which in turn hinders performance of statutory obligations of said governments and in the case of extreme cases, leads to insolvency and failure in delivering public services. Poland's local governmental units are mandated to apply approved accounting policy credibly and clearly present financial balances and performance (Accounting Act, Art. 4, Para. 1). The choice of accounting policy is guaranteed to local entities by regulations within the accounting law. In order to effectively take advantage of said law, one should be clear of the policy's impact on financial result and condition of local entities in the context of established goals. Accounting policy should allow greatest latitude to local entities in realizing said goals (Furman, 2011).

With regard to the import and currency of problems associated with assessing local governmental units' indebtedness, efforts to identify conditions shaping acceptable levels of debt are justified through application of accounting policy instruments. With the above in mind, the primary intentions of this article are:

Q1: To test whether Poland's local governmental units adjust acceptable levels of debt through the use of goals and instruments of accounting policy.

Q2: Indicate the determinants for applying instruments of accounting policy to adjust allowable levels of debt by local governmental units.

2. Fiscal Rules for Limiting Debt

As required for various analyses, individual states and international organizations define 'public sector' according to their specific methodologies. The European Union lacks uniform criteria defining public sector entities. The International Monetary Fund defines entities of the public sector as the sector of national and local government institutions (general government), and financial and non-financial public

companies controlled by a state (Government Finance Statistics Manual 2001). The equivalent expression for the Polish '*sektor instytucji rządowych i samorządowych*' is '*general government sector*', understood as a collection of institutions creating a 'government': Poland's finance law labels it as '*sektor finansów publicznych*' ergo '*public finance sector*' (Curristine *et al.* 2007; Boex 2003) offers an interesting definition where he claims the differences of local governments by country results from structural separation and central administration form. However, the obligations and roles of local government remain relatively the same. They are all obligated for performing effective public service and securing facilities for a community, maintaining stability and constitutional jurisdiction. Thus, with the above in mind, local government is dependent on the national government of a given state and its structures, even though the functions of local authorities generally remain similar with respect to serving the community².

Various types of fiscal rules exist regarding debt limits, deficits or expenditures. According to the definition of Kopits and Szymansky (1998), a fiscal rule indicates a permanent restriction to fiscal policy based on budgetary indicators. In many states, fiscal rules are seen as important instruments in addressing the crisis of public finances (Cilak, 2013). The impetus for their introduction into the systems of public finances was the tendency of public administrators to incur budgetary deficits leading to steady indebtedness growth and budgetary expenditures to service and amortize said debts. The essence of fiscal rules is consistent discretionary restriction in fiscal policy (Cilak, 2013). Poland's current regulations impose stabilizing rigor, especially with regard to indebtedness, and budgetary and expenditure balances (Filipiak, 2017).

A key fiscal provision of these rules is the resultant of Art. 243, Para. 1, of the Public Finance Law calculated as follows:

$$\left(\frac{R + O}{Db_i}\right) \leq \frac{1}{7} \times \sum_{i=1}^7 \frac{Db_{ei} - Wb_{ei}}{Db_i} \quad (1)$$

where 'R' is the year's planned gross sum for credit and loan rate payments and purchase of issued securities, excluding credit and loan rate payments and purchase of issued securities appropriately entered into or issued to cover current passing budget deficits of a local government's short term obligations if they require same year amortization in which they were issued; 'O' is the year's planned budgetary current spending to service debt, as in interest for existing credits and loans, interest and discount from securities, and payments resulting from granted sureties and guarantees; 'Db' – year's planned current budget revenues reduced by subsidies and

²At present, *gmina* (municipality), *powiat* (county) and *województwo* (province) are the local governmental units and a three level administrative differential exists. An additional classification, that of *powiat miejski* exists where a larger city consolidates the administration of a county and city(s). See also *powiat grodzki*.

funds earmarked for current purposes; ' Db_{ei} ' – current revenues from previous year i where the relation is reduced by subsidies and current funds for realizing a program, project or financial task with contributions from the EU budget, and funds not subject to return of granted assistance from other European Free Trade Association member states; ' Db_i ' – current revenues of previous year i where the relation is reduced by subsidies and funds earmarked for current purposes; ' Wb_{ei} ' – current spending of previous year i where the relation is reduced by current spending for credit and loan payments, current spending for servicing debt and current spending for realizing a program, project or financial task with contributions from the EU budget, and funds not subject to return of granted assistance from other European Free Trade Association member states.

Poland's literature label the above relation as 'indywidualny wskaźnik zadłużenia' (individual debt ratio) (Denek and Dylewski, 2013; Jastrzębska, 2012; Walczak, 2016).

Local governmental units determining said relation from Art. 243 for 2019, applied the specifications of Art. 243 (Public Finance Law) whose wording precluded approving a budget by a given unit because it would cause that in a budget year, and every year following, the relation of the total sum for a given budget year for credit and loan payments, purchase of securities, potential payments resulting from issued sureties and guarantees to the planned overall budget revenues would exceed the arithmetic mean reached for the three previous years' relation of current revenues increased by revenues from property sales and reduced by current spending, to overall budget revenues, calculated as follows:

$$\left(\frac{R+O}{D}\right)_n \leq \frac{1}{3} \left(\frac{Db_{n-1} + Sm_{n-1} - Wb_{n-1}}{D_{n-1}} + \frac{Db_{n-2} + Sm_{n-2} - Wb_{n-2}}{D_{n-2}} + \frac{Db_{n-3} + Sm_{n-3} - Wb_{n-3}}{D_{n-3}} \right) \quad (2)$$

where ' R ' is the planned budget year sum for credit and loan payments and purchase of securities intended to finance anticipated budget deficits, payment of earlier made obligations, anticipatory financing for EU budget funding, and financing investment undertakings; ' O ' – anticipated credit and loan interest for said budget year, contracted to cover interim deficits during said year, financing anticipated budget deficits, payment of earlier made obligations, anticipatory financing for EU budget funding, and financing investment undertakings, as well as interest and discount of securities issued for such purposes and payments resulting from issued sureties and guarantees; ' Db ' – current revenues; ' D ' – overall budget revenues for given

budgetary year; 'Wb' – current spending³; 'Sm' – revenues from sold properties; 'n' – budgetary year under consideration; 'n-1' – previous year to year under consideration; 'n-2' – second previous year; 'n-3' – third previous year.

3. Creative Accounting in the Public Sector – Literature Review

The literature pertaining to the subject undertaken contains many concepts which are unchangeably used with regards to shaping accounting results e.g., *creative accounting*, *financial engineering*, and the currently preferred expression in the United States (and as such the most prevalent) – *earnings management* (Piosik 2016). Piosik (2016) affects that shaping financial results is a goal, or a collection of goals, accepted by management of a reporting entity and integrated collection of instruments for realization (accounting tied to accepted methods and above all, all estimates in accounting and of tangibles tied to expedited transactions), which lack results indicating short term financial finding known to management. If it was shown in the financial balance, it would be applied in a specified sub-group of objectives and instruments. It is assumed that shaping results is realized in correspondence in accordance with an adopted balance policy of the reporting entity (especially in the area of accounting instruments) and in accordance with accounting law.

However, the intention in gaining the goal(s) in adjusting the financial report and detailed decisions are important in the instruments used in said realization. Adjusting results should be defined as unequivocally harmful in the case where factors are hidden which impact on an entity's value over a longer period of time (Piosik, 2016). Amat and Gowthorpe (2004) perceive the issue as taking advantage of certain instruments of accounting policy to present a particular financial perspective desired by those generating said reports.

With regard to entities of the public sector, it bears noting that their functional goals are decidedly different than those of entities in the private sector. Cai and Wang (2012) note that the goals of the private sector focus on profit, whereas the focus of the public sector units center of activities recognized as public interests – delivery of public goods and services which identifies the entry points of differences between private and public sectors. The functional goal of local governmental units is performing the tasks identified by areas of economic activity. The necessity of performing these tasks result from public need without regard to incurred costs and/or gained revenues by a given unit. Therefore, the effectiveness of local governmental unit cannot be assessed on the basis of profit and loss.

³Art. 9, Para. 2 of the amending law indicates that in the calculations of Art. 243 for 2019, the law for public finance, current budget spending being reduced by expenditures for payments resulting from obligations. undertaken by debtor as referred to in Art. 72, Point 2, regarding current spending for servicing debt and current spending for realizing a program, project or financial task from funds as listed in Art. 5, Para. 1, Point 2.

Reporting can be recognized as the main information source for all users, irrespective of public or private interests. Nistor and Stefanescu (2012) observe that reports are considered key accounting tools in assessing management by various users. Entities of the public sector are not pursuing profits; they endeavor to deliver services to the community maintaining appropriate balance between expenditures and budget revenues. Arcas Pellicer *et al.* (2013) contend that the agency theory may be taken under consideration to describe the relation between a central government and local governments. Both central and local governments can be recognized as involved and maximizing agents. The authors emphasize that public entity administrators, as those charged with responsible reporting, will be encouraged to report balanced results as they are obligated in fulfilling established fiscal principles set by higher authorities, but may also signal accomplishing aims beyond financing or signal effective financial management (Arcas Pellicer, Hodges, and Martí, 2013).

Ferreira *et al.* (2012) report the optimal desired point for presented results appears to be 'just above zero'. 'Near zero' revenues indicate the skill of local politicians to match the level of expenditures with gained revenues. Similarly, Clémenceau and Soguel (2017) showed, on the basis of data from Swiss cantons, the aim of accounting policy is to demonstrate thrift in the management of entrusted public funds. In this context, Stalebrink and Sacco (2007) indicate instead that local authorities may try to report minimal surplus in order to indicate that tax levels were not exceedingly high and spending appropriately controlled.

As research has shown the above to be true, the system which gives budgetary policy the means to adjust reported debt, may be the accounting system which allows for so-called *fiscal illusions* (Easterly, 1999; Koen and van den Noord, 2005), where the adopted goal of accounting policy in local governmental units is maintaining certain fiscal rules. Of the multiple studies performed, the one by von Hagen and Wolf (2006) indicates that of the analyzed years, the divergence between debt growth and deficits is significant. Researchers have confirmed that these adjustments result from issues as (among others), taking advantage of effects of debt measurement, capital funding and privatization of public companies, or transactions involving financial assets.

Similarly, Milesi-Ferretti (2003) noted that in the case of introduced principles of budgetary policy whose purpose was to prevent budgetary abuse, those principles were partially neutralized as a result of creative accounting. Pilcher and van Der Zahn (2010) analyzed the influence of amortization deductions on accounting policy instruments in budget reports. Hirota *et al.* (2017) recognized the fact that many local units are dependent on central government structures for subsidies, and many Japanese local units have large, accumulated debts, declared they had initiated changes in debt not based on budget deficit or surplus levels, but by reducing reserves for obligations. Easterly (1999), and Petersen (2003) further provide other

examples of such instruments in accounting policy such as changed time frames of cash flow.

The main factors in shaping local governmental results through accounting policy, as mentioned in literature, are political factors. A concept proposes that indebtedness can be a consequence of premeditated behavior by politicians where debt studies show, for example, that indebtedness is raised to compromise future administrations (Ashworth, Geys, and Heyndels, 2005). According to Persson and Severson (1989) conservative/liberal administrations collect more/less debt when they know that they will be replaced by liberal/conservative administrators in order to force the next administration to spend less/more. Hodler (2011) suggested a conservative government may strategically manage a budget deficit not only to influence the expenditures of a liberal candidate (of the opposition), but may also influence the results of an election.

The issue of political influence on indebtedness of local governments is also presented by Leonardo and Letelier (2011). During their studies they raised numerous hypotheses. One of them, that conservative coalitions are more inclined to honor the principles of debt. Song *et al.* (2012) developed a dynamic political/economic model for public debt in which administrations use debt to transfer fiscal burden to future generations. The stronger the political power of an old government, the larger accumulated debt.

Empirical results clearly indicate the presence of ‘good-times’ political cycles. Gomes *et al.* (2011) studied to what degree does information from the accounting system influence voter behavior during local re-elections. Their results show that the quality of reported accounting, as well as information regarding financial and economic conditions have a decided influence on election results.

A subsequent question that draws attention in the studies of writers regarding creative budgetary accounting is the aspect of mandated review of financial reports by statutory auditors. Studies in the private sector indicate auditors perform an important role in assuring high quality reporting. Acting as a link between a reporting entity and interested parties, an audit assures that a given financial report is credible (Cassel, 2014). Donatella *et al.* (2018) carried out a study confirming that audits of financial reports acts as a deterrent for creative accounting on local entities in their annual reports.

Brusca *et al.* (2005), stress that accrual-based accounting is characterized with the possibilities of alternative criteria in valuating assets, liabilities, revenues, and costs. As such, the requirement of reviewing financial report should limit subjectivity and discretion of entities generating financial reports and limit the possibility of adopting principles based on artificial improvement of results within the reporting system framework of accrual-based accounting.

Referring to the above issues, it remains to emphasize a factor which currently facilitates loosening local governmental budgetary discipline in many countries. It appears that key motivation for decision makers to manipulate results is elections. Foreign research show that the closer to elections, the greater the probability that there are changes leading to better budgetary results. Connected to the above, the phenomenon of 'fiscal illusion' is noted which distorts rational voter judgement, inclining voters to favor a sitting government. Accounting policy may serve to hide the consequences of various decisions and may enable 'buying' the electorate's voice.

Furthermore, the obligation of financial report review by statutory auditors should limit said manipulation as the objective of the review/audit is, but not limited to, assessment as to whether a financial report contains significant distortion caused by human error or deliberate tampering of chosen line items. Foreign authors' studies confirmed the need for financial report audits with the purpose of prescribing manipulation of reported public debt. In Poland's public finances sector, as mentioned in this work's earlier section, the mandate for auditing financial reports is clearly constrained which may imply wider use of specific instruments of accounting policy in units exempted from review.

4. Objectives and Research Hypothesis

In relation to the accepted concept of applying creative accounting practices in the public sector with the objective of fulfilling active requirements of limiting public debt, this research undertakes to examine said phenomenon, based on data analysis of reports by Poland's local governmental units. The research objectives are:

- Q1: To test whether Poland's local governmental units adjust acceptable levels of debt through the use of goals and instruments of accounting policy.*
- Q2: Indicate the determinants for applying instruments of accounting policy to adjust allowable levels of debt by local governmental units.*

The main hypothesis to be proven: *Goals and instruments of accounting policy influence the appraisal and adjustment of allowable debt of Poland's local governmental units.*

Specific hypotheses to be proven:

- H1: Instruments of accounting policy are used by Poland's local governmental units with the intention of adjusting the allowable level of debt.*
- H2: There exists a correlation between applying accounting policy instruments with the intent of adjusting allowable levels of debt and political factors.*
- H3: There exists a negative correlation between applying accounting policy instruments with the intent of adjusting allowable levels of debt and the requirement of local government units' financial report audits.*

5. Selection of Research Base

The research sample base was local governmental units from województwo (region – largest), powiat (county), and cities with powiat and/or gmina authority. The sample group for analysis was formed as stratified random sampling, where the differential was the rank of authority in local government hierarchy.

The research approach consisted of a two-phase selection sampling using various methods. The objective of these safeguards was to limit the number of analyzed entities for the research and insure the most effective group representation for the sampling conditions. The first phase of selection relied on the differential of authority: (1) gmina (smallest), (2) powiat, (3) cities with powiat authority, and (4) województwo. The scheme of the systematic random selection requires an ordered listing of all entities in said sampling frame numbering each in order (1, 2, 3 ...).

Systematic selection relies on qualification for selection as in ‘every k’ (3rd, 5th, etc.), after randomly establishing the first one. With the above in mind, the initial selection produced 196 entities. As of 2018, all local entities were required to submit electronic reports; some entities did not meet this requirement and were thus stricken from the sample list. Only entities with complete report listings were accepted for analysis. After elimination because of inadequate data bases, the research sample base was 130 entities.

6. Specifications for Regressive Models for Research

Referring to the instruments of accounting policy by other authors, a preliminary selection of regressive models was made. Currently in Poland, in establishing surplus or deficit budget condition in local governmental units, operations pertaining to revenues and expenditures are recorded in registers of separate accounts; actual revenues and expenditures are recorded cash in said accounts, with the exception of detailed operations enumerated in separate regulations (Regulation of the Minister of Finances and Development regarding accounting – Section 5).

The essential operations regarding budget accounting in Poland’s local units are recognized according to cash based accounting rules. In separate accounts of the main register are other recorded non-cash operations as accrual entries tied to revenues and expenditures pertaining to budget operations which do not cause cash revenues in a given year (Regulation of the Minister of Finances and Development regarding accounting – Attachment No. 2). In the year when non-cash operations became required, they burdened budget expenditures or increased revenues in accordance with cash based accounting rules. The accrual rule came into play regarding specified budget entries, such as the narrow category of receivables and financial obligations.

From the point of view of regulations limiting debt levels for local governmental units, it is more advantageous for contracts to fulfill conditions of operational leasing contracts. In the case of financial leasing, both assets and obligations to the lessor require entry into the record of local governmental units and is a condition to take said obligation into account when verifying compliance with public finances pertaining to debt limits. In accordance with Law of amending the public finance (Law amending, Art. 9) leasing operation obligations entered into in budget planning, individual debt ratio estimation is being introduced; however, to the combined sum of a given year, payments and buy-outs are not included to the sums resulting from obligations entered into for this purposes before the effective date of the modifying law. It should be noted that entering into this type of obligation i.e. operational leasing, may further be an advantageous influence in fulfilling Regulations of Article 243, of the law regarding public finances ($LEAS_{i,t}$).

Regarding the ability of local governmental units to adjust debt, attention should be directed to so-called non-standard financial instruments. Identified in public finance regulations as innominate contracts with a redemption date of more than a year tied to financing service, supply, or construction which have economic consequences similar to loans or credits (Niestandardowe instrumenty finansowe, 2016). Alternative financing instruments for local governments ($DEBT_PRO_{i,t}$), as presented by Jastrzębska (2017) this work will focus on, among others, factoring agreements, securitization, leaseback, reverse sale, subrogation, capitalization, and public-private partnerships.

The category of non-expiring expenses, introduced into the budgetary economy, may be a positive tool rationalizing budgetary spending through increasing the flexibility in meeting a budget ($NON_EXP_{i,t}$). The non-expiring established at the end of a budget year cause in-fact spending in the next budget period, however, this spending lowers the budget surplus as planned for a given year. Thus, such undisbursed portions of these expenses artificially impact the raising of operational surplus in the next budget year.

Furthermore, by using one-off redemption write-offs for fixed assets and intangible fixed assets, a local government, changing the sum limit for classification of fixed assets and intangible fixed assets (lower than specified in the tax code), may influence reported current spending, and by that adjust the operating surplus of the budget ($DEP_{i,t}$). This category enables capability assessment of a local unit's ability to pay debts, and the possibility of choice by a local unit's manager with regard to accounting policy, in the above case, can shape the debt level as defined in Art. 243 of the public finance law. With the above in mind, in completing the independent variable of the regression models, will be the variable referring to measuring

principles i.e., taking advantage of non-expiring expenses and the existence of required liabilities ($LIAB_DUE_{i,t}$).⁴

As a determinant for adjusting acceptable indebtedness levels of Poland's local governmental units, political considerations ($ELECT_{i,t}$) and statutory audits ($AUDI_{i,t}$) will be examined. Regarding the variable reflecting political influence, as dictated by literature on the topic, activities in election years will be analyzed. In his studies, M. Clémenceau (2014) proposes a regression model where an independent variable reflecting election years. Gomes *et al.* (2011) also researched to what degree information arising from accounting systems influences voter attitudes toward local authorities during election years. Results show that financial and asset bases have decided impact of election results. With this in mind, the present regression model contains an independent variable reflecting Poland's local elections for 2014-2019, inclusive.

Furthermore, another incorporated independent variable was included, that of governmental units required to have audits by statutory auditors. Poland's local governments are exempted from the principle and legal requirement of audit and advertising financial reports. The public finance law instructs however, that local governmental units must undergo statutory audits annually when the number of residents – as established by Poland's Central Statistical Office on December 31 of the previous year – exceeds 150,000 (Public Finance Law, Art. 268). Thus, population is accepted as an additional variable for indicating statutory audits for the model at present.

Current literature foresees that local governmental units in Poland will use instruments of accounting policy in avoiding over-shooting certain fiscal regulations. In Art. 243 of the law for public finances regarding indebtedness limits for local governments, stresses the volume of payments for credits and loans, purchase of bonds, payment of debt resulting from granted sureties and guarantees, along with charges in a given year to service said obligations and operational results of a given unit. Thus, the dependent variable will be the relation between operational budget surplus of i unit in year t , scaled according to general revenues from year t , to the volume of rate payments and repurchases defined in the public finance law, Art. 243, of i unit in year t , scaled by general revenues of year t .

The data used for analysis is derived from 130 local units in Poland, and all were examined for 2014-19, inclusive. The econometric analysis linked data in time periods with cross-referenced data, creating a cross reference/time attempt (Welfe 1977). Estimated econometric models based on such data create a group called

⁴Because of a lack of sufficient data regarding shifting payments resulting from supplies and services, shifting current spending for renovations, and shifting expenses to community corporations, it was impossible to include these variable in the model.

'panel data models' (Greene, 2003; Baltagi, 2008; Mátyás and Sevestre 2008; Andreß, Golsch, and Schmidt-Catran 2013).

These studies are based on majority accomplishments for 4th quarters in 2014-2019, inclusive. In the first phase of said studies, the various variables were specified (Table 1) which could decidedly influence analysis of the model's explanatory variable.

Table 1. Selected variables

Variable symbol	Description
Dependent variable	
$IND_{i,t}$	Ratio of budget operational surplus of i unit in year t , scaled general revenues from year t to volume of payment rates and purchases ⁵ as defined in Art. 243, i unit in year i , scaled general revenues from year t
Control variables	
$INC_CURR_{i,t}$	Current revenues of i unit in year t , scaled general revenues from year t
$EXP_CURR_{i,t}$	General current payments of i unit in year t , scaled general revenues from year t
$INC_PROP_{i,t}$	Fixed asset revenue of i unit in year t , scaled general revenues from year t
$EXP_PROP_{i,t}$	Fixed asset spending of i unit in year t , scaled general revenues from year t
$FREE_CASH_{i,t}$	Free resources i unit from year t , scaled general revenues from year t
$REV_{i,t}$	Revenues from credits, loans, issued bonds of i unit from year t , scaled general revenues from year t
$SUR_RES_{i,t}$	Budget surplus of i unit from year $t-1$, scaled general revenues from year t
Independent variables	
$DEBT_PROP_{i,t}$	Qualitative variable with a value of 1, if assets spending occurs to pay-off budget debt of i unit in year t ; otherwise a value of 0.
$dt_{(1, 2, 3, 4, 5)}$	Zero-one variable for time – stable effects for model
$DEP_{i,t}$	Qualitative variable having value of 1 when unit established one-time lower limit threshold value for writing-off remaining fixed and intangible assets; otherwise a value of 0.
$LEAS_{i,t}$	Qualitative variable having value of 1 when unit shows obligation totals originating from operational leases in accordance with tax regulations – if by accounting regulations, then financial leasing; otherwise a value of 0.
$LIAB_DUE_{i,t}$	Qualitative variable having value of 1 when unit encounters debt maturity; otherwise a value of 0.
$\ln\text{Pozycja}$	Natural logarithm for a chosen item.
$NON_EXP_{i,t}$	Qualitative variable having value of 1 if unit encounters unused allocated expenditure which did not expire in previous budgetary year; otherwise a value of 0.
$ELECT$	Qualitative variable having value of 1 if year is election year; otherwise a value of 0.
AUD	Qualitative variable having value of 1 if local governmental unit is required to have statutory audit; otherwise a value of 0.
$YEAR$	Defining variable for time period in one-way random effects model.

Source: own study

⁵Payments of credits and loans and purchase of issued bonds intended to finance budget deficits, early pay-offs of obligations, anticipatory financing financial activity from EU funds (in kind funds) and financing investments including interest from taken credits and loans to cover temporary budget deficits, financing budget deficits, as well as interest and discounts of issued bonds for these purposes and payments resulting from issuing sureties and guarantees.

All calculations for the study were done using the GRETL 2020b program. Variables expressing the amount of current revenues ($INC_CURR_{i,t}$) and current expenditures ($EXP_CURR_{i,t}$), because of low coefficients of variation, were excluded from further study. Similarly, the $SUR_RES_{i,t}$ variable was also excluded as the coefficient of variation for it was 5.125. The variable $DEP_{i,t}$ receiving a value of 1, in the case where a local unit established a lower value limit for classification of fixed and intangible assets as a single write-off for these components; a zero value in the opposite condition after a frequency analysis and was completely excluded from the completed regression models because of a lack of variation for the studied variable for specified units in the accepted period of years.

The next step involved using the set of independent variables for the multiple regression panel model. The procedure of stepwise regression allowed identification of determinants with maximum correlation for the explanatory variables of the original list, and smallest correlation with the remaining explanatory variables (Stanisz 2007, p. 138). The panel of data for the 130 government units, organized into 6 periods after identifying outliers produced a study sample of $N = 678$.

With the intention of verifying hypotheses H1, H2, and H3 in a multi-factor analysis shaping the left and right sides of individual debt indicators in the defined period of years, a multiple dependency regression model influencing specific instruments of accounting policy accepted as independent variables scaled by revenues in general i.e. debt amounts whose payment was made from budgetary expenditures, obligation amounts resulting from leases when a unit qualifies the leasing contract in accordance with tax regulations (operating lease) where according to accounting regulations it would be a finance lease, the existence of funds established in the previous budget expenditure year as non-expiring, the existence of maturing liabilities at the end of the current budget year and control values for the dependent variable $IND_{i,t}$.

It is assumed that when a local unit undertakes to adjust an individual debt indicator, it defines its accounting policy towards paying-off its debt through budget expenditure as non-expiring expenditure from the previous year (as current expenses), increasing the value of an operating lease and evident maturing liabilities. Thus, expected signs while assessing the model parameters, will be positive for all of the above variables.

In addition, in defining the determinant of adjusting debt and the verification of hypotheses H2 and H3, variables $ELECT$ and AUD will be added to the model. Explanatory variables used in the models were converted into logarithms which limited the problem of heteroscedasticity and improved the range for the rest of the model and made interpretation of results easier in view of logarithmic function properties. The control variables of the model were equally retarded by $t-1$, in view of the possible influence of these variables from a previous period on the realized

range of debt payment t . The resulting regressive model is presented in the following equation:

$$\begin{aligned} \ln IND_{i,t} = & \beta_0 + \beta_1 \ln REV_{i,t} + \beta_2 \ln REV_{i,t-1} + \beta_3 \ln INC_PROP_{i,t} + \\ & \beta_4 \ln INC_PROP_{i,t-1} + \beta_5 \ln EXP_PROP_{i,t} + \quad (3) \\ & \beta_6 \ln EXP_PROP_{i,t-1} + \beta_7 LEAS_{i,t} + \beta_8 DEBT_PROP_{i,t} + \beta_9 LIAB_DUE_{i,t} + \\ & \beta_{10} NON_EXP_{i,t} + \beta_{11} ELECT + \beta_{12} AUD_{i,t} + \varepsilon_i \end{aligned}$$

The next step of the analysis checked the correctness of applying estimated method of least squares. In the performed statistical diagnostic tests, the Wald test totaled $F(88, 133) = 3,724$ with a value $p < 0.000$, which gave ground to rejecting hypothesis H_0 ; that the method of least squares panel model is correct with regard to hypothesis H_1 ; that the model of fixed effects is true. Next, the Breusch-Pagan test where the statistical test produced, $LM = 15.820$ with a value of $p < 0.000$. The low value of p indicates the rejection of hypothesis H_0 ; that the method of least squares panel model is correct regarding hypothesis H_1 ; that the random effect model is true. The Hausman test statistics: $H = 18.166$ with a value of $p = 0.071$ confirms the correctness of applying the random effect model.

The performed combined regression models for the above mentioned statistical tests indicated the continued presence of heteroscedasticity where the parameters of the subsequent model corrections introduce robust standard errors. This does not change the estimated parameter values, only the error assessment

7. Results

With regard to the above, the parameters of the two-way error model with random effects were estimated as follows:

$$\begin{aligned} \ln IND_{i,t} = & \beta_0 + \beta_1 \ln REV_{i,t} + \beta_2 \ln REV_{i,t-1} + \beta_3 \ln INC_PROP_{i,t} + \\ & \beta_4 \ln INC_PROP_{i,t-1} + \beta_5 \ln EXP_PROP_{i,t} + \quad (4) \\ & \beta_6 \ln EXP_PROP_{i,t-1} + \beta_7 LEAS_{i,t} + \beta_8 DEBT_PROP_{i,t} + \beta_9 LIAB_DUE_{i,t} + \\ & \beta_{10} NON_EXP_{i,t} + \beta_{11} ELECT + \beta_{12} AUD_{i,t} + u_{it} \end{aligned}$$

The estimation results for the two-way error model with random effects are presented in Table 2.

Among the initially identified explanatory variables, the control variables were essential i.e. the revenue amount from credits, loans, bond issues of i unit in year t , the revenue amount from credits, loans, bond issues of i unit in year $t-1$, the revenue amount from assets of i unit in year t , the revenue amount from assets of i unit in year $t-1$, the general asset expenditure amount of i unit in year t , the general asset expenditure amount of i unit in year $t-1$, variables pertaining to leasing classification choice, the occurrence of non-standard instruments and unused funds from non-expiring expenses of the previous year, and the variable indicating an election year.

Table 2. Parameter assessment of the two-way error model with random effects – Dependent variable $\ln\text{IND}_{i,t}$

	Coefficient	Standard error	t-student	Value p
β_0	-0.961	0.275	-3.498	0.001*
$\ln\text{REV}_{i,t}$	-0.231	0.064	-3.602	0.000*
$\ln\text{REV}_{i,t-1}$	-0.304	0.062	-4.893	<0.000*
$\ln\text{INC_PROP}_{i,t}$	-0.241	0.075	-3.208	0.001*
$\ln\text{INC_PROP}_{i,t-1}$	-0.232	0.060	-3.901	<0.000*
$\ln\text{EXP_PROP}_{i,t}$	0.518	0.135	3.824	0.000*
$\ln\text{EXP_PROP}_{i,t-1}$	0.530	0.096	5.494	<0.000*
$\text{LEAS}_{i,t}$	0.017	0.076	2.203	0.038*
$\text{LIAB_DUE}_{i,t}$	0.009	0.072	1.756	0.440
$\text{DEBT_PROP}_{i,t}$	0.114	0.073	4.716	<0.000*
$\text{NON_EXP}_{i,t}$	0.022	0.065	2.796	0.043*
ELECT	0.191	0.076	2.658	0.008*
AUD	0.186	0.151	1.227	0.219
Between= 0.23; Within= 0.14; Theta = 0.52; $R^2=0.49$				
Breusch-Pagan Test: Test statistics: Chi-square(1) = 15.820, value $p<0.000$				
Hausman Test: Test statistics: Chi-square (11) = 18.647, value $p=0.068$				
Normal Distribution Test of remaining: Test statistics: Chi-square (2) = 4.654, value $p=0.098$				
Auto-correlation Test of remaining: Test statistics: $F(1, 30) = 4.149$, value $p=0.061$				

Note: *value $p < 0.05$

Source: Own study.

With regard to the studied key variables for adjusting acceptable indebtedness of local governmental units, the occurrence of qualified leasing costs as operational in accordance with tax regulations ($\text{LEAS}_{i,t}$) has a positive characteristic influence on the relation of operating surplus to capital rate payments and purchases defined in said Art. 243 (parameter assessment $\beta_7=0,017$, $p=0,038$). Similarly, the variable for expressing debt payment through expenditures ($\text{DEBT_PROP}_{i,t}$) characterizes positive growth of the dependent variable ($\beta_9=0,114$, $p=0,000$). The occurrence of non-implemented funds resulting from unexpired liabilities from the previous year also positively influence the studied dependent variable (parameter assessment $\beta_{10}=0,022$, $p=0,043$). It should be noted that an essential statistic was the ELECT variable where an election year resulted in growth of the dependent variable. The next accepted determinant of adjusted debt – the obligation of financial report audit (AUD) was shown to be an irrelevant variable in the panel.

The assessed panel model explains 49% of the explanatory variables' influences on adjusting permissible indebtedness of Poland's local governmental units. Higher variation between intergroups than within a given group, according to a proper random model, indicates that the model better explains differentiation within given governmental units in time rather than between these units. The results also allow confirmation that unchanged non-observable condition in time for said units, as in the case of the two-way error model, taking into account random effects associated

with a particular unit and the effect of time⁶, account for 52% of combined random error. The next estimation test of the model was for one-way error, as set below:

$$\begin{aligned} \ln IND_{i,t} = & \beta_0 + \beta_1 \ln REV_{i,t} + \beta_2 \ln REV_{i,t-1} + \beta_3 \ln INC_PROP_{i,t} + \\ & \beta_4 \ln INC_PROP_{i,t-1} + \beta_5 \ln EXP_PROP_{i,t} + \beta_6 \ln EXP_PROP_{i,t-1} + \beta_7 LEAS_{i,t} + \beta_8 DEBT_PROP_{i,t} + \beta_9 LIAB_DUE_{i,t} + \\ & \beta_{10} NON_EXP_{i,t} + \beta_{11} ELECT + \beta_{12} AUD_{i,t} + \beta_{13} YEAR + u_{it} \end{aligned} \quad (5)$$

The estimation results for the one-way error model with random effects are shown in Table 3. The validity of applying method of least squares was checked again. The Wald test statistics produced, $F(88, 132) = 3.644$ with a value of $p < 0.000$ which justified discarding hypothesis H_0 ; that the method of least squares panel model is correct in regard to hypothesis H_1 ; that the model of fixed effects is appropriate. Next, the Breusch-Pagan test, testing the statistics produced, $LM = 14.580$ with a value of $p = 0.000$. The low p value indicates rejection of hypothesis H_0 ; that the method of least squares panel model is correct regarding hypothesis H_1 ; that the random effects model is appropriate. The statistics of the Hausman test were: $H = 25.850$ with a value of $p = 0.061$, confirmed that applying the random effect model was proper. The assessed panel model explains 48% of the influence the selected explanatory variables have of adjusting the debts of Poland's local governmental units.

Table 3. Parameter assessment of the one-way error model with random effects – Dependent variable $\ln IND_{i,t}$

	Coefficient	St. error	t-student	Value p
β_0	92.029	52.804	1.743	0.081
$\ln REV_{i,t}$	-0.210	0.063	-3.310	0.001*
$\ln REV_{i,t-1}$	-0.294	0.060	-4.812	<0.000*
$\ln INC_PROP_{i,t}$	-0.244	0.077	-3.189	0.001*
$\ln INC_PROP_{i,t-1}$	-0.237	0.059	-4.014	<0.000*
$\ln EXP_PROP_{i,t}$	0.551	0.142	3.881	0.000*
$\ln EXP_PROP_{i,t-1}$	0.517	0.096	5.406	<0.000*
$LEAS_{i,t}$	0.018	0.079	1.889	0.048*
$LIAB_DUE_{i,t}$	0.008	0.065	1.713	0.057
$DEBT_PROP_{i,t}$	0.117	0.071	4.887	<0.000*
$NON_EXP_{i,t}$	0.019	0.067	2.694	0.037*
$ELECT$	0.196	0.079	2.903	0.004*
AUD	0.157	0.144	1.089	0.276
$YEAR$	-0.046	0.026	-1.761	0.038*

Between= 0.20; Within= 0.14; Theta = 0.51; $R^2 = 0.48$

Breusch-Pagan Test: Test statistics: Chi-square (1) = 14.580, value $p = 0.000$

Hausman Test: Test statistics: Chi-square (12) = 22.888, value $p = 0.063$

Normal Spread Test remaining Test statistics: Chi-square (2) = 4.309, value $p = 0.116$

Auto-correlation Test remaining Test statistics: $F(1, 30) = 4.543$, value $p = 0.061$

Note: *value $p < 0.05$. **Source:** Own study.

⁶ Illustrating the common for all local governmental units effects in the individual years, such as changes in economic conditions.

The one-way error model showed the importance of the control variables and variables pertaining to lease classification choice; the occurrence of non-standard instruments and the occurrence of unused funds arising from planned non-expiring liabilities from the previous year; and the variable related to an election year. In addition, another important variable was the *YEAR* variable which showed that the growth during the years in question influences lowering the operational surplus in relation to capital rate payments and purchases.

With regard to the variables used, the occurrence of qualified leasing totals as operational in accordance with tax regulations ($LEAS_{i,t}$) characterizes positive influence on the relation of operational surplus to capital rate payments and purchases defined in said Article 243 (parameter assessment $\beta_7=0.018$, $p=0.048$). Similarly, the variable determining the occurrence of debt payments through expenditure ($DEBT_PROP_{i,t}$) characterizes positive increase in the dependent variable (parameter assessment $\beta_9=0.117$, $p=0.000$). The occurrence of unused funds from non-expiring liabilities from the previous budgetary year also positively influences the particular dependent variable (parameter assessment $\beta_{10}=0.019$, $p=0.037$).

The variable *ELECT* was equally statistically significant as when an election year turned-up, there was an increase in the dependent variable. The chosen determinant – financial report audit – was found to be irrelevant in the model, as was the two-way error model. The higher intergroup variance, as opposed to within a given group, also indicates that the model better explains internal group variance of governmental units in time than between these unit groups. The results also allow confirmation of unchanged in time a lack of observable conditioning in units which is responsible for 51% combined random error. The statistical quality of the assessed equations is very good, as shown by the high coefficient value of R^2 determination, and it should be noticed that better empirical data was generated for the two-way error model than for the one-way error model.

8. Conclusions

Local governmental units play a very role in the economy from the point of view of the community and economically. Subordinated processes of gathering and disbursing financing funds, the management of these resources, or the character of performed tasks, are just a few of the situational factors faced by a governmental unit in a particular group of entities.

Moreover, postured of accomplishing activity profit and burdened with a full spectrum of legal regulation requirements imply the need to treat accounting rules differently. The formulas from which public service is assigned determines the level and terms encountered from budget expenditures and gained revenues from the budget, as well as the scale of obligations burdening a local unit. Consequently, the

choice of methods to realize various tasks impacts on the current, as well as future financial condition of said units, inclusive of the level of indebtedness.

Demonstrating the relations shaping caused by said Article 243, through choice of appropriate instruments of accounting policy required the application of relevant econometric methods leading to quantifying dependencies among the studied variables. From among the available research methods, chosen were hypotheses verification procedures supported by panel models.

Summarizing the performed studies on the financial reports for the years listed (2014-19, inclusive), the randomly selected local governmental units in Poland applied accounting policy instruments in order to maintain the relations incorporated in said Article 243. Thus, hypothesis *H1* can be accepted, that: Instruments of accounting policy are used by Poland's local governmental units with the intention of adjusting the allowable level of debt. Similar results were generated by foreign authors in this issue applying dependent variables indicating limited debt in studies they carried out in selected countries (Moriyama, 2006; von Hagen and Wolff, 2006; Hodler, 2011; Clémenceau, 2014; Reischmann, 2016; Hirota *et al.*, 2017).

In the estimation models, the control variables were significant, i.e., revenues gained from credits, loans, issued bonds of *i* unit for *t* year; revenues gained from credits, loans, issued bonds of *i* unit for *t-1* year; assets revenues gained for *i* unit for *t* year; total revenues gained for *i* unit for *t-1* year; total asset expenditures for *i* unit for *t* year; and total expenditures for for *i* unit for *t-1* year. Among the explanatory variables, statistically significant were, but not limited to, the qualifying variable regarding occurring obligating sums from operational leasing in accordance with tax regulation – financial leasing according to accounting regulations – and the qualifying variable referring to asset expenditures payed-off through the budget by *I* unit for *t* year.

The gained positive indicators with the above variables were in agreement with expectations. The variable regarding the application of principles of measure in budgetary accounting was especially significant i.e. the qualifying variable indicating unused funds resulting from non-expiring liabilities. The above results also confirm that Poland also take advantage principles of assessment in adjusting debt and appropriate structuring of financial transactions.

Among the applied determinants of accounting policy instruments with the purpose of adjusting acceptable levels of indebtedness of local governmental units, the relation of operational surplus to volume of payments and purchases defined in said Article 243, was prominent in election years. The *ELECT* variable was shown to be significant and positively influencing the appropriate variable. In view of the above, hypothesis *H2* can be confirmed, that: There exists a correlation between applying accounting policy instruments with the intent of adjusting allowable levels of debt and political factors.

In the case of the variable regarding financial report audits, differed from the cited research of foreign authors i.e. the requirement of financial report statutory audits did not influence or retard undertaken decisions to take advantage of accounting policy instruments to adjust allowable debt by said local units in Poland. Thus, hypothesis *H3* is discarded. There does not exist a negative correlation between applying accounting policy instruments with the intent of adjusting allowable levels of debt and the requirement of local government units' financial report audits.

Turning to the conclusion, the performed literature review and empirical studies confirmed the primary hypothesis, and as such declare that goals and instruments of accounting policy influence the measure and adjustment of allowable levels of indebtedness by local governmental units. Finally, the above research should be also considered in light of the global pandemic. The corona virus pandemic critically burdens the finances of local governments world-wide. Local governments frequently stand 'on the front' in the battle with the corona virus. There is no doubt that there will be subsequent research regarding 'camouflaging' of debt in the financial reporting of local governmental units as long as the pandemic continues.

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