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Diagnosing Fiscal Distress: Regional evidence from Polish Municipalities

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ABSTRACT

The paper deals with the problem of municipalities' fiscal distress and its diagnosis. The study examines the key financial indicators of Polish municipalities located in the West Pomeranian Region and uses them to build an aggregate measurement to identify the level of these municipalities' fiscal distress. The analysis is based on taxonomy methods in order to group the municipalities according to increasing risk of fiscal distress. Based on the aggregated results, ratings for these municipalities have been created. The municipalities have subsequently been classified into three groups: fiscally distressed, fiscally stable, and fiscally neutral. The data set covers the period from 2008-2013 and encompasses 106 municipalities.

Key words: fiscal distress, municipalities, self-government, public finance, crisis

JEL Classification: H7, H12, G01

1. Introduction

Fiscal distress reflects short-term considerations, such as a local government's ability to meets its payroll and generally make payments in a timely manner, and long-term considerations, encompassing trends in a local government's tax base relative to its expenditures and commitments (Rossi et al. (2012)). Fiscal distress is an economic category that has increased in importance since the crisis of 2008. During that time, many public and private entities had been financially distressed, meaning that they were financially unbalanced and were unable to provide goods and services in a normal manner. The example of Detroit (among others) is particularly poignant because the city did not fulfill its statutory tasks and failed to serve the local community properly.

The problem of fiscal distress is crucial, especially in the case of public entities, due to the economic and social results caused by the phenomenon for local and regional communities (Rossi et al.(2012)). In recent years, the role of self-government entities has become more important because of fiscal federalism and the decentralization process. This means that self-governing units took on more responsibility for providing public services and tasks than before. The delivery of public goods and

services requires financial funds to cover all costs and necessary expenditures. For this reason, examining and predicting municipalities' financial standing has become a key issue in recent years.

Fiscal distress results in budgetary distortion, the loss of financial liquidity, and may ultimately result in bankruptcy. The experience of the 2008 crisis confirmed how risky fiscal distress could be. In Poland in 2008 only 3 self-government entities among 2478 were excess debt. In 2012 the number of cases has increased significantly to 95.

The disastrous aftermath caused by fiscal distress is determined by how municipalities respond differently to this phenomenon. They may raise local taxes, impose new fees, or start austerity programs. Cutting expenditures results in a lower quality of public services by increasing prices or suspending the delivery of public goods and services entirely (Costanzo et al. 2012). This kind of fiscal distress is called citizen fiscal distress (Trussel and Patrick, 2012).

There is also the real threat that fiscally distressed entities can't ensure public safety and basic services responsible for people's wellbeing (i.e., the health care system). The social and economic risks created by fiscal distress for local communities and self-governing entities suggest the necessity for research and analysis that is focused on predicting and preventing fiscal distress. Both categories include early warning systems to identify key factors responsible for the fiscal distress phenomenon.

The problem is that very few studies try to predict fiscal distress in large samples of governments (Costanzo et al. 2012). Some authors, such as Stevens and LaPlante, actually recommend that the best studies of fiscal distress are those with limited, homogeneous groups of municipalities (Costanzo et al. 2012). Predicting fiscal distress in self-government entities is also very rare because in generally those units are not able to go bankruptcy according local low (there are exceptions such as USA, Hungary etc.).

The goal of this study is to identify the crucial, financial variables that are commonly used to diagnose municipalities' fiscal distress and subsequently build a rating and ranking of municipalities according to an increasing risk of fiscal distress.

The paper is structured as follows: introduction, related work (section 1), methods and variables (section 2), results and discussion (section 3), conclusions (section 4). In introduction and sections 1,2 theoretical background of fiscal distress and decentralization process in Poland were presented, especially literature review and the main thesis and the goals of the study. The empirical evidence (sections 3,4) contains the ratings analysis, the results' discussion, and findings.

2. Fiscal Distress in Self Government - Entities. Theoretical Background and Related Work

According to the literature review, fiscal distress is described in very different ways depending on the authors, who include DeSanto, Trussel, Patric, Howell, Stamm, Fuchs, Lewis, Groves, Godsey, Shulman, Campbell, Brown, and others.

Based on Kloha et al., the definition of fiscal distress reflects "terms of whether a local government is sufficiently meeting the needs of its community" (García-Sánchez et al. 2012). Another approach to fiscal distress describes the phenomenon as the "sustained inability of a municipality to fund the delivery of basic public goods and other requirements as per its constitutional mandate and also meet its financial obligations" . According to the GAO definition, a fiscally distressed municipality is one "in which residents bear substantially higher tax burdens in order to obtain levels of public services comparable to better-off communities" (Trussel and Patrick., 2012). It is worth mentioning that fiscal distress is not the same as a crisis. Fiscal distress may turn into a crisis if the measures preventing fiscal distress fail to work (Pew Charitable report, 2013).

There are some commonly used terms found in the fiscal distress literature that describe the fiscal distress of local government. Fiscal stress, fiscal strain, fiscal health, financial distress. Table 1 presents some commonly used definitions

Table 1 Commonly Used Definitions Found In The Fiscal Distress Literature

Term	Definition	Authors
Fiscal health	Underlying or structural ability to deliver public services to its residents, independent of the budgetary decision made by city officers	Ladd and Yinger (1989)
Fiscal strain	An institutional lack of adaption to a changing environment	Clark and Appleton (1989)
Fiscal stress	The imbalance between the revenue raising capacity and expenditure needs of a local government	Badu and Li (1994)
Financial distress	Occurs when the entity, municipality or province, is no longer able to perform its essential functions and deliver due services, or when it is no longer able to meet debt with third parties through the ordinary means of restoring fiscal balance or the debt instrument with a balance sheet	Constanzo, Rossi, Zito (2012)

Note: Own elaboration based on: J. M. Trussel and P. A. Patrick. (2012). A Survival Analysis of U.S. Municipalities in Fiscal Distress, International Journal of Public Administration, 35(9), 620-633; U.S. General Accounting Office. (1990). Distressed Communities: Public Services Declined in California as Budget Pressures Mounted. Washington, DC: Author. (HRD-90-95); and Adeyemi, B. (2011). Bank Failure in Nigeria: A Consequence of Capital Inadequacy, Lack of Transparency and Non-Performing Loans, Banks and Bank System, 6(1), 99–109, Y. Badu, and S. Li, Fiscal Stress in Local Government: A Case Study of the Tri-Cities in the Commonwealth of Virginia,"The Review of Black Political Economy, 1994, vol. 22, no. 3, pp. 5-17, T. Clark, and L. Appleton, Coping in American cities, In S. Clarke (ed.), Urban Innovation and Autonomy (31-68). Newbury Park, CA: Sage Publications, 1989, F. Ladd, and J. Yinger, "America's ailing cities: fiscal health and the design of urban policy," Baltimore, MD: John Hopkins University Press, 1989, Costanzo A., Rossi M. F., Zito M., (2012). How to prevent distress in local government: a new model applied in Italy, Advanced Research in Scientific Areas, International Virtual Conference, Section Finance and Accounting, p. 627, Hong J. H, Huang Ch.J, Monitoring the Fiscal Health of Taiwan's Local Government: Application of the 10-Point Scale of Fiscal Distress, World Academy of Science, Engineering and Technology International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering Vol:8, No:7, 2014, pp. 2193-2194.

There are two major schools of research devoted to fiscal distress. The first one concerns factors responsible for creating the issue and the second one relates to in-depth analyses of problems in early warning systems that are designed to predict and prevent fiscal distress risk and provide fiscal distress measurement. The factors creating fiscal distress risk are classified as economic, socioeconomic, infrastructural, and financial (Trussel and Patrick, 2012). The main important among them according to Trussel and Patrick(2012) are :

- population growth, the unemployment rate, or the new business development rate (economic factors);
- per capita income, poverty, or education (socioeconomic factors);
- the state of infrastructure assets (physical factors); or
- dependence on intergovernmental revenue, debt financing, or tax revenue (financial factors).

The second one focuses on selection of financial variables supporting diagnosis of fiscal distress plays the crucial role. The analysis of state of art in this scope provided the core financial measures used by authors in related work. Table 2 presents the list of financial variables selected in different studies for diagnosis and predicting fiscal distress phenomenon

Table 2 Financial Factors Predicting Financial Distress Phenomenon Based on Literature Review

Financial Indicator	How To Measure	Study / Year / Authors
One year operations	Revenues – Expenditures	ACIR (1973)
Continuous operations	Revenues – Expenditures Over Time	ACIR (1973); Congressional Budget Office (1978)
Working Capital	Current Assets – Current Liabilities	ACIR (1973)
Short-term operating loan Balance	Current Debt	ACIR (1973)
Property tax delinquency	Property Taxes Delinquent / Total Property Taxes	ACIR (1973)
Property Valuation	Assessed Value Of Real Property	ACIR (1973); Congressional Budget Office (1978)
Coverage of expenditures	Cash + Securities / Total Expenditures	Congressional Budget Office (1978)
Debt burden	Total Debt / Total Revenues	Congressional Budget Office (1978)
Per capital income	Net Income / Population	Congressional Budget Office (1978)
Own source revenue	Total Revenue – Revenue From Federal And State Government (Total Revenue – Revenue From Federal And State Government) / Total Revenues	Congressional Budget Office (1978); Brown (1993)
Per capital longterm Debt	Long-Term Debt / Population	Congressional Budget Office (1978); Brown (1993); Raman (1982)
Per capita revenue	Revenue / Population	Brown (1993)
Other source revenue	Revenue From Federal And State Government / Total Revenue	Brown (1993)
Operating expenditure Ratio	Operating Expenditures / Total Expenditures	Brown (1993)
Revenues to Expenditures	Total Revenues / Total Expenditures	Brown (1993)
Unreserved general fund Ratio	Unreserved General Fund Balance / General Fund Revenues	Brown (1993)
Liability coverage	(Cash + Securities) / Total Liabilities	Brown (1993)
Debt to Revenue ratio	Total Liabilities / Total Revenues	Brown (1993)
Debt service to revenues	Debt Service / Total Revenues	Brown (1993)
ST Debt to Revenue	ST Debt / Total Revenues	Raman (1982)
Working capital change to Debt	Change In Working Capital / Total Debt	Raman (1982)
Cash change to Debt	Change In Cash / Debt	Raman (1982)
Real taxable value growth	Year To Year Percentage Change In Assessed Value Of Real Property	Kloha, Weissert, Kleine (2005a)

Financial Indicator	How To Measure	Study / Year / Authors
General expenditures to taxable value	General Expenditures / Assessed Value	Kloha, Weissert, Kleine (2005a)
Operating margin	(Revenues – Expenditures) / Revenues	Kloha, Weissert, Kleine (2005a)
General fund balance to revenues	General Fund Balance /Total Revenues	Kloha, Weissert, Kleine (2005a)
Fund balance	Assets – Liabilities	Kloha, Weissert, Kleine (2005a)
LT debt to taxable value	LT Debt / Taxable Value	Kloha, Weissert, Kleine (2005a)
Revenue	Per Capita Revenues, Restricted Revenues, Intergovernmental Revenues, Property Tax Revenues, Uncollected Property Tax Revenues	Groves, Godsey, Shulman (1981); Grove and Valente (1994)
Expenditure	Per Capita Expenditures, Employees Per Capita, Fixed Costs, And Fringe Benefits	Groves, Godsey, Shulman (1981); Grove and Valente (1994)
Operating position	Operating Deficits, Enterprise Losses, Fund Balances, And Liquidity	Groves, Godsey, Shulman (1981); Grove and Valente (1994)
Debt	Current Liabilities, Long-Term Debt, Debt Service	Groves, Godsey, Shulman (1981); Grove and Valente (1994)
Unfunded liabilities	Unfunded Pension Liability, Pension Assets, And Accumulated Employee Leave	Groves, Godsey, Shulman (1981); Grove and Valente (1994)
Capital plant	Capital Expenditures	Groves, Godsey, Shulman (1981); Grove and Valente (1994)

Note: Own elaboration based on: J. M. Trussel, P. A. Patrick, (2009), 'A Predictive Model of Fiscal Distress in Local Governments', Journal of Public Budgeting, Accounting & Financial Management, 21 (4), pp. 578-616, M. Ziolo, M. Porada-Rochon, E. Szaruga, The Financial Distress of Public Sector Entities, Causes and Risk Factors. Empirical Evidence from Europe in the Post-Crisis Period, unpublished research material presented on Conference SAN Warsaw, Economic Security of Business Transactions, Warsaw 2015.

The specificity of public entities makes the problem of predicting insolvency particularly difficult to solve in terms of the consequences that it creates for local and regional communities reporting a demand for public services. Therefore, key questions address the validity, scope, and nature of the regulations relating to the procedures and practices in the field of insolvency, which should be implemented on the basis of the individual Member States of the European Community. Some countries like USA (Pennsylvania case) defined the Financially Distressed Municipalities Program and criteria for classifying financially distress entities based on it the following financial criteria were proposed:

- the entity has maintained a deficit over a three-year period;
- the entity has declared a five percent cumulative deficit in relation to revenue over the same period (three years);
- the municipality has maintained a deficit over a three-year period, with a deficit of at least 1% in each of the previous fiscal years;
- the municipality's expenditures have exceeded revenues for a period of at least three years;

- the municipality has defaulted in payment of principal or interest on a bond or note, or in payment of rentals due to an authority;

- the municipality has missed a payroll for thirty days;

- the municipality has failed to make required payments to judgment creditors for thirty days beyond the date of the recording of the judgment;

- the municipality, for a period of at least thirty days beyond the due date, has failed to forward taxes withheld on the income of employees, or has failed to transfer employer or employee contributions for Social Security;

- the municipality has accumulated and has operated for each of two successive years a deficit equal to at least 5% of its revenues;

- the municipality has failed to make the budgeted payment of its minimum municipal obligation;

- a municipality has sought to negotiate resolution or adjustment of a claim in excess of 30% against a fund or budget, and has failed to reach an agreement with creditors;

- a municipality has filed a Municipal Debt Readjustment Plan; or

- the municipality has experienced a decrease in a quantified level of municipal service from the preceding fiscal year, which has resulted from the municipality reaching its legal limit in levying real estate taxes for general purposes.

Based on the criteria pointed out in Financially Distressed Municipalities Program public entities may be classified as either financially distressed or non-financially distressed.

3. Self - Government and Decentralization Process in Poland

The Polish public sector was totally centralized till 1989. Devolution in Poland began in 1990 when the first local government entities (municipalities) were restored. The most effective allocation of public sources requires efficient public finance system. This system should guarantee delivery of public goods and services to the citizens (customers) timely, so that the local demand could be met at the right quantity and quality. Both theory and practice confirm that spending public money and allocation other public resources depends on division of power and responsibility between local and central government (Owsiak, 2005). The closer to the local society the authority is, the more effective spending public funds. The decentralization of Polish public sector is a long term process consists of three major reforms in scope: public finance (revenues and expenditures) and monetary system, public administration, sharing of competence between local and state bodies.

The transferring of public task to the local government level required many changes of Polish law including the Constitution, which was adopted in 1997. After long time of preparation Polish legal framework has been coherent since 1997. Before this period of time power sharing in Poland was regulated by the constitutional law of 1992 based on many unsystematised acts and regulations. The new Constitution includes one chapter devoted to local government affairs (Ruśkowski,2014).

The common hierarchy of tasks and responsibilities in Poland is based on three tiers of local government (municipalities, poviats and voivodships), which are subordinated to the state (see table 3). The state authorities are active at the central tier and local governments usually are responsible for the regional and local affairs. The state provides public services in such fields as: state defense and national security, police and intrastate safety (partly), central administration, justice and judiciary, diplomacy, health care, education, system of social insurance, central banking, fiscal policy, others. On the contrary, the self-government's domain are: providing drinking water, keeping the area clean, maintaining local and regional roads, public transport, provision of education and health services at

the local level, spatial planning and others. The public sector entities provide all of these services with support of own and central sources of revenues.

Table 3 Local Government Tasks And Responsibilities According To The Polish Law

Main Tasks Obligatorily Handed Over To:		
Municipalities	**Poviats**	**Voivodships**
- running nurseries and nursery schools - running primary schools - maintenance of municipal libraries and cultural centers - street cleaning and maintenance of dumping sites - local roads, streets, bridges and traffic control - local public transport - water and gas supply, sewage system - electricity and heat supply - maintenance of marketplaces and municipal cemeteries - maintenance of utility buildings - management of municipal housing stock	- intermediate-level social infrastructure covered public education, health care and social welfare - technical infrastructure and public roads, providing local transport facilities - public order and safety (flood and fire protection) - environmental protection and spatial planning (in local dimension) - social activity (consumer protection, disabled affairs unemployment fighting) - public relation and promotion of poviat	- public education (including higher schools) - health care - protection of culture and its goods - social welfare - spatial planning - environmental protection - water management - public roads and transport - sports and tourism - protection of consumer's rights - public safety - promotion and regional planning - stimulating and promoting local employment market - reducing of unemployment

Source: M. Mackiewicz, E. Malinowska, W. Misiąg, A. Niedzielski, M. Tomalak: Public finance in Poland 1989-2001. Case study of transformation. IBnGR, Chapter 5, p. 99.

The restoration of local government with decentralization of public tasks and administration should enhanced effectiveness and efficiency of activities of public administration. It should also improve the public management methods in Polish public sector. The major goals of the territorial reform in Poland were preliminary focused on (Owsiak, 2005):

- to raise the standard of efficiency of the public sector activity by relegation many tasks and power to the self-government level for decision,
- to reorganize the public finance system, in particular in the scope of relationship between LGEs' budgets and GDP,
- to create a democratic state with civic society,
- to adapt standards of the Polish local self-governments (territorial structure, activities of the public sector) and Polish Law to the EU solutions.

Decentralization of public spending that have been taking place during last several years in Poland brought about to hand over a wide range of competency to the local self-government (autonomy). However, the fact has been worth to mention, that allocation of public means through self-governed expenditures in the most wide rang has been carried on at the autonomy level, i.e. council of local administration. It reflects the scale of implemented by the local administration budgets of self-governed expenditures in comparison with spent financial means, for financing of tasks at districts and voivodeships levels. The wide rang of public spending, implemented through local administration have

become possible, among others, thanks to considerable size of the average local administration. Carrying out of the State administrative reform in Polish conditions, it had been possible to avoid a radical territorial fragmentation. This situation made possible to create strong self-governed units at the lowest level.

Financing of self-government in Poland is regulated by two major legal acts: the first one - the public finance bill and the second one, the local government revenues bill. The second one was enacted in 2003 and it has brought significant changes in local government financing system. The financing local expenditures is based mainly on own sources of self-government like: council taxes (municipalities), share of central taxes (PIT and CIT) and subventions. The percentage share of total local revenues in total central revenues has risen about five percent for one year (since the bill was enacted) (Surówka,2004). The role of grants has been radically diminished since 2003. The new regulations regarding financing system of local government emphasize the need of financial independence of local authorities. The increasing share of own revenues in financing self-government tasks could be assessed positively including the one exception - linkages between local revenues and economic growth (Surówka, 2004). The common solution limits a possibility of creating local revenues. The percentage share in income taxes is a kind of financing source that restricts direct influence on behavior of commercial bodies, which conduct business on chosen local areas. As an additional factor restricting efficiency and reliability of financing from these sources has been a low (in relation to hidden taxes) dynamic of changes, characterizing income taxes as well as lack possibility of planning receipts from PIT and CIT at territorial self-government level. The process of decentralization of public finances at self-governmental level remains in strict correlation with the functioning of public transfers system. Active management of the territorial self-government finance has not been possible in conditions of administrative control of the self-governed expenditure structure (subjection to conditions of realization of self-governed expenditures to the sources of their financing in the form of subsidy and subvention from the central budget).

A requirement in the public finance decentralization area has been a parallel decentralization of connected with them power as well. The legal competences in the area of public finance determine respective legal acts, determining, among others, right for the following (Trussel and Patrick, 2009):

- collection of the public budgetary means as well as their accumulation in the public budgets,
- independent financial economy,
- contraction and management of public debt.

Carrying out projections aforesaid regulations on the territorial self-government in Poland necessary to ascertain, that decentralization process comprised only the law for keeping the financial economy of the territorial self-governmental units based on its own budget. Remaining categories of laws had not been fully decentralized. Performing the analyses of the budgets execution among units of the respective self-governmental levels it happens noticeable respectively high level of the financial independence of the local government councils as well as the weeklies working out on this background the level of district's independence. The only one, out of the factors, influencing forming such matter of fact, has been carried out in the widest scale at local governmental level, principal of the public finance decentralization, comprising at the same time, decentralization of power in this scope. The parallel decentralization of the public finance and legislation competency appears itself in giving possibility to local-government administration to determine local laws in the scope of some taxes and charges having local character (power of taxes). It determines as well compliance with demand written in art. 9 passage 3 of the European Card of Territorial Self-government in sounding: at least a part of financial resources of the local community should originate from local taxes and charges, amount which these communities have got the right to determine.

4. Methods And Variables

Despite the research carried out so far, there is still a lack of knowledge about preventing and predicting municipalities' fiscal distress. Generally, the models of fiscal distress assessment are divided into two types: those that reflect actual situations and those used to predict fiscal distress risk.

Aside from these models, it is possible to identify two other classifications: relative and absolute (Rossi et al.2012). Both categories' models and early warning systems are based on financial variables, the range of which may be different. According to the literature, the list of variables may include the net savings index, current financial independence index, total financial independence index, non-financial budgetary results index and financial charge per inhabitant, net debt index, or fiscal revenue index (Rossi et al.2012).

Trussel and Patrick have built their predictive model of fiscal distress based on different kinds of variables, including taxes to revenues, inter-governmental revenues, administrative cost ratio and debt level, debt to revenue, size, and revenue growth (Trussel and Patrick, 2012). In fiscal distress analysis, some studies also consider the role of negative cash balance, operating surplus, debt to total assets, operating expenses to own source revenue ratio, revenue per capita, expenditures per capita, and deficit / surplus balance (Measuring Fiscal Distress in South African Local Government). It is worth mentioning that the range of variables is determined by the audience, meaning that it depends on whom the model is addressing - stakeholders or local authorities.

In order to classify fiscally distressed municipalities, the Hellwig aggregate measure has been used. This measure is a taxonomic tool that divides the population into similar groups of units based on the given variables. The data used in this study encompasses financial variables collected in the dataset published by the Central Statistical Office of Poland and the Regional Accounting Chamber. The research period included in the dataset covers the years 2008-2013, the period following the crisis. The study encompassed 106 municipalities (the lowest level of government in Poland) located in the West Pomeranian Region. The study presents municipalities in two categories of classification: first category distinguishes municipalities like: rural, urban – rural, urban and big city. The classification based on Polish legal act – polish Territorial Division Act which describes the list of municipalities according to the mentioned groups. The classification is determined by legal regulations. The second classification of municipalities is a results of research carried in this paper with Hellwig measure. According to this category municipalities have been classified taking into account the fiscal distress threat and finally categorized into three groups: fiscally stable, fiscally neutral, fiscally distressed. The main research steps has been taken are presented in Table 4.

Table 4 The Research Steps in Hellwig Measure Procedure

Step	Description
Step 1	Expressing inputs in the matrix – the diagnostic variables (characteristics)
Step 2	Constructing the normalized matrix by means of standardization
Step 3	Determining the stimulants (S; ideal pattern) and the destimulants worst (D; worse pattern)
Step 4	Calculating the distance of each municipality from the pattern and the worst alternative
Step 5	Calculating the synthetic measure M which takes values [0;1], the closer to 1, the better the situation of a municipality

Source: own elaboration

The Hellwig model has provided new value as the variable size of the government usually is calculated in total revenues (Trussel and Patrick, 2012) and in the model proposal the indicator base on administrative expenditures as a percentage of regional GDP. The Hellwig aggregate measure was calculated as follows:

$$d_i = 1 - \frac{c_{i0}}{c_0} \qquad i = 1,2,\ldots n \tag{1}$$

Where: c_{i0} - the Euclidean distance every z_{ij} to z_{0j}

c_0 – distance the unit to benchmark

$$c_{i0} = \left[\sum_{j=1}^{n} \left(z_{ij} - z_{0j} \right) \right]^{1/2} \tag{2}$$

Where:

$$z_{ij} = \frac{x_{ij} - \bar{x}_j}{s_j} \tag{3}$$

and: $\bar{x}_j$ - statistical average

s_j - standard deviation

and

$$c_0 = \overline{c_0} + 2 \times s_d, \qquad \overline{c_0} = \frac{1}{n} \times \sum_{j=1}^{n} c_{i0}, \qquad s_d = \left[\frac{1}{n} * \sum_{j=1}^{n} \left(c_{i0} - \overline{c_0} \right)^2 \right]^{\frac{1}{2}} \tag{4}$$

Coordinate of benchmark $\left(x'_{ij} \right)$ for stimulants (S) and for destimulants (D) are identified as:

$x_{oj} = \max_i x_{ij}$ when $j \in S$, $x_{oj} = \min_i x_{ij}$, when $J \in D$

In order to diagnose financial distortion among Polish municipalities, a range of financial variables have been examined. The variables used in the analysis are listed below and were selected taking into account the cluster of indicators proposed by Trussel J. M. & P. A. Patrick, 2012 (Table 5). Worth mentioning is that the list of variables was built in consideration of the context of the economic and legal determinants of determining the risk of fiscal distress of the municipalities in Poland with the leading role of the Public Finance Act of 27 August 2009 and the Law of 13 November 2003 on income of local government units (see Table 6).

Table 5 The Description Of Variables

Variable	**Description**	**Character S – stimulants D – destimulants**
X_1	General Long-Term Debt As A Percentage Of Taxable Value;	D
X_2	General Fund Balance As A Proportion Of General Fund Revenues;	S
X_3	Operational Surplus As A Percentage Of Current Revenues;	S
X_4	Population Decrease;	D

X_5	General Fund Expenditures As A Percentage Of Taxable Value;	D
X_6	Budgetary Payables Divided By Budgetary Receivables Except Grants;	S
X_7	Administrative Expenditures As A Percentage Of Regional GDP;	D
X_8	Fiscal Receivables Divided By Net Current Budgetary Receivables;	S
X_9	Revenues From Federal And State As A Percentage Of Total Revenues;	D

Source: own elaboration based on: Trussel J. M. & P. A. Patrick, (2012). A Survival Analysis of U.S. Municipalities in Fiscal Distress, International Journal of Public Administration, 35(9), pp. 620.

In the current discussion of the urgent need to reform the system of local government, budgets affected by crises highlight the high sensitivity of the system to the impact of economic fluctuations. Property taxes are among the stable sources of funding in recession conditions. The other complaints regarding the system of financing public tasks in Polish local government units are presented in Table 6.

Table 6 The Description Of Variables

Complaints regarding the system of financing public tasks in Polish local government units	Explanation
High degree of correlation between local government budgets and the state budget, including the interaction between central and local government debt	Self-government budgets in Poland are strictly dependent on the state budget, that means the debt limits at self-government level are strictly determined by the level of state debt (measured as %GDP), also the tax revenue at self-government level is dependent on state fiscal policy (especially in field of CIT and PIT regulation because self-government have the shares in this two types of income taxes)
Limited taxation powers of local government units (basically at the level of municipalities and the unsatisfactory powers of these bodies in the making of local levies	Local taxation and imposing local taxes is a privilege of municipalities only. The state creates a framework for local fiscal policy as it creates the minimum and maximum taxation level which municipality may implemented. There is the limited list of local taxes, partially local taxation and local fiscal policy meet criteria defined in the European Charter of Local Self-Government
Own income categories, among which are the dominant share of income tax revenues from individuals and legal entities that do not bear the characteristics of their own income. In the literature, they are often treated on equal footing with the influence of transfer, because local governments do not have any influence on the size of the income and was often raised the demand to replace the shares additions to taxes	Among local taxes are also shares in PIT and CIT. Many experts argue that shares cannot be in the same category as local taxes as they are different in nature. Self-government is not capable to influence on the level of taxation from this source.
Property tax structure, which should be an ad valorem duty	Property tax is calculated based on square meters not based on market value of property, so the revenue are underestimated
The structure and mechanism of the adjacency levy and the collection of planning fees, the function of which within the current form does not create a basis for treating them as efficient sources of income, hence the discussion of the possibility of introducing	There are a lot of fees in financial system hence only few of them are fiscally sufficient what mean are able to generate real budgetary income

Complaints regarding the system of financing public tasks in Polish local government units	Explanation
a mandatory infrastructure charge	
Mechanism for calculating the amount of the subsidy (educational part) and its unsuitability to the problems of the real economy (including the main factor affecting the amount of the subsidy being the number of students, while the amount of the subsidy is calculated based on the data from the two years preceding the given financial year)	Subsidy is calculated based on criteria which do not follow the current financial situation as the mechanism of calculation encompasses the historical data set (two years before given financial year). That is the reason why the amount of subsidy which is main source of education services is not enough to cover all cost what means municipalities still have to borrow money to close the budgets. There is urgent need to change the calculation mechanism in terms of decreasing number of students which are the second factor determining the amount of money transferred as subsidy to self government
Horizontal redistribution and the need to introduce changes involving in particular the introduction of a limit apportionment amounts transferred to the beneficiaries of the compensatory portion of the subsidy	Horizontal redistribution means that the self-governments which are more efficient and create more budgetary revenue than average are forced to transfer the surplus as financial support for the entities which are poorer. The problem is that there is no legal limit of money (amount) which is being transferred, only percentage of amount is defined, what means the efficient entities are very often near solvency limits sharing the revenue with other units
Formula to calculate debt ratio (for example ignores the revenues from privatization of assets as the impact)	Debt limit do not include of sources of revenues hence all cost and expenditures are included, the result is the self-government which spending more money financing investments are in worse position calculating debt limits and credit worthiness than others which is not fair and do not reflect the real financial standing
Catalog of titles of debt, which as far as the public-private partnership is imprecise and inconsistent with the Eurostat decision of 2004 (no. 18/2004 of 11 February 2004, STAT / 04/18)	Catalog of debt titles is a list of debt categories which are included in calculating debt limit. The list is uncompleted and self-governments very often omit the law creating financial structures which are not in this list example reverse transactions

Source: own elaboration

As the result of Hellwig measure with usage of variables defined as stimulants and destimulants (Table 5) the municipalities have been classified. The ranking of municipalities is presented in Table 1.1. in the Appendix. The next step was dividing municipalities as: fiscally stable municipalities (Hellwig measure value between: 0,5-1), fiscally neutral were entities (Hellwig measure value between 0,1-05), the fiscally distressed municipalities (Hellwig measure below 0,1 value). For each group of municipalities (fiscally: stable, neutral, distressed) in depth research was carried out. The goal of the analysis was to assess the financial profile of municipalities that are selected in three categories taking into consideration the criterion of financial autonomy. Financial autonomy (financial independence) in meaning of European Charter on Local Self-Government (see variables in Tables 1.2, 1.3, 1.4 in the Appendix). The financial indicators which were used are as follows:

- Own Revenues / Total Revenues;
- Operating Surplus / Operating Revenues;
- PIT + CIT Municipality's Share / Total Revenues;
- Local Taxes / Operating Revenues;

- Transfers / Operating Expenditures;
- Transfers / Total Revenues;
- Operating Expenditures / Total Expenditures;
- Debt / Total Revenues;
- Debt/Own Source Revenues

The financial indicators mentioned above are typical one used in Polish literature to describe the financial independence of self – government entities (see J. Glumińska – Pawlic, L. Patrzałek, S. Owsiak, E. Markowska-Bzducha). Recognizing that subnational government is organized differently and can vary is important when taking into account financial independency. Worth mentioning is that it is impossible to adapt directly the financial variables which are discussed in international papers as they do not reflect Polish legal and economic framework which crucially impacted on subnational government finance in Poland

5. Results and discussion

Fiscally stable municipalities are distinguished by a high level of financial autonomy (the highest score of Hellwig measure Table 1.1. and Table 1.2 in the Appendix). Municipalities fiscally sound are characterized by a high level, both the independence of the income and expenditure. The units are entities of the active model with a high proportion of their income in total income. Municipalities of the active model are predominantly urban and achieve significant revenues from property tax. Municipalities in this group have the ability to create an operating surplus that can be used to finance investments. The current transfer receipts are not the predominant source of income in this group of municipalities. Municipalities in this group often use EU subsidies and investment. The main risks to municipalities in the active model are risk-investment and liquidity risks arising from high investment activity.

Fiscally neutral municipalities are more dependent on transfer receipts than fiscally stable units are (the average score of Hellwig measure Table 1.1. and Table 1.3 in the Appendix). Financial ratios of fiscally neutral entities reflect the attitude of moderate risk decision-makers, which manifests itself in a controlled process of debt. Long-term liabilities remain for internal sources of funding at a safe level. Policy makers are trying to minimize the cost of financing and provide feedback to maximize profit from municipal investments. Fiscally neutral municipalities tend to reinforce their position or promotion by stepping up their investment process. Municipalities are heterogeneous, and their development is usually derived (secondary development) from the endogenous potential of a big city (usually the seat of the municipal council) that is adjacent to the area of the municipality or from the proximity of the traffic. Investment carried out by fiscally neutral municipalities is fragmented, heterogeneous, does not normally use economies of scale, supports the process of service provision by the municipality, and contributes to the improvement of its investment appeal (Kloha et al. 2005a). External investors implementing investment projects in the municipality are primarily domestic investors.

Fiscally distressed municipalities have a limited ability to create operating surpluses and the structure of their income is based on income transfer (the lowest score in Hellwig measure ranking Table 1.1 and Table 1.4. in the Appendix). Income for rural communities in the form of agricultural tax largely depends on external conditions. Other categories of income in the current budget do not provide the desired level of performance and are sensitive to fiscal opportunism. The result is significant debt previously directed at stabilizing the current budget. Active rural communities orient their activities to the use of existing natural values and, depending on their characteristics, their ability to attract tourists and investors (mainly external). Such activities do not greatly contribute to improving the

financial situation of the municipalities in the study group, whose budgets are highly dependent on the condition of the state budget.

6. Conclusions And Contribution to Existing Knowledge

This study has examined the population of 106 Polish municipalities located in the West Pomeranian Region. Based on key financial variables, the rating and ranking of municipalities has been proposed. The municipalities have been divided into three categories that differ from each other based on the scope of financial autonomy and propensity for fiscal distress. The types of municipalities are classified as fiscally distressed, fiscally stable, and fiscally neutral. Fiscally stable municipalities are usually large cities (example Szczecin) with a high level of their own revenues, especially from local fees and taxes. Big cities deal well with fiscal distress due to their local tax base, particularly property tax, which plays a key role in stabilizing local budgets. These entities are financially sound with a low debt level and a high level of financial autonomy. Fiscally neutral entities encompass urban and urban-rural municipalities with a low ability to generate their own revenue resources. These units are financially dependent on central budget transfers and are more prone to fiscal distress risk. The tax base for these entities is not as strong as in the first group. The last category of fiscally distressed municipalities includes those with serious liquidity problems. This group is mostly comprised of small, rural units with no financial autonomy. Transfers from the central budget mostly finance this group. Operational expenditures dominate the structure of total expenditures. This study confirms that there is a strong correlation between financial autonomy and the threat of fiscal distress. Higher levels of financial autonomy are associated with more stable financial conditions and a lower risk of fiscal distress.

Taking into account related work the study is original because of the hypothesis that the fiscal autonomy (increasing level of local taxes as percent of the total amount of tax revenues, especially the property tax) allows to decrease the fiscal distress threat for municipal budgets. The list of variables selected, methodology and comprehensive approach are also a crucial regards to contribution to existing knowledge. Usually authors either proposed ranking of municipalities or classify the municipalities into groups according to increasing fiscal distress risk.

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Appendix

Table 1.1 Hellwig Measure Results

Municipality / Year	2008	2009	2010	2011	2012	2013
Gmina Banie	0,075	0,076	0,078	0,101	0,111	0,089
Gmina Barlinek	0,095	0,097	0,098	0,121	0,118	0,107
Gmina Barwice	0,088	0,085	0,086	0,106	0,114	0,093
Gmina Będzino	0,084	0,086	0,085	0,106	0,114	0,102
Gmina Białogard g.	0,079	0,083	0,081	0,101	0,109	0,089
Gmina Białogard m.	0,107	0,115	0,115	0,136	0,145	0,120
Gmina Biały Bór	0,071	0,079	0,080	0,101	0,115	0,092
Gmina Bielice	0,071	0,073	0,072	0,096	0,033	0,073
Gmina Bierzwnik	0,070	0,067	0,066	0,084	0,099	0,078
Gmina Biesiekierz	0,074	0,078	0,077	0,097	0,103	0,082
Gmina Bobolice	0,088	0,082	0,085	0,098	0,113	0,097
Gmina Boleszkowice	0,070	0,074	0,072	0,093	0,099	0,078
Gmina Borne Sulinowo	0,092	0,085	0,092	0,088	0,104	0,090
Gmina Brojce	0,072	0,073	0,073	0,094	0,104	0,081
Gmina Brzeżno	0,071	0,075	0,070	0,094	0,101	0,079
Gmina Cedynia	0,075	0,077	0,081	0,098	0,104	0,084
Gmina Chociwel	0,075	0,078	0,078	0,103	0,105	0,086
Gmina Chojna	0,118	0,087	0,089	0,115	0,110	0,095
Gmina Choszczno	0,095	0,101	0,089	0,113	0,122	0,106
Gmina Czaplinek	0,089	0,091	0,091	0,117	0,116	0,096
Gmina Człopa	0,075	0,078	0,078	0,103	0,107	0,086
Gmina Darłowo g.	0,087	0,089	0,087	0,115	0,119	0,096
Gmina Darłowo m.	0,094	0,096	0,107	0,122	0,135	0,101
Gmina Dębno	0,119	0,111	0,116	0,138	0,148	0,128
Gmina Dobrzany	0,072	0,074	0,076	0,101	0,104	0,085
Gmina Dolice	0,083	0,079	0,080	0,100	0,109	0,090
Gmina Drawno	0,075	0,080	0,076	0,093	0,097	0,077
Gmina Drawsko Pomorskie	0,121	0,118	0,114	0,125	0,135	0,117
Gmina Dygowo	0,077	0,076	0,079	0,099	0,107	0,089
Gmina Dziwnów	0,083	0,083	0,089	0,102	0,113	0,089
Gmina Golczewo	0,074	0,075	0,069	0,091	0,101	0,080
Gmina Goleniów	0,137	0,145	0,145	0,180	0,173	0,142
Gmina Gościno	0,077	0,080	0,078	0,101	0,105	0,090
Gmina Gryfice	0,109	0,107	0,108	0,131	0,123	0,118
Gmina Gryfino	0,164	0,136	0,131	0,143	0,141	0,174

Municipality / Year	2008	2009	2010	2011	2012	2013
Gmina Grzmiąca	0,075	0,076	0,076	0,098	0,103	0,083
Gmina Ińsko	0,073	0,072	0,070	0,092	0,104	0,081
Gmina Kalisz Pomorski	0,099	0,166	0,134	0,115	0,120	0,110
Gmina Kamień Pomorski	0,090	0,087	0,090	0,110	0,116	0,123
Gmina Karlino	0,091	0,089	0,083	0,099	0,107	0,011
Gmina Karnice	0,071	0,074	0,073	0,096	0,103	0,080
Gmina Kobylanka	0,076	0,077	0,079	0,102	0,099	0,081
Gmina Kołbaskowo	0,084	0,084	0,081	0,109	0,119	0,097
Gmina Kołobrzeg g.	0,087	0,089	0,088	0,113	0,138	0,111
Gmina Kołobrzeg m.	0,196	0,169	0,184	0,215	0,211	0,199
Gmina Kozielice	0,071	0,073	0,073	0,097	0,102	0,084
Gmina Krzęcin	0,073	0,076	0,076	0,097	0,105	0,082
Gmina Lipiany	0,073	0,074	0,071	0,092	0,100	0,081
Gmina Łobez	0,094	0,091	0,094	0,114	0,132	0,106
Gmina Malechowo	0,076	0,079	0,081	0,104	0,107	0,088
Gmina Manowo	0,074	0,076	0,080	0,098	0,106	0,083
Gmina Marianowo	0,063	0,052	0,049	0,084	0,098	0,078
Gmina Maszewo	0,077	0,079	0,079	0,098	0,104	0,091
Gmina Mielno	0,093	0,099	0,093	0,115	0,114	0,108
Gmina Mieszkowice	0,079	0,080	0,081	0,103	0,110	0,089
Gmina Międzyzdroje	0,091	0,085	0,089	0,119	0,147	0,119
Gmina Mirosławiec	0,075	0,081	0,082	0,104	0,112	0,091
Gmina Moryń	0,072	0,076	0,075	0,099	0,103	0,083
Gmina Myślibórz	0,099	0,105	0,104	0,116	0,124	0,110
Gmina Nowe Warpno	0,068	0,072	0,068	0,090	0,101	0,109
Gmina Nowogard	0,111	0,107	0,104	0,104	0,124	0,125
Gmina Nowogródek Pomorski	0,073	0,074	0,075	0,098	0,103	0,082
Gmina Osina	0,072	0,074	0,073	0,095	0,101	0,079
Gmina Ostrowice	0,063	0,051	0,046	0,067	0,090	0,069
Gmina Pełczyce	0,077	0,065	0,065	0,085	0,108	0,101
Gmina Płoty	0,081	0,083	0,084	0,109	0,111	0,092
Gmina Polanów	0,087	0,089	0,090	0,103	0,115	0,096
Gmina Police	0,173	0,158	0,193	0,175	0,206	0,160
Gmina Połczyn Zdrój	0,094	0,099	0,103	0,104	0,114	0,114
Gmina Postomino	0,090	0,092	0,101	0,120	0,116	0,099
Gmina Przelewice	0,078	0,089	0,086	0,098	0,108	0,085
Gmina Przybiernów	0,078	0,060	0,076	0,088	0,093	0,074

Municipality / Year	2008	2009	2010	2011	2012	2013
Gmina Pyrzyce	0,096	0,098	0,096	0,111	0,121	0,105
Gmina Rewal	0,092	0,087	0,096	0,120	0,135	0,124
Gmina Rymań	0,072	0,075	0,075	0,099	0,111	0,085
Gmina Sianów	0,090	0,088	0,089	0,107	0,122	0,099
Gmina Siemyśl	0,075	0,074	0,074	0,096	0,103	0,078
Gmina Sławno g.	0,081	0,082	0,081	0,106	0,111	0,092
Gmina Sławno m.	0,086	0,087	0,088	0,109	0,120	0,103
Gmina Sławoborze	0,073	0,079	0,075	0,097	0,110	0,083
Gmina Stara Dąbrowa	0,071	0,071	0,073	0,096	0,106	0,082
Gmina Stare Czarnowo	0,073	0,075	0,076	0,100	0,107	0,084
Gmina Stargard Szczeciński g.	0,083	0,086	0,085	0,109	0,119	0,096
Gmina Stargard Szczeciński m.	0,178	0,163	0,175	0,174	0,188	0,217
Gmina Stepnica	0,063	0,058	0,057	0,082	0,118	0,088
Gmina Suchań	0,073	0,075	0,076	0,096	0,106	0,082
Gmina Szczecinek g.	0,089	0,089	0,088	0,111	0,117	0,094
Gmina Szczecinek m.	0,127	0,133	0,145	0,163	0,189	0,145
Gmina Świdwin g.	0,075	0,077	0,076	0,091	0,101	0,083
Gmina Świdwin m.	0,088	0,099	0,091	0,113	0,124	0,105
Gmina Świerzno	0,068	0,066	0,067	0,093	0,107	0,081
Gmina Świeszyno	0,082	0,078	0,073	0,097	0,106	0,088
Gmina Trzcińsko-Zdrój	0,075	0,080	0,078	0,099	0,107	0,087
Gmina Trzebiatów	0,102	0,108	0,110	0,123	0,111	0,104
Gmina Tuczno	0,073	0,078	0,077	0,102	0,108	0,084
Gmina Tychowo	0,081	0,082	0,082	0,103	0,111	0,096
Gmina Ustronie Morskie	0,083	0,085	0,088	0,113	0,112	0,088
Gmina Wałcz g.	0,088	0,092	0,091	0,120	0,119	0,102
Gmina Wałcz m.	0,109	0,113	0,109	0,134	0,134	0,126
Gmina Warnice	0,072	0,076	0,070	0,092	0,101	0,080
Gmina Widuchowa	0,075	0,078	0,077	0,099	0,108	0,081
Gmina Wolin	0,086	0,090	0,090	0,102	0,117	0,097
Gmina Złocieniec	0,101	0,092	0,093	0,115	0,119	0,100
Miasto Koszalin	0,268	0,313	0,292	0,318	0,299	0,308
Miasto Szczecin	0,457	0,440	0,445	0,612	0,670	0,512
Miasto Świnoujście	0,191	0,219	0,213	0,244	0,262	0,185

Source: Own calculations

Table 1.2. The Empirical Testing – Selected Budgetary Indicators Of Fiscally Stable Municipalities

Variable	Model: Fiscally stable - type of municipality / indicator			
Financial Autonomy	Rural	Urban - rural	Urban	Big City
Own Revenues / Total Revenues	45%	55%	60%	70%
Operating Surplus / Operating Revenues	20%	25%	35%	40%
PIT + CIT Municipality's Share / Total Revenues	25%	40%	40%	50%
Local Taxes / Operating Revenues	40%	45%	45%	50%
Transfers / Operating Expenditures	45%	40%	30%	20%
Transfers / Total Revenues	55%	50%	40%	30%
Operating Expenditures / Total Expenditures	70%	65%	65%	60%
Debt / Total Revenues	25%	30%	25%	20%
Debt / Own Source Revenues	40%	50%	35%	30%

Source: Own calculations

Table 1.3. The Empirical Testing - Selected Budgetary Indicators Of Fiscally Neutral Municipalities

Variable	Model: Fiscally neutral - type of municipality / indicator			
Financial Autonomy	Rural	Urban - rural	Urban	Big City
Own Revenues / Total Revenues	40%	45%	55%	60%
Operating Surplus / Operating Revenues	10%	15%	15%	20%
PIT + CIT Municipality's Share / Total Revenues	15%	10%	20%	25%
Local Taxes / Operating Revenues	30%	35%	50%	55%
Transfers / Operating Expenditures	65%	60%	50%	40%
Transfers / Total Revenues	55 %	50%	45%	35%
Operating Expenditures / Total Expenditures	80%	75%	70%	70%
Debt / Total Revenues	40%	45%	35%	35%
Debt / Own Source Revenues	55%	60%	45%	35%

Source: Own calculations

Table 1.4 The Empirical Testing - Selected Budgetary Indicators Of Fiscally Distress Municipalities

Variable	Model: Fiscally distress - type of municipality / indicator			
Financial Autonomy	Rural	Urban - rural	Urban	Big City
Own Revenues / Total Revenues	20%	25%	30%	40%
Operating Surplus / Operating Revenues	5%	3%	10%	15%
PIT + CIT Municipality's Share / Total Revenues	3%	2%	5%	15%
Local Taxes / Operating Revenues	15%	15%	20%	20%
Transfers / Operating Expenditures	90%	80%	75%	75%
Transfers / Total Revenues	80%	70%	60%	50%
Operating Expenditures / Total Expenditures	90%	85%	80%	80%
Debt / Total Revenues	60%	60%	55%	55%
Debt / Own Source Revenues	80%	70%	65%	70%

Source: Own calculations