Revenue Concentration and Debt Usage:

As they affect fiscal distress in district government

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Abstract—**This paper investigates revenue concentration and debt usage with fiscal distress in district government with adopting Trussed and Patrick Fiscal Distress Model. We hypothesize that fiscal distress is positively correlation with revenue concentration and debt usage. This study uses descriptive method with quantitative approach, the data obtained is processed by logistic regression method. This study was conducted in all district government in Indonesia. The dependence of local governments on districts and municipalities against the amount of general allocation funds, so as to indicate the occurrence of fiscal distress in districts and cities in Indonesia post decentralization implementation. This has a negative impact on regional heads in each region, as it is unlikely to work hard to generate local revenues.**

Keywords—revenue concentration; debt usage; fiscal distress; district government

I. INTRODUCTION

Many municipalities are in fiscal distress; a key public issue that affects the economic, social and political wellbeing of both individuals and communities [1]. Fiscal distress may mean different things to different people. In this context, fiscal distress is defined and understood as the sustained inability of a municipality to fund the delivery of basic public goods and other requirements as per their constitutional mandate. It is a fiscal condition that is generally inadequate and with far reaching implications for the political, social and economic state of affairs in municipalities [2]. Municipalities in fiscal distress are not only failing to satisfy their service obligations to citizens but also drain the fiscal by requiring ameliorative measures, which implies forgone economic growth and development. Therefore fiscal distress modelling is needed to provide early warnings of fiscal distress. Fiscal crises can be averted, thereby saving valuable human, physical and financial resources in terms of corrective measures [3].

Examining the fiscal condition of local governments has been the subject of academic scholarship and state legislation since the 1970s, sparked largely by the well-publicized fiscal difficulties of cities such as New York and Cleveland [4]. In the past few years, states have had to deal with major budget gaps and have had to reduce spending, including that for local governments. The number of local governments experiencing fiscal problems is growing, in part because many states are cutting aid to local governments to help balance their budgets.

It is ironic that the states may be creating fiscal problems for local governments that the states will have to deal with in the future. A substantial flaw in the legislation adopted by most states, however, is that the laws were almost entirely *reactive* to fiscal distress. Most states do not have any sort of formal early warning system for fiscal distress, and therefore they are not in a strong position to recognize and prevent fiscal distress before it occurs.

The same thing happened with the South African local government sector [3]. The fiscal performance of the South African local government sector is increasingly under scrutiny, as more municipalities are failing to create and deliver public value to their communities, which has caused a plethora of problems. Although National Treasury (NT) has developed a diagnostic tool for fiscal health, the tool simply reports fiscal distress when it has occurred, instead of predicting it. The NT indicators also do not capture the service delivery side of fiscal health/distress of a municipality. What is needed is a fiscal distress model that would anticipate those municipalities more likely to be fiscally distressed. These models would provide important insights on local government performance and minimize the direct and indirect costs associated with corrective measures after the fact [5].

Following Trussel and Patrick, we define fiscal distress as a significant and persistent imbalance between revenues and expenditures [6]. We operationalize this imbalance as a district that has three consecutive years of operating deficits (scaled by total revenues) that cumulate to more than five percent. Fiscal distress is caused by various factors. According to Trussel and Patrick the words that cause fiscal distress are factors that come from financial statements [7]. In developed countries, Gorina et al. use tax, debt and analysis indicators in calculating fiscal distress in governments in California, Pennsylvania and Michigan [8]. Trussel and Patrick show that the factors that influence fiscal distress on local governments in Pennsylvania are the concentration of income and the use of debt [6]. Trussel and Patrick again conducted research on factors that influence fiscal distress on these countries [7].

The criteria that cause fiscal distress are in accordance with the conditions of local governments in Indonesia that have a variety of sources of income, dependence on the central government and the use of high debt. This causes local governments to be more vulnerable to fiscal distress. Research

focusing on fiscal distress on local governments in Indonesia is still relatively small. Research conducted by Halim et al. which shows that the level of decentralization, regional financial dependency ratios and regional financial independence ratios do not affect fiscal distress in districts and cities in the provinces of East Nusa Tenggara, Maluku and North Maluku [9]. Mubarrok states that income concentration has a positive effect on fiscal distress [10]. However, long-term regional loans and local government resources do not affect fiscal distress. Supranggono shows that Locally-Generated Revenue, General Allocation Funds, Profit Sharing Funds, Debt, Capital Expenditure Ratio, Revenue Growth and Revenue Amount [11]. However, this is not in line with the results of research conducted by Indrayeni which shows that IGR, SIZE and Growth have a relationship with fiscal distress, but in the opposite direction [12]. Whereas, TAXREV, ADMIN, DEBT and DEBTREV did not have a relationship with fiscal distress.

In determining fiscal distress, in previous studies generally analysis tools were used by developed countries, one of which was the United States using logistic regression. This is because the dependent variable is categorical (distress and non-distress). According to some previous research results, Gorina et al. use a binary logistic regression model with the results of the study showing that 32% of local governments in California, Pennsylvania and Michigan experience fiscal distress [8]. Trussel and Patrick used a Cox regression model that was able to produce predictive accuracy of 93.4% in all districts in the United States [7]. Trussel and Patrick used a logistic regression model, capable of producing predictive accuracy up to 91% of the sample Regional Government in Pennsylvania [6]. Previous research in Indonesia, which uses logistic regression in determining fiscal distress by Supranggono shows that 9.6% of all regional governments in Indonesia experience fiscal distress [11].

Stevens and LaPlante closed areas that were more specific and limited to homogeneous areas of specific aspects [13]. Supranggono states that a lot of fiscal distress occurs in districts / cities outside the island of Java and regions with district government levels suffer more from fiscal distress [11]. Riyanti states that the average degree of municipal fiscal autonomy is greater than the average degree of district government fiscal autonomy [14]. The high dependence on the central government can cause district governments to be more vulnerable to experiencing fiscal distress.

Fiscal distress in this study uses relative size, not absolute size, because in Indonesia there is no absolute measure that indicates a regional government experiencing fiscal distress as regulated as the 1987 Financially Distressed Municipalities Act (Act 47) in Pennsylvania. Theoretically, fiscal distress is less likely to occur in district and city governments in Indonesia. According to Bahl that research on fiscal distress has not produced consensus (final conclusion) [15]. Similar to the statement put forward by Kloha et al. that the absence of consensus is probably caused by empirical problems in defining what fiscal distress is [4].

This study focuses on how the influence of the revenue concentration and debt usage on the occurrence of fiscal distress, the research questions are: 1) how much influence the

concentration of income on fiscal distress; and 2) how much influence the use of debt on fiscal distress. The structure of this paper is as follows. The Review of Fiscal Distress Research section offers an overview of the literature that guided us toward the choice of fiscal distress predictors. We then present Methodology that we use in this study. The Data section describes the operationalization of the dependent variable, independent variables, and the empirical models. In Results section, we present and interpret the findings. The Discussion and Conclusion section highlights the paper's implications for the theory of fiscal distress research and offers suggestions for the practice of fiscal management.

II. LITERATURE REVIEW

Previous research addresses the issue of measuring and assessing fiscal distress. Groves et al. use a set of financial indicators to assess the fiscal condition of 24 cities [16]. Their indicators include environmental factors such as changes in population growth, personal income levels, property values, unemployment rates, and business activity, as well as regional inflation rates. They also consider intergovernmental constraints (e.g., the extent of grants-in-aid, tax restrictions, and federal/state mandates), legislative policies and managerial practices. They develop a theoretical model, which captures all these external factors with several basic financial indicators, and they develop financial ratios for each factor. In the end, the model includes six broad categories--revenues, expenditures, earnings, debt structure, unfunded liabilities, and condition of capital plant –and approximately 30 related financial ratios. This model, developed by Groves and Valente and published by the International City/County Management Association, is a widely accepted fiscal monitoring tool for local governments [17].

Fiscal distress is defined in various ways in the for-profit, nonprofit, and government sector literature [6]. Most definitions describe what the entity experiences as a result of financial problems. In many of the early studies in the for-profit literature, fiscal distress is defined as a bankruptcy declaration [18,19]. Later research in the for-profit literature defined fiscal distress as a significant and persistent decline in stock returns or earnings [20-22]. In the nonprofit literature, fiscal distress is defined as a significant decline in resources, such as revenues or net assets or a persistent decline in program spending [23-25]. In the government sector literature, there are also alternative definitions of fiscal distress. The U.S. Government Accountability Office (GAO) defines a fiscally distressed local government as one "in which residents bear substantially higher tax burdens in order to obtain levels of public services comparable to better-off communities" [26]. DeSanto et al. define fiscal distress as "a persistent shortfall in cash flows resulting from an imbalance between revenues and expenditures for given service levels" [27]. Kloha et al. define fiscal distress as "a failure to meet standards in the areas of operating position, debt, and community needs and resources over successive years" [4]. These definitions are difficult to operationalize. Raman identifies fiscally distressed entities using bond ratings from Moody's; specifically, local governments that were downgraded from an A rating are classified as fiscally distressed [28]. As discussed in more

detail in the next section, we define a fiscally distressed local government as one that experiences a significant and persistent imbalance between revenues and expenditures.

Many previous studies develop risk factors or indicators of fiscal distress in local governments. The Municipal Finance Officers Association (MFOA, 1978; now called the Government Finance Officers Association) suggests 29 indicators in five categories, including economic vitality, financial independence and flexibility, productivity, deferred recognition of costs, and financial management practices. The U.S. Congressional Budget Office (1978) discusses three indicators of distress: cumulative budget deficits, cash plus investments as a percent of general fund expenditures, and total debt to total revenue. Groves and Valente developed an indicator system with 36 quantifiable variables grouped into seven categories: revenue expenditure, operating position, debt, unfunded liability, capital plant, and community needs and resources [17]. Raman defines four indicators of fiscal distress--long-term general obligation debt per capita, short-term debt to general revenues, net change in working capital to general obligation debt, and net change in cash from operations to general obligation debt [28]. Recently, Kloha et al. described ten indicators of fiscal distress in local governments [4]. The indicators include items such as population growth and real taxable value growth. Also recently, Watson, Handley and Hassett identify five factors associated with fiscal distress in local governments [29]. The five factors are poor financial management, a declining population, structural changes in the economic base, natural or man-made disasters, and civic distrust.

According to Trussel and Patrick states that "Defining fiscal distress as a condition in which local governments experience persistent operating deficits for three consecutive years" [6]. Local governments that experience fiscal distress, must meet two criteria. First, the regional government must experience an operating deficit for three consecutive years. Second, the cumulative amount of operating deficit over the three-year period must be more than 5% of total income. The operating deficit is a condition of an imbalance between the difference between local government revenues and expenditure realization.

Trussel and Patrick's model cannot be applied in Indonesia, because there are problems, one of them is the government in the country of Indonesia that adheres to the principle of decentralization [6]. In many countries, one of them is the United States, if a regional government categorized as distress is said to be a bankruptcy. For example, in the city of Detroit in the United States, the regional government is said to be financially bankrupt, because the regional government cannot fulfill its obligations, cannot meet the needs in public services and others according to the definition of fiscal distress in the United States. Local governments in Indonesia, are less likely to experience bankruptcy (fiscal distress). This is due, because most of the fiscal needs have been realized by funds transferred from the central government to regional governments as one of the instruments of fiscal decentralization. Therefore, local governments in Indonesia are less likely to experience fiscal distress in Indonesia. Calculations to determine the fiscal distress used by Trussel and Patrick namely the operating

deficit on total income [6]. Indrayeni, Mubarrok and Supranggono modify the Trussel and Patrick Models using the elements contained in the Cash Flow Statement [10-12]. The operating deficit calculates the amount of net cash flows from operating activities divided by total income. Therefore, a fiscal distress measure to be applied in Indonesia is using a relative measure, because in Indonesia there is no possible fiscal distress in the absolute sense, as happened in other countries, especially the United States and places of research on regional financial health that have many do. Determine 2 (two) statuses in determining fiscal distress for local governments [4,10-12]. In regions that do not experience fiscal distress (non-distress) are areas within the average limit of observation plus 4 standard deviations ($\mu + 4\sigma$) from the ratio of net cash flows derived from operating activities divided by total regional income. For regions experiencing fiscal distress are areas within the average limit of observation minus the standard deviation ($\mu - 4\sigma$) from the ratio of net cash flows derived from operating activities divided by total regional income. As discussed in Section 3, we derived the revenue concentration and debt usage for our fiscal distress model primarily from Trussel and Patrick Our focus is on financial indicators of fiscal distress [6].

III. METHODS

This study uses descriptive research with a quantitative approach. The population in this study is the District Government in Indonesia, using financial data in 2015. The sample obtained using purposive sampling technique. The data used in this study is secondary data, namely the 2015 Regional Government Financial Report obtained by requesting data from the Audit Board of the Republic of Indonesia (BPK RI). This study uses logistic regression, this is because the dependent variable in this study is categorical data (distress and non-distress). Logistic regression is a special form of regression where the dependent variable (bound) is a nonmetric (binary) variable. The binary nature of the dependent variable (0 or 1) has properties that do not meet the assumptions used in multiple regression analysis [30]. The logistic regression model used is as follows:

$$FD = \beta_0 + \beta_1 \llbracket PAD\_TotPend \rrbracket\_t + \beta\_(2) \llbracket DAU\_TotPend \rrbracket\_t + \beta\_3\ Ln\_PinjDaerah + \mathrm{e}\_i$$

Which is :
Fiscal Distress (FD) = Probability of local government to experience fiscal distress (1) or no fiscal distress (0)
ß0 = Constant
ß1, ß2, ß3 = regression coefficient
PAD_TotPendt = Total Realization of Regional Original Revenue in year t divided by the Total Realization of Regional Revenues on year t
DAU_TotPendt = Realization of General Allocation Funds in year t divided with Total Realization of Regional Revenues in year t
Ln_PinjDaeraht = Natural Logarithm Total Loan Areas Length in year t

ϵ_i = Error term

IV. RESULT AND DISCUSSION

The category of fiscal distress in this study is divided into 2 (two), namely areas that fiscal-non distress are given a value of 0 (zero) and fiscal distress are given a value of 1 (one). Based on the sample selection with purposive sampling method, the samples obtained were 56 samples of district governments. Hypothesis testing results show that the variable income concentration with the proxy of local revenue and general funds and the variable use of debt with long-term regional loan proxy has a positive effect on fiscal distress.

TABLE I.   LOGISTIC REGRESSION TEST

		B	**Exp(B)**
Step 1ᵃ	PAD_TotPend	1,638	5,144
	DAU_TotPend	,408	1,504
	Ln_PinjDaerah	,007	1,007
	Constant	-,520	,594

Based on the table above, it can be seen that the variables of Regional Original Revenue (PAD_TotPendt), General Allocation Funds (DAU_TotPendt) and Long Term Regional Loans (Ln_PinjDaeraht) indicate the direction has a positive effect. So that it produces the logistic regression equation below:

Fiscal Distress = -0,520 + (1,638 PAD_TotPend$_t$) + (0,408 DAU_TotPend$_t$)   +

(0,007 Ln_PinjDaerah$_t$) + ϵ_i

To examine what variables caused fiscal distress in the district government in Indonesia, several variables were used in Trussel and Patrick's research [6]. In the first variable the concentration of income in this study uses 2 (two) proxies. The first proxy is local revenue according to the research conducted by Trussel and Patrick and Mubarrok measured by the ratio of local revenue to total income (PAD_TotPend) found to have an effect on fiscal distress [6,10]. The results of this study are in line with those found by Supranggono that local revenue significantly affects the occurrence of fiscal distress [11]. The second proxy is the general allocation fund, which is a source of income that comes from outside namely dependence on the central government. This proxy is measured by the ratio of income from general allocation funds to total income (DAU_TotPend) in accordance with Trussel and Patrick's research, found to have a positive influence on fiscal distress [6]. The results of this study are consistent with those found by Supranggono, Mubarrok, and Indrayeni that general allocation funds have a positive effect on fiscal distress [10-12].

Debt use variables in this study, using long-term regional loan proxies (Ln_PinjDaerah) which theoretically can be a support in financing infrastructure development if local revenue and transfer funds from the central government do not meet local government funding needs. Kloha et al. stated that a high level of debt to the ability of local governments to generate income is a clear sign of indications of a fiscal distress [4]. In this study, Ln_PinjDaerah was found to have a positive

influence on fiscal distress. The results of this study are consistent with those found by Gorina et al., Supranggono and Trussel and Patrick that long-term regional loans have a positive influence on fiscal distress [7,8,11].

The test results of data analysis and testing were carried out at the district government in 2015, the results of the analysis can be concluded that the Regional Original Income (PAD_TotPendt) has a positive influence on fiscal distress. In the table above it can be seen that the PAD_TotPendt variable has a positive regression coefficient of 1.638 with an odds ratio of 5.144 which indicates that the greater the Regional Original Revenue tends to be more vulnerable to the occurrence of fiscal distress. This means that the greater the Regional Original Revenue in a district government obtained, then it is likely that the district government tends to be more vulnerable to experiencing fiscal distress. In the context of Indonesia, dependence on internal sources is measured by how much income is concentrated in local revenue (PAD). This is due, because in the APBD structure in Indonesia there are other sources of income besides taxes. The source of regional income received by the regional government is certainly diverse, consisting of Regional Original Revenue, Balancing Funds and Other Legitimate Regional Revenues. Meanwhile, the source of the PAD itself consists of Regional Taxes, Regional Retributions, Results of Regional Wealth Management that are separated and Other Legitimate PAD. In this study, researchers used a proxy for Regional Original Income (PAD) with a more diverse income received. The variety of income received by the district government indicates that the government is experiencing a fiscal distress. The results of the study are supported by the theories of Trussel and Patrick suggesting that "local governments experiencing fiscal distress have more diverse sources of income" [7]. The results of the analysis can be concluded that the concentration of income in the first proxy, namely the regional income has a positive influence on fiscal distress. Thus, the results of this study accept an alternative hypothesis (Ha-1) which states that regional original income has a positive effect on fiscal distress.

Based on the results of the research and discussion that has been presented, this research is coherent and supports the results of previous research conducted by Mubarrok who conducted a study with the title Fiscal Distress Prediction Model in District Governments in Indonesia which found that regional original income affects fiscal distress [10]. The results of the study also showed a positive regression coefficient which means that the greater the PAD_TotPend in a district government, the more likely there is an indication of fiscal distress in the district government.

General allocation fund (DAU_TotPendt) has a positive regression coefficient of 0.408 with an odd ratio of 1.504 which indicates that the higher the level of dependence of general allocation funds from the central government owned by local governments, then the possibility of regional governments to experience fiscal distress. General allocation funds are funds that are generally used by local governments to cover the funding needs and debts of local governments. The higher the dependency of the general allocation fund owned by the district government, the higher the indication of fiscal distress in the district government. Thus the results of this study accept an

alternative hypothesis (Ha-2) which states that the general allocation fund has a positive effect on fiscal distress.

Based on the results of the research and discussion that has been presented in this study coherent and support the previous research conducted by Trussel and Patrick, which conducted a study entitled A Predictive Model of Fiscal Distress in Local Governments which found that the Intergovernmental Revenue had a positive effect on fiscal distress [6]. This is supported by Reid's theory arguing that "The high dependence on the Intergovernmental Revenue (IGR) can cause the regional government to experience a fiscal distress, if the general fund is depleted" [6]. In practice, the general allocation fund is one of the instruments for implementing fiscal decentralization which is realized in the form of transfer funds that are allocated with the aim of equitable financial capacity among local governments. The dependence of high general allocation funds on the district government on the central government is due to the fact that local governments generally use general allocation funds to cover the funding needs and debts of the district government, this is because local revenues are low. This has caused the regional government to become increasingly dependent on general allocation funds which indicate that the district government tends to experience fiscal distress.

Long-term regional loans (Ln_PinjDeraht) have a positive regression coefficient of 0.007 with an odd ratio of 1.007 which indicates that the higher the level of debt held by the regional government, then it is likely that local governments tend to experience fiscal distress. Regional loans affect the ability of local governments to survive. One type of regional loan is a long-term loan which is a regional loan with a loan period of more than one year which is usually used to finance investment projects that can generate revenue in an area. Regional loans can be used as a support for development financing in an area, if local revenue and transfers from the central government are insufficient to meet the needs in an area. However, district governments that are heavily dependent on debt financing are more vulnerable to fiscal distress than district governments that rely less on debt. This is because the district government must meet the requirements of their debt, even when the government is experiencing financial difficulties. Regional loans have a big risk to experience the possibility of fiscal distress in the district government.

Based on the results of the research and discussion that has been presented, this study coherent and supports previous research conducted by Trussel and Patrick, who conducted a study entitled A Predictive Model of Fiscal Distress in Local Governments which found that the use of debt on proxy debt has a positive effect against fiscal distress [6]. This is supported by the theory of Kloha et al. states that "A high level of debt to the ability of local governments to generate income is a clear sign of indications of a fiscal distress" [4]. Therefore, in this study researchers only use long-term regional loan proxies on debt use variables. Thus, the results of this study accept an alternative hypothesis (Ha-3) which states that long-term regional loans have a positive effect on fiscal distress.

V. CONCLUSION

This study describes the effect of income concentration and the use of debt on fiscal distress on district governments in Indonesia. With a sample of 56 regions, found that experienced fiscal distress as many as 34 district governments and who did not experience fiscal distress as many as 22 district governments. Theoretically, fiscal distress is less likely to occur in local governments in Indonesia. Fiscal distress in this study uses relative size, not using absolute size, because in Indonesia there is no absolute measure that indicates a regional government experiences fiscal distress. Based on the results of the research and discussion carried out by the authors in the previous chapter, it can be concluded that the Income Concentration uses 2 (two) proxies, namely the first of the original regional income and the second proxy of the general allocation fund. The first proxy, the local revenue has a positive effect on fiscal distress, which indicates that the greater local revenue in a district government tends to increase the fiscal distress of the district government in Indonesia in 2015. The second proxy, general allocation funds have a positive effect on fiscal distress, which indicates that the higher level of dependency of district governments on transfer funds from the central government tends to increase the occurrence of fiscal distress in district governments in Indonesia in 2015. 2. Use of Debt using long-term regional loan proxies. Long-term regional loan proxies have a positive effect on fiscal distress, which indicates that high dependence on debt financing indicates that district governments in Indonesia in 2015 are more vulnerable to fiscal distress. Based on the results of the Nagelkerke R Square study, the factors of income concentration and the use of debt affect the fiscal distress of 33.5%. There were 66.5% influenced by other factors not examined.

For local governments, this research can be used for get an overview of the financial conditions of each area with connect with public services. Finally, the predictive power of individual measures is modest, and future research could focus on variable interactions as predictors of fiscal distress.

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