Examining the Association between Local Government Financial Indicators and Public Service

Annisa Fisakinah Nursetyautami

This study analyse the financial indicators associated with reductions of public services in Indonesian local governments. Because of the limited number of research focusing in public service reductions, the nature of this study is exploratory. This study could be one of the first studies which predict the probability of significant reductions in public services by local governments in the Indonesian context. This prediction model could serve as an early warning system to avoid fiscal distress in local governments. Logistic regression analysis is used to examine whether or not reductions in public services is caused by particular symptoms of fiscal distress. Public service reductions is hypothesised to be positively associated with revenue risk and debt usage, and negatively associated with organisational slack and entity resources. During the period 2007-2010, there are 66.67 percent of the local governments which have reduced public services. The results also showed that a high level of capital expenditures relative to total revenues in the year before the reduction is the most influential predictor of a reduction in public services.

Keywords: Fiscal Distress, Public Finance, Logistic Regression, Public Service Expenditure.

Introduction

Local governments provide crucial public services. The citizens expect local governments to react towards matters such as public safety, water, sewer, streets, parks, and recreation. However, local governments could contribute to the quality of community life by providing such services only if they avoid fiscal distress. The fiscal health of a local government is important because it influences its ability to maintain its present level of public services (Honadle et al., 2004).

For nearly half a century, fiscal distress has been a concerning subject. The Northeast region of the United States started to experience fiscal distress in the 1960s. The fiscal distress that the older industrialized cities experienced began to be linked with the decline in the Industrial Revolution. Entering 1980s the fiscal distress continued, starting in New York City when it nearly experience fiscal collapse due to the 1970s oil crisis and high inflation. Soon other cities such as Cleveland, Ohio; Parlier, California; and Saco, Maine also began to experience fiscal distress (ACIR, 1985b).
For many years to come, the present crisis affecting the local governments may continue. Local governments are predicted to face significant fiscal challenges until at least 2050. The fiscal health of U.S. local governments are expected to consistently decline between 2010 and 2050, mainly caused by the anticipated rise in the cost of employee compensation, health insurance, and pension benefits. The inability of the local governments to provide services needed for a growing economy and the deterioration of national infrastructure could be the possible result of this anticipated fiscal decline (U.S. Government Accountability Office, 2008).

Economic crisis also occurred in Indonesia since 1997, bringing its impact into every aspect of life. Such impact is faced by not only the private sector, but also the government and other public sector. Crisis could have a positive impact, a higher export value due to the rise of the exchange rate of American dollar to Indonesian Rupiah for instance. However, crises have more negative impact such as the increase of unemployment and poverty. Crisis also caused a decline in economic activity of the citizenry which would bring further impact to local income from local tax and retribution. Local income would decline which would result in the dependence of intergovernmental fund (Halim, 2001).

Decentralization of the Indonesian central government authority over to the local government began in 1999 (Act 22/1999). Revenue, expenditures, and finance are now being managed by the local government as a result of the local autonomy. The intergovernmental revenue received by the local governments increased almost five times due to the fiscal decentralization of more than thirty percent of the central government budget. Another result of the new local autonomy is that the central government does not provide detailed rules to manage local finance anymore, now it merely provide the principles which results in the variation of financial conditions among the local governments (Ritonga et al., 2012). This variations proved that there are some local governments who are capable to manage their finance themselves while there are also some that struggled, which would eventually led them into fiscal distress.

The financial statement of the local government in Indonesia are made up of balance sheets, statements of cash flows, and statements of actual performance compared to budget (APBD) which have to be audited by The Supreme Audit Board of The Republic of Indonesia in accordance to the Government Accounting Standards (Act 17/2003, Act 1/2004, Act 15/2004, Act 32/2004 and Government Regulation 58/2005). Unfortunately, the local government financial conditions failed to be shown in these audited financial statements (Ritonga et al., 2012). However, in order to ensure the sustainability of local governments in delivering public services and to avoid fiscal distress, it is crucial to know the financial condition of local governments (Honadle et al., 1998).

At an international level, efforts have been made to develop indicators to measure the financial condition of local governments to detect fiscal distress. In the United States, Brown (1993), Honadle and Lloyd-Jones (1998), and Kloha et al. (2005a, 2005b), have developed indicators of fiscal distress, while GASB (1999, 2004), Hendrick (2004), and Wang et al. (2007) have tried to explain and calculate the concept.
of financial condition. The Canadian Ministry of Municipal Affairs and Housing (2006) published the Financial Information Return and the Australian Accounting Research Foundation (1996) has produced Financial Reporting by Local Government. In France, the Dirección Générale de Collectivités Locales (1997) used intervals of particular budgetary indicators to form a financial warning system. In the United Kingdom, Comprehensive Performance Assessment (CPA) includes a section named “Use of Resources,” which has the auditors’ opinion on the local government financial condition, evaluated using a “star rating” system (Cutler & Waine, 2003). In Israel, Carmeli and Cohen (2001) suggested that to measure the financial condition in local governments there are four indicators that must be tested.

Despite these accomplishments, there are very few studies that tried to associate the causes of fiscal distress with reductions of public services. Patrick and Trussel (2011) developed a model using symptoms of fiscal distress to predict whether or not municipalities will reduce public services by operationalizing the key consequence of fiscal distress, and then identifying the symptoms of fiscal distress that could lead to public service reductions. It derived to the definition of fiscal distress as a significant reduction in public services. Public services are outputs that cannot be easily measured (Berne, 1992). The model developed by Patrick and Trussel managed to proxy public service outputs and measure those efforts as public service expenditures per capita. It then operationalizes the construct of a significant reduction in public services as a reduction in annual expenditures of public services per capita by more than five-percent.

From the survey of national integrity conducted by Corruption Extermination Commission (KPK), the public service index has been fluctuating from the year 2007 up to 2012. In fact, from 2008 until 2009 the public service index has been declining. The local government stakeholders in Indonesia demands for information about what caused the reductions of public service which reflects the fiscal distress that occurred in the Indonesian local governments, they wanted to be able to understand this occurrence in order to prevent it from happening. Unfortunately, to answer these demands limited researches have been conducted in the developing countries and very few have been done in Indonesia.

Given the little evidence on the relationship between public service reduction and financial determinants, the purpose of this study is to predict whether or not local governments will reduce public services by replicating the body of literature constructed by Trussel and Patrick (2011) and applying it to the Indonesian local governments. Furthermore, it improves the model employed by Trussel and Patrick as it adjust the financial determinants to better suit the Indonesian context into the model and examines its relationship with public service reductions. Replication is necessary to establish the increasing range of significantly different conditions from where the findings originally took place, and also to validate the previous findings. Additionally, this study examines the sample of a few provinces in the Java Island; therefore it covers a wider scope than the study by Trussel and Patrick (2011) which only observe one state Pennsylvania. This also becomes the empirical contribution of this study because the sample of the Indonesian government is limited, given the vast majority of mainstream studies are
focused on US data. Henceforth, applying the predictive model of public service reduction in the Indonesian context is worth further study.

The remainder of the paper is organized as follows. The next section is the literature review and hypothesis development. The following section addresses sample selection process, measurement, and econometric model. Further section discusses results and analysis. The last section concludes the research, outlines the limitations, as well as proposes some suggestions for future research.

Literature Review and Hypothesis Development

Fiscal Distress

Indicators that identify a municipality as vulnerable to significant public service reductions are what are known as the symptoms of fiscal distress. These symptoms are proxied by financial ratios or indicators. Financial condition of a local government can be measured by financial ratios at a certain point in time. Financial ratios are indicators that can also be used to evaluate the results of local government operations over a period of time. In Pennsylvania where Trussel and Patrick’s study is conducted, municipalities are equipped with a fiscal monitoring system created by the Allegheny League of Municipalities to measure its financial condition at a particular point in time and a trend analysis technique to measure changes in financial conditions over time (DCED, 1999). The system focuses on cash solvency (e.g., the relationship of current assets to current liabilities), budgetary solvency (e.g., the relationship of revenues to expenditures), long-term solvency (e.g., the extent of long-term debt usage) and service-level solvency (the ability of the municipality to maintain its current level of public services). The indicators to assess the financial conditions of municipalities are identified by the Allegheny League of Municipalities with those recommended by the Government Accounting Standards Board (Mead, 2001) and the International County/City Management Association (Groves and Valente, 1994). A complete review of the indicators used to detect municipal fiscal distress is provided by Trussel and Patrick (2009). A significant reduction in public services is hypothesized as a function of four symptoms of fiscal distress by using a combination of the financial indicators recommended by the Allegheny League of Municipalities and Trussel and Patrick (2009). The symptoms of fiscal distress are proxied by financial indicators which are also used to hypothesize that public service reductions are positively correlated with revenue risk and debt usage and negatively correlated with organizational slack and entity resources.

In Indonesia there has been a few studies attempted to analyse the occurrence of fiscal distress in Indonesia. Indrayeni (2011) replicates the earlier study of Trussel and Patrick (2009) to all the local governments (kabupaten) and local municipal governments (kota) in Indonesia for the years 2006-2010. In the earlier study of Trussel and Patrick (2009), local government is considered as fiscally distressed if it suffers decline of its revenue by more than five percent for three consecutive years. This definition is what mostly differentiates the findings of Indrayeni to this study, apart from that some of the proxies used are also different. Mubarrok (2012) also replicates the
earlier study of Trussel and Patrick (2009) for the years 2006-2009 to all the local governments (kabupaten) in Indonesia only, excluding the local municipal governments (kota) to maintain homogenity of the sample. Unlike Indrayeni (2011), Mubarrok (2012) modified some proxies and changed the definition of fiscal distress by Trussel and Patrick (2009), local government is considered as fiscally distressed if it is below the mean value and the deviation standard. Ritonga et al. (2012) also used similar financial indicators to assess the financial condition of local governments in Indonesia, which could then eventually be used as a warning input to avoid fiscal distress.

Revenue Risk

In Indonesia, revenue risk also became a challenge in the implementation of regional autonomy. The main characteristics that a local government is able to implement regional autonomy are: first, the financial state of the local government, which implies that the local government has the ability and the authority to exploit the financial sources, manage and utilize its own revenue to fund government operations; second, the dependence towards central funding is low (Halim, 2007).

According to the independence of the local government finance is shown by the ratio of the size of own-source revenues to revenues from other sources, such as intergovernmental revenues or debt. Independence ratio reflects the local government dependence towards external sources funds. High independence ratio implies that the level of dependence towards external funds (particularly from the central government and provinces) is low. Independence ratio also reflects the level of public participation in the local development. The higher the independence ratio, the higher public participation to pay local tax and retribution which are the main component of own-source revenue. The higher public participation to pay local tax and retribution will reflect the higher public welfare (Halim & Damayanti, 2008). If the intergovernmental funds received from the central government, province or other local government diminish, a local government runs the risk of having to replace revenues with its own sources. This leads to the first hypothesis of this research:

H1: Revenue risk is positively associated to public service reductions.

Organizational Slack

Public safety, public works, parks and recreation are programmatic functions of the local government and are not included as administrative expenditures. Expenditures made from the General Fund such as office salaries, office supplies, office rent, utilities and maintenance are what are considered as administrative expenditures. Debt service costs or costs incurred to support programmatic functions, entitlement programs, and social services are also excluded from administrative expenditures (Trussel & Patrick, 2009). Administrative costs are more discretionary than programmatic and debt service costs, which are non-discretionary. Because of that, local governments that spend more on administrative costs, relative to total expenditures, are less prone to fiscal distress. Fiscal distress can be caused by programmatic and debt services costs which are
mandatory and can put a strain in local governments. Moreover, funded and unfunded mandates are increasingly imposed by state and federals government upon local governments (Brown, 1993). However, the proxy to measure the administrative cost is omitted in this study. In the Indonesian context it is difficult to track the administrative cost of the local government due to the format of the financial statement, therefore this study will measure organizational slack with the proxy of capital expenditure only.

An entity’s resource utilization and level of discretionary spending is measured with what is called the organizational slack (Hendrick, 2004b). Local governments with the resources needed to buffer against fiscal distress usually have high levels of organizational slack (Cyert & March, 1968). On the contrary, local governments which do not have enough resources would have exhausted all their surplus resources to mitigate the distress before reducing public services, such local governments usually have low level organizational slack (Hendrick, 2004). This leads to the second hypothesis of this research:

**H2:** Organizational slack is negatively associated to public service reductions.

**Debt Usage**

Government debt is a crucial source of funding. Government debt can be used to fund local development when own-sourced revenue and intergovernmental revenue does not suffice the needs of local government (Halim & Damayanti, 2008). Local governments can borrow from the central government or a third party. Debt is the supplement to other sources of local government revenues and is aimed to fund activities which would increase income that can be used to pay back the debt, and bring benefit to the public services. Moreover, debt can be aimed to solve short-term problems which might be related to the local government cash-flow (Government Regulation, 54/2005).

There has been some research in the public sector which used the variable government debt. Trussel and Patrick (2009) used two proxies of solvability; the first is total debt which is measured with the natural log of total debt, and the second proxy calculated debt size to revenue. The debt ratio to revenue measured the number of years needed to pay the debt.

Local governments can be susceptible to fiscal distress when using debt. Because fixed, debt service costs, even in times of financial difficulty must be met, local governments that rely too heavily on debt financing can become distressed (Mead, 2001). Fiscal distress can be caused by the overuse of debt. The third hypothesis of this research is as follows:

**H3:** Debt usage is positively associated to public service reductions.
Entity Resources

According to Groves et al. (2003), the indicators of the need for public resources encompass the characteristics of economy and demography which includes population, private income, property value, job, and business activity. The characteristics of tax, along with economy and demography are viewed as two different aspects. Tax determines the public welfare and has the ability to generate income (in the level of private, commercial, and industrial income). On the other hand, the characteristics of economy and demography influence the public demand, such as the demand for security, capital development, and public services.

The resources of an entity in the public sector can be seen from how big its ability to generate income in various conditions it is facing. Patrick and Trussel (2009) determined entity resources by using the size of the entity and the revenue growth. The resources and the needs of the public are often linked to the size of an entity. The theoretical models developed by Borcherding and Deacon (1972) and Bergstrom and Goodman (1973) mentioned that the size of the public sector organization depended on the revenue, population, public service expenses and the characteristics of the economy and demography which influenced the demand and supply of public goods and services. Bergh and Karlsson (2010) also have the same view that the size of a government by definition is related to the tax and public spending as a part of Gross Domestic Product (GDP), which they then used as the variable to proxy the government size.

A key symptom of fiscal distress is the balance between the needs and resources of the local community (Groves & Valente, 1994) and (ACIR, 1985). Total revenues which is highly correlated with population, is being used to measure the relationship of the balance between the needs and resources of the local community. Local governments experiencing population growth must provide public services without the needed infrastructure, whereas local governments experiencing drops in population (and thus total revenues) must support underutilized infrastructures (Kelsey, 1998). Local governments strive to maintain decaying infrastructures with fading resources, as they experience out-migration fare worse in this imbalance (Kelsey, 1998). The last directional hypothesis is:

H4: Entity resources are negatively associated to public service reductions.

Methodology

Sample Selection Process

Secondary data of local government financial statements audited by the Supreme Audit Board of the Republic of Indonesia (BPK RI) for the period of the fiscal year 2007-2010 is used in this study. The sample in this study is all local governments (kabupaten) in Java, excluding municipal local governments (kota). Local governments have different characteristics compared to municipal local government; one of the differences is that local governments have a higher level of dependence towards
intergovernmental funds compared to the municipal local governments (Mubarrok, 2012). The average fiscal autonomy level of municipal local government is larger than those of the local governments. The higher dependence towards intergovernmental fund caused the local governments to be more vulnerable to experience fiscal distress rather than the municipal government, based on this reason this study limits the study to local governments only. In terms of environment, socioeconomic factors, culture and infrastructure, local governments in Java are more or less homogenous (Ritonga et al., 2012). Homogenity is necessary to obtain maximal comparability.

The first year to be observed is 2007, this is due to the fact in 2006 Indonesia undergo a change of the government accounting standard. Therefore, the scope of this study is four fiscal years from 2007 up to 2010. The data are obtained from the financial statements of the Indonesian local governments consisting of balance sheets, statements of cash flows, and statements of actual performance (APBD). During 2007-2010 there are 84 local governments in Java that are supposed to be observed, however 36 of these local governments have incomplete data. Since almost 50 percent of the local government data are incomplete, they are too significant in numbers to be eliminated. The average of the sample is then used to fill in the missing data, by doing so the 36 local governments can still be included in the observation.

As noted earlier, a local government is defined as fiscally distressed if it has an annual decrease in public service expenditures of more than five-percent. Two consecutive years of data are needed to define fiscal distress; therefore local governments could not be defined as fiscally distressed in 2010. Henceforth the data in the year 2010 is merely needed to determine whether or not the local governments in the year 2009 are fiscally distressed, but it is not to be included in the analysis. For example, if there is a decrease in public service expenditure in a local government between 2009 and 2010 that cumulates to more than five-percent, then it is considered to be fiscally distressed in 2009.

**Dependent Variable - Public Service Reductions**

Patrick and Trussel (2011) defined fiscal distress as a significant public services reduction. Unfortunately, it is difficult to measure public services (Berne, 1992). Patrick and Trussel managed to proxy public service outputs and measure those efforts as public service expenditures per capita. It then operationalizes the construct of a significant reduction in public services as a reduction in annual expenditures of public services per capita by more than five-percent (Patrick & Trussel, 2011).

Trussel and Patrick defined public service expenditures per capita (EXPCAP) as total operating expenses scaled by population. EXPCAP excludes capital expenditures, interest costs and administrative costs so that only public services expenditures are counted. Patrick and Trussel used a five percent cut off to account for the significance or materiality of the reductions because minor reductions in public services are not always the result of fiscal distress.
In this study the public service is measured as total operating expenses scaled by total revenues. The reason why the denominator is replaced by total revenue is due to the nature of the population data in Indonesia. In Indonesia the population census is only done every 10 years for the year ending with the number 0, only forecast is available for the population data for the other years (Act 16/1997). This study used data from 2007-2010, the year 2010 is the only year in the sample which is a census year. There is a great volatility between the forecast and the actual census population data, in order to maintain the model to be as representative as possible this study replaced population with total revenue. Population is also viewed as a socioeconomic factor of a region. In discussing fiscal distress, observation is more relevant to be carried out towards the local government instead of the actual region; Total revenue is a more relevant factor to assess the local government which is why it replaced population in this study.

**Independent Variable - Revenue Risk**

The intergovernmental revenues received from the central government, province, or other local government sources to own-source revenues are measured as the revenue risk (REVRISK). Revenues from current operations, taxes and miscellaneous revenues are what are considered to be the own-source revenues. Trussel and Patrick measures the relationship of between intergovernmental revenue and own-source revenue is measured in this ratio, and can be defined as the percent of own-source revenues that would have to be increased for every percentage decrease in intergovernmental revenue. The higher the REVRISK, the more the local government would have to increase own-source revenues to cover decreases in intergovernmental revenue.

The Indonesian Directorate General of Fiscal Balance also used the same ratio to measure the regional dependence, which is transfer-fund scaled by total revenue. The regional dependence ratio illustrates the level of dependency of a region towards external help. The bigger the transfer-fund ratio, the bigger the dependency level in funding the regional expenditure. Henceforth, the region which has a low level dependency is the region with a low transfer-fund ratio (DJPK, 2012).

**Independent Variables - Organizational Slack**

The measure of organizational slack is capital expenditures relative to total revenues and bond proceeds (CAPREV). Before reducing public services, a local government in fiscal distress will reduce capital expenditures first (GAO, 1990). CAPREV measures organizational slack as well as acts as a proxy for the condition of the municipality’s physical infrastructure, where low organizational slack suggests low capital expenditures and a deteriorating physical infrastructure. CAPREV is measured as capital expenditures scaled by total revenues. In this study we removed the bond proceeds denominator from the original model of Trussel and Patrick (2011) because the local governments in Indonesia does not issue bond, therefore the denominator
bond proceeds is removed due to its irrelevance to the Indonesian context. The percentage of total revenues spent on capital expenditures is measured by the ratio.

A similar ratio is also used by Indonesian Directorate General of Fiscal Balance to analyse the regional capital expenditure, which is capital expenditure scaled by total expenditure. The difference in this ratio is that total expenditure is used as denominator instead of total revenue; nevertheless both ratios measured the portion spent on capital expenditure. The realisation on capital expenditure will have a multiplier effect to drive the wheels of regional economy. High capital expenditure ratio is hoped to indicate positive economic growth (DJPK, 2012).

Independent Variable - Debt Usage

There are two measures of debt usage used in this research. First, debt per capita (DEBTASS) is measured as total liabilities divided by total population. This study used total asset as the denominator instead of population which is used in the original model by Trussel and Patrick (2011). Just like the case with the dependent variable in this study, this replacement is due to the nature of the population data in Indonesia which has already been explained previously. Ritonga et al. (2012) also used a similar ratio to measure short term solvency, short term solvency is the ability of local governments to fulfil its obligations that matures within 12 months. The short term solvency ratio is total asset scaled by total liabilities. Despite the opposite placement of the numerator and denominator compared to the ratio used in this study, the two ratios both illustrate the debt usage of the local government. Second, debt scaled by revenue (DEBTREV) is used to measure the number of years of revenues needed to repay debt (The U.S. Congressional Budget Office, 1978).

Debt has the potential to add burden of local government due to the interest payment, therefore debt must be managed prudently. Henceforth, in Indonesia the amounts of debt which will be budgeted into the Statements of Actual Performance Compared to Budget (APBD) are being limited by the Minister of Finance Regulation each year. The Indonesian Directorate General of Fiscal Balance used the ratio total liabilities scaled by total revenues to measure the debt usage of the local government.

Independent Variable - Entity Resources

The evaluations of fiscal distress should include a determinant reflecting the resources and the needs of the surrounding community (ACIR, 1985). The balance between the needs and resources of the surrounding community is a key factor in assessing the risk of fiscal distress (Groves & Valente, 1994). The entity resources are measured as the log natural of total revenue. Local governments with low revenues are more likely to experience fiscal distress which could then lead them to cut their public services.
Econometric Model

To test the model of public service reductions, this study uses cross-sectional time-series (panel data) analysis. The significance of the model is calculated using logistic regression analysis and adjusted for autocorrelation because the dependent variable is categorical. Using this method, the underlying latent dependent variable is the probability of fiscal distress for local government $i$, which is related to the observed variable, $Status_i$, through the relation:

$$\begin{align*}
Status_i &= 0 \text{ if the local government did not reduce public services; and} \\
Status_i &= 1 \text{ if the local government reduced public services.}
\end{align*}$$

The model includes all of the dependent variables from Table 3.2. The predicted probability of the $k^{th}$ status for local government $i$, $P(\text{Status}_{ik})$, is calculated as:

$$P(\text{Status}_{ik}) = \frac{1}{1+e^{-Z_i}}$$

Where

$$Z_i = \beta_0 + \beta_1 \text{REVRISK} + \beta_2 \text{CAPREV} + \beta_3 \text{DEBTASS} + \beta_4 \text{DEBTREV} + \beta_5 \text{SIZE} + \epsilon_i$$

The variables in the regression above are defined as follows:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z$_i$</td>
<td>public service, measured as operating expenditure scaled by total revenues</td>
</tr>
<tr>
<td>REVRISK</td>
<td>revenue risk, measured as revenues from other governments scaled by own-source revenues</td>
</tr>
<tr>
<td>CAPREV</td>
<td>capital outlays, measured as capital expenditure scaled by total revenues</td>
</tr>
<tr>
<td>DEBTASS</td>
<td>debt to asset, measured as total liabilities scaled by total asset</td>
</tr>
<tr>
<td>DEBTREV</td>
<td>debt to revenue, measured as total liabilities scaled by total revenues</td>
</tr>
<tr>
<td>SIZE</td>
<td>size, measured as the ln of total revenues</td>
</tr>
<tr>
<td>$\beta_{0,5}$</td>
<td>coefficient of regression</td>
</tr>
<tr>
<td>$\epsilon$</td>
<td>error term</td>
</tr>
</tbody>
</table>

Results

Descriptive Analysis

The descriptive analysis gave the general description of the research data which can be observed from the number of sample, minimum value, maximum value, average value and the deviation standard. The descriptive analysis will be explained in the table for each of the following variables:
Table 1: Result of Descriptive Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Observations</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std.Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>REVRISK</td>
<td>252</td>
<td>3.949426</td>
<td>28.17738</td>
<td>12.56345</td>
<td>4.568616</td>
</tr>
<tr>
<td>CAPREV</td>
<td>252</td>
<td>0.047322</td>
<td>0.409447</td>
<td>0.191237</td>
<td>0.064008</td>
</tr>
<tr>
<td>DEBTASS</td>
<td>252</td>
<td>0.000006</td>
<td>0.240244</td>
<td>0.007072</td>
<td>0.018517</td>
</tr>
<tr>
<td>DEBTREV</td>
<td>252</td>
<td>0.000007</td>
<td>0.243863</td>
<td>0.010987</td>
<td>0.022716</td>
</tr>
<tr>
<td>SIZE</td>
<td>252</td>
<td>26.63277</td>
<td>28.40949</td>
<td>27.44253</td>
<td>0.288291</td>
</tr>
</tbody>
</table>

In Table 1, the lowest REVRISK value is 3.949426 which belongs to the local government of Sidoarjo in the year 2009. The highest value of 28.17738 belongs to the local government of Ngawi in the year 2008, and the average value is 12.56345. The local government of Garut has the lowest CAPREV value of 0.047322 in the year 2009, whereas the local government of Bekasi has the highest value of 0.409447 in the year 2009 and the average value is 0.191237. DEBTASS has the minimum value of 0.000006 which belongs to the local government of Pandeglang in the year 2009, and has the maximum value of 0.240244 which belongs to the local government of Pandeglang in the year 2007 with the mean value of 0.007072. The local government of Tasikmalaya has the lowest DEBTREV value of 0.000007 in the year 2007, whereas the local government of Pandeglang has the highest value of 0.243863 in the year 2007 and the average value is 0.022716. The lowest SIZE value of 26.63277 belongs to the local government of Pasuruan in the year 2009. The highest value of 28.40949 belongs to the local government of Bogor in the year 2009, and the average value is 27.44253.

Correlation Test

Multicollinearity presents the relationship between independent variables. Multicollinearity is tested with correlation matrix. If there are variables that have strong correlation, then the strongly correlated variables indicated that there is multicollinearity. Gujarati (1995) stated that two independent variables have multicollinearity if the value exceeds 0.8.

Table 2: Correlation Result of Covariance Analysis

<table>
<thead>
<tr>
<th>CORRELATION</th>
<th>CAPREV</th>
<th>DEBTASS</th>
<th>DEBTREV</th>
<th>REVRISK</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAPREV</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEBTASS</td>
<td>0.159648</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEBTREV</td>
<td>0.141647</td>
<td>0.913548</td>
<td>1.000000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REVRISK</td>
<td>0.029589</td>
<td>0.004973</td>
<td>-0.017353</td>
<td>1.000000</td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>0.086144</td>
<td>0.026928</td>
<td>0.026275</td>
<td>0.338245</td>
<td>1.000000</td>
</tr>
</tbody>
</table>

*coefficient>0.9

The correlation test showed that there is a high correlation of 0.913548 for DEBTASS and DEBTREV. The high correlation may cause a problem with
multicollinearity, to solve this one of the two variables that is highly correlated must be omitted. Between the two variables, the coefficients of DEBTREV are more consistent with the predicted signs in the hypotheses therefore DEBTASS is omitted.

Regression Result

<table>
<thead>
<tr>
<th>Variables</th>
<th>Predicted Sign</th>
<th>Coefficient (B)</th>
<th>Probability (P)</th>
<th>Odds Ratio Exp(B)</th>
<th>Impact Exp(B)_{0.10, -1}</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-</td>
<td>-48.23672</td>
<td>0.0027***</td>
<td>1.12476E-21</td>
<td>-0.99196278</td>
</tr>
<tr>
<td>REVISK</td>
<td>+</td>
<td>0.033701</td>
<td>0.3291</td>
<td>1.034275312</td>
<td>0.003375785</td>
</tr>
<tr>
<td>CAPREV</td>
<td>-</td>
<td>-7.534160</td>
<td>0.0012***</td>
<td>0.00053451</td>
<td>-0.529244299</td>
</tr>
<tr>
<td>DEBTREV</td>
<td>+</td>
<td>2.628853</td>
<td>0.6658</td>
<td>13.85786581</td>
<td>0.300677523</td>
</tr>
<tr>
<td>SIZE</td>
<td>-</td>
<td>1.821848</td>
<td>0.0017***</td>
<td>6.18327459</td>
<td>0.199835903</td>
</tr>
</tbody>
</table>

McFadden R-squared: 0.072888
LR statistic: 23.38270
Prob(LR statistic): 0.000106

Observation with Dependent Variable=0: 84
Observation with Dependent Variable=1: 168
Total Observation: 252

*P<0.10; **P<0.05; ***P<0.01

From Table 3 above, an apparent econometric model can be depicted as follow:

\[ Z_i = -48.23672 + 0.033701 \times \text{REVISK} - 7.534160 \times \text{CAPREV} + 2.628853 \times \text{DEBTREV} - 1.821848 \times \text{SIZE} + \epsilon_i \]

The results of the logistic regression (adjusted for multicorrelation) are included in Table 3 and overall the model is significant at the 0.01 level. The variables that are significantly related to the probability of public service reduction are CAPREV and SIZE. The model seems to fit the data well except for the unexpected sign of SIZE which does not have the anticipated negative sign.

The regression analysis also allows users to measure the impact of a change in the indicators on the likelihood of public service reductions. In Table 3 shows Exp(B) odds ratio, which is the change in the odds of public service reductions given a one-unit change in the indicator. Since a one unit change in a ratio is not realistic, the last column in Table 3 shows the impact on the likelihood of public service reductions due to a 0.10 increase in the variables. The impact is computed as Exp(B)_{0.10, -1}. The details of analysis will be explained in the next section.
H1: Revenue risk is positively associated to public service reductions.

In table 4.2 the statistical result of REVRISK (P=0.3291) is not significant, it can be derived that association between revenue risk and public services reduction does not exist, hence the first hypothesis (H1) is rejected. Although insignificant, the relationship between revenue risk and public service reduction is positive (B=0.033701), still in line with the predicted sign. Local governments that are overly dependent towards intergovernmental revenues relative to own-source revenues are more likely to experience fiscal distress (Reid, 198). The positive coefficient suggest that the more local governments depend on revenues from intergovernmental funds, the more it will be at risk financially which would then lead them to reduce public services in order to cover its other needs. This finding proves that the condition does not only apply in the United States context where Trussel and Patrick (2011) conduct the research which this study replicates, but it also applies in the Indonesian context although the statistical result is not significant.

The positive relationship in this study is consistent with the finding by Mubarrok (2012) who adapted the fiscal distress research by Trussel and Patrick (2009) to the Indonesian context. However, the finding by Mubarrok is significant, this might be due to the slight difference in the proxy used which is own-source revenue scaled by total revenue. The insignificant association between revenue risk and public service reduction in the Indonesian context is due to the weak financial independence of the Indonesian local governments which are being regulated in the Indonesian Constitution 1945 Article 33. The constitution states that land, water, and all that significantly influence the life of the people must be managed by the state (in this case the central government). As a result, the strategic sources of revenue becomes the revenue for the central government although they are located in the local government region. The local governments are left to manage the non-strategic revenue sources which does not significantly influence the life of the people. According to the study by Ritonga et al. (2012), only approximately eight percent of Indonesian local governments are under their control.

The impact value of REVRISK is 0.003375785 which shows that it is not a very influential indicator to predict public service reduction. If the association between revenue risk and public service reductions had been significant, then the impact value would mean that an increase in REVRISK by 0.10 will increase the risk of public sector reductions by 0.003375785, just as a decrease in REVRISK of 0.10 will decrease the risk of public service reductions by 0.003375785.

H2: Organizational slack is negatively associated to public service reductions.

The statistical result of CAPREV (P=0.0011) is significant, henceforth the second hypothesis (H2) is accepted. The result proved that there is a correlation between organizational slack and public service reductions. The significantly negative relationship (B= -7.350045) indicates that the lower organizational slack of local government (lower capital expenditure and deteriorating physical infrastructure), the
more likely it will reduce its public services. A local government in fiscal distress will reduce capital expenditures before reducing public services (GAO, 1990). However this study conducted in Indonesian portrays a different result as the prior study done by Trussel and Patrick (2011) in the United States which results in a positive relationship.

The positive relationship might occur because in the United States capital projects are usually planned and financed over a several year period and paid for with bond proceeds, not annual tax revenues so it could be difficult for local governments to cancel the contracts and bond issue related to the project once a long-term capital project is started (Trussel and Patrick, 2011). Another reason is that ideally the local government’s long-term capital budgets to plan the financing of capital projects and short-term operating budgets to plan the financing of public service should be integrated. However the source of these revenue streams is separate, as a result local governments might need the improvements and equipment financed with capital funds so they would proceed with planned capital outlays while reducing public services (Vogt, 2004).

The most influential indicator of public service reductions is capital expenditures relative to total revenues (CAPREV), this is shown by the impact value of which is the highest compared to those from other variables. A decrease in CAPREV by 0.10 will increase the risk of public service reductions by 0.529244299, just as an increase in CAPREV by 0.10 will decrease the risk of public service reductions by 0.529244299.

H3: Debt usage is positively associated with public service reductions.

The third hypothesis (H3) is rejected because there are no association between debt usage and public services reduction, this can be seen by the statistical result of DEBTREV (P= 0.6658) which is not significant. The relationship between debt usage and public service reduction is positive (B=2.628853), although insignificant it is still in line with the predicted sign. The local governments that are too dependent towards debt financing can become distressed because they must cover their fixed, debt service costs, even in times of financial difficulty (Mead, 2001). The positive coefficient portrayed that the more local government depend on debt financing, the more it will be at risk financially which would then lead them to reduce public services to meet its obligations.

Indrayeni (2011) who used the exact same proxy also found insignificantly relationship; however the result is negative contradicting the predicted sign unlike the positive result in this study. Mubarrok (2012) measured debt usage differently by calculating the natural log of the local government long term liability, despite the different measurement the same insignificant positive result is also received. The insignificant association between debt usage and public service reduction in the Indonesian context is due to the limited use of debt financing by the Indonesian local government. The use of debt financing is strictly regulated in Indonesian Government Regulation Number 30 of 2012 regarding Regional Debt. The regulation states that local governments may issue bonds to fund infrastructure and investment activities within the
framework of the provision of public services that creates revenues, which are acquired from levies on the use of the infrastructure and or facilities, for the local government. At the moment investing in Indonesian local government bonds is not very appealing, in the future debt financing would be a good provision for local governments if it is able to raise funds from the public through the issuance of bonds (Ritonga et al, 2012).

The impact value of liabilities relative to total revenue (DEBTREV) is 0.300677523 which shows that it is quite an influential indicator to predict public service reduction. If the association between debt usage and public service reductions had been significant, then the impact value would mean that an increase in DEBTREV by 0.10 will increase the risk of public sector reductions by 0.300677523, just as a decrease in DEBTREV of 0.10 will decrease the risk of public service reductions by 0.300677523.

H4: An Entity resource is negatively associated to public service reductions.

The statistical result of SIZE (P=0.0017) is significant, the result proved that there is a correlation between entity resources and public service reductions. However the fourth hypothesis (H4) is rejected because the relationship is positive (B=1.821848) contradicting the predicted negative sign. A balance between the needs and resources of the local community is necessary to avoid fiscal distress as suggested by Groves and Valente (1994) and ACIR (1985). The positive relationship indicates that the higher entity resources of local government, the more likely it will reduce its public services. This finding does not comply with United States context where Trussel and Patrick (2011) conduct the research which this study replicates.

The contradicting significant positive relationship in this study is again consistent with the findings by Indrayeni (2011) who adapted the fiscal distress research by Trussel and Patrick (2009) to the Indonesian context. In Indonesia, having a higher entity resources does not necessarily prevent the local government from reducing public services, Mubarrok (2012) concluded that this result is due to the bad management of the local government in allocating the resources it possessed.

The impact value of SIZE is 0.199835903 which shows that it is not a very influential indicator to predict public service reduction. Since the association between entity resources and public service reductions is significant, then the impact value means that an increase in SIZE by 0.10 will increase the risk of public sector reductions by 0.199835903, just as a decrease in SIZE of 0.10 will decrease the risk of public service reductions by 0.199835903.

Conclusions, Limitations, and Suggestions

Conclusions

This study investigates whether or not the local governments in Indonesia will reduce public services. Trussel and Patrick defined local government to be fiscally
distressed if it reduces its public service by more than 5 percent in the following year. With the total sample of 252 local government years, 168 of them reduced its public services causing them to be considered as fiscally distressed. This study also analysed the determinants that influenced the fiscal distress in the Indonesian local governments. Initially, correlation test is conducted to observe the relationship among the determinants. The correlation test showed that there is a high correlation of 0.913548 between DEBTASS and DEBTREV. Between the two variables, the coefficients of DEBTREV are more consistent with the predicted signs in the hypothesis therefore DEBTASS is omitted. From the regression result only 2 out of 4 variables are significant at the 0.05 level and followed the predicted sign of the hypothesis which are CAPREV and SIZE; however SIZE has a positive sign which contradicts the supposedly negative predicted sign. CAPREV measures organizational slack, as well as acts as a proxy for the condition of the local government’s infrastructure, where low organizational slack suggests low capital expenditure and a deteriorating physical infrastructure that could lead to public service reductions and fiscal distress (Trussel & Patrick, 2011). SIZE measures entity resources, a balance between the needs and resources of the local community is necessary to avoid fiscal distress as suggested by Groves and Valente (1994) and ACIR (1985). The regression result of other variables REVRISK, and DEBTREV are not significant, nevertheless both variables have positive sign which complies with the predicted sign. The regression analysis also allows users to measure the impact of a change in the indicators on the likelihood of public service reductions. The model shows that the most influential indicator of public service reductions is capital expenditures relative to total revenues (CAPREV), this result is the same as that of Trussel and Patrick (2011) which also found that CAPREV to be the most influential indicator. After reviewing the statistical facts, the insignificant result documented in this study is suspected to be the consequence of the incomplete data and the global crisis that occurred in 2008.

Research Limitations

This study has view limitations which require correction and development in the future studies. These limitations are:

1. There are no determinants that are perfectly suitable yet to measure fiscal distress which occurred in the Indonesian local governments.
2. In this study there is a variable DEBTASS that must be omitted to avoid multicollinearity.
3. The sample used in this study is limited to the local governments in Java; this is because the local governments in Java are relatively homogenous in environment, socioeconomic factors, culture and infrastructure (Ritonga et al., 2012).
4. From the total sample of 84 local governments, there are 36 who have incomplete data. Because the number of local governments with incomplete data is significant, it is likely to influence the result of this study.
Suggestions for Future Studies

The result of this study is hoped to be a useful input to the governments in Indonesia to avoid the possibility of fiscal distress. The occurrence of fiscal distress in the Indonesian local governments should trigger the Indonesian central government to device system to avoid fiscal distress in the form of an indicator of the financial health of the local government. The local government are advised to increase the own-source revenue in the hope of decreasing the dependence towards the revenues from other government. The local governments should also manage the resources owned optimally and wisely to create welfare of the people.

Future studies should be able to provide more suitable and relevant determinants towards fiscal distress in the Indonesian local governments. The use of better proxies that are not highly correlated with one another is also advised for in order to avoid creating a bias model and achieve a more accurate result. In the future, this study should be broadened to other homogenous local governments in other islands of Indonesia. Local municipal governments (kota) should also be included. Since local municipal government (kota) and local governments (kabupaten) are different in nature, to solve this control variable of type should be included. Finally for future studies it is important to try to acquire data as complete as possible to achieve a more accurate result.

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