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The Analysis of Sub-National Fiscal Risk in Indonesia

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ABSTRACT

A Fiscal Risk Management will increase fiscal sustainability in the nation development. The International Monetary Fund revealed that one source of fiscal risk for the government is Sub-national Risk or a fiscal pressure which came from the local governments. Until 2021, the Government of Indonesia has not assessed the Sub-national fiscal risk as a source of fiscal risk in the preparation of the State Revenue and Expenditure Budget (APBN). This study aims to propose a sub-national fiscal risk assessment model and carried out an assessment of the risk level in the provincial governments, and analyzed it for the year 2023. The data used was The Budget Realization Report and Balance Sheet of the Provincial Government for the year 2015 - 2020. The method used is literature study, quantitative descriptive analysis, and forecasting time series analysis. The results of this study are the definition of subnational fiscal risk, a measurement formula, and a map of Indonesia's subnational fiscal risk. The Local Government which lowest fiscal risk in the year 2023 is DKI Jakarta and the highest fiscal risk is DI Aceh. A deeper analysis shows the results that regions with the Trade development sector have better fiscal management and lower levels of fiscal risk. This study provides new insights for the Government of Indonesia in develop a strategy to improve a fiscal capacity of local government and the formulation of policies regarding the financial balance between central government and local government.

1. INTRODUCTION

1.1 Background

COVID-19 pandemic has hit all countries in the world and put a fiscal pressure to all governments. There was a contraction in economic growth of 5.32 percent. The IMF revealed that this pandemic has exerted global pressure to a very high and worst magnitude since the 2008/2009 crisis and has estimated a cumulative world loss of US$ 9 trillion. This condition increases the fiscal vulnerability and fiscal risk of all countries in the world, including Indonesia.

Fiscal risk can be interpreted as the possibility of deviation of fiscal results from what is expected [1]. One form of fiscal risk for a government is the failure and weakness of fiscal management by local governments or what is referred to as sub-national risk [2]. On a normal condition, Local Governments receive Balancing Funds from the Central Government by taking into account the fiscal needs and fiscal capacity of each region. With these funds, the fiscal needs of Local Government in running the government and development are expected to be fulfilled. However, if there is a risk such as a pandemic, natural disaster, or failure in fiscal management in the regions, there will be a threat to the fiscal sustainability of the Local Government and put pressure on the Central Government.

Local Fiscal sustainability is the ability of local governments to maintain their fiscal solvency in the long term [3]. This is also influenced by the ability of the Local Government itself to provide financial resources to carry out development or autonomy fiscal. The autonomy fiscal of local governments in Indonesia is currently still low. In 2019, 8 of 34 Provincial Governments (34%) and 458 of 497 City District Governments (92.15%) were categorized as "Not yet Autonomic" and only 8 provinces (34%) and 2 cities (0.4%) are "Autonomic". While the rest are in the category "Towards Autonomic" [4]. This condition is be in accordance with the low capacity of local governments in managing their tax administration and policies. The ability of local governments to collect local revenue from gross regional income or the local government tax ratio in Indonesia is only 1.2% on average.

The low fiscal capacity of local governments in the midst of this pandemic will increase fiscal vulnerability and fiscal risk. All local government in Indonesia are facing a difficult situation to maintain sustainability fiscal. This is a risky situation that must be managed by local Government. The Local Governments should implement a Fiscal Risk Management.

Effective Fiscal Risk Management will provide valuable input on the fiscal policy. Information on the level of fiscal risk can be used as the basis for formulating the structure of state and regional financial budgeting, as well as strategies for increasing fiscal capacity.

1.2 Research purpose

The condition of Local Government's fiscal in Indonesia indicates a weakness in the fiscal management. This can have an impact in the form of fiscal pressure on the Central Government if certain events occur. In the central government's fiscal management, it is important for the central government to have sufficient knowledge about the fiscal risk profile of the local government.

The current problem is that the definition of Sub-National Fiscal Risk has not been properly defined and its measurement indicators have not been formulated. This encourages the objectives of this research:

(1) Formulate the definition of Sub-National Fiscal Risk

(2) Formulate indicators of Sub-National Fiscal Risk as a monitoring and control tool for the Central Government.

(3) Assessing the level of Sub-National Fiscal Risk of Provinces in Indonesia in 2023.

(4) Conducting analyze related to a Sub-National Fiscal Risk of Provinces in Indonesia.

With the aim of this research, it is hoped that it can provide suggestions regarding the formula for measuring regional fiscal risk and improving the central government's fiscal policy towards the regions.

2. LITERATURE REVIEW

2.1 Fiscal risk management

Risk defined as the chance of something happening that has an impact on the achievement of goals [5]. ISO defines Risk as the impact of uncertainty on objectives [6]. Meanwhile, The Government of Indonesia defines risk as an event that may occur and if it occurs will have a negative impact on the achievement of government agency goals.

Risk management is more important than before in line with the increasing number of critical events in the world such as natural disasters, terrorism, and massive disruption [7]. Organizational management is always ready to face various risks that can arise at any time. Risk management refers to a process of activities and methods used to direct the organization and control risks that may affect its ability to achieve organizational goals [6]. The International Standardization Organization or ISO also defines risk management as an architecture used to manage risk. Implementation of risk management in the organization will encourage the achievement of organizational goals. Integrated risk management in all business processes of the organization will encourage the achievement of the targets set and prevent failures, irregularities, and scandals [8].

Risk Management is a process to provide high confidence in the achievement of the goals of the organization or institution. To implement risk management, organizations must enforce the principles, establish a framework, and maintain a risk management process [6].

Risk management in public sector is more complex than corporations' sector due to structures, functions, roles, and tasks. The Treasury Board of Canada Secretary classifies government risk into agency risk, cross section risk, and whole of government risk. The types of risk in the public sector can also be classified into two categories, internal risk (endogenous) and external risk (exogenous). One type of whole of government risk is fiscal risk.

IMF has conducted Analysis for Fiscal Risk. The results of fiscal risks analysis [3], there are several main fiscal risks faced by a government. These risks are Macroeconomic Risk, Financial System Risk, Natural Disaster Risk, Legal Risk, State-Owned Enterprise Risk, Public Private Partnership Risk, Sub-National Risk, and Corporate Risk. All fiscal risks must be managed properly by each government so that all development programs can run well and achieve the desired target.

2.2 Public sector risk management in Indonesia

Indonesia is an archipelagic country in Southeast Asia. The total population of Indonesia in 2021 is 272 million people (BPS, 2022). The Indonesian government is in the form of a Republic and is divided into 34 Provincial Governments and 514 Regency/City Governments.

Indonesia's Development Planning is stated in the Long-Term Development Plan (RPJP) for a 20-year period, the National Medium-Term Development Plan (RPJMN) for a 5-year period, and the annual Development Work Plan (RKP). These documents state the National Vision, Mission, and Objectives.

To provide confidence in the achievement of the National Objectives, the Government of Indonesia implements Public Sector Risk Management. The implementation of Public Sector Risk Management in Indonesia began in the year 2008. The Financial and Development Supervisory Agency or BPKP was entrusted with the mandate to supervise the implementation of Public Sector Risk Management and Control Systems. The Ministry of Finance initiated the implementation of Risk Management and it was followed by other Ministries, Agencies, and Local Governments.

Fiscal risk management in Indonesia is carried out by the Ministry of Finance which is integrated in the process of preparing the Development Work Plan (RKP) and the State Revenue and Expenditure Budget or APBN [9]. In the process of preparing the Macroeconomic Framework and Fundamentals of Fiscal Policy (KEM-PPKF) which serves as a scenario for the management of the State Budget, the Government of Indonesia conducts an assessment of the risks that may arise and may hinder the smooth implementation of the State Budget. These risks must be identified, analyzed, and mitigation. At the stage of APBN implementation, the Government of Indonesia will monitor the effectiveness of the control system for these risks. If the control system fails to prevent the occurrence of a risk, the Government of Indonesia will be able to anticipate it appropriately so that it does not hinder or damage the smoothness of fiscal availability in the implementation of the APBN. The results of the Fiscal Risk assessment are stated in the State Budget Financial Note.

3. RESEARCH METHODS

This research use research method comprises:

(1) Literature Study. Literature study is a research conducted by researchers by collecting a number of books, magazines related to the problem and research objectives [10]. This method is used in obtaining the most appropriate definition of Sub-National Fiscal Risk in the context of the Indonesian Government. In addition, this method is also used to obtain the right measuring instrument from the Sub-national Fiscal Risk indicator.

(2) Quantitative Descriptive Analysis. Descriptive research methods are research that conducted to determine the value of independent variables, either one or more (independent) variables without making comparisons or connecting between one variable and another. Meanwhile Quantitative research methods can be interpreted as research methods based on the philosophy of positivism, used to examine certain populations or samples, data collection using research instruments, quantitative data analysis, with the aim of testing predetermined hypotheses [11]. This analysis is used to obtain an overview of the level of Subnational Fiscal Risk per Province in Indonesia. Furthermore, this quantitative descriptive analysis is also used to see disparities between provinces or between islands in Indonesia.

(3) Forecasting Time Series Analysis. Time series is a set of data observations ordered in time [12]. This method is used in projection an occurrence and impact of the risks. Technique that used is Trend Projection. Researcher projected an occurrence and impact of some type of natural disaster like flood, landslides, forest fires, and fiscal impact use this method. The data used to projection are Government Financial Reports of 34 Provincial Governments of Indonesia from 2015 to 2020.

4. RESULT AND DISCUSSION

4.1 Definition of subnational fiscal risk

The definition of Subnational Fiscal Risk can be described in terms of two words, namely Subnational and Fiscal Risk. "Subnational" is defined as a collective concept for the administrative level of government under a sovereign government, which is given a certain autonomy in decision-making and public duties [13]. The Merriam-Webster Dictionary translates subnational as "existing or occurring below a national level". From these two meanings it can be concluded that Subnational is a level of government that is under the Central Government and has the authority to make decisions and public service tasks. In the Indonesian context, subnational can be defined as Provincial, Regency and City Governments which are autonomous regions under the Government of the Republic of Indonesia and have the authorization to take public policies and have government affairs duties.

Fiscal risk is a fiscal deviation as a result of the difference between what is happening and what is expected when doing budgeting or other projections [6] or the possibility of a deviation in fiscal results from what is expected [1]. Fiscal risk is a source of fiscal pressure that the government may face in the future [14]. Fiscal risk can also be interpreted as the possibility of foreign exchange of fiscal results from those expected in budgeting or other forecast calculations [15].

The synthesis of two definitions, the notion of Subnational Risk is fiscal pressure on the Central Government as a result of the difference between what is happening and the projections that have been determined previously in the planning process for Local Government. Subnational Fiscal Risk is a fiscal pressure on the Central Government as a result of the failure in fiscal management by the Local Government.

4.2 Indicator of subnational fiscal risk

A comparative analysis result of several instruments for risk level measurement, it is carried out to obtain the right indicators of Subnational Fiscal Risk. Types of risk level measurements compared are as follows:

No	Formula
F1	Risk=Likelihood x Consequence [16]
F2	Risk=Severity x Probability x Frequency of Exposure [17]
F3	Risk=Severity x Probability x Prevention Effectiveness [18]
F4	Risk=(Hazard x Vulnerability) / Capacity [19]

The F1 formula that published by ISO measures the level of risk based on the level of likelihood or probability (L) and the level of consequence (C) or its impact. The level of risk will be higher when the event is more likely to occur and the greater the impact or consequences it can cause. On the other side, the level of risk will be lower when the probability of its occurrence is low with little impact. The F2 formula measures the level of risk based on the level of damage that can be happened (S), the probability of occurrence (P), and the frequency of disclosure (E). A risk will be higher if the event is more likely to occur, the greater the impact, and the more often it is revealed. The use of the F3 formula to measure the level of risk of an event based on the level of damage it can cause (S), the probability of occurrence (P) and the effectiveness of the control system (C). With F3, the level of risk does not only consider the level of damage and the level of possibility of risk, but also considers the level of effectiveness of the control system that can prevent the risk from occurring. The use of the F4 formula in measuring the level of risk uses a wider variable. The risk level assessment is carried out by considering the level of hazard that threatens, vulnerability in the face of risk, and the capacity of the risk subject to anticipate risk. This formula considers not only the level of possibility and impact, but also considers the ability to anticipate it.

The formulation of the Subnational Fiscal Risk indicator uses literature study and a multi-criteria analysis of some existing formulas. The criteria used are the criteria for good performance indicators according to Horst and Weiss [20] and Hester et al. [21] which are modified, namely Quantifiable, Relevant, Accurate, Understandable, and Actionable. The results of the analysis are described in the Table 1.

Table 1. Analysis of multi criteria for fiscal risk formula

No	Criteria	F1	F2	F3	F4
1	Quantifiable	V	V	V	V
2	Relevant	V	V	V	V
3	Accurate	X	X	V	V
4	Understandable	V	V	V	V
5	Actionable	X	X	X	V

The results of an analysis show that the best formula to be used as a Subnational Fiscal Risk Indicator is F4, which is measured by multiplying the level of hazard and vulnerability, and divided by capacity. This formula can meet all criteria, namely Quantifiable, Relevant, Accurate, Understandable, and Actionable. This result is in line with the indicators used by INFORM from the European Commission in assessing Subnational Risk.

In the context of Subnational Fiscal Risk in Indonesia, the Hazard variable will be measured through factors that pose a threat or danger in maintaining fiscal sustainability for local governments. From the results of observations and interviews with experts in the field of regional financial management, factors that can be used include:

(1) Performance of Local Revenue Management, as measured by Local Tax Ratio

(2) The presence of Natural Disasters in the area, as measured by the Natural Disaster Risk Index level

(3) Budget Deficit, as measured by the indicator of the percentage of the deficit to GDP.

Local fiscal vulnerability is measured using indicators published by The International Organization of Supreme Audit Institution (INTOSAI) in the form of local debt levels. A region has a vulnerability in anticipating fiscal risk if it has a high level of debt which becomes a heavy burden for local fiscal. In this study, the indicator used is Debt/Income.

Local Fiscal Capacity is the fiscal capacity of the local government in financing its development, including in providing funds to mitigate and deal with risks. An area with a high fiscal capacity will be able to prevent and anticipate fiscal risks well. This variable uses indicators that have been determined by the Government of Indonesia, namely Income minus Revenue whose use has been determined and certain expenditures. From this calculation, a fiscal capacity index is determined by taking into account the average fiscal capacity of other local government.

The F1 formula is not appropriate to be used as an indicator of Sub-National Fiscal Risk because it is qualitative in nature and there are difficulties in measuring the likelihood level. This will reduce the level of accuracy in measuring the level of subnational fiscal risk.

Formula F2 is not appropriate to be used as an indicator of Sub-National Fiscal Risk because probability level and the frequency of exposure indicator are not appropriate to be used in the context of fiscal management. This indicator is widely used in activities with risks in the form of failure to apply a standard operation, such as in medical science.

Meanwhile, the F3 formula is also not used appropriately to measure the level of subnational fiscal risk due to the complexity in using the indicators of prevention effectiveness and probability level. This formula is more appropriate to use to measure risk in operational activities that install control systems at the activity level, not in the context of regional risk levels.

With this study, the formula that can be used to measure the level of Subnational Fiscal Risk is:

Subnational Fiscal Risk=(Hazard x Vulnerability)/Capacity

where, Hazard=Local Tax Ratio x Natural Disaster Index x Budget Deficit; Vulnerability=Debt to Income Ratio; Capacity =Local Fiscal Capacity Index.

The measurement of each variable uses the projected value of the year which is measured by the level of risk, using the data of the last 5 years. The results are categorized using an ordinal scale according to the characteristics of each variable.

4.3 Analyzing the subnational fiscal risk

Assessing and Analyzing the Subnational Fiscal Risk used data of the Balance Sheet and Budget Realization Reports for 34 Provincial Governments throughout Indonesia for the year 2015 – 2020. The calculation of the Provincial Fiscal Risk Level in Indonesia is carried out using the formula that has been prepared previously.

The results of these calculations, it is concluded that the highest Fiscal Risk level is Provincial Government of Aceh with a score of 4.66 and the lowest Fiscal risk level is the Provincial Government of DKI Jakarta with a score of 0.199. The results of all the subnational fiscal risk level by province are described in the Table 2.

Table 2. Subnational Fiscal Risk Level for the year 2023

Provincial	Fiscal Risk Level
Provinsi Aceh	4.662
Provinsi Sumatera Utara	3.663
Provinsi Sumatera Barat	2.997
Provinsi Riau	3.330
Provinsi Jambi	2.664
Provinsi Sumatera Selatan	3.330
Provinsi Bengkulu	1.998
Provinsi Lampung	2.664
Provinsi DKI Jakarta	0.199
Provinsi Jawa Barat	1.498
Provinsi Jawa Tengah	1.332
Provinsi DI Yogyakarta	1.998
Provinsi Jawa Timur	1.498
Provinsi Kalimantan Barat	2.331
Provinsi Kalimantan Tengah	2.664
Provinsi Kalimantan Selatan	2.331
Provinsi Kalimantan Timur	3.330
Provinsi Sulawesi Utara	2.331
Provinsi Sulawesi Tengah	2.664
Provinsi Sulawesi Selatan	2.997
Provinsi Sulawesi Tenggara	2.664
Provinsi Bali	1.998
Provinsi Nusa Tenggara Barat	2.331
Provinsi Nusa Tenggara Timur	2.664
Provinsi Maluku	2.664
Provinsi Papua	2.664
Provinsi Maluku Utara	2.331
Provinsi Banten	2.664
Provinsi Bangka Belitung	3.330
Provinsi Gorontalo	1.998
Provinsi Kepulauan Riau	2.664
Provinsi Papua Barat	2.331
Provinsi Sulawesi Barat	2.664
Provinsi Kalimantan Utara	2.997

The high level of fiscal risk in Aceh is due to the high natural disaster index and the level of regional financial debt. DI Aceh province is an area prone to natural disasters in the form of landslides and tsunamis. In addition, the level of fiscal sustainability of the DI Aceh Province is also low due to the high ratio of Debt to Revenue. The low fiscal readiness of DI Aceh will increase the possibility of failure in fiscal management in the face of risk.

The level of Subnational Fiscal Risk in 2023 was described spatially on Figure 1.

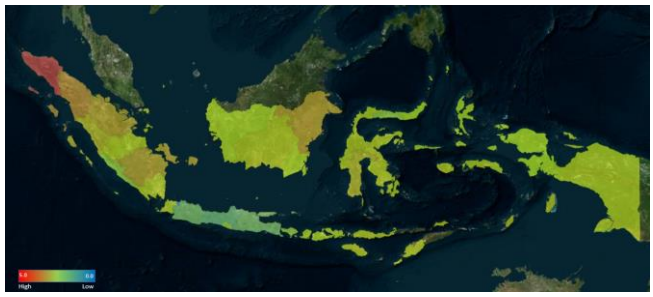

Figure 1. The level of subnational Fiscal Risk 2023

The result of spatial analysis concluded that the level of Subnational Fiscal Risk was high on the island of Sumatra and

Kalimantan. While the level of Subnational fiscal risk is low on the island of Java. This result is in line with the results of the bar graph of the average subnational fiscal risk level per island, where for the Sumatra's average is 3.2, followed by Kalimantan Island with an average score of 2.7. Meanwhile, Java Island shows an average risk level of 1.5.

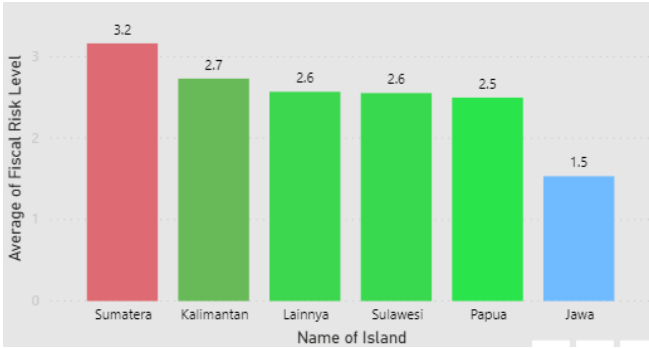

Figure 2. Average level of subnational fiscal risk per island

A deeper analysis is carried out by looking at the relationship between the fiscal risk level and other variables, namely population density, income of the population, and the level of poverty by using correlation analysis and scatter plot graphs.

The results of the correlation analysis show that the level of regional fiscal risk has a relationship with the level of population density (-0.59) and is not related to the level of population income (0.25) and poverty (-0.06). In addition, the results of the analysis conclude that there is a relationship between the level of population density and the level of income (0.71). The result of analysis is described in the Figure 2.

The relationship between the level of Regional Fiscal Risk and population density is further elaborated using a Scatter Plot Graph. From the graph results, it can be seen that the province of DKI Jakarta is an area with a very high level of population density with a very low level of fiscal risk.

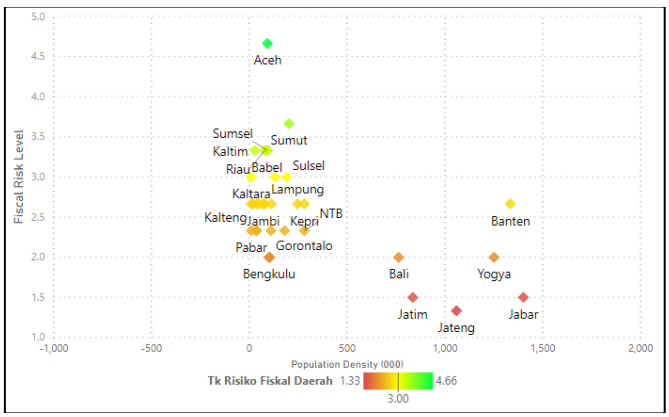

Figure 3. The relation the subnational fiscal risk and Population Density (exclude DKI Jakarta)

On the other hand, The Province of DI Aceh is an area with a low population density and the highest level of fiscal risk. Several other areas with high population density, such as Central Java, West Java, and East Java, has a lower level of fiscal risk. The result of analysis is described in the Figure 3.

The analysis of fiscal risk of development sector use a bar graph. The result concludes that area with development sectors of Mining have a higher level of subnational fiscal risk (2.93), meanwhile area with the development sector of Trade has a lower level of subnational fiscal risk (0.20).

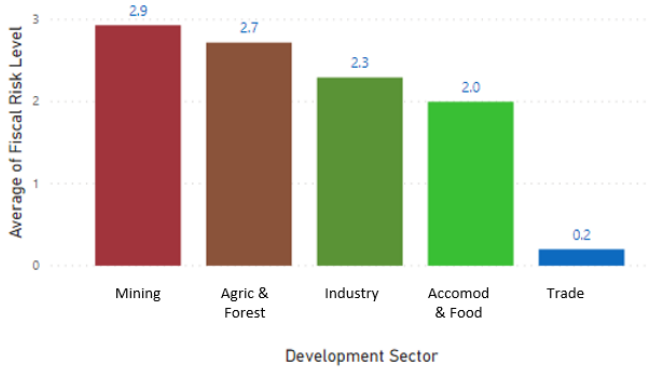

Figure 4. Subnational fiscal risk level per sector

Lower fiscal risk reflects more conducive economic condition in subnational level. Local governments of provinces with lower fiscal risk are able to manage their fiscal stance sustainably, and this might lead to better performance of various economic sectors. Jawa Tengah with the second lowest fiscal risk level (1.33), for example, performs well not only in trade sector but also in agriculture and services including of banking and finance [22]. The result of analysis are describe in the Figure 4.

5. CONCLUSIONS

Some of the analysis results can be concluded several things, namely:

(1) The province with the lowest level of fiscal risk is DKI Jakarta. Meanwhile, the Province with the highest level of fiscal risk is the Province of Aceh. Provinces on the island of Sumatra have the highest level of fiscal risk, while provinces on the island of Java have the lowest level of fiscal risk.

(2) An Area with Trade as a dominant development sector and high population density made a large contribution to the fiscal capacity of the region to reduce the level of subnational fiscal risk. For an example, an area with this character is Province of DKI Jakarta. This is an indication that fiscal policy and fiscal administration for the trade sector have been running effectively.

(3) The correlation test shows that the level of population density has a fairly strong relationship with the level of income of the population. In general, densely populated areas in Indonesia are generally centers of productive economy and trade and provide high income. This condition encourages an increase in the amount of tax contributions to the government, thereby increasing regional fiscal capacity and reducing the level of fiscal risk. This is also in line with the results of the analysis by development sector where areas with a trade development sector have a low level of fiscal risk.

(4) An area with development sectors in Mining as well as Agriculture, Forestry and Fisheries still have a high level of fiscal risk. For an example, an area with a high level of fiscal risk is the province of East Kalimantan. Meanwhile, the area of Agriculture, Forestry, and Fisheries that has a high level of fiscal risk is DI Aceh. This condition indicates that fiscal policy and fiscal administration in these two areas are still not

effective. Finally, areas with dominant development sector in Trade have a low level of fiscal risk.

Some of these conclusions can be input for the Government of Indonesia in the formulation of fiscal policy regarding financial balance between Central Government and Local Government. Local governments with high risk need to receive a larger allocation of balancing funds in order to have sufficient capacity to anticipate the risks. In addition, the level of regional fiscal risk can be one of the variables in the development of regional fiscal capacity by the Central Government. Conclusions regarding the relationship between the development sector and the level of fiscal risk can be used as input for local governments in developing strategies for increasing fiscal capacity.

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APPENDIX

Result of correlation test

	Fiscal risk	Income of population	Population density	Poverty
Fiscal risk	1			
Income of population	-0.2563477	1		
Population density	-0.5969561	0.7168286	1	
Poverty	0.0671475	-0.3257232	-0.2191499	1