JANE
Journal of Entrepreneurial Economic
JANE 2(1): 70–93
ISSN 3048-0213

Institute for Advanced Science, Social and Sustainable Future
MORALITY BEFORE KNOWLEDGE

Analysis of factors affecting regional financial independence in primary leading sector districts

Siti Lailatul Latipah[1]*, Hady Sutjipto[1], Rah Adi Fahmi Ginanjar[1], Sugeng Setyadi[1], Saharuddin Didu[1]
[1] *Universitas Sultan Ageng Tirtayasa, Banten, 42163, Indonesia.*
*Correspondence: sitilailatullatipah@gmail.com

Received Date: December 30, 2024 Revised Date: February 19, 2025 Accepted Date: February 28, 2025

ABSTRACT

Background: Regional autonomy in Indonesia has been in place for over two decades; however, local governments still struggle with managing their finances independently. This challenge is influenced by both domestic and international factors. Domestically, there is a growing demand for transparency and self-sufficiency, while globally, the increasing pace of globalization requires nations to enhance their competitiveness, including at the local government level. This study investigates the factors influencing regional financial independence, focusing on primary output, natural resource revenue-sharing funds, general allocation funds, special allocation funds, and tax ratios. **Methods**: This study uses panel data, comprising time series data from 2018 to 2022 and cross-sectional data from 140 districts in Indonesia with primary leading sectors. The analysis is conducted using the Generalized Method of Moments (GMM) with the System GMM approach to identify the relationship between these financial variables and regional financial independence. **Findings:** The study finds that primary output and the tax ratio have a positive and significant effect on regional financial independence. Conversely, natural resource revenue-sharing funds and general allocation funds have a negative and significant impact. Interestingly, special allocation funds do not show any significant effect on regional financial independence. **Conclusion**: This research highlights the importance of primary output and tax ratios in enhancing the financial autonomy of local governments in Indonesia. It also suggests that over-reliance on intergovernmental transfers, such as natural resource revenue-sharing and general allocation funds, may hinder financial independence. Policies should focus on strengthening local revenue generation through taxation and boosting the primary output sectors for sustainable regional autonomy. **Novelty/Originality of this article:** This study offers valuable insights into the complex dynamics of regional financial independence in Indonesia, highlighting the specific roles of different financial factors and providing evidence for policymakers aiming to improve local government self-sufficiency.

KEYWORDS: regional financial independence; primary output; intergovernmental transfers.

1. Introduction

Regional autonomy has been present in Indonesia for more than 2 (two) decades, since the reform movement in 1998. However, regional autonomy has been legally applied in Indonesia since Law No. 22/1999 on Regional Government came into force. The regulation on regional autonomy that is still active today is Law No. 23/2014 on Regional Government. In Law No. 22/1999, it is stated that regional autonomy is essentially applied at the Regency/City level. However, the government uses a transitional period of indirect transfer

Cite This Article:
Latipah, S. L., Hady Sutjipto, Ginanjar, R. A. F., & Setyadi, S. (2025). Analysis of Factors Affecting Regional Financial Independence in Primary Leading Sectors Using the System Generalized Method of Moments Approach. *Journal of Entrepreneurial Economic*, *2*(1). 70-93. https://doi.org/10.61511/jane.v2i1.2025.1432

of authority so that later the principles of decentralization and deconcentration can be implemented optimally. Local government at the Regency/City level is considered more important because emphasizing regional autonomy may be more important in the long run than implementing it at the Provincial level (Kaloh, 2007).

In line with Law No. 22/1999 concerning Local Government, the government at the district level is given the widest possible authority in implementing all government activities starting with planning, implementation, monitoring, control, and evaluation, except for matters relating to the authority in the field of foreign policy which have been determined by government regulations. As a result of the broad autonomy authority, local governments must continue to improve public facilities and community welfare fairly and equitably so that there is no gap in the region. This obligation can be achieved if the local government can manage all of its regional potential (natural resources, human resources, financial resources) optimally (Halim, 2008).

The regional autonomy policy follows the current times, so Law No. 22/1999 is no longer enforced because it is no longer by the demands of regional autonomy implementation. Then the regulation was replaced by Law No. 32/2004 concerning Regional Government which was eventually replaced again with Law No. 23/2014 concerning Regional Government because it was deemed necessary to adjust to the development of the current situation. This law views regional autonomy as the right, authority, and obligation of an autonomous region to regulate and manage all government activities and the interests of the local community within the NKRI system. Through the implementation of regional autonomy, it can be seen how financial independence in a region. In the publication Description and Analysis of APBD in the DJPK of the Ministry of Finance in 2011, the ratio of independence is indicated by the ratio of regional original income to total regional income. If the value of the independence ratio is high, it reflects that the regional original income of a region is large so it can be concluded that the region is financially independent. To optimize the objectives of regional autonomy and increase regional financial independence, the government issued Law No. 1/2022 concerning Financial Relations between the Central Government and Regional Governments (HKPD Law). This law is expected to have a positive effect on increasing regional financial independence. Financial independence is a key factor in realizing sustainable development and empowering regional potential.

Regional financial independence (fiscal autonomy) implies the ability of local governments to self-fund all government activities, development, and services to the people who have paid taxes and levies as a source of revenue needed by the region. The independence ratio illustrates the region's dependence on external sources of funds. A higher level of independence means that the region's dependence on external aid funds is lower. The self-reliance ratio also illustrates the level of community participation in regional development. If the value of the independence ratio is higher, then community participation in paying local taxes and levies is also higher, which is the main component of Regional Original Income, so it will have an impact on the higher level of community welfare (Halim, 2008). In terms of regional autonomy, the issue is not about the delegation of authority and financing to the regions, but the desire to increase efficiency and effectiveness in managing regional financial resources for the realization of people's welfare (Yani, 2004). In principle, a region must implement autonomy responsibly to achieve the objectives of regional autonomy, namely strengthening regional capacity and improving people's welfare by continuing to prioritize the aspirations and interests of the community. In addition, the implementation of regional autonomy must ensure harmonious relations between regions and other regions so that inequality does not occur and be able to ensure harmonious relations with the government.

According to the Supreme Audit Agency (*Badan Pengawas Keuanagan*/BPK) in its review of the fiscal independence of local governments in 2020, there were 443 out of 503 local governments, or 88.07% were still in the “Not Independent” category. This means that almost all local governments still have a high dependence on central transfer funds to fund the expenditures of each local government. BPK also mentioned that 468 local governments were in a stagnant condition in the category of not yet independent for the past 11 years until 2020. The development of financial independence at the provincial level in Indonesia can be seen in the following figure.

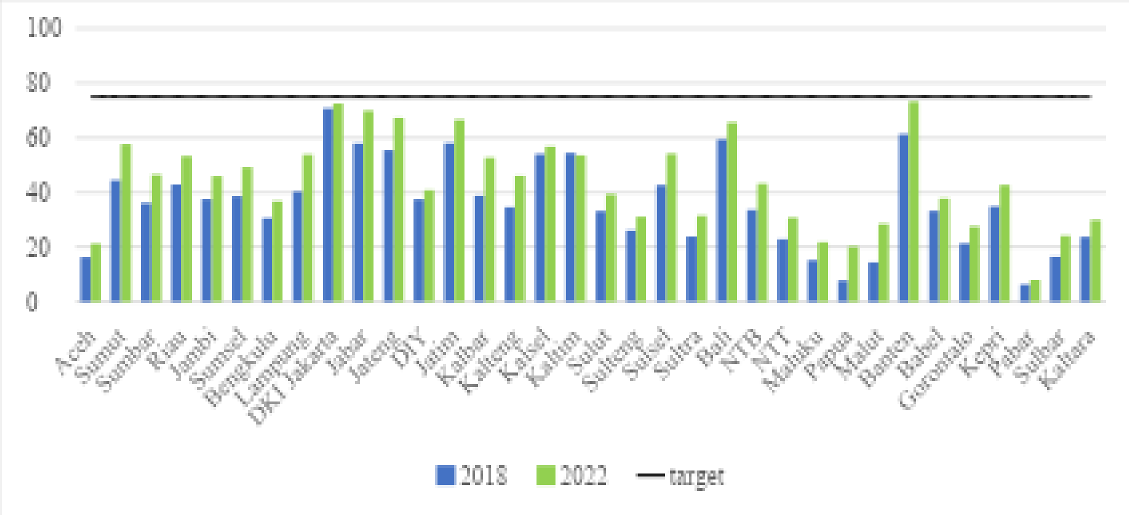

Fig. 1. Development of regional financial independence of all provinces in indonesia (percent)

Figure 1 shows the development of the average independence of all provinces in Indonesia in 2018 and 2022, showing that all provinces are still under the category of "high" independence in the range of 75 to 100 percent. When viewed, many regions are increasingly independent in managing all government activities, which is indicated by the increase that occurred in 2022. This indicates that the local government has maximized its local revenue to meet all the interests of the local community.

In general, it is believed that the implementation of this fiscal independence system can improve human development which will ultimately bring prosperity to the community. The measurement of community welfare can be seen from the ease of accessing all community needs, such as education, health, infrastructure, and public services that must be fulfilled properly and regulated by each local government. To become an autonomous region in terms of finance, the regional government needs to play an active role in managing the potential of its region to increase its regional income. However, if local revenues cannot meet government activities, then the costs incurred for local expenditures will also be difficult. If the potential for regional income is large, while the potential cannot be managed properly, it will not be able to affect the amount of regional income. In theory, if the region has a very large potential income, the level of welfare of its people will be greater. However, in its implementation, it is not so.

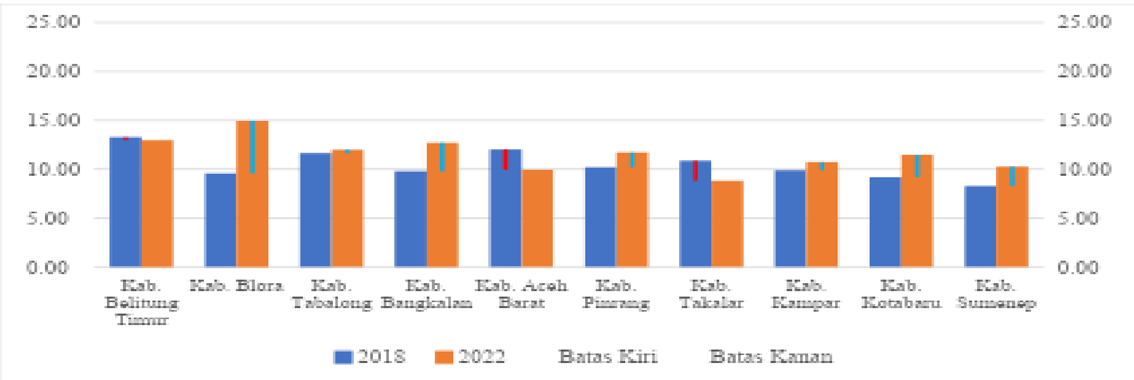

Fig. 2. Development of regional financial independence in the 10 highest districts in 140 Indonesia districts (percent)

Figure 2 presents the development of the 10 districts with the highest level of financial independence compared to 140 other districts in Indonesia in 2018 and 2022. It can be concluded that each region has a diverse level of independence. Blora Regency, Tabalong Regency, Bangkalan Regency, Pinrang Regency, Kampar Regency, Kotabaru Regency, and Sumenep Regency found that financial independence increased from 2018 to 2022. While Belitung Timur Regency, West Aceh Regency and Takalar Regency experienced a decrease from 2018 to 2022. Although more has increased in 2022, the level of independence of each region is still very low, which is shown in the figure which is only between the ranges of 0.00 - 25.00%. Where this indicates that the regional government is still very dependent on central government transfer funds and has not been able to manage its regional income optimally. The paradigm of regional financial management has been regulated in Law No. 32/2004 and Law No. 33/2004 as a reference in implementing regional autonomy. In essence, regional wealth is obtained from providing broad opportunities for local governments to manage and maximize the potential of each region, including natural resources, budgets, human resources, and other resources (Rochmah, 2015).

The purpose of implementing regional autonomy in each local government is so that local governments can improve public facilities and community welfare in a fair, equitable, democratic, and sustainable manner. To achieve these goals and responsibilities, local governments must be able to optimally manage the potential of natural resources, human resources, and financial resources. The ability of local governments to manage and manage finances can be seen from the realization of the current year's APBD (Periansya, 2019). To see local government revenue through existing natural resources, we need to look at the economic sector base of each region. The economic structure is divided into 3 (three) sectors, namely: a) Primary sector, with categories of agriculture, forestry, fisheries, mining, and quarrying; b) Secondary sector, with categories of processing industry, electricity and gas, water supply, waste management, waste, recycling, and construction; and c) Tertiary sector, with categories of provision of accommodation and eating and drinking, financial services and insurance, information and communication, real estate, company services, government administration, defense and mandatory social security, education services, activity services and other services.

The agricultural sector plays a significant role in the Indonesian economy. This can be seen from its contribution to the increase in GRDP and foreign exchange earnings, as well as the fact that most of Indonesia's population works in this sector. Agricultural development carried out by the government aims to increase economic growth and equitable distribution of regional income and can be a source of employment for the community to meet their basic needs (Julia, et al., 2015). Research (Umam, 2017; Oki, 2019; Adha, 2022) revealed that primary output or the agricultural sector has a positive and significant effect on financial independence. This means that an increase in primary output can increase regional financial independence. The agricultural sector is the most important in the Indonesian economy because when viewed from the increase in GRDP and the acquisition of foreign exchange shows that this sector is important in Indonesia. Meanwhile (Fatmala, 2020) in its findings revealed that the agricultural sector has a positive but insignificant effect on fiscal independence.

Based on the phenomena previously described, this study aims to analyze what are the determinants of regional financial independence in 140 districts with primary leading sectors, especially regarding the influence of primary output variables, natural resource revenue sharing funds, general allocation funds, special allocation funds, and tax ratio from 2018 - 2022 using dynamic panel data regression analysis through the First-Difference GMM and System GMM approaches to modeling the level of regional financial independence in Indonesia.

1.1 Agency theory

This theory discusses the correlation between agents (entities that manage companies) and principals (owners) who have an agreement. The view in this theory says that there is work interdependence between principals and agents in the form of cooperation. This theory assumes that everyone has desires and motivations because of their interests so principals and agents tend to cause conflicts which usually occur because there is a separation between ownership and company management. When there is an evaporation of reports between agents (company managers) and principals (owners), there are often differences in perceptions between agents and principals.

Jensen & Meckling (1976) say that asymmetric information is divided into two types, namely: Adverse selection and moral hazard. An adverse choice is a condition when the owner of the company does not understand an action chosen by the manager (negligence in duty). Moral hazard is a condition where the manager (agent) violates the obligations that have been mutually agreed upon in an employment contract. The implication of agency theory with the case study is that the relationship between principals and agents in regional financial activities can be said to be a transfer of responsibility from the principal (central government) to the agent (local government) to implement regional autonomy. In the context of regional autonomy, local governments have the right to receive relocation of funds by the central government as a source of funding for the implementation of regional autonomy.

1.2 Stewardship theory

Stewardship theory is part of agency theory. This theory has roots in psychology and sociology which are structured to explain the conditions under which managers as stewards act in the interests of the owners (Donalson, 1997). In this theory, managers will behave based on mutual interests. If there is a misalignment between the steward and the owner, the steward will try to cooperate rather than oppose it. After all, the steward considers that the common interest and behavior must be following the interests of the owner and become a rational consideration because the steward looks more at efforts to achieve organizational goals (Wahyuni & Ardini, 2018).

Stewardship theory assumes a strong relationship between organizational success and owner satisfaction. Stewards will protect and optimize the wealth of the organization owned by the company's performance so that the utility function can be maximized. The key assumption of this theory is that managers will align goals with the goals desired by the owner. However, stewards still have life needs (Wahyuni & Ardini, 2018). The relationship between this theory and regional financial independence is that local government is an institution that can be trusted to act in the public interest by carrying out all its duties and functions appropriately, making financial accountability mandated by the central government so that it will create a good economy, and public services and public welfare can be realized optimally.

1.3 Theory of fiscal federalism

This theory was introduced by Friedrich August Hayek in 1945, Oates in 1972, and Musgrave in 1959. Decentralized decision-making becomes more feasible as local governments are more closely connected to the people, thus using information more efficiently. The theory of fiscal federalism emphasizes the importance of Fiscal Decentralization in development. This illustrates that decentralization at the local level is expected to improve public welfare through the management of revenues and costs between governments.

According to Haryanto (2019), fiscal federalism theory is a theory that explains the relationship between decentralization and the economy, public services, and public welfare. In various studies on fiscal federalism, two theoretical perspectives describe the economic impact of decentralization, namely traditional theory (first generation) and new perspective theory (second generation). Fiscal federalism illustrates a normative model that depicts the central government as the wise interpreter of people's aspirations, providing guidelines in intergovernmental institutional regulations to ensure that local government institutions act following central directives on the assumption that they are by the wishes of the whole people. The theory of Fiscal Federalism by Musgrave (1959) illustrates that growth in a region can be achieved by regional autonomy and fiscal decentralization. Decentralization aims to meet regional needs, increase the role of the community in regional development, minimize disparities between regions in Indonesia, and ensure the implementation of services to the community equally in each region. So that it is expected that the overall welfare of the community will occur (Hastuti, 2018). Similar to regional autonomy, fiscal decentralization has the aim of increasing regional development and developing regional potential, in this case in fiscal terms.

1.4 Classic economic and neo-classical growth theory

Classical economics refers to economic theories that emerged in the 18th and 19th centuries, particularly in the UK, which emphasized the importance of market freedom and the role of the individual in determining prices and the allocation of resources. These classical concepts formed the cornerstone of modern economic thought and continue to influence economic policy today. According to Adam Smith and David Ricardo, four factors can affect economic growth, namely natural wealth, population, capital stock, land area, natural wealth, and technology. In this theory, land area and wealth are assumed to be constant, and technology does not change. However, classical economists generally only focus on the effect of population growth on economic growth (Martadinata, 2022).

This theory has been developed since the 1950s by Robert Solow and Trevor Swan based on an analysis of economic growth according to classical economic views (Arsyad, 2010). Solow and Swan argue that economic growth tends to be dominated by the supply of factors of production and technological progress. This theoretical thinking refers to classical economic theory, which suggests that the economy operates at the level of maximum employment opportunities and optimal use of factors of production. As economic growth is sustained, it depends on population growth, capital investment, and technological progress. Flexibility in the economic system allows freedom of capital and labor use. In this theory, it is explained that the capital-output ratio or capital ratio of production has a high torque. In other words, to achieve a certain output, various combinations of capital and labor can be used. If the amount of capital used increases, the amount of labor required may decrease. Conversely, if the amount of capital available is limited, the use of labor will increase (Anisa, 2023).

1.5 Stiglitz theory and

Stiglitz in Martha (2012) said that the tax ratio can be used to measure the size of the public sector. The increase in public scale can initially have a positive effect on economic growth and can then affect the improvement of government performance in carrying out functions and tasks in the public sector, which is in line with Musgrave's view. However, if the value of the tax ratio is too high, it will increase the burden on society, which is not in line with the ultimate goal of autonomy and decentralization, namely public welfare (Anisa, 2023). Stiglitz also indicated that the principles of tax collection must consider several aspects: 1) Economic efficiency, meaning that tax collection should not disrupt the structure of the economy; 2) Administrative simplicity, meaning that the tax collection process must be easy to administer; 3) Flexibility, meaning that tax policy can be adjusted to economic conditions; 4) Political responsibility, meaning that tax collection and its results can be accounted for before the community; 5) Justice, namely the imposition of taxes must be carried out fairly to all levels of society vertically and horizontally.

1.6 Primary output on regional financial independence

Primary output is the amount of output obtained from an economic production process. This output is also known as the primary sector, which results from the agriculture, forestry fisheries, and mining and quarrying sectors. The primary sector depends solely on the natural resources of each region. This sector is the most important part of developing countries, but its importance is decreasing due to the development of developed countries (Adha, 2022).

Neo-classical economic growth theory states that growth is dominated by the supply of factors of production and technology. The supply of factors of production refers to the ability and availability of factors of production used, such as land, labor, capital, and skills. It involves the quantity and quality of factors of production available for use in the production of goods and services. If the supply of factors of production increases, there will usually be more resources available for use in production, which can result in increased output and economic growth. Conversely, if the supply of factors of production decreases, there can be a downward pressure on production and growth. The natural wealth owned by each region can be a positive influence on the increase in economic growth which will later result in welfare in the community through the income obtained by taxes and local revenue. This is in line with research conducted by (Umam, 2017; Oki, 2019; Adha, 2022) that gross added value in the economic sector can increase economic growth to create prosperity, which is the only goal of regional autonomy which is reflected in the independence of regional finances. H1: Primary output has a positive and significant effect on regional financial independence.

1.7 Natural resources revenue sharing fund on regional financial independence

The Natural Resources Revenue Sharing Fund is included in the balancing fund, the purpose of which is to fund all local government activities to achieve the goal of community welfare. The percentage of natural resource revenue-sharing funds is channeled to the regions to meet regional needs related to the implementation of decentralization. The funds are expected to improve the vertical balance at the center along with looking at the financial independence of the region (Indrianingrum & Priyono, 2023). Natural Resources Revenue Sharing Fund as revenue obtained by local governments from the utilization of natural resources in their territory, such as mining, forestry, agriculture, and fisheries products, plays an important role in the independence of a region. If not utilized properly, the allocation of revenue-sharing funds from natural resources cannot be felt by all levels of society because if it used wisely and strategically, will increase regional independence due to sustainable local economic development.

According to Boex (2002:1), the central government focuses on financial distribution and stabilization, while local governments allocate the financial resources obtained (Suyanto, 2010). Several researchers who have examined the effect of natural resource revenue sharing funds on regional financial independence, namely (Sanga, et al., 2018; Marzuki et al., 2022; Natasya et al., 2024) state that there is a positive and significant effect of natural resources revenue sharing variables on regional financial independence. H2: Natural resources revenue sharing fund has a positive and significant effect on regional financial independence.

1.8 General allocation fund on regional financial independence

The existence of fiscal decentralization can make a region more independent because the authority at the central level has been transferred to the local government, so the region needs to allocate aid funds from the center for the benefit of local communities and public infrastructure development. The purpose of general allocation fund is to address the fiscal-financial gap between the central and local governments and the gap between local governments due to unequal resources (Kiak & Nuro, 2018). For regions with large fiscal potential but small fiscal needs, the central government will allocate general allocation fund, which tends to be smaller compared to regions that have small fiscal potential but large fiscal needs. Then, the central government will allocate general allocation fund larger. If a region has a higher poverty rate, the general allocation fund will be given more than a rich region (Setiawan, et al., 2021).

According to the theory of Fiscal Federalism by Musgrave (1959), the theory focuses on the allocation of fiscal resources between the central government and different local governments in a country. General Allocation Fund plays an important role in regional autonomy and financial management because the amount of general allocation fund and its distribution can affect regional independence in determining fiscal policy, regional development, and managing the potential of each region. This concept is consistent with research that has been studied by (Oki, 2019; Martini, et al., 2019; Periansya, 2019) where general allocation funds can positively affect regional financial independence. H3: General allocation fund has a positive and significant effect on regional financial independence.

1.9 Special allocation fund on regional financial independence

Special allocation fund is fund allocated to certain local governments to fund any special activities under national priorities. National priority programs will be contained in the RKP for the current fiscal year. The amount of these funds is determined by calculating an index based on general, specific, and technical criteria. The government determines special allocation fund through a fiscal gap mechanism, the amount of allocation based on cost per unit, the amount of central government loans for local government public infrastructure for the medium or long term, and the amount of subsidies.

The allocation of funds provided by the central government to local governments can be an additional fund in financing all government activities and the development of infrastructure and public services to increase local economic growth. For special allocation fund to be an enhancement to regional independence, it needs to be managed efficiently and used for important and appropriate purposes. This is so that local governments are not dependent on external assistance and prevent waste of resources. Research conducted by (Andriana, 2020; Musfirati & Sugiyanto, 2021; Natasya, et al., 2024) reveals that special allocation funds channeled by the central government can have a positive impact on increasing regional financial independence. H4: Special allocation fund has a positive and significant effect on regional financial independence.

1.10 Tax ratio on regional financial independence

In the practice of autonomous regions, local governments have the authority to organize all government activities including financing all government activities. Furthermore, how can local governments fund increasingly large expenditures. Whether the local government will continue to depend on central transfers or depend on the ability of the region itself (Anisa, 2023). In this regard, for the implementation of good regional autonomy, local governments must be able to minimize dependence on central government transfers by striving for regional independence.

Taxes are the main source of local revenue. The contribution of the community in paying taxes is very meaningful in government activities and regional development. Taxes have a vital role, especially in the implementation of regional development because taxes are a source of local revenue that is used to finance all expenditures, including development spending. The tax ratio is a comparison of local tax realization received with the Gross Regional Domestic Product (GRDP) in the same period. The tax ratio explains the performance of the taxation sector from GRDP that can be received by the government. The high tax ratio of a region illustrates the large amount of community income received by the region as regional income. This is in line with research conducted by (Setiawan, et al., 2021) which states that an increase in the tax ratio in a region can also increase the financial independence of the region. H5: Tax Ratio has a positive and significant effect on regional financial independence.

2. Methods

This study belongs to the quantitative research type and is analyzed by dynamic panel method or Generalized Method of Moment (GMM) and uses annual secondary data from 2018-2022. Data sources were obtained from the official websites of the Indonesian Central Bureau of Statistics and the DJPK of the Ministry of Finance.

Table 1. Number of receptors in each container

Variable	Concept	Indicator	Symbol	Unit	Source
Regional financial independence (Y)	Regional financial independence is the ability of local governments to self-fund all government activities, development, and community services using their local revenues.	The ratio of regional financial independence by looking at the comparison of regional original income and total regional income in 140 districts in 2018 – 2022.	RFI	Percent	DJPK
Primary output (X_1)	An economic sector that relies solely on natural resources. The primary sector includes agriculture, forestry, fisheries, mining and quarrying.	Primary Output Rate of agriculture, forestry, fisheries, mining, and quarrying sectors in 140 districts in 2018 – 2022.	PO	Billion IDR	DJPK
Natural resources revenue sharing fund (X_2)	The budget obtained from PNBP and given to each region according to a certain number to finance all regional needs.	The value of Natural Resources Revenue Sharing Fund in 140 Regencies in 2018 - 2022.	NRSF	Million IDR	DJPK
General allocation fund (X_3)	The budget allocated from APBN to local governments for implementation needs and creating horizontal equalization of regional capabilities.	Value of general allocation funds in 140 districts in 2018 - 2022.	GAF	Million IDR	DJPK
Special allocation fund (X_4)	A budget allocated from the state budget to certain local governments to help fund special activities based on national priorities.	Value of special allocation fund in 140 districts in 2018 - 2022.	SAF	Million IDR	DJPK
Tax ratio (X_5)	Tax ratio is the amount of local tax value which is then	Comparison of local taxes with GRDP based on	TR	Percent	DJPK and BPS

	compared to GRDP at current prices during a certain period.	current prices in 140 districts in 2018 - 2022.

2.1 Research model

This study uses a dynamic panel data analysis model where panel data itself is a combination of time series data and cross-section observation units so that panel data has a space and time relationship (Gujarati & Porter, 2015). In this study, the panel data analysis method applies dynamic panel data regression analysis where the use of dynamic panels is due to the many dynamic economic correlations. This dynamic relationship is characterized by the lag variable of the dependent variable which becomes the independent variable, causing endogeneity problems to arise. The use of static panel data is less suitable for this study because the prediction results tend to be biased and inconsistent. However, this problem can be overcome with the GMM model (Ginanjar, et al., 2020). The regression equation model applied in this study based on (Arellano & Bond, 1991) is as follows:

$$RFI_{i,t} - RFI_{i,t-1} = \beta\left(RFI_{i,t-1} - RFI_{i,t-2}\right) + \gamma\left(lnPO_{i,t} - lnPO_{i,t-1}\right) + \gamma\left(lnNRSF_{i,t} - lnNRSF_{i,t-1}\right) + \gamma\left(lnGAF_{i,t} - lnGAF_{i,t-1}\right) + \gamma\left(lnSAF_{i,t} - lnSAF_{i,t-1}\right) + \gamma\left(TR_{i,t} - TR_{i,t-1}\right) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \quad \text{(Eq. 1)}$$

The variables used in this study are defined as follows: $RFI_{i,t}$ represents Regional Financial Independence in percentage terms, while $RFI_{i,t-1}$ denotes the Regional Financial Independence from the previous year. $lnPO_{i,t}$ refers to the natural logarithm of Primary Output (in percentage), $lnNRSF_{i,t}$ is the natural logarithm of the Natural Resources Revenue Sharing Fund, and $lnGAF_{i,t}$ stands for the natural logarithm of the General Allocation Fund. Similiarly, $lnSAF_{i,t}$ indicates the natural logarithm of the Special Allocation Fund, and $TR_{i,t}$ refers to the Tax Ratio, expressed as a percentage. The symbol β, γ represent the coefficient vectors of the predictor variables, while ε denotes the error term. The subscript i corresponds to the 140 districts across Indonesia used as cross-sectional data, and t represents the time series from 2018 to 2022.

2.2 First-differences generalized and system generalized method of moment

The First-differences GMM (FD-GMM) model aims to make the estimation model consistent, valid, and free from bias so that there is no relationship between the independent variables and the error term. The purpose of this model is to eliminate individual effects caused by the relationship between the lag of endogenous explanatory variables and errors (Arellano & Bond, 1991).

Blundell & Bond (1998) argue that this model is a model that can overcome the weak instrument problem that occurs in FD-GMM estimation. He also correlated the bias and poor precision of the FD-GMM estimator with the weak instrument that can be identified from the parameter concentration. Furthermore, a lighter stationarity setting in the early stages of the process may allow for the extended use of the SYS-GMM estimator by utilizing lag variation as an instrument for the equations in the FD-GMM.

2.3 Instrument validity test (Sargan)

The Sargan test is employed to evaluate the validity of all instrument variables in a model, assuming that these instruments are valid—meaning they are not correlated with the error terms and that the number of instruments exceeds the number of estimated parameters. This test is also useful for checking the homoscedasticity of residuals in Generalized Method of Moments (GMM) estimations (Arellano & Bond, 1991). The interpretation of the test results is based on the probability (Prob) value of the Chi-squared statistic in the table of overidentifying restrictions.

If the Prob Chi2 value is greater than the significance level α (0.05), the null hypothesis (H0) is not rejected, which implies that the model estimation is valid and there is no correlation between the instrument variables and the error term. On the other hand, if the Prob Chi2 value is less than α (0.05), the alternative hypothesis (H1) is accepted, indicating that the model estimation is invalid due to a correlation between the instrument variables and the error term.

2.4 Consistency test (Arellano-Bond)

According to Arellano and Bond (1991), this test serves to ensure that the error term does not exhibit a serial correlation of the second order, or AR(2), thereby producing consistent estimates under the assumption of no autocorrelation. The Arellano test itself is specifically designed to detect serial correlation at the first-difference level, focusing on both the first-order and second-order components. The criteria for interpretation are based on the probability (Prob) values obtained from the test.

If the Prob value for the first-order is less than the significance level α (0.05) and the Prob value for the second-order is greater than α (0.05), the null hypothesis (H0) is not rejected, indicating that there is no autocorrelation. Conversely, if the Prob value for the first-order is greater than α (0.05) and the Prob value for the second-order is less than α (0.05), the alternative hypothesis (H1) is accepted, which implies the presence of autocorrelation.

2.5 Unbiasedness and statistical hypothesis test

The unbiasedness test is used to see whether the resulting estimates are biased or not. If only using the Ordinary Least Square (OLS) method, dynamic panel regression will produce biased and inconsistent estimates due to the correlation of the dependent lag with the error. The unbiasedness criterion is determined by comparing the GMM-dependent lag estimator with FEM which is biased downward and PLS (Pooled Least Square) which is biased upward. Unbiased estimation can be seen by the coefficient value of FD-GMM or SYS-GMM which is between FEM and PLS.

A statistical hypothesis is an initial assumption about a population whose validity has not yet been firmly established. There are two main types of hypotheses: the null hypothesis (H0) and the alternative hypothesis (H1). In the process of decision-making, researchers must test these hypotheses by considering their associated probability values (Gujarati & Porter, 2015). The criteria for making decisions in statistical hypothesis testing are based on the comparison between the probability value and the level of significance α (0.05). If the probability value is less than α (0.05), then the null hypothesis (H0) is rejected, and the alternative hypothesis (H1) is not rejected. This implies that the primary output variable—natural resource revenue sharing funds, general allocation funds, special allocation funds, and the tax ratio—has a significant effect on regional financial independence, assuming that other variables remain constant (ceteris paribus). Conversely, if the probability value is greater than α (0.05), the null hypothesis (H0) is not rejected, meaning that those variables do not have a significant effect on regional financial independence under the same assumption.

3. Results and Discussion

3.1 Generalized method of moment (GMM) model estimation results

Based on Table 2 below using the FD-GMM approach, it is known that the variables of natural resource revenue sharing fund and general allocation fund have a significant effect and have a negative coefficient on regional financial independence, while the tax ratio variable has a significant effect and has a positive coefficient on regional financial independence. As for the lag variable of regional financial independence, primary output and special allocation fund have no significant effect on regional financial independence.

Table 2. FD-GMM model estimation results

Variable	Coefficient	Std. Error	z	P-value
L1.RFI	0.1551797	0.1857116	0.84	0.403
InPO	0.2730803	0.3306552	0.83	0.409
InNRSF	-0.4186265	0.152264	-2.75	0.006
InGAF	-5.135461	0.9928588	-5.17	0.000
InSAF	-0.6299057	0.4456856	-1.41	0.158
TR	7.175357	1.304252	5.5	0.000
_cons	81.63787	12.46853	6.55	0.000

Based on the table below using the SYS-GMM approach, it is known that the variable of natural resource revenue sharing fund and general allocation fund have a significant effect and have a negative coefficient on the variable of regional financial independence. Meanwhile, the lag variable of regional financial independence, primary output, and tax ratio have a significant effect and have a positive coefficient on regional financial independence. Meanwhile, the special allocation fund variable has no effect and is not significant on regional financial independence.

Table 3. SYS-GMM model estimation results

Variable	Coefficient	Std. Error	z	P-value
L1.RFI	0.5340715	0.1272203	4.20	0.000
InPO	1.347092	0.6000129	2.25	0.025
InNRSF	-0.5988536	0.1615019	-3.71	0.000
InGAF	-4.939938	1.104383	-4.47	0.000
InSAF	-0.9483406	0.4848271	-1.96	0.050
TR	9.061156	1.074011	8.44	0.000
_cons	73.17186	114.45784	5.06	0.000

3.2 Regression specification test results

Based on Table 4 regarding the results of the Sargan Test with the FD-GMM approach, it shows that the Prob chi2 value (0.4314) > α (0.05) which means that the model is valid, or the instrument variable has no correlation with the error. While for the SYS-GMM approach shows that the Prob chi2 value (0.0896) > α (0.05) which means that the model is valid, or the instrument variable has no correlation with the error.

Table 4. Sargan test results of FD-GMM and SYS-GMM Models

	First Difference GMM	System GMM
Statistic value	4.874225	13.70987
P-value	0.4314	0.0896

The table above shows the results of the Arellano-Bond Test through two approaches. In the FD-GMM approach, it is known that the AR(1) significance test value is 0.0195 and the AR(2) significance test value is 0.4711, it can be concluded that the FD-GMM approach in this study has consistent properties. Meanwhile, the SYS-GMM approach shows that the AR(1) significance test value is 0.0000 and the AR(2) significance test value is 0.9588, so the decision that can be taken is that this model has consistent properties because the results are not significant. After seeing the results of the two approaches, it can be concluded that the FD-GMM and SYS-GMM models are consistent and there is no autocorrelation in the two models.

Table 5. Arellano-Bond test results of FD-GMM and SYS-GMM Models

	FD-GMM		SYS-GMM	
Order	Statistic value of AB-test	P-Value	Statistic of AB-test	P-value
1	-2.3362	0.0195	-4.4547	0.000
2	-0.72071	0.4711	0.05162	0.9588

Based on Table 6 above, it can be seen that the coefficient value of the lag of the dependent variable, namely Regional Financial Independence in the FD-GMM model is (0.15517965) < FEM (0.17325869) < PLS (0.69513482) which means that the FD-GMM approach in this study does not pass the unbiased test, or the estimator generated in this approach is biased. While the coefficient value of the lag of the dependent variable in the FEM model (0.17325869) < SYS-GMM (0.53407148) < PLS (0.69513482) means that the resulting estimator is not biased. Thus, it can be concluded that the best model chosen is SYS-GMM because the instruments used are valid, consistent, and unbiased.

Table 6. Unbiasedness test results of FD-GMM and SYS-GMM Models

Variable	FEM	FDGMM	SYSGMM	PLS
L1.RFI	0.1732586	0.15517965	0.53407148	0.69513482
InPO	0.40135234	0.27308032	1.3470919	0.75382639
InNRSF	-0.40352388	-0.41862646	-0.59885365	-0.16793635
InGAF	-5.9656459	-5.135461	-4.9399378	0.48858092
InSAF	-0.37082055	-0.62990569	-0.94834056	-0.24044572
TR	7.482826	7.175357	9.0611559	4.8713616
_cons	88.097368	81.637869	73.17186	-6.8512607
N	560	420	560	560
r2	0.20819408			0.80318782
r2_a	-0.06912925			0.80105242

3.3 Model estimation results

The effect of each independent variable on the dependent variable is measured through statistical tests on the probability value. The regression results of the influence of lag variables of regional financial independence, primary output, natural resource revenue sharing fund, general allocation fund, special allocation fund, and tax ratio on regional financial independence in 140 districts in the primary superior sector can be seen in Table 7.

Table 7. SYS-GMM model estimation results

Regional financial independence				
Variable	Coefficient	Std. Error	z	P-value
L1.RFI	0.5340715	0.1272203	4.20	0.000
InPO	1.347092	0.6000129	2.25	0.025
InNRSF	-0.5988536	0.1615019	-3.71	0.000
InGAF	-4.939938	1.104383	-4.47	0.000
InSAF	-0.9483406	0.4848271	-1.96	0.050
TR	9.061156	1.074011	8.44	0.000
_cons	73.17186	114.45784	5.06	0.000

Table 7 shows the estimation results with the selected SYS-GMM model, and the following equation can be made:

$$RFI_{i,t} = 73.17186 + 0.5340725\ RFI_{i,t-1} + 1.347092\ lnPO_{i,t} - 0.5988536\ lnNRSF_{i,t} - 4.939938\ lnGAF_{i,t} - 0.9483406\ lnSAF_{i,t} + 9.061156\ TR_{i,t} + \varepsilon_{i,t} \quad \text{(Eq. 2)}$$

Based on the equation above, several interpretations can be made. The constant value of 73.17186 suggests that if the variables Primary Output, Natural Resources Revenue Sharing Fund (NRSF), Special Allocation Fund (SAF), General Allocation Fund (GAF), and Tax Ratio (TR) are all zero, then the Regional Financial Independence (RFI) would be 73.17186 percent. The coefficient for L1.RFI is 0.5340715, which indicates that a 1 percent increase in last year's RFI will lead to a 0.53 percent increase in the current year's RFI, assuming all other variables remain constant (ceteris paribus).

The coefficient for lnNRSF is -0.5988536, meaning that a 1 percent increase in the Natural Resources Revenue Sharing Fund is associated with a 0.59 percent decrease in Regional Financial Independence, all else being equal. Similarly, the coefficient for lnGAF is -4.939938, indicating that a 1 percent increase in the General Allocation Fund leads to a 4.93 percent decrease in Regional Financial Independence. The lnSAF coefficient is -0.9483406, implying that a 1 percent increase in the Special Allocation Fund will reduce Regional Financial Independence by 0.94 percent, under the assumption that other variables remain unchanged. On the other hand, the Tax Ratio (TR) has a positive coefficient of 9.061156, which means that a 1 percent increase in the Tax Ratio will increase Regional Financial Independence by 9.06 percent, assuming ceteris paribus.

3.4 The effect of primary output on regional financial independence

Based on the GMM estimation test results with the SYS-GMM model approach that has been carried out, it is obtained that the Primary Output variable has a positive and significant effect on Regional Financial Independence. The coefficient value obtained is 1.347092, which means that an increase in primary output by 1 percent will increase regional financial independence by 1.34 percent. This can also be proven by partial statistical tests where the p-value is 0.025 < alpha 0.05 which means not rejecting H1 and consequently rejecting H0. With this, the Primary Output variable influences Regional Financial Independence.

Following classical economic growth theory, Adam Smith and David Ricardo mention that natural wealth is one of the factors that can affect economic growth in a country. Adam Smith argued that natural wealth can be obtained by humans without having to work hard because it is free or natural. However, he also revealed that natural wealth can be influenced by labor and capital used to process natural wealth into added value for regional income. This is in line with current conditions where natural resources are free and can be owned by anyone as long as they do not have property rights. Still, sufficient labor and capital are needed so that there are more opportunities to improve the economy in the region.

Meanwhile, David Ricardo argues that his theory focuses more on the relationship between production and income distribution. He revealed that economic growth and industrial development can increase the value of land because the demand for natural resources will also increase. Economic growth accompanied by industrial development can have a positive impact on the demand for natural resources such as land and minerals. This can increase land prices because land has a higher economic value in terms of the needs of industry and growing economic development.

The findings of this study are consistent with studies revealed (Umam, 2017; Oki, 2019; Adha, 2022) that primary output has a positive and significant effect on fiscal independence. This means that an increase in primary output can increase regional financial independence. The agricultural sector is the most important in an Indonesian economy because if seen from the increase in GRDP and foreign exchange earnings, it shows that this sector is important in Indonesia. It is also because most people still rely on natural resources as an object of livelihood. The primary sector also includes the forestry, fisheries, mining, and quarrying sectors. These sectors are the main source of income from taxes and levies for local governments. All activities such as logging, fishing, mineral mining, and excavation of raw materials can affect the imposition of land and building tax from the land owned, value-added tax from sales, and also retribution from the utilization of natural resources owned by the region. The positive and significant results between the primary output variable and regional financial independence can also be influenced by several districts in the provinces of Aceh, Riau, East Kalimantan, and Papua, where the provincial economic sector is dominated by activities in the mining and quarrying sector (Ministry of Finance Opinion, 2021).

Based on the results that have been obtained regarding the significant positive effect of the primary output variable on regional financial independence in 140 districts in Indonesia, the local government can take several policies to maximize natural resources in districts that have higher primary output values than secondary and tertiary outputs. First, optimizing the use of biological natural resources. Second, managing agricultural production. The current problems related to agricultural development are the rapid increase in population, the decline in the quality of land and water resources, climate change, increased competition, and the deterioration of environmental quality. To overcome these problems, measures are needed to improve land use efficiency, land productivity, global competitiveness, and attention to environmental aspects. Third, management of aquatic and fisheries conservation areas. If waters and fisheries are optimally managed, then regional income tends to increase, which leads to the welfare of the people in the increasingly independent region.

Contrary to the results of this study, (Fatmala, 2020) says that primary output has the potential to have a positive impact on the fiscal independence of districts/cities in Southeast Sulawesi Province, but the effect is not significant. The growth of regional original income in the Regency/City in Southeast Sulawesi Province during the 2008-2012 fiscal year was also accompanied by an increase in Total Regional Revenue in the same period. According to a study conducted by (Fatmala, 2020), the agricultural sector is the economic sector that makes the largest contribution in Southeast Sulawesi Province compared to other economic sectors. However, the contribution of the agricultural economic sector cannot be directly absorbed as local taxes and levies as is the case in the trade, hotel and restaurant sector, and the service sector.

3.5 The effect of natural resources revenue sharing fund on regional financial independence.

Based on the results of the GMM estimation test with the SYS-GMM model approach that has been carried out, it is obtained that the Natural Resource Revenue Sharing variable has a negative and significant effect on Regional Financial Independence. The coefficient value obtained is -0.5988536, which means that if the natural resources revenue sharing fund increases by 1 percent, the level of regional financial independence will decrease by 0.59 percent. This can also be proven by a partial statistical test where the p-value is 0.000 < alpha 0.05 which means not rejecting H1 and consequently rejecting H0. With this, the Natural Resources Revenue Sharing Fund variable influences Regional Financial Independence.

According to Agency Theory, the central government has the authority to delegate its responsibilities to local governments, as well as local governments that have the authority to organize and manage all government activities themselves. The central government provides natural resource revenue sharing funds evenly according to the natural resource revenues of each region which are then managed properly by the local government to create community welfare through the development of public facilities. Meanwhile, based on the theory of Fiscal Federalism, which focuses on the allocation of fiscal resources between the central government and different local governments in a country. Natural resource revenue sharing fund is fund that play an important role in regional autonomy and financial management because the amount of natural resource revenue sharing fund and their distribution can affect regional independence in determining fiscal policy, regional development, and managing the potential of each region.

This study shows results that following research conducted by (Verawaty, et al., 2017; Martini, et al., 2019; Indrianingrum & Priyono, 2023; Rahayu, et al., 2024) that revenue-sharing fund has a negative and significant effect on regional financial independence. This means that any increase in natural resource revenue-sharing fund allocated from the central government to local governments will result in a decrease in the level of regional financial independence. This also indicates that local governments have a great dependence on the central government so they have not been able to properly manage existing natural resources so that they become a source of income for their regions.

The results of this study state that there is a negative and significant effect of natural resource revenue sharing funds on regional financial independence because this study focuses on 140 districts in Indonesia with primary superior sectors and their regional financial independence is still very low so it can be proven that the allocation of natural resource revenue sharing funds provided by the central government has not been maximized for regional development activities, instead, the region only relies on revenue sharing fund distribution. This also indicates that local governments are still very dependent on external sources of funds. Based on an article from the Ministry of Finance's Financial Media, there are several ways that revenue-sharing fund can be managed fairly. First, equalization in all parts of Indonesia. Strong coordination is needed between national institutions and local governments to continue to provide support in terms of strengthening the capacity of local governments to manage public finances. Second, redesign revenu sharing fund to minimize inequality. Redesign is an action to change and improve the structure of an object, system, or concept to increase policy efficiency. Third, conduct a verification process quickly. Efforts to redesign revenue-sharing funds aim to support increased state revenue through fairer management. The redesign is also useful for reducing disparities between regions both vertically and horizontally.

3.6 The effect of general allocation fund on regional financial independence

Based on the results of the GMM estimation test with the SYS-GMM model approach that has been carried out, it is found that the General Allocation Fund variable has a negative and significant effect on Regional Financial Independence. The coefficient value of the variable is -4.939938 which means that an increase in the general allocation fund by 1 percent can reduce regional financial independence by 4.93 percent. This can also be proven by partial statistical tests where the p-value is 0.000 < alpha 0.05 which means not rejecting H1 and consequently rejecting H0. With this, the general allocation fund variable influences Regional Financial Independence.

Following the theory of Fiscal Federalism by Musgrave (1959) which focuses on the allocation of fiscal resources between the central government and different local governments in a country. General allocation fund plays an important role in regional autonomy and financial management because the amount of general allocation fund and its distribution can affect regional independence in determining fiscal policy, regional development, and managing the potential of each region. According to Agency theory, the central government has the authority to delegate its responsibilities to local governments, as well as local governments that have the authority to organize and manage all government activities. The central government provides general allocation funds evenly according to the needs of each region and the capacity of the region.

This research is in line with research conducted by (Musfirati & Sugiyanto, 2021) which shows the results that the general allocation fund variable has a negative and significant effect on financial independence. This means that the greater the local government allocates general allocation fund for realization, the level of independence in a region will decrease.

Vice versa, the less general allocation fund allocation realized by the local government, there will be an increase in regional financial independence. Musfirati & Sugiyanto (2021) explain that the negative and significant results between the general allocation funds on regional financial independence are due to the large transfer of funds provided by the central government to the regions, which can be proven by the general allocation fund as the highest transfer funds in the Regency/City in DIY Province so that it can mean that dependence on general transfer funds is still high. In the case study of regional financial independence in 140 districts with primary leading sectors, it was concluded that the low financial independence of the districts was due to the high level of general and special transfer funds, as well as high natural resource revenue sharing in several districts with an agricultural economic base.

General allocation funds are adjusted to the fiscal potential and needs of each region. Regions with high fiscal potential but low fiscal needs will receive a smaller general allocation fund from the central government, while regions with low fiscal potential but large fiscal needs will receive a larger general allocation fund compared to richer regions. If a region has a higher poverty rate, the general allocation fund will be given more than a rich region (Setiawan, et al., 2021). A rich region does not determine that the region is financially independent because the fiscal needs of each region are different. Optimizing the realization of general allocation fund for local economic development is needed so that the size of the general allocation fund can affect increasing regional independence.

If we look at the results of research showing that the general allocation of funds in 140 districts in Indonesia have a negative effect on regional financial independence, then several things must be considered by local policymakers to pay more attention to the allocation funds provided by the central government so that they become an increase in financial independence. First, use general allocation funds efficiently. The allocation of general allocation fund from the central government is given based on looking at regional needs through the fiscal gap approach, which is determined from regional needs with regional potential. Second, maximizing fiscal potential to meet regional fiscal needs. Local governments need to understand how much fiscal potential each region has so that it can be optimized appropriately. To find out this, data collection on economic potential can be done along with the opening of wider and more equitable investment opportunities in all regions of Indonesia. Third, reduce dependence on central government grants. Although it has handed over full authority to local governments, the central government needs to supervise the allocation of aid funds from the center so that the funds provided by the center can be used properly and can be optimally utilized for the welfare of the people in the regions.

3.7 The effect of special allocation fund on regional financial independence

Based on the results of the GMM estimation test with the SYS-GMM model approach that has been carried out, it is found that the Special Allocation Fund variable has no negative and insignificant effect on Regional Financial Independence. The coefficient value obtained is -0.9483406, meaning that when the special allocation fund increases by 1 percent, the level of regional financial independence will decrease by 0.94 percent. This can also be proven by a partial statistical test where the p-value is 0.050> alpha 0.05 which means do not reject H0 and consequently reject H1. With this, the special allocation fund variable has no influence and is not significant on Regional Financial Independence.

The results of this study are consistent with research conducted by (Setiawan et al., 2021) that the special allocation fund variable has no negative and insignificant effect on regional financial independence. This means that the allocation of special allocation fund to each regional government tends to have strict regulations so that the regions are not flexible in carrying out their regional activities with the allocation of funds provided by the central government. According to research by (Setiawan, et al., 2021) which examines the "Effect of Regional Original Income, General Allocation Fund, and Special Allocation Fund on

Provincial Regional Financial Independence on the Island of Sumatra in 2010-2016" concluded that the special allocation fund received by the provincial government on the island of Sumatra could not affect the increase in the level of regional financial independence. This is because the implementation of special allocation fund is focused on investing in the development, procurement, improvement, or repair of community infrastructure with a long economic life. The reason for the lack of effect of special allocation funds on financial independence is due to the limited authority of local governments in managing and using special allocation funds because their use has been determined by the central government. Therefore, local governments can only implement special allocation funds following the provisions set by the central government.

However, this result contradicts the findings of research conducted by (Aisyah, 2019; Marzuki, et al., 2022; Riyadi, 2022) which revealed that special allocation fund has a negative and significant effect on regional financial independence. Aisyah (2019) in her research on "The Effect of Regional Original Revenue, General Allocation Fund and Special Allocation Fund on the Level of Regional Financial Independence of Sumbawa Regency for the 2012 - 2018 Fiscal Year Period" stated the results that special allocation fund had a negative and significant effect. In his case study, he stated that the greater the region received the distribution of special allocation funds, the lower the level of regional financial independence. Conversely, the smaller the region receives the distribution of special allocation funds, the smaller the level of regional financial independence. This is because the special allocation funds given by the central government to certain local governments are due to low local revenue. The special allocation fund itself is allocated to support activities that are part of the national priority program and are the responsibility of the region. With these funds, it can assist regions in financing physical needs such as basic facilities and infrastructure that are national priorities in various sectors, including education, health, infrastructure, marine and fisheries, agriculture, government infrastructure, and the environment.

To optimize the distribution of special allocation funds, the government has made various efforts so that it is expected that regional financial independence can be improved. The first step is for the government to implement a performance-based fund distribution policy. In its implementation, the distribution of transfer funds to the regions will be carried out by the central government based on reports on the use of these funds. Reports on physical special allocation fund and non-physical special allocation fund will be monitored periodically. In addition, the government conducts strict supervision and evaluation of the use of special allocation funds by local governments to prevent misuse of funds. Other efforts include the provision of training and capacity for local governments to manage finances, as well as a push to improve transparency with the development of effective financial information systems. Improvements in development planning are also a key focus in the hope of creating better planning that will lead to the targeted use of special allocation funds and greater development impact. In addition, coordination between the central government and local governments is also needed to optimize the use of special allocation funds effectively and efficiently. These efforts not only aim to support infrastructure development but also to strengthen regional financial independence as a whole.

Based on the results of the study which show that special allocations do not affect regional financial independence, this indicates that the amount of allocation funds provided by the central government has no impact on increasing regional financial independence in 140 districts in Indonesia. The implementation of special allocation fund is intended for activities that involve investment in the development, procurement, improvement, or repair of community physical facilities that have a long useful life. Thus, the central government hands over its authority to local governments. Meanwhile, local governments do not have the authority to manage special allocation fund because special allocation funds have been determined by the central government, so the task of local governments is only to be carried out according to the instructions given by the central government.

3.8 The effect of tax ratio on regional financial independence

Based on the results of the GMM estimation test with the SYS-GMM model approach that has been carried out, it is found that the Tax Ratio variable has a positive and significant effect on Regional Financial Independence. The coefficient value of the variable is 9.061156, meaning that when there is an increase in the tax ratio variable by 1 percent, regional financial independence will also increase by 9.06 percent. This can also be proven by a partial statistical test where the p-value is 0.000 < alpha 0.05 which means not rejecting H0 and consequently rejecting H1. With this, the Tax Ratio variable influences Regional Financial Independence.

Following Stiglitz's theory which states that the tax ratio is an indicator in the public sector where an increase in the public scale can have a positive impact on economic growth which in turn can affect the improvement of government performance in carrying out public sector functions and duties. However, a high tax ratio value will also increase the burden on local communities where this is not in line with the ultimate goal of regional autonomy, namely welfare.

In line with research conducted by (Safarina, 2021; Marselina, 2022; Rachmadani, 2022) which shows the results that local taxes using the tax ratio have a positive and significant effect on regional financial independence. Research (Anisa, 2023) also says that the tax ratio has a positive and significant effect on regional financial independence in the expansion result area (a case study of the Regencies and Cities of Banten and Gorontalo Provinces). This means that when the tax ratio of a region increases, there will also be an increase in the financial independence of the region. The Tax Ratio describes how much the performance of the taxation sector of GRDP can be received by the government. The increase in the tax ratio reflects that the income received by the community is getting bigger, which will affect the amount of regional income. The size of the tax value can determine how the region performs in financing and routine budget expenditures. Local tax revenues that always increase every year will certainly increase the income of a region which will form the independence of the local government in meeting all the spending needs it has and does not continue to depend on the central government.

Related to the research results that show that the tax ratio has a positive and significant impact on increasing local financial independence, local governments in 140 districts in Indonesia can explore and explore more local potential that can be a source of local taxes. Several strategies to explore the potential of local taxes can be found in the book Local Taxes and Levies (In the Policy of Central and Local Financial Relations) initiated by (Anggoro, et al., 2023), namely: First, institutional/organizational strengthening. The government can conduct institutional strengthening through organizational restructuring according to regional needs. For example, Bapenda West Bandung Regency has stood alone since February 2021 and separated itself from the Regional Financial Management Agency so that it is more focused on exploring regional income. Second, collecting data. This can be done by local governments by re-recording data related to extracting potential to produce forms of real potential in their respective regions. Third, profiling local taxpayers. In this case, the District/City local government can cooperate with the provincial government or SAMSAT in collecting data in the field from house to house. Fourth, potential analysis. The data collection that has been carried out previously is then followed up with analysis and study to be converted into an appropriate policy. The policy will be returned to the government for follow-up.

4. Conclusions

Based on the results of data analysis and processing using GMM with the SYS-GMM approach regarding regional financial independence in 140 primary sector regencies from 2018 to 2022, several conclusions can be drawn, namely as follows: (1) Primary output has a regression coefficient value of 1.347092 with a probability value (0.025) which indicates that the primary output variable has a positive and significant effect on regional financial independence. This means that when there is an increase in primary output, regional financial independence will increase; (2) Revenue Sharing Fund of Natural Resources has a regression coefficient value of -0.5988536 with a probability value (0.000) which indicates that the Natural resources revenue sharing fund variable has a negative and significant effect on regional financial independence. This means that when there is an increase in natural resource revenue sharing funds, regional financial independence will decrease; (3) The general allocation fund has a regression coefficient value of -4.939938 with a probability value (0.000) which indicates that the general allocation fund variable has a negative and significant effect on regional financial independence. This means that when there is an increase in the general allocation fund, regional financial independence will decrease; (4) The special allocation fund has a regression coefficient value of -0.9483406 with a probability value (0.050) which indicates that the special allocation fund variable has no effect on regional financial independence. This indicates that a decrease or increase in the special allocation fund will not affect the decrease or increase in regional financial independence either; and (5) The tax ratio has a regression coefficient value of 9.061156 with a probability value of (0.000) which indicates that the tax ratio variable has a positive and significant effect on regional financial independence. This means that when there is an increase in the tax ratio, regional financial independence will increase.

After seeing the results of research on regional financial independence in Indonesia, there are several implications that can be taken, namely: (1) The results show that primary output has a positive and significant effect on regional financial independence, so various parties, both the government and the community, can optimize the natural resources in their regions and diversify the local economy by developing other sectors that can become stable and sustainable income generators; (2) Natural resource revenue sharing funds and general allocation funds that have a negative and significant effect on regional financial independence indicate that the central government must pay more attention to the allocation of aid funds according to the potential and capacity of the region and supervise the local government so that aid funds from the center can be optimized for regional infrastructure; (3) From the research results which state that the tax ratio has a positive and significant effect on regional financial independence, the local government must supervise so that more contributions are made by the community in increasing regional financial independence through taxes received by the region; (4) For local governments in all districts that have a primary superior sector, it is hoped that they will be able to develop their natural resource wealth to the maximum so that this wealth becomes additional income for their regions because in this research case study it states that primary output can have a positive effect on regional financial independence. In addition, local governments are also tasked with providing more effective policies so that the allocation funds provided by the central government can be optimized for regional development in supporting all government activities and are expected to manage the allocation funds as well as possible so that they do not only rely on funds from the center; (5) For the central government, it is expected to supervise local governments in using the allocation funds provided and continue to socialize so that local governments do not always depend on transfer funds from the central government alone. In addition, the central government can also encourage local governments to be more financially independent by maximizing the wealth of existing natural resources; (6) For future researchers, it is expected to use other public variables that can affect regional financial independence. Researchers can also expand the research object space so that the research results can be compared across all districts/cities in Indonesia; and (7) This research is still limited because it only uses the STATA 14 analytical tool with the Generalized Method of Moment (GMM) approach. It is hoped that future researchers can use other latest analytical tools and with a more diverse approach, not only GMM.

Acknowledgement

Acknowledgments are inserted at the end of the manuscript after the conclusion section. Individuals who assisted with the research should be listed here (e.g., providing language assistance, writing assistance, proofreading articles, etc.). Use unnumbered section titles for Acknowledgments, similar to the titles References, Author Contribution, Funding, Ethical Review Board Statement, Informed Consent Statement, Data Availability Statement, Conflict of Interest, and explanations related to Open Access.

Author Contribution

Conceptualization, S.L.L. and H.S.; Methodology, R.A.F.G.; Formal Analysis, R.A.F.G. and S.S.; Investigation, S.L.L. and S.D.; Resources, H.S. and S.S.; Writing – Original Draft Preparation, S.L.L.; Writing – Review & Editing, H.S. and S.D.; Visualization, R.A.F.G.; Supervision, H.S.; Project Administration, S.L.L.

Funding

This research received no external funding.

Ethical Review Board Statement

Not available

Informed Consent Statement

Not available

Data Availability Statement

Not available

Conflicts of Interest

The authors declare no conflict of interest.

Open Access

References

Adha, A. N. (2022). *Model kemandirian fiskal daerah provinsi di Indonesia*. Universitas Sultan Ageng Tirtayasa.

Anisa, S. (2023). *Analisis faktor-faktor yang mempengaruhi kemandirian keuangan daerah pada daerah hasil pemekaran (Studi kasus Kabupaten dan Kota Provinsi Banten dan Gorontalo).* Universitas Sultan Ageng Tirtayasa.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies, 58*(2), 277–297. https://doi.org/10.2307/2297968

Baltagi, B. H. (2005). *Econometric analysis of panel data* (3rd ed.). John Wiley & Sons.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87*(1), 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8

Direktorat Dana Perimbangan. (2017). *Buku pegangan pengalokasian dana bagi hasil sumber daya alam.*
Djaenuri, A. (2012). *Hubungan keuangan pusat-daerah: Elemen-elemen penting hubungan keuangan pusat–daerah.* Ghalia Indonesia.
Fatmala, W., & Baubau, P. (2020). Pengaruh sektor ekonomi dominan terhadap kemandirian fiskal kabupaten/kota di Provinsi Sulawesi Tenggara. *Jurnal Ekonomi & Keuangan Daerah, 8*(1), 25–40. https://ojs.unm.ac.id/economix/article/view/14251
Ginanjar, R. A. F., Zahara, V. M., Suci, S. C., & Suhendra, I. (2020). Human development convergence and the impact of funds transfer to regions: A dynamic panel data approach. *Journal of Asian Finance, Economics and Business, 7*(12), 593–604. https://doi.org/10.13106/JAFEB.2020.VOL7.NO12.593
Gujarati, D. N., & Porter, D. C. (2015). *Dasar-dasar ekonometrika* (5th ed.). Salemba Empat.
Halim, A. (2008). *Akuntansi sektor publik: Akuntansi keuangan daerah.* Salemba Empat.
Haryanto, A. F. A. N. (2019). Analisis pengaruh pendapatan asli daerah, dana alokasi umum, dan belanja modal terhadap tingkat kemandirian keuangan daerah pada pemerintah daerah kabupaten/kota di Provinsi Jawa Tengah tahun 2012–2017. *Diponegoro Journal of Accounting, 8*(2), 1–13. https://ejournal3.undip.ac.id/index.php/accounting/article/view/25545
Hastuti, P. (2018). *Desentralisasi fiskal dan stabilitas politik dalam kerangka pelaksanaan otonomi daerah di Indonesia.* UIN Sunan Kalijaga Yogyakarta.
Hendri, W., & Utama, M. S. (2019). Analysis of factors that influence the independence of regional finance in West Nusa Tenggara Province. *Russian Journal of Agricultural and Socio-Economic Sciences, 89*(5), 169–175. https://doi.org/10.18551/rjoas.2019-05.20
Indrianingrum, H., & Priyono, N. (2023). Analisis pengaruh PAD, DAU, DAK, dan DBH terhadap tingkat kemandirian daerah di Kabupaten Magelang pada tahun 2006–2021. *Jurnal Economina, 2*(1), 10–20. https://doi.org/10.55681/economina.v2i1.269
Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X
Julia, D., Asmara, A., & Heriyanto, H. (2017). Dampak kebijakan fiskal terhadap kinerja sektor pertanian di Provinsi Riau. *Dinamika Pertanian, 30*(3), 233–248. https://journal.uir.ac.id/index.php/dinamikapertanian/article/view/797
Kaloh, J. (2007). *Mencari bentuk otonomi daerah: Suatu solusi dalam menjawab kebutuhan lokal dan tantangan global (Edisi revisi).* PT Rineka Cipta.
Listya Nindita, N., & Rahayu, S. (2018). Pengaruh pendapatan asli daerah (PAD), dana alokasi umum (DAU), serta belanja modal terhadap tingkat kemandirian keuangan daerah kabupaten/kota Provinsi Jawa Barat. *Journal Accounting and Finance, 2*(1). https://journals.telkomuniversity.ac.id/jaf
Martadinata, M. A. (2022). Analisis pengaruh pertumbuhan penduduk, tenaga kerja, investasi, dan inflasi terhadap pertumbuhan ekonomi kabupaten/kota di Provinsi Jawa Tengah tahun 2015–2019. *Diponegoro Journal of Economics, 11*(1), 37–52. https://doi.org/10.14710/djoe.32660
Marselina, A., & Herianti, E. (2022). Determinan kemandirian keuangan daerah. Jurnal Akuntansi dan Governance, 2(2), 110–118. https://doi.org/10.24853/jago.2.2.110-118
Martha, I., Hendrati, & Manurung, M. (2012). *Exploring Indonesia tax ratio development 1970–2010.* Public Finance Management Conference.
Marzuki, Akhyar, C., Nurlela, & Yandani, F. (2022). Pengaruh penerimaan APBD terhadap kemandirian keuangan kabupaten/kota di Provinsi Sumatera Barat. *Jurnal Visioner & Strategis, 11*(1), 45–55. https://ojs.unimal.ac.id/index.php/visi/article/view/8023
Musfirati, A., & Sugiyanto, H. (2021). Pengaruh dana alokasi umum, dana alokasi khusus, dana bagi hasil, dan dana keistimewaan terhadap tingkat kemandirian keuangan

daerah. *Substansi: Sumber Artikel Akuntansi, Auditing, dan Keuangan Vokasi, 5*(1), 55–67. https://doi.org/10.35837/subs.v5i1.1382

Oki, K. K. (2019). Dampak otonomi daerah terhadap kapasitas fiskal Kabupaten Timor Tengah Utara Provinsi NTT. *EKOPEM: Jurnal Ekonomi Pembangunan, 4*(2), 45–60. https://core.ac.uk/outputs/230833998/

Periansya. (2019). Analisis pengaruh kemandirian keuangan daerah pada kabupaten/kota di Provinsi Sumatera Selatan. *I-Finance, 5*(1). http://jurnal.radenfatah.ac.id/index.php/i-finance

Parapat, E. P., Hutagalung, D. S., & Malau, E. I. (2021). Pengaruh dana alokasi umum dan dana alokasi khusus terhadap tingkat kemandirian keuangan daerah di Kota Pematangsiantar. *JAMIN: Jurnal Administrasi dan Inovasi Manajemen, 3*(1), 25–32. https://www.jurnal.murnisadar.ac.id/index.php/JAMIN/article/view/358

Rahmadani, F. (2022). Factors affecting regional financial independence in the Special Region of Yogyakarta. *Efficient: Indonesian Journal of Development Economics, 5(*1), 1468–1478. https://doi.org/10.15294/efficient.v5i1.50786

Riyadi, W. (2022). Pengaruh dana alokasi umum, dana alokasi khusus dan belanja modal terhadap tingkat kemandirian keuangan daerah pada kabupaten/kota di Provinsi Jawa Barat. *JAKSI: Jurnal Akuntansi Keuangan dan Sistem Informasi, 3*(1), 22–34. https://doi.org/10.31949/j-aksi.v3i1.2143

Rochmah, S. N. (2015). *Faktor-faktor yang mempengaruhi kinerja keuangan daerah (Studi empiris pada kota dan kabupaten di Provinsi Jawa Tengah tahun 2009–2012)* (Skripsi, Universitas Muhammadiyah Surakarta).

Roodman, D. (2009). Practitioners' corner: A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics, 71*(1), 135–158. https://doi.org/10.1111/j.1468-0084.2008.00542.x

Setiawan, P., Widiyanti, R., Siregar, L. M., Nurhaida, & Oktavia, E. (2021). Pengaruh PAD, DAU dan DAK terhadap kemandirian keuangan daerah provinsi di Pulau Sumatera tahun 2010–2016. *Menara Ekonomi, 7*(1), 44–57. https://jurnal.umsb.ac.id/index.php/menaraekonomi/article/view/2536

Shah, A. (1994). *A fiscal needs approach to equalization in a decentralized federation. Policy Research Working Paper No. 1289.* World Bank.

Suyanto. (2010). Flypaper effect theory dalam implementasi kebijakan desentralisasi fiskal. *Jurnal Ekonomi Pembangunan, 11*(1), 45–54. https://doi.org/10.23917/jep.v11i1.335

Umam, K. (2017). Kemandirian fiskal kabupaten/kota di Provinsi Kalimantan Barat. *Jurnal Pembangunan dan Pemerataan, 6(*2), 80–91. https://jurnal.untan.ac.id/index.php/jcc/article/view/23225

Verawaty, Fransisca, S., & Rahmawati, R. (2017). Determinan tingkat kemandirian keuangan daerah pada kabupaten/kota di Provinsi Sumatera Selatan. *Jurnal Ilmiah MBiA, 16*(1), 1–10. https://journal.binadarma.ac.id/index.php/mbia/article/view/59

Yani, A. (2004). *Hubungan keuangan antara pemerintah pusat dan daerah di Indonesia*. PT Raja Grafindo Persada.

Biographies of Authors

Siti Lailatul Latipah, Universitas Sultan Ageng Tirtayasa, Banten, 42163, Indonesia

- Email: sitilailatullatipah@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A

Hady Sutjipto, Universitas Sultan Ageng Tirtayasa, Banten, 42163, Indonesia

- Email: hadysutjipto@untirta.ac.id
- ORCID: N/A
- Web of Science ResearcherID: 32664526
- Scopus Author ID: N/A
- Homepage: https://sinta.kemdikbud.go.id/authors/profile/5986056

Rah Adi Fahmi Ginanjar, Universitas Sultan Ageng Tirtayasa, Banten, 42163, Indonesia

- Email: rah.adi@untirta.ac.id
- ORCID: N/A
- Web of Science ResearcherID: 2285564
- Scopus Author ID: 57220574829
- Homepage: https://sinta.kemdikbud.go.id/authors/profile/6696230

Sugeng Setyadi., Universitas Sultan Ageng Tirtayasa, Banten, 42163, Indonesia

- Email: sugeng.setyadi@untirta.ac.id
- ORCID: N/A
- Web of Science ResearcherID: 57686150200
- Scopus Author ID: N/A
- Homepage: https://sinta.kemdikbud.go.id/authors/profile/6013420

Saharuddin Didu, Universitas Sultan Ageng Tirtayasa, Banten, 42163, Indonesia

- Email: sahdidu@untirta.ac.id
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: https://sinta.kemdikbud.go.id/authors/profile/6702606