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The Influence of Regional Financial Independence and Population Size on Regional Production Capacity and Community Welfare In West Kalimantan Province

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fiscal decentralization, human development index, structural equation modeling

ABSTRACT
This study examines the influence of regional financial independence and population quantity on regional production capacity and community welfare in West Kalimantan Province. Using a quantitative approach with Structural Equation Modeling–Partial Least Squares (SEM-PLS), panel data from 14 districts/cities during the 2015–2024 period were analyzed. Regional financial independence was measured through the degree of fiscal decentralization, degree of regional dependence, and ratio of fiscal independence. Population quantity was assessed using population density, labor force participation rate, and dependency ratio. Regional production capacity was represented by Gross Regional Domestic Product (GDP), while community welfare was measured by the Human Development Index (HDI). The results indicate that regional financial independence significantly affects both regional production capacity (t-stat = 2.163, p = 0.031) and community welfare (t-stat = 13.019, p = 0.000). Population quantity also shows significant effects on production capacity (t-stat = 2.989, p = 0.003) and welfare (t-stat = 3.923, p = 0.000). Furthermore, regional production capacity significantly influences community welfare (t-stat = 2.154, p = 0.031). The mediation analysis reveals that production capacity successfully mediates the relationship between population quantity and community welfare (t-stat = 2.668, p = 0.008), but does not mediate the relationship between regional financial independence and welfare (t-stat = 1.738, p = 0.082). The model demonstrates strong predictive relevance, with an R-square value of 81.0% for community welfare and a Q-square value of 89.9%. These findings emphasize that strengthening fiscal independence and optimizing demographic potential through enhanced production capacity are crucial strategies for improving community welfare in West Kalimantan Province.

INTRODUCTION

Fiscal decentralization in Indonesia is one of the strategic policies aimed at strengthening regional independence, improving the efficiency of resource management, and expanding the equitable distribution of welfare (Bucci et al., 2024; Hayat et al., 2023; Mutiarin, 2017; Slavinskaitė, 2017). Within the framework of public economic theory, it emphasizes three main functions of government, namely allocation, distribution, and stabilization. The allocation function highlights the importance of the efficient provision of public goods and services; the

distribution function relates to the equitable distribution of welfare; and the stabilization function concerns maintaining macroeconomic stability. This perspective is further expanded by emphasizing that delegating fiscal authority to local governments improves the efficiency of resource allocation, as local governments better understand the preferences and needs of their communities (Fabre & Borgert, 2022; Kessler & Wagner, 2022; Wagner, 2025).

Putri and Saputra (2019) state that fiscal decentralization essentially aims to achieve efficient management of regional potential, improve the quality of public services, and encourage community participation in development activities. Adequate fiscal authority enables local governments to adapt development policies to local characteristics, expand access to basic services, and strengthen regional competitiveness. However, the success of fiscal decentralization highly depends on the capacity of regions to manage finances transparently, efficiently, and accountably. Low fiscal capacity increases dependence on central transfers and exacerbates regional income inequality (Ashfahany et al., 2020).

High regional financial independence provides a broader policy space for local governments to allocate budgets for productive expenditures, including infrastructure development, public service improvement, and economic investment. Conversely, regions highly dependent on central transfers face limitations in implementing policy innovations due to restricted fiscal space. Research even shows that large fiscal capacity consistently increases social spending and drives per capita income growth. This finding underscores the importance of fiscal independence as a foundation for improving the quality of people's welfare, particularly in developing countries (Murshed et al., 2022).

In most regions, the portion of central transfer funds is much larger than that of Pendapatan Asli Daerah (PAD). This condition illustrates the high fiscal dependence of regions on the central government and highlights the limitations of local fiscal capacity. The narrow fiscal space constrains local governments' ability to finance human development in the areas of education, health, and infrastructure, ultimately affecting the quality of community welfare (Priyono et al., 2020).

The Directorate General of Financial Balance (Direktorat Jenderal Perimbangan Keuangan or DJPK) states that in measuring regional financial independence, three main indicators can be used: the degree of fiscal decentralization, the degree of regional dependence, and the ratio of fiscal independence. These three ratios indicate the extent to which regional fiscal capacity contributes to improving public services to realize community welfare. To provide a more detailed picture of the fiscal conditions in each district/city, the following presents a calculation of the three main indicators—degree of fiscal decentralization, degree of regional dependence, and ratio of fiscal independence—in West Kalimantan Province in 2024.

The results show that most districts in West Kalimantan still have a very low ratio of fiscal independence. The high degree of dependence on central funds, ranging from 80 to 90 percent, indicates the weak fiscal capacity of these regions. Only the cities of Pontianak and Singkawang exhibit a relatively high ratio of fiscal independence, pointing to a significant fiscal gap between regions. Such inequality has the potential to create disparities in the provision of public services and the quality of development across areas.

In addition to fiscal aspects, population quantity also plays an important role in determining the success of regional development. Indicators such as the Labor Force Participation Rate (Tingkat Partisipasi Angkatan Kerja or TPAK) reflect the readiness of the

workforce to enter the labor market, while the dependency ratio describes the burden borne by the productive-age population in supporting the non-productive population. Meanwhile, population density reflects both pressure on the region's carrying capacity and a factor influencing the dynamics of regional economic growth (Kurniawati & Sugiyanto, 2021).

In general, the demographic conditions of West Kalimantan Province in 2024 show significant variations between regions. Pontianak City has the highest population density (5,760 people/km²), while Kapuas Hulu has the lowest (8 people/km²), reflecting the inequality of population distribution between urban and rural areas. The provincial average Labor Force Participation Rate (TPAK) is relatively high, with the highest rate in Sekadau (76.65%) and the lowest in Pontianak City (64.53%), indicating the differing levels of workforce readiness among regions. Meanwhile, the dependency ratio remained relatively stable, ranging from 1.82 to 1.92, suggesting that the burden on the productive-age population was still fairly balanced. These findings illustrate that West Kalimantan possesses a substantial potential demographic bonus, yet continues to face challenges such as unequal population distribution, variations in labor force participation, and differences in dependency burdens across regions.

However, population quantity does not always have a positive impact. The imbalance between the number of productive-age individuals and the availability of job opportunities has the potential to increase unemployment, poverty, and social inequality. Research shows that a high dependency ratio can lead to low labor productivity and a slowdown in improving community welfare. This indicates that population quantity can only become a developmental strength if properly managed through efforts to enhance economic capacity, create sufficient employment opportunities, and improve the quality of education and workforce skills (São Paulo et al., 2020).

Meanwhile, regional production capacity is an important indicator reflecting the extent to which the government and society can utilize production factors to generate economic output. According to the Solow-Swan Growth Model (1956), economic growth is influenced by capital accumulation, labor growth, and technological advancement. At the regional level, production capacity is generally represented by Gross Regional Domestic Product (GDP), which describes the total value added from all economic activities in a region.

Based on data from BPS West Kalimantan (2025), the GDP at current prices in 2024 reached IDR 300.16 trillion, with a GDP per capita of IDR 52.70 million. Provincial economic growth in the fourth quarter of 2024 was recorded at 4.98% (y-on-y), driven mainly by the mining and quarrying sector, which grew by 16.66%, and the information and communication sector, which increased by 8.19%. However, West Kalimantan's economic structure remains dominated by the agriculture, forestry, and fisheries sectors, contributing 22.71% to the total GDP. This high dependence on primary sectors poses vulnerability to global commodity price volatility (BPS, 2025).

The results also present the district and city GDP in West Kalimantan Province in 2024. The data show variations in economic capacity across regions, with Pontianak, Kubu Raya, and Ketapang recording the highest GDP values, while North Kayong and Melawi remain at relatively low levels. This indicates an imbalance in economic productivity between regions, which consequently affects their ability to enhance community welfare.

Nevertheless, development cannot be viewed solely from the perspective of economic output. Pigou (1920), through the theory of welfare economics, emphasized that resource

allocation must yield optimal social benefits. Therefore, regional development should also be assessed from the perspective of community welfare. According to the United Nations Development Programme (UNDP), the Human Development Index (HDI) serves as an instrument to assess overall societal well-being, covering three main dimensions: health (longevity and healthy living), education, and standard of living (Suhyanto et al., 2021).

Based on data from the Central Statistics Agency (BPS), the HDI value of West Kalimantan Province over the past decade has shown an increasing trend, although it remains below the national average. In 2015, the province's average HDI was recorded at 65.59 and increased to 67.61 in 2024.

Although the average HDI of the province has increased, this achievement has not been evenly distributed across all districts and cities. Pontianak City has the highest HDI, followed by Singkawang City, while North Kayong and Sekadau show relatively low HDI levels. This difference indicates a disparity in human development between regions, where urban areas tend to achieve higher outcomes than inland areas. This condition shows that the increase in the provincial average HDI has not yet fully reflected equitable human development across all districts and cities.

Various previous studies have produced different findings regarding the relationship between regional financial independence, population quantity, GDP, and HDI. Winarni et al. (2022) found that the compatibility of expenditure allocation and fiscal decentralization ratios contributed positively and significantly to the increase in HDI. Hardana and Nasution (2022) also stated that regional financial ratios have a significant positive effect on increasing HDI. However, Squirrel et al. (2023), Stuttgart et al. (2024), and Wibawa and Arif (2021) found different results, showing that the ratio of independence and fiscal dependence actually had a negative effect on HDI.

Several empirical studies support the important role of productive capacity as a link between fiscal policy and welfare. Stuttgart et al. (2022) found that the effective use of Pendapatan Asli Daerah (PAD) can improve infrastructure and public services, thereby strengthening regional production capacity. Luciana et al. (2024) added that labor force participation significantly affects welfare only when production capacity is sufficient. Meanwhile, São Paulo and Raihansyah (2024) showed that poverty and unemployment negatively impact HDI, while GDP and government expenditure have positive and significant effects.

Differences in these research results may be caused by variations in regional characteristics, analysis periods, or methodologies used. This underscores the need for further empirical studies to gain a more comprehensive understanding of how fiscal independence and demographic factors influence community welfare. Although several previous studies have discussed the influence of fiscal decentralization on welfare or the impact of demographic factors on development, research that simultaneously integrates regional financial independence, population quantity, regional production capacity, and community welfare remains limited. Therefore, this study seeks to fill the research gap by aiming to encourage the improvement of community welfare in West Kalimantan.

The implementation of fiscal decentralization in Indonesia aims to strengthen regional independence, increase production capacity, and ultimately promote community welfare. However, conditions in West Kalimantan Province still show a high dependence on central

transfer funds, while the contribution of Pendapatan Asli Daerah (PAD) remains relatively low. This indicates that regional financial independence is still limited, constraining the fiscal space and ability of local governments to allocate spending productively.

In addition to fiscal factors, demographic aspects also influence development outcomes in West Kalimantan. A large and continually growing population can serve as an important asset, strengthening the labor base and expanding the domestic market. However, rapid population growth also demands adequate basic services, infrastructure, and employment opportunities. Without appropriate fiscal strategies and development policies, population growth risks becoming a burden rather than a catalyst for regional development.

Regional production capacity, as measured by Gross Regional Domestic Product (GDP), has indeed grown, but it has not yet fully improved the quality of life for the community. Economic growth in West Kalimantan remains uneven across regions and has not been effective in significantly reducing poverty levels or accelerating HDI improvement.

The gap between fiscal potential, demographic dynamics, production capacity, and community welfare achievements raises several important questions. First, to what extent does regional financial independence influence the enhancement of production capacity in West Kalimantan? Second, does population quantity truly act as a driving factor for production capacity, or does it become a burden for regional development? Third, how does regional production capacity serve as a mediating link between fiscal independence, demographic factors, and community welfare.

Therefore, this research is motivated by the gap between the theoretical expectations of fiscal decentralization and the actual conditions in West Kalimantan. The observed reality includes low fiscal independence, high dependence on central transfers, rapid population growth, suboptimal production capacity, and welfare levels that lag behind those of other provinces. This issue requires scientific investigation to provide a deeper understanding of the relationships among these variables within the context of regional development.

RESEARCH METHOD

This study uses a quantitative approach with the Structural Equation Modeling–Partial Least Squares (SEM-PLS) method. The quantitative approach was chosen because this study focuses on measuring causal relationships between variables, testing hypotheses, and analyzing numerical data objectively. According to Creswell (2014), a quantitative approach is used to test theories by examining the relationships between variables through structured statistical procedures.

The SEM-PLS method was chosen because the model in this study includes a complex structure consisting of two exogenous variables (regional financial independence and population quantity) and two endogenous variables (regional production capacity and community welfare), each with reflective indicators forming a latent construct. SEM-PLS is capable of handling research models that involve multiple constructs and structural relationship pathways simultaneously. According to Hair et al. (2019), the PLS-SEM method is specifically designed to manage highly complex models in terms of the number of constructs, indicators, and structural relationships analyzed.

In addition, all constructs in this study are formed by reflective indicators. SEM-PLS is recommended for models with reflective indicators because it can comprehensively test the

validity and reliability of indicators while maintaining estimation stability despite structural complexity (Hair et al., 2017).

This study employs an explanatory quantitative design using panel data from 14 districts and cities in West Kalimantan Province covering the period 2015–2024. The data include fiscal, demographic, GDP, and HDI indicators, which were analyzed using SEM-PLS to examine relationships between constructs. Prior to analysis, data pre-processing was conducted to ensure consistency, validity, and completeness of observations. Hair et al. (2019) also assert that PLS-SEM is effectively used when data tend to be non-normal and the sample size is relatively small. This consideration is important since regional fiscal and demographic data are generally not normally distributed.

Chin (2010) stated that PLS-SEM is preferred when the research aims to improve the predictive accuracy of structural models. This approach aligns with the objectives of this study, which seeks to identify the influence of fiscal and demographic factors on regional development. The method allows simultaneous testing of causal relationships, analysis of latent constructs formed by reflective indicators, management of non-normal data, and evaluation of predictive power. Therefore, SEM-PLS was selected to examine the influence of regional financial independence and population quantity on regional production capacity and community welfare in the districts and cities of West Kalimantan Province.

This research uses secondary data—data obtained not directly from respondents but from official government documents and publications. Secondary data were chosen because this study focuses on regional macro indicators such as local government financial data and demographic, economic, and community welfare indicators, which can only be accessed through statistical institutions and official agencies. According to Sugiyono (2020), secondary data refer to data collected by other parties for specific purposes but which can be reused for scientific research. The data sources for this study include the Central Statistics Agency (Badan Pusat Statistik, BPS) of West Kalimantan Province and the Directorate General of Financial Balance (Direktorat Jenderal Perimbangan Keuangan, DJPK) of the Ministry of Finance of the Republic of Indonesia.

Data on HDI, GDP, population density, labor force participation rate (Tingkat Partisipasi Angkatan Kerja or TPAK), and the dependency ratio were obtained from BPS publications, while data on the realization of the Regional Revenue and Expenditure Budget (Anggaran Pendapatan dan Belanja Daerah, APBD) were sourced from the DJPK. The type of data used in this study is panel data, which combine time series data (2015–2024) and cross-section data (14 districts/cities in West Kalimantan Province). The use of panel data provides several advantages, including increasing the number of observations, enriching data variation, and strengthening the ability to analyze empirical models. Gujarati and Porter (2009) noted that panel data offer richer information, higher variability, and reduced collinearity problems compared to cross-section or single time series data.

The population is the entire object of research that possesses certain characteristics relevant to the research problem. The population in this study consists of all regency and city governments in West Kalimantan Province, totaling 14 districts/cities. The selection of this population is based on the consideration that each district/city has different fiscal, demographic, and development achievements, providing a comprehensive picture of variation in regional

financial independence, population quantity, production capacity (GDP), and community welfare (HDI) (Sugiyono, 2020).Click or tap here to enter text.

A sample is a subset of the population considered to represent its overall characteristics. In this study, the sampling technique used is total sampling or census, where all members of the population are included as research samples. According to Kothari (2004), total sampling is suitable when the population size is relatively small, allowing researchers to include the entire unit of analysis.

Therefore, this study uses the 14 districts/cities in West Kalimantan as a full sample observed during the 2015–2024 period. The use of total sampling was chosen to obtain more accurate and comprehensive analytical results, as all units of analysis within the population are represented in the study.

Data analysis is a crucial stage in quantitative research to test hypotheses and answer the problem formulations established earlier. According to Gujarati and Porter (2009), the selection of analytical techniques must be aligned with the type of data and research objectives to ensure the validity and reliability of results. In this study, the data analysis method applied is Structural Equation Modeling with the Partial Least Squares (SEM-PLS) technique to analyze the influence between variables. The software used for this analysis is SmartPLS 4.0.

Partial Least Squares–Structural Equation Modeling (PLS-SEM) is a variant-based SEM statistical method designed to address multiple regression scenarios under certain data constraints, such as missing data, small sample sizes, or multicollinearity (Hamid & Anwar, 2019). PLS can explain how variable X affects variable Y while also clarifying the theoretical relationship between them. Moreover, PLS is a regression technique that identifies factors belonging to a combination of variable X (as explanatory) and variable Y (as response). The strengths of the PLS method, according to Hamid and Anwar (2019), include: a) The ability to manage multicollinearity problems among independent variables.

b) The capacity to model many dependent and independent variables simultaneously.

c) Applicability to both reflective and formative constructs.

d) Suitability for small sample sizes.

e) No requirement for normally distributed data.

f) Flexibility in handling data of various scale types, including ordinal, nominal, and continuous data.

Partial Least Squares–Structural Equation Modeling (PLS-SEM) is a statistical approach used to analyze relationships between latent variables and their indicators using regression-based techniques. This method was developed as an alternative to covariance-based SEM, focusing more on predicting and exploring relationships among variables in complex models (Magno et al., 2024). PLS-SEM is particularly useful for research combining theoretical and practical perspectives, especially in situations with small samples or when data do not meet multivariate normality assumptions.

PLS-SEM employs the partial least squares (PLS) estimation method, which is more flexible than covariance-based SEM. One of the method's main advantages is its ability to handle models with multiple latent variables while allowing simultaneous analysis of direct and indirect relationships. In practice, PLS-SEM optimizes the variance explained by endogenous variables using an iterative, algorithm-based estimation technique that ensures result stability even in complex model structures (Sarstedt et al., 2019). The stages in PLS analysis include

evaluating the inner model, assessing the outer model, and performing hypothesis testing. This method enables researchers to construct a structured model of cause-and-effect relationships using a path analysis approach (Iba & Wardhana, 2024).

RESULTS AND DISCUSSION

The purpose of this study, as explained in Chapter I, is to analyze and explain the influence of Regional Financial Independence and Population Quantity on Regional Production Capacity and Community Welfare in West Kalimantan Province. This study also examines the structural relationships among the constructs using the Structural Equation Modeling–Partial Least Squares (SEM-PLS) approach. The object of the study includes all 14 districts/cities in West Kalimantan Province, with an observation period from 2015 to 2024. Using 10 years of panel data and 14 units of analysis, the total number of observations in this study amounts to 140. All data are secondary, obtained from official publications such as BPS West Kalimantan Province, Bappeda, and the Directorate General of Financial Balance (Direktorat Jenderal Perimbangan Keuangan)**.**

The analytical methods used include descriptive statistics and SEM-PLS analysis conducted using SmartPLS software version 4. Descriptive statistics were utilized to provide an overview of the characteristics of the indicators for each variable, while SEM-PLS was employed to test the structural relationships between constructs according to the conceptual model that had been developed. This study used four latent variables consisting of two exogenous variables and two endogenous variables. The exogenous variables—Regional Financial Independence and Population Quantity—each consist of three indicators. Meanwhile, the endogenous variables are Regional Production Capacity, represented by the Gross Regional Domestic Product (GDP) indicator, and Community Welfare, represented by the Human Development Index (HDI) indicator.

Before evaluating the measurement model, the researcher conducted reverse scoring on the DKD indicators, population density, and dependency ratio. The indicators at their initial scales displayed opposite directions of measurement relative to their corresponding latent constructs; therefore, a transformation was required to ensure that higher values indicate higher construct levels and align with the direction of the other indicators. This transformation is consistent with the methodological guidelines of Hair et al. (2019), who emphasize that maintaining indicator direction consistency is critical in reflective SEM-PLS models. Similar recommendations are provided by DeVellis (2017) and Furr (2018), who argue that reverse-coded items must be transformed before conducting reliability and validity analyses. After the reverse scoring, the external loading values of the indicators increased, demonstrating greater measurement consistency and supporting the convergent validity and reliability of the constructs, as recommended by Kline (2016) and Brown (2015). Thus, the reverse scoring process effectively improved the quality of the measurement model and ensured that all indicators accurately reflected the constructs under study.

Descriptive Analysis Results

The results of descriptive statistical analysis from 140 data observations include average statistics, maximum values, minimum values, and standard deviations for each indicator of every latent variable. Descriptive statistical analysis was conducted to provide an overview of the characteristics of the data for each indicator in this study. These descriptive statistics include the mean, minimum, maximum, and standard deviation values of each indicator variable used in the SEM-PLS model. All results in the table represent data processing outputs generated through the SmartPLS software, based on 140 observations (14 districts/cities × 10 years of observation). Overall, the results of the descriptive statistics indicate considerable variation across the data, particularly for indicators related to population and regional economic aspects. The description of each indicator is explained as follows:

Regional Financial Independence

The variables of regional financial independence in this study consist of three indicators, namely the degree of fiscal decentralization (DDF), the degree of regional dependence (DKD) and the ratio of fiscal independence (RKF). The results of descriptive statistical analysis of each indicator are described as follows: 1) The Fiscal Decentralization Degree (DDF) indicator has an average value of 9.351 with a minimum value of 1.540 and a maximum of 31.640. The standard deviation value of 6.637 indicates that the level of PAD's contribution to the total regional revenue between districts/cities in West Kalimantan varies quite highly. This illustrates the gap in the ability of regions to produce PAD independently. 2) The transformed DKD value showed an average of 18.583, with a minimum value of 7.770 and a maximum of 44.760, and a standard deviation of 8.480. This variation illustrates the difference in the level of fiscal dependence between districts/cities. After reverse scoring, a higher score reflects better fiscal independence. The relatively large standard deviation shows the difference in the ability of regions to reduce dependence on central fund transfers. This strengthens the relevance of the DKD indicator as a construct component of Regional Financial Independence in this study. 3) The Fiscal Independence Ratio (RKF) indicator has an average of 12.557, with a minimum value of 1.730 and a maximum of 57.270. The standard deviation of 11,634 shows that the variation in the level of fiscal independence between districts/cities is quite prominent, although in general the average value still shows a low level of independence.

Population Quantity

The population quantity variables in this study consist of three indicators, namely population density (Kep), labor force participation rate (TPAK) and *dependency ratio* (DR). The results of descriptive statistical analysis of each indicator are described as follows: 1) The population density indicator has an average of 5,725,293, with a value range of 8,000 to 6,213,000, and a standard deviation of 1,502,460. The very high number and a very wide range show that there is a density inequality between districts/cities in West Kalimantan. After *reverse scoring*, the interpretation of the value becomes consistent with the Population Quantity construct, where the higher value now describes demographic conditions that are more in line with the direction of the construct. 2) The Labor Force Participation Rate (TPAK) indicator has an average of 69,846, with a minimum value of 57,410, a maximum of 82,030, and a standard deviation of 5,381. The relatively narrow distribution of values and small standard deviations indicate that the labor participation rate is relatively homogeneous between districts/cities. This stability shows that TPAK serves as a consistent indicator in describing regional employment dynamics and is still feasible to be used to measure the Population Quantity construct. 3) The Dependency Ratio (DR) indicator has an average value of 49.588, a range of 39.560 to 57.910, and a standard deviation of 4.372 after reverse scoring. This moderate variation reflects the relatively similar structure of the burden of the population between districts/cities. Since DR is a sensitive indicator of demographic dynamics, its existence may help explain the burden of the non-productive age population burden on the productive population in the Population Quantity construct.

Regional Production Capacity

The Regional Production Capacity variable, represented by the Gross Domestic Product (GDP) indicator, shows an average value of 9,835.945 billion rupiah. The minimum value of 2,062.070 and the maximum value of 28,784.470 indicate a clear inequality in economic capacity among districts and cities. The standard deviation of 6,475.767 further reinforces the indication that certain regions possess significantly higher levels of economic activity compared to others.

Community Welfare

The Community Welfare variable, represented by the Human Development Index (HDI) indicator, has an average value of 67.347, with a range from 60.090 to 81.570. The standard deviation value of 4.138 shows that the level of community welfare across districts and cities varies moderately, although the variation is not as pronounced as that observed in GDP or population density. In general, HDI values fall within the medium category, with some regions achieving a high category. From these overall descriptive statistical results, it can be concluded that the research indicators exhibit sufficient empirical diversity, making them suitable for application in SEM-PLS modeling. The variation in data across regions and time periods provides a robust foundation for analyzing the structural relationships among fiscal independence, population quantity, regional production capacity, and community welfare.

Structural Equation Modeling (SEM) – Partial Least Square (PLS) Analysis Results

The Microsoft Excel program was used to input and organize data for each indicator in this study. Once the data for all indicators were entered, they were imported into the SmartPLS software version 4.0 for further analysis.

Measurement Model Test Results (Outer Model)

The outer model describes the relationship between latent constructs and their reflective indicators**.** Evaluation is carried out through three stages: Convergent Validity Test (via *loading factor* and AVE). Discriminant Validity Test (via Fornell-Larcker Criterion and HTMT Ratio). Internal Reliability Tests (via Cronbach's Alpha and Composite Reliability),

R-Square Test Results

To measure the predictive strength of the structural model in the study, it can be seen by the value of R-Square. The R-Square value is used to indicate the number of variables that can be explained by the structural model and how much percentage of endogenous construct variation can be explained by the construct that affects it (exogenous) (Ghozali, 2014). The R-Square value of this study can be seen in the following table 1:

Table 1. R-Square Results

	R-square
Regional Production Capacity	0.466
Community Welfare	0.810

Source: SmartPLS Output

The table above shows that the R-Square value of the Regional Production Capacity variable of 0.466 means that about 46.6% of the variation in Regional Production Capacity can be explained by exogenous variables in the model, namely Regional Financial Independence and Population Quantity, while the rest is explained by other variables that are not studied in this study. Furthermore, the R-square value for Community Welfare is 0.810, indicating that about 81.0**%** of the variation in Community Welfare is explained by the constructs in the model (including the contribution of Regional Production Capacity as a mediator), while the rest is explained by other variables that were not studied in this study.

Q-Square Test Results

To measure how well the observation value is produced by the model and the estimation of its parameters, it is necessary to pay attention to the Q-Square value. The test of the Q-Square value or predictive relevance can be calculated using the following formulations and calculations:

$Q2 = 1–(1–R12)\ (1–R22)$

$Q2 = 1 – (1 – 0.466)\ (1 – 0.810)$

$Q2 = 1–0.101$

$Q2 = 0.899$

The value of Q-Square must be greater than 0 (zero) to indicate that the research model has a predictive relevance value. The Q-Square quantity has a range value of $0 < Q^2 < 1$. The closer you get to 1 means the better the model is (Ghozali, 2014).

The results of the calculation of a predictive relevance value of 0.899 or 90% show that the diversity of data that can be explained by the model is 90%. The remaining 10% can be explained by other variables not hypothesized in this study. These results provide meaning that this research model is a viable model because it has relevant predictive values.

1. F-Square Test

The F-Square or effect size test is carried out to determine the change in the R-Square value in the endogenous construct. Changes in the value of F-Square indicate the influence of

exogenous constructs on endogenous constructs, regardless of whether they have a substantive influence. According to Ghozali (2014), the values of^{f2} are 0.02; 0.15; and 0.35. It can be interpreted whether the predictor of latent variables has a weak, medium or large effect on the structural level. The following is the f-square value for this study according to table 4.9:

Table 2. F-Square Results

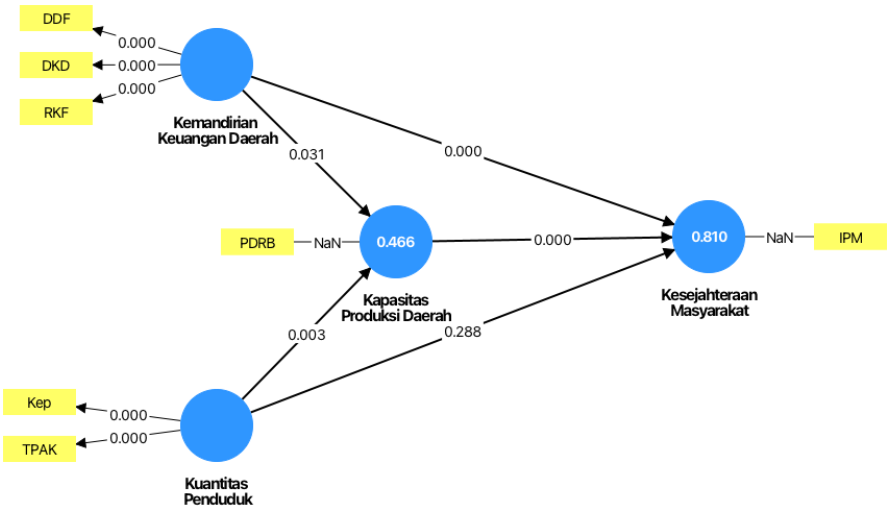
Construct	Regional Financial Independence	Regional Production Capacity	Population Quantity	Community Welfare
Regional Financial Independence		0.049		0.746
Regional Production Capacity				0.073
Population Quantity		0.085		0.005
Community Welfare				

Source: SmartPLS Output

The results of the F-Square (effect size) test are presented in Table 4.9. Referring to the guidelines of Ghozali (2014) (f^2: 0.02 = small, 0.15 = medium, 0.35 = large), the analysis shows that the influence of Regional Financial Independence on Community Welfare is very large (f^2 = 0.746), indicating the substantive contribution of fiscal independence to HDI. The effect of Financial Independence → Production Capacity (f^2 = 0.049), Population Quantity → Production Capacity (f^2 = 0.085), and Production Capacity → Welfare (f^2 = 0.073) are subcategories, thus making a limited but significant contribution to the variance of the associated endogenous constructs. Meanwhile, the direct influence of Population Quantity → Welfare is very weak/negligible (f^2 = 0.005). These findings indicate that efforts to increase regional fiscal independence are in line with substantial improvements in welfare, while the role of population quantity is more likely to affect welfare through indirect channels (through production capacity) than directly.

Hypothesis Testing Results

There are seven hypotheses in this study which are divided into five hypotheses to see the direct effect, and two hypotheses to see the intervening effect. To see the direct influence and intervening influence, hypothesis testing was carried out by bootstrapping the two models of this study. The bootstrapping results of the two studies are shown in figure 1 below:



Source: SmartPLS Output

Figure 1. Bootstrapping Calculation Results

Results of Inner Model Evaluation Test: Direct Effect Significance Test

Internal model evaluation testing in the form of a direct influence significance test will be carried out in this study. Inner model or inner measurement is also called structural model test. Table 3 shows the path coefficient values as well as the P-Values for the direct effect significance test.

Table 3. Total Effect (Mean, STDEV, T-Values, P-Values)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Regional Financial Independence - > Regional Production Capacity	0.306	0.311	0.142	2.163	0.031
Population Quantity -> Regional Production Capacity	-0.403	-0.393	0.135	2.989	0.003
Financial Independence - > Community Welfare	0.781	0.779	0.060	13.019	0.000
Regional Production Capacity - > Community Welfare	0.161	0.158	0.041	3.923	0.000
Population Quantity - > Community Welfare	-0.128	-0.127	0.060	2.154	0.031

Source: SmartPLS Output

Table 3 presents the results of the significance tests for direct effects and the magnitude of influence between latent variables in this study. From the table, the magnitude of each influence can be observed in the original sample estimate column, while the significance level can be determined from the t-statistics and p-values columns. According to Ghozali (2014), a t-statistic value greater than 1.96 or a p-value less than 0.05 indicates a significant effect; therefore, the hypothesis is accepted. The results of hypothesis testing based on Table 4.10 are described as follows.

The first hypothesis of this study states that Regional Financial Independence has a significant effect on Regional Production Capacity. The results show a t-statistic value of 2.163 (greater than 1.96) and a p-value of 0.031 (less than 0.05). This indicates that Regional Financial Independence significantly influences Regional Production Capacity, thus hypothesis H1 is accepted. The second hypothesis states that Population Quantity has a significant effect on Regional Production Capacity. The hypothesis testing results show a t-statistic value of 2.989 (greater than 1.96) and a p-value of 0.003 (less than 0.05). This demonstrates that Population Quantity significantly affects Regional Production Capacity, so hypothesis H2 is accepted.

The third hypothesis states that Regional Financial Independence has a significant effect on Community Welfare. The test results show a t-statistic value of 13.019 (greater than 1.96) and a p-value of 0.000 (less than 0.05). This confirms that Regional Financial Independence significantly influences Community Welfare, and therefore hypothesis H3 is accepted.

The fourth hypothesis posits that Population Quantity significantly affects Community Welfare. The test results show a t-statistic value of 3.923 (greater than 1.96) and a p-value of 0.000 (less than 0.05). This finding indicates that Population Quantity significantly influences Community Welfare, so hypothesis H4 is accepted. The fifth hypothesis proposes that Regional Production Capacity has a significant effect on Community Welfare. The test results show a t-statistic value of 2.154 (greater than 1.96) and a p-value of 0.031 (less than 0.05). This demonstrates that Regional Production Capacity significantly affects Community Welfare, thereby supporting and accepting hypothesis H5..

Results of Internal Model Evaluation Test (Structural Model): Test

Significance of Intervening Effect

The next stage of the internal model evaluation conducted in this study is the intervening effect significance test, which aims to examine whether corporate social responsibility mediates the relationship between company characteristics and tax avoidance. The results of the indirect relationships among variables in this study are presented in Table 4 below.

Table 4. Specific Indirect Effect (Mean, STDEV, T-Values, P-Values)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Regional Financial Independence -> Regional Production Capacity -> Community Welfare	0.049	0.050	0.028	1.738	0.082
Population Quantity -> Regional Production Capacity -> Community Welfare	-0.065	-0.061	0.024	2.668	0.008

Source: SmartPLS Output

The sixth hypothesis of this study states that Regional Production Capacity mediates the relationship between Regional Financial Independence and Community Welfare. Based on Table 4, the results show a t-statistic value of 1.738 (less than 1.96) and a p-value of 0.082 (greater than 0.05). Thus, Regional Production Capacity is not proven to mediate the

relationship between Regional Financial Independence and Community Welfare, and therefore hypothesis H6 is rejected.

The seventh hypothesis of this study states that Regional Production Capacity mediates the relationship between Population Quantity and Community Welfare. The results of the hypothesis test show a t-statistic value of 2.668 (greater than 1.96) and a p-value of 0.008 (less than 0.05). This indicates that Regional Production Capacity successfully mediates the relationship between Population Quantity and Community Welfare, thus hypothesis H7 is accepted.

CONCLUSION

This study analyzes the effects of Regional Financial Independence and Population Quantity on Regional Production Capacity and Community Welfare in West Kalimantan Province using the SEM-PLS approach with panel data from 14 districts/cities during the 2015–2024 period. The results show that both Regional Financial Independence and Population Quantity have positive and significant influences on Regional Production Capacity, indicating that stronger fiscal capacity and a productive demographic structure contribute to higher regional economic output. Regional Financial Independence also has a strong and significant direct effect on Community Welfare, emphasizing the crucial role of fiscal autonomy in enhancing human development through improved public services.

Population Quantity has a positive but relatively weak direct effect on Community Welfare, suggesting that demographic factors alone have limited impact unless supported by increased economic productivity. Regional Production Capacity is proven to significantly enhance Community Welfare, confirming the importance of sustained economic growth in improving quality of life. The mediation analysis reveals that Regional Production Capacity does not mediate the relationship between Regional Financial Independence and Community Welfare, as fiscal independence directly affects welfare. However, it does mediate the relationship between Population Quantity and Community Welfare, indicating that demographic potential can improve welfare only when supported by adequate production capacity. Overall, the model demonstrates strong predictive power, explaining a substantial proportion of the variance in Regional Production Capacity and Community Welfare in West Kalimantan Province.

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