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THE ROLE OF SHARIA FINANCING ON SECTORAL GDP IN CENTRAL SULAWESI: MACROECONOMIC ANALYSIS WITH THE VAR/VECM APPROACH

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Abstract :

Islamic financing in Indonesia is experiencing rapid growth and has the potential to become a key instrument in encouraging regional economic growth based on inclusive and sustainable principles. However, its effect on sectoral performance at the provincial level has not been studied empirically using a dynamic approach. This study aims to analyze the role of sharia financing and gross fixed capital formation (PMTB) on sectoral Gross Regional Domestic Product (GDP) in Central Sulawesi, covering the primary, secondary, and tertiary sectors. The analysis was conducted using quarterly data for the period 2022–2024 with the Vector Error Correction Model (VECM) approach for sectors showing long-term relationships and Vector Autoregression (VAR) for sectors without cointegration. Tests of stationarity, optimal lag, and Johansen cointegration were used to ensure the validity of the model. The results show that there is a difference in influence between sectors. In the primary sector, PMTB has a negative effect in the long term but positively in the short term. In the secondary sector, PMTB has a significant positive effect on both time horizons. In the tertiary sector, sharia financing has a significant positive effect in the short term without long-term relationships. This research offers novelty as the first post-pandemic sectoral study with a province-level dynamic model, which affirms the strategic role of Islamic finance in regional economic transformation. The implications of the research results show the need for sharia financing policies that are adjusted to sectoral characteristics to encourage inclusive, productive, and harmonized regional economic growth in line with Islamic economic principles.

Keywords : *Sharia financing; Sectoral GDP; PMTB; Regional Economic Growth; VAR/VECM.*

INTRODUCTION

In the last decade, the sharia economy in Indonesia has shown significant development, along with increasing public awareness of the importance of sharia principles in various aspects of life, including in the economic and financial sectors. This growth is inseparable from Indonesia's strategic role as a country with the largest Muslim population in the world,

which creates a conducive environment for the development of Islamic financial products and services. According to Annisya & Nurbaiti, (2023), Indonesia's Islamic banking assets have increased drastically from Rp1.79 trillion in 2000 to Rp272 trillion at the end of 2014, with an annual growth rate of around 23.57%. This trend continued until 2020, where Islamic banking assets reached approximately $37.3 billion, making a significant contribution to the national financial landscape (F. Fauzi, 2023).

The contribution of Islamic banking to the Gross Regional Domestic Product (GDP) in various regions of Indonesia is also noteworthy. Supriani et al. (2021) It found that Islamic bank financing contributed about 0.0016 to economic growth, suggesting that a 1% increase in the ratio of financing to deposits of Islamic banks could increase economic growth by 0.16%. In addition, the market capitalization of Islamic capital and Islamic banking reportedly accounted for around 6.83% of total GDP in 2020 (Saleem et al., 2021). The existence of Islamic banks also plays an important role in increasing financial inclusion and supporting the development of micro, small, and medium enterprises (MSMEs), which are the backbone of Indonesia's economy (Habriyanto et al., 2022).

However, despite the positive contribution of Islamic banking to national economic growth, there are significant challenges in measuring its impact at the regional level, especially in provinces such as Central Sulawesi. Several studies have shown that the growth of sharia GDP in these areas is influenced by a variety of factors, including the regulatory environment, the performance of sharia banks, and regional socioeconomic characteristics. The regulatory framework established by the Indonesian government, particularly through the passage of the Sharia Banking Law in 2008, has been instrumental in expanding the reach of Islamic banking throughout the country (Dahrani, 2023). This legal support creates a supportive environment for Islamic financial institutions to offer products that are compliant with Islamic principles, thus attracting a wider customer base (F. Fauzi, 2023).

The performance of Islamic banks is also a key factor in encouraging the growth of Islamic GDP. Research shows that Islamic bank financing has a positive impact on economic growth, especially in sectors such as agriculture and trade (Nofrianto et al., 2021; Ramadhanty et al., 2022). Capital adequacy ratio, investment level, and non-performing financing management are important factors that affect the ability of Islamic banks to provide financing (Nastiti & Kasri, 2019). Effective management of these factors can improve the financial performance of Islamic banks, which in turn supports economic growth (Ledhem & Mékidiche, 2021).

In addition, the increasing awareness and demand for financial products that are in accordance with sharia principles among Indonesia's Muslim population is further driving the growth of Islamic finance (Putri et al., 2023). Sharia financing has a significant impact on the primary sector at the regional level. In the perimeter sector, Islamic banks offer financing models such as profit-sharing contracts (Mudharabah and Musharakah) that are in

accordance with sharia principles, giving farmers access to capital without interest burden (Nur et al., 2023; Sudarsono et al., 2019). Research shows that sharia financing can increase agricultural productivity by enabling farmers to invest in better technologies and practices, thereby increasing their yields and incomes (Anwar et al., 2021).

In the secondary sector, sharia financing facilitates business operations by providing working capital and investment financing to small and medium enterprises (SMEs) (Habriyanto et al., 2022). The availability of sharia-compliant financing options encourages entrepreneurship and trading activities, which ultimately results in diversification and economic resilience (Ramadhanty et al., 2022; Trianto & Masrizal, 2021). Studies show that Islamic bank financing significantly contributes to the growth of SMEs, which is vital for regional economic development (Ninglasari, 2023; Pertiwi et al., 2021).

Nevertheless, the development of the sharia economy at the regional level such as in Central Sulawesi faces various challenges. The complexity of legal regulations related to Islamic finance is one of the main obstacles. Many regions, including Central Sulawesi, do not yet have a comprehensive legal framework to support the implementation of Islamic financial products and services, which can lead to confusion and mistrust among investors and consumers (Hayati, 2023; Muhaimin, 2024). In addition, the human resources that support the Islamic economy are often not optimized, with shortcomings in education and socialization on the principles of the Islamic economy (Hayati, 2023; Judijanto et al., 2024). This lack of understanding can hinder the effective use of Islamic financial instruments and limit participation in the Islamic economy.

Inadequate government support for sharia economic initiatives is also a challenge. The integration of Islamic finance into regional economic policies is often not a priority, resulting in a lack of strategic planning and investment in sharia-compliant sectors (Hayati, 2023; Muhaimin, 2024; Nashoh, 2024). The ongoing digital transformation also presents its own challenges. While fintech can increase access to sharia-compliant financial products, the readiness of small and medium-sized enterprises (SMEs) to adopt this technology is still low, which can hinder their growth and sustainability (Atikah, 2023; Mahyarni & Okfalisa, 2024).

The performance of Islamic financial institutions in Central Sulawesi is still in the development stage, with many institutions facing challenges related to regulatory compliance and market penetration(Nugroho, 2024; Pamuji et al., 2022). The integration of sharia economic principles into local governance and community development initiatives is key to improving the performance of the sharia economy in this area. This includes building partnerships between governments, financial institutions, and local businesses to create a more conducive environment for sharia-compliant economic activities (Basyirah et al., 2022; Muhaimin, 2024; Nashoh, 2024).

This study fills the sectoral evidence gap at the provincial level by examining the influence of sharia financing and PMTB on sectoral GDP

(primary, secondary, tertiary) in Central Sulawesi for the 2022–2024 period. Using Johansen cointegration and VECM/VAR estimation, this study maps the differences in long-term and short-term effects between sectors. The results present an empirical basis for the design of sharia financing policies that are differentiated according to sectoral characteristics.

RESEARCH METHOD

This study uses an econometric quantitative approach with the Vector Autoregression (VAR) and Vector Error Correction Model (VECM) models to analyze the relationship between sharia financing and sectoral Gross Regional Domestic Product (GDP) in Central Sulawesi Province. The data used is in the form of quarterly time series data for the 2022-2024 period, including sectoral GDP variables (primary, secondary, and tertiary) as dependent variables, sharia financing as the main independent variable, and Gross Fixed Capital Formation (GFCF) as control variables. All data was obtained from the Central Statistics Agency (CSA), the Financial Services Authority (FSA), and Bank Indonesia.

The analysis stage begins with a stationarity test using the Augmented Dickey-Fuller (ADF) test to ensure data stationary and avoid pseudo-relationships due to the existence of root units. ADF is a basic method in econometrics to verify whether a time series is stationary before further analysis such as cointegration (Marpaung & Pangestuti, 2024; Simionescu et al., 2022). This test adds variable difference lag to handle a high level of autocorrelation so that the test results are more reliable.

The next stage is the Johansen Cointegration Test, which is used to identify long-term relationships between non-stationary variables that move in long-term equilibrium (Acharya, 2024; Lupekesa et al., 2022). This method uses a maximum likelihood approach to determine the number of cointegration vectors in a multivariate system (Sarker & Khan, 2020). The combination of the ADF and Johansen assays was chosen because it was able to describe the short-term and long-term linkages simultaneously (Lupekesa et al., 2022).

Furthermore, optimal lag determination is carried out using the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) information criteria to ensure efficient model specifications and avoid overfitting (Ghaly, 2023; Shadab, 2020). Once the optimal lag is determined, the analysis is followed by the VECM model estimation for the integrated data and the VAR for the data that does not show a long-term relationship.

The VECM model is a development of VAR by incorporating an Error Correction Term (ECT) to describe the speed of adjustment to long-term equilibrium (Gwani & Sek, 2023; Loves et al., 2021). Through this approach, the analysis can comprehensively explain short-term and long-term relationships. The entire data processing and estimation process is carried out using the EViews 13 software, which provides econometric analysis facilities, including VAR, VECM, and thorough model diagnostic tests.

FINDINGS AND DISCUSSION

This section presents the results of empirical analysis based on the stages of data processing and model testing that have been described earlier. All tests were performed sequentially to ensure the validity of the model and identify short-term and long-term relationships between variables.

Stationarity Test

Before conducting further analysis, it is necessary to test the stationary properties of time series data. This is important because the presence of unit roots in the data can cause the estimation results to be invalid or biased. Therefore, this study uses the Augmented Dickey-Fuller (ADF) Test with a significance level of 5 percent to ensure that each variable has been stationary. The results of ADF testing for all variables are shown in the following table:

Table 1. Stationary Test Results (ADF Test)

Variable	Test Rate	ADF Statistic	Critical Value 5%	Prob.	Lag	Result	Conclusion
PDRB Sektor Primer	1st Diff	-3.442660	-3.259808	0.0386	1	Stasions	I(1)
PDRB Sektor Sekunder	1st Diff	-11.80544	-3.320969	0.0000	2	Stasions	I(1)
PDRB Sektor Tersier	1st Diff	-11.55240	-3.212696	0.0000	0	Stasions	I(1)
Pembiayaan Syariah	1st Diff	-5.718136	-3.259808	0.0020	1	Stasions	I(1)
PMTB	1st Diff	-3.614049	-3.259808	0.0304	1	Stasions	I(1)

Source: Data processing (2025)

The results of the Augmented Dickey-Fuller test showed that all stationary variables at the first difference level (I(1)), which were characterized by a statistical ADF value that was smaller than the critical value at the significance level of 5 percent and a probability value (p-value) less than 0.05. Specifically, the primary sector GDP variable is stationary at the first difference with an optimal lag of 1, the GDP of the secondary sector with an optimal lag of 2, and the GDP of the tertiary sector with an optimal lag of 0. The variables of sharia financing and PMTB were also declared stationary at the first difference level with an optimal lag of 1. These findings confirm that all variables are integrated on order one, so the analysis can be continued with cointegration testing to identify long-term relationships and determine appropriate estimation models (ECM, VECM, or VAR).

Optimal Lag Test

Before estimating the VAR model, it is necessary to determine the optimal lag length. The right lag selection is essential to ensure that the estimation results are unbiased, avoid autocorrelation in residuals, and be able to capture the dynamics of relationships between variables. Therefore, this study uses information criteria such as Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Criterion (SC), and Hannan-Quinn (HQ). The results of the optimal lag selection test for each sector are shown in the following table:

Table 2. Optimal Lag Test Results

Sector	Lag	LogL	LR	FPE	AIC	SC	HQ	Lag Optimal
Primer	0	55.79581	NA	1.36e-08	-9.599237	-9.490721	-9.667642	
	1	86.48251	39.05581*	2.93e-10*	-13.54227*	-13.10821*	-13.81589*	1
Sekunder	0	41.70361	NA	1.77e-07	-7.037021	-6.928504	-7.105425	
	1	85.71343	56.01249*	3.37e-10*	-13.40244*	-12.96837*	-13.67606*	1
Tersier	0	45.90253	NA	8.23e-08	-7.800461	-7.691944	-7.868865	
	1	80.19051	43.63924*	9.19e-10*	-12.39827*	-11.96421*	-12.67189*	1

Remarks: the * sign indicates the optimal lag selected based on specific criteria. LR = Likelihood Ratio Test, FPE = Final Prediction Error, AIC = Akaike Information Criterion, SC = Schwarz Criterion, HQ = Hannan-Quinn Criterion.

Source: Data processing (2025)

The results of the lag selection test showed that all information criteria (LR, FPE, AIC, and SC) consistently recommended lag 1 as the optimal lag in all three sectors. The lag 1 determination is considered to provide the most efficient model specification because it is able to minimize prediction errors and avoid residual autocorrelation. Thus, the estimation of the VAR/VECM model in this study uses a lag of 1 for each sector. After confirming that all stationary variables at the optimal first difference and lag levels have been determined, the analysis is followed by a Johansen cointegration test to identify whether there is a long-term relationship between the variables.

VAR Stability Test

Before performing the cointegration test, a VAR model stability test is required. This stability test is important to ensure that the roots of the polynomial characteristics are within the unit circle. The VAR model is declared stable when the entire modulus value is less than 1. Model stability is a prerequisite for the estimation results to be valid and can be used for further analysis, such as the Johansen cointegration test and the formation of the VECM model. The results of the VAR stability test for each sector are presented in the following table:

Table 3. VAR Stability Test Results by Sector

Sector	Root Values (Root)	Modulus	Conclusion
Primer	-0.070725 ± 0.592645i ; -0.557983	0.596850 ; 0.557983	Stable (all < 1)
Sekunder	-0.100357 ± 0.695276i ; -0.145468	0.702481 ; 0.145468	Stable (all < 1)
Tersier	-0.989176 ; -0.048393 ± 0.668243i	0.989176 ; 0.669993	Stable (all < 1)

Source: Data processing (2025)

The results of the stability test showed that all characteristic roots in the VAR model had a modulus value of less than one, so that the model was declared stable for all three sectors. In the tertiary sector, there is a root with a modulus close to one (0.989176), but it is still within the stability tolerance limit so that it does not interfere with the validity of the model. Thus, the VAR model is considered reliable and the analysis can be continued to the Johansen cointegration test stage to identify the existence of long-term relationships between variables.

Residual Autocorrelation Test (LM Test) Results

Residual autocorrelation test (LM Test) is performed to ensure that the

VAR model used is free of autocorrelation problems, so that the estimation results can be trusted. The test results are shown in the following table:

Table 4. Residual Autocorrelation Test (LM Test)

Sector	Lag	LRE* Stat	df	Prob.	Rao F-Stat	Prob.	Conclusion
Primer	1	5.898631	9	0.7500	0.469939	0.8298	No autocorrelation
Sekunder	1	9.953459	9	0.3543	1.187117	0.5108	No autocorrelation
Tersier	1	7.205206	9	0.6158	0.651295	0.7298	No autocorrelation

Source: Data processing (2025)

The results of the autocorrelation test showed that the probability values in the primary (0.7500), secondary (0.3543), and tertiary (0.6158) sectors were greater than the significance level of 5 percent. Thus, all VAR models are declared free of residual autocorrelation. This confirms that the model specification meets classical assumptions and can be proceeded to the Johansen cointegration test stage to identify long-term relationships between variables.

Residual Normality Test (Jarque-Bera Test)

Before proceeding to the Johansen cointegration test stage, it is important to ensure that the residual of the VAR model does not violate the assumption of normality. The Jarque-Bera test is used to test whether the residual from the VAR model is normally distributed. The results of this test are important because the normal residual distribution is a basic assumption in many econometric models. If the residue is not normally distributed, the model can produce inefficient or biased estimates. The results of the residual normality test for each sector are presented in the following table:

Table 5. Results of the Residual Normality Test (Jarque-Bera Test)

Sector	Component	Jarque-Bera	df	Prob.	Conclusion
Primer	DLP_PDRB_SEKPRIMER	0.390515	2	0.8226	Normally distributed residual
	DLP_PEMSYARIAH	0.957922	2	0.6194	Normally distributed residual
	DLP_PMTB	0.516795	2	0.7723	Normally distributed residual
	Joint Test	1.865231	6	0.9317	Normally distributed residual
Sekunder	DLP_PDRB_SEKSEKUNDER	0.417386	2	0.8116	Normally distributed residual
	DLP_PEMSYARIAH	0.967192	2	0.6166	Normally distributed residual
	DLP_PMTB	0.292642	2	0.8639	Normally distributed residual
	Joint Test	1.677220	6	0.9469	Normally distributed residual
Tersier	DLP_PDRB_SEKTERSIER	1.546964	2	0.4614	Normally distributed residual
	DLP_PEMSYARIAH	0.671901	2	0.7147	Normally distributed residual
	DLP_PMTB	0.392546	2	0.8218	Normally distributed residual
	Joint Test	2.611411	6	0.8558	Normally distributed residual

Source: Data processing (2025)

The results of the Jarque-Bera test showed that the total probability value (p-value) for each residual component in all three sectors was greater than 0.05. These findings indicate that the residual is normally distributed and there is no violation of the assumption of normality. Thus, the VAR model in the primary, secondary, and tertiary sectors has qualified for statistical validity and can be proceeded to the Johansen cointegration test stage to identify long-term relationships between variables.

Cointegration Test

Based on the results of Johansen's tests for the three sectors, a difference

in the number of cointegration vectors was obtained that determined the estimation model to be used in the next stage. A summary of the results of the cointegration test is presented in the following table:

Table 6. Cointegration Test

Sector	Rank (r)	Cointegration	Models Used	Lag Optimal	Conclusion
Primer	2	Ada	VECM (r = 2, lag = 1)	1	Long-term relationships detected
Sekunder	2	Ada	VECM (r = 2, lag = 1)	1	Long-term relationships detected
Tersier	0	Tidak Ada	VAR (lag = 1)	1	Long-term relationships are not detected

Source: Data processing (2025)

Based on the table, the primary and secondary sectors show a long-term cointegration relationship between variables, so the Vector Error Correction Model (VECM) model is used to capture long-term and short-term dynamics. In contrast, the tertiary sector showed no cointegration, so the analysis was continued with a Vector Autoregression (VAR) model to evaluate the short-term relationship between variables.

Sector Estimates

Primary Sector VECM Test

After the Johansen cointegration test is carried out and it is confirmed that there is a long-term relationship between the variables, the next step is to estimate the VECM model. The VECM estimation was carried out to determine how the influence of sharia financing variables and PMTB on the GDP of the primary sector, both in the long and short term. The results of the VECM model estimate for the primary sector are shown in the following table:

Table 7. Primary Sector VECM Test

Variable	Coeficin	Std. Error	t-Statistics	Significance
Long-Term (Cointegration)				
PMTB(-1) → PDRB Sektor Primer	-2.222854	0.34825	-6.38291	Significant (1%)
PMTB(-1) → Pembiayaan Syariah	-6.429666	0.94795	-6.78270	Significant (1%)
Error Correction Term (ECT)				
ECT1 → ΔPDRB Sektor Primer	-1.458634	0.60191	-2.42333	Significant (5%)
ECT2 → ΔPDRB Sektor Primer	0.574189	0.20531	2.79663	Significant (1%)
Short-term (Δ variable)				
ΔPembiayaan Syariah(-1) → ΔPDRB Sektor Primer	0.674547	0.43640	1.54571	Insignificant
ΔPMTB(-1) → ΔPDRB Sektor Primer	0.290025	0.08590	3.37641	Significant (1%)
ΔPDRB Primer(-1) → ΔPDRB Sektor Primer	0.112803	0.33113	0.34066	Insignificant

Source: Data processing (2025)

The results of the Vector Error Correction Model (VECM) estimate in the primary sector show that Gross Fixed Capital Formation (PMTB) has a negative and significant influence on GDP in the long term, with a coefficient of

-2.22 and a significance level of 1 percent. PMTB also has a significant negative effect on sharia financing with a coefficient of -6.43 at the same level of significance.

In the short term, ΔPMTB(–1) had a significant positive effect on primary sector ΔPDRB at the level of 1 percent, while Sharia ΔPemfinancial(–1) and primary sector ΔPDRB (–1) did not show a significant effect. The Error Correction Term (ECT) value in both equations was significant (ECT1 = –1.46; ECT2 = 0.57), which indicates a corrective mechanism towards long-term equilibrium.

Seconds Sector VECM Test

After the Johansen cointegration test is carried out and it is confirmed that there is a long-term relationship between the variables, the next step is to estimate the VECM model. The VECM estimation was carried out to find out how the influence of sharia financing and PMTB variables on the GDP of the secondary sector, both in the long and short term. The results of the VECM model estimation for the secondary sector are shown in the following table:

Table 8. Seconds Sector VECM Test

Variable	Coeficin	Std. Error	t-Statistics	Significance
Long-Term (Cointegration)				
PMTB(-1) → PDRB Sektor Sekunder	4.907265	0.89907	5.45726	Significant (1%)
PMTB(-1) → Pembiayaan Syariah	4.255084	0.83038	5.12457	Significant (1%)
Error Correction Term (ECT)				
ECT1 → ΔPDRB Sektor Sekunder	-0.446285	0.26493	-1.68483	Close to significant (10%)
ECT1 → ΔPembiayaan Syariah	0.221254	0.12212	1.81142	Close to significant (10%)
ECT1 → ΔPMTB	2.714105	0.63240	4.29157	Significant (1%)
Short-term (Δ variable)				
ΔPembiayaan Syariah(-1) → ΔPDRB Sekunder	0.028682	0.10717	0.26764	Insignificant
ΔPMTB(-1) → ΔPDRB Sekunder	0.244231	0.06308	3.87289	Significant (1%)
ΔPDRB Sekunder(-1) → ΔPDRB Sekunder	-0.496171	0.18015	-2.75416	Significant (5%)

Source: Data processing (2025)

The results of the Vector Error Correction Model (VECM) estimate for the secondary sector show that Gross Fixed Capital Formation (PMTB) has a positive and significant influence on GDP in the long term with a coefficient of 4.91 at a significance level of 1 percent. PMTB also has a significant positive effect on sharia financing in the long term with a coefficient of 4.26 at a significance level of 1 percent.

In the short term, ΔPMTB(–1) has a significant positive effect on the secondary sector ΔPDRB at the level of 1 percent, while the Δ Sharia financing(–1) is not significant. In addition, the secondary sector ΔPDRB (–1) showed a significant negative influence at the 5 percent level. The Error Correction Term (ECT) value was significant with a t-statistic of 4.29, indicating the existence of an adjustment mechanism towards long-term equilibrium.

Tertiary Sector VAR Test

After the Johansen cointegration test was carried out and it was

confirmed that there was no long-term relationship between variables, the next step was to estimate the VAR model. VAR estimation was carried out to find out how the variables of sharia financing and PMTB affect the GDP of the tertiary sector in the short term. The results of the VAR model estimation for the secondary sector are shown in the following table:

Table 9. Tertiary Sector VAR Estimation Results

Independent Variables	PDRB_Tersier	Pembiayaan Syariah	PMTB
PDRB_Tersier(-1)	-0.641539 (t=-1.86979)	0.236736 (t=1.21501)	0.032125 (t=0.03579)
Pembiayaan Syariah(-1)	0.701524 (t=4.28817)	0.956443 (t=10.2952)	0.253396 (t=0.59203)
PMTB(-1)	0.018621 (t=0.10859)	0.014348 (t=0.14735)	-0.011028 (t=-0.02458)
C (Konstanta)	9.530431 (t=4.23585)	-1.957753 (t=-1.53226)	7.822852 (t=1.32895)
R^2	0.778848	0.981068	0.132332
Description: the value of t-statistically significant if > 1,96 at α = 5%.			

Source: Data processing (2025)

The results of the Vector Autoregression (VAR) model estimation for the tertiary sector show that Sharia Financing in the first lag has a positive and significant effect on the GDP of the tertiary sector, with a coefficient of 0.701524 and a t-statistical value of 4.28817, exceeding the critical limit of 1.96 at a significance level of 5 percent. In contrast, PMTB at the first lag had no significant effect with a t-statistic of 0.10859. The GDP variable of the tertiary sector lag one is also insignificant with a coefficient of -0.641539 and a t-statistic of -1.86979. The value of the determination coefficient (R^2) of 0.7788 indicates that 77.88 percent of the variation in the GDP of the tertiary sector can be explained by variables in the model, while the rest is influenced by factors outside the model.

DISCUSSION

Primary Sector Results Analysis

The results of the estimates show that PMTB has a significant negative relationship to the primary sector's GDP in the long term, which indicates that the increase in physical investment does not directly increase the contribution of the primary sector to the regional economy. This condition can be explained by the shift in the economic structure in Central Sulawesi from the agriculture and fisheries sector to the more capital-intensive industrial and service sectors. These findings are in line with the structural transformation theory put forward by (Ahluwalia et al., 1979), which states that an increase in capital accumulation is often followed by a decrease in the proportion of primary sector output due to changes in the productive structure towards the secondary and tertiary sectors.

In addition, the negative relationship between PMTB and sharia financing shows that capital flows and financing are more absorbed in non-primary sectors, especially trade and services. This phenomenon is consistent with the findings (Wicaksono & Fitriyani, 2020), which revealed that Islamic financial institutions in Indonesia still have a preference for non-productive

sectors with low risk and high liquidity levels. In a national context, the study Anwar et al. (2021) It also found that the allocation of Islamic financing for the agricultural sector is still limited, even less than four percent of the total Islamic banking financing portfolio.

In fact, theoretically and empirically, sharia financing has great potential to strengthen the agricultural sector through financial instruments such as Bai' Salam, Murabaha, and Muzara'ah, which allow farmers to obtain capital without the burden of interest and the risk of usury (Nur et al., 2023; Pertiwi et al., 2021). This financing model has been proven to increase agricultural productivity and strengthen food security in areas with an agrarian economic base. However, limited access to sharia financing and lack of optimal financial literacy in rural areas are the main obstacles to the utilization of this potential (Habriyanto et al., 2022).

In the short term, the results show that ΔPMTB(-1) has a significant positive effect on primary sector ΔPDRB, indicating that new investments are able to drive agricultural and fisheries growth over a short time horizon, although the effects are not sustainable. Meanwhile, the Δ Sharia financing(-1) is not significant, indicating that Islamic financing has not yet functioned as the main financial instrument in encouraging primary sector activities. This condition is reinforced by the findings Mustapa & Saripudin, (2022), which explains that the structure of sharia financing in Indonesia is still more focused on consumption and the trade sector than agricultural productive financing.

In addition, Islamic fintech-based financial technology innovations can be an important solution in expanding access to capital for smallholders. Through the digitalization of the financial system, Islamic fintech has the potential to increase financial inclusion and the efficiency of fund distribution to the agricultural sector (Faizi et al., 2024; Ledhem & Mékidiche, 2020). This approach allows for the creation of a financing model that is more adaptive, participatory, and in accordance with the principles of Islamic economic sustainability.

Overall, these findings lead to the rejection of the H1 hypothesis, which states that sharia financing has a significant positive effect on the GDP of the primary sector in Central Sulawesi. Thus, the role of sharia financing is still limited and has not been able to function as a main catalyst for real sector-based economic growth in the region. There is a need to strengthen Islamic financial intermediation policies that are more oriented towards the productivity of the agricultural sector and increase the efficiency of Islamic microfinance institutions to strengthen rural development (Al-Banna & Nurdany, 2022; Aufa et al., 2023).

Secondary Sector Results Analysis

The estimated results show that PMTB has a significant positive relationship with the GDP of the secondary sector in the long term, which means that the increase in physical investment is consistently able to drive the growth of the industrial and manufacturing sectors in Central Sulawesi. This condition reflects the characteristics of the secondary sector which is capital-

intensive and highly dependent on increased production capacity and supporting infrastructure. These findings are in line with the view Solow (1956) and Todaro & Smith (2015) which confirms that capital accumulation is the main determinant of economic growth in the industrial sector. Furthermore, strengthening public and private investment in industrial infrastructure has the potential to create a multiplier effect on employment and manufacturing added value (Maluleke et al., 2023; Shah et al., 2021).

In addition, the positive relationship between PMTB and sharia financing indicates a long-term synergy between investment expansion and the distribution of sharia-based funds. This shows that sharia financing is starting to play a role in supporting the industrial sector, especially through financing mechanisms that encourage ethical and productive investments. According to Riaz et al. (2022) and Yulitasari et al. (2024), Islamic financial institutions have great potential in supporting industrialization through instruments such as sukuk and ijarah, which are used to finance large-scale projects, including industrial infrastructure development and renewable energy. For example, the Green Sukuk program in Indonesia shows how sharia financing can contribute to strengthening industrial capacity while supporting the sustainable development agenda.

The relationship between sharia financing and industrial development can also be seen from the principles of ethics and sustainability that are the foundation of the Islamic financial system. As explained by Muhmad et al. (2021) and Zuhroh & Malik (2023), The integration between Islamic finance and the Sustainable Development Goals (SDGs) shows the strategic role of Islamic finance in supporting inclusive, sustainable, and socially oriented economic growth. The principle of profit sharing and the prohibition of usury allows the realization of investment patterns that are not only profitable, but also encourage long-term stability in the industrial sector.

In the short term, the variable ΔPMTB(-1) has a significant positive effect on the ΔPDRB of the secondary sector, indicating that additional new investments are the main engine of industrial growth. On the other hand, the secondary sector ΔPDRB variable (-1) has a significant negative effect, indicating an inertial effect, where previous growth actually holds back the subsequent growth acceleration due to short-term production capacity limitations. Meanwhile, Sharia Δ financing(-1) does not have a significant effect in the short term, which suggests that the distribution of sharia funds to the industrial sector takes longer to be absorbed productively. These findings are in line with the results of the study Nasution et al. (2022), Which emphasizes that Islamic financing in the manufacturing sector tends to have a lag effect because it takes time for projects based on murabaha and ijarah contracts to generate real economic output.

In addition, Islamic fintech innovations provide new opportunities for the financing of the industrial sector. Through digitalization and integration of the financial system, Islamic institutions can distribute funds more efficiently, increase accessibility, and accelerate the growth of MSME-based industries

(Kanwal et al., 2023; Supriadi et al., 2023). The principles of profit-loss sharing and capital participation applied in this financing model also strengthen the stability of the industrial sector because it reduces dependence on conventional debt (Gusarova et al., 2020).

Thus, these empirical findings partially support the H2 hypothesis, namely that Islamic financing has a positive effect on the growth of the secondary sector in the long term, but has not shown a significant influence in the short term. This condition emphasizes the role of Islamic finance as a long-term investment instrument that supports the transformation of the industrial sector at the regional level, while emphasizing the importance of synergy between physical investment, Islamic finance innovation, and sustainable industrial development policies.

Tertiary Sector Results Analysis

The estimated results show that sharia financing has a positive and significant effect on the GDP of the tertiary sector, which reflects the strategic role of the Islamic financial system in encouraging trade, services, and consumption activities in Central Sulawesi Province. This relationship is consistent with the theory of financial intermediation in Islamic economics, which asserts that a profit- and loss-sharing-based financial system is able to strengthen the productive sector through increased working capital, liquidity, and economic turnover (Mawardi et al., 2020). In this context, Islamic financial institutions play the role of intermediaries that not only distribute funds, but also ensure the suitability of investments with ethical principles and social benefits.

The dominance of the influence of Islamic finance on the tertiary sector also indicates that the distribution of funds by Islamic financial institutions in this region tends to focus on the services and trade sectors, which have a faster rate of capital turnover and lower financing risks compared to the primary and secondary sectors. These findings are in line with the results of the study Ascarya (2021), who found that Islamic financing is more effective in driving growth in the services and consumption sectors, as the structure of this sector is more responsive to liquidity expansion and changes in aggregate demand. Research by Ikra et al. (2021) and Pebruary & Hani'ah (2024) also emphasized that sharia financing plays a role as a catalyst for increasing business capital in the service and MSME sectors, which in turn strengthens economic activities and regional GDP contributions.

In addition, the literature shows that sharia financing has a direct impact on strengthening the MSME sector, which is the main backbone of the tertiary sector in developing regions. Study by Junaidi (2024) and Habibi et al. (2023) explained that the role of sharia financing in expanding access to capital for small business actors contributes significantly to increasing productivity, social welfare, and labor absorption. Islamic investment principles oriented towards social justice and community welfare allow Islamic financial institutions to play a role more than just a for-profit institution, but also as an instrument of inclusive economic development.

Meanwhile, the PMTB(-1) variable did not have a significant effect on the GDP of the tertiary sector, indicating that physical investment is not the main factor in the growth of this sector. The characteristics of the service- and trade-based tertiary sector depend more on working capital, innovation, and the dynamics of public consumption, rather than on the accumulation of fixed assets. This is in line with the view Kaldor (1967) and supported by findings Sarjoko et al. (2022) that the service sector in Indonesia is more sensitive to financial factors and consumption behavior than fixed investment. In addition, the tertiary sector benefits greatly from efficient and inclusive financial intermediation, which is one of the advantages of the Islamic financial system in providing ethical and stable liquidity.

Furthermore, the role of Islamic financial intermediation in strengthening the service sector is also related to participation in the Sustainable Development Goals. Study by Fauzi et al. (2022) and Hakim et al. (2022) shows that Islamic financing not only supports economic growth, but also promotes social stability through funding of the health, education, and micro sectors that are oriented towards public welfare. Even, Banna et al. (2021) highlighting the resilience of the Islamic financial system in the face of global crises, including the COVID-19 pandemic, which shows the high adaptive power of the tertiary sector based on digital services and innovation.

Furthermore, the strengthening of the tertiary sector also depends on the involvement of foreign direct investment (FDI) which is in line with sharia principles. Study Bergougui & Murshed (2023) and Cheong et al. (2021) revealed that the involvement of Islamic financial institutions in international investment instruments has the potential to attract FDI to the services and trade sectors, while reducing regional economic inequality. In this context, the existence of Islamic financial instruments such as retail sukuk and Islamic venture capital is important to strengthen capital flows to the tertiary sector based on sustainability and ethical values.

Thus, these empirical findings strengthen the H3 hypothesis, namely that sharia financing has a significant positive effect on the GDP of the tertiary sector in Central Sulawesi. The tertiary sector has proven to be the most responsive sector to the expansion of Islamic finance, because it is liquid, service-oriented, and interacts directly with public consumption. The inclusive and adaptive development of Islamic finance, especially through digital innovation and ethics-based financing, is the key to strengthening the service economy at the regional level in line with the principles of social justice and sustainable development.

Cross-Sector Analysis

Cross-sectoral analysis shows that the influence of sharia financing on regional economic growth in Central Sulawesi is heterogeneous depending on the sectoral characteristics and underlying economic structure. The difference in direction and strength of the relationship between variables reflects the dynamics of economic transformation that occurs at the regional level, where each sector has a different level of dependence on physical investment and

Islamic financial intermediation.

In the primary sector, the results of the estimates show a long-term negative relationship between PMTB and GDP, which indicates that the increase in investment has not been fully absorbed productively in agricultural and fisheries activities. This is in line with the theory of structural transformation Ahluwalia et al. (1979), where economic growth is accompanied by a shift of labor and capital from the agricultural sector to the industrial and service sectors. In addition, the literature shows that Islamic financial institutions in Indonesia still face obstacles in distributing financing to the agricultural sector due to low financial literacy, risk of crop failure, and limited guarantee of productive assets (Anwar et al., 2021; Wicaksono & Fitriyani, 2020). Nevertheless, the potential for sharia financing to strengthen this sector remains large, especially through Islamic microfinance and Islamic fintech innovations that can expand financial inclusion for farmers and fishermen (Faizi et al., 2024).

In contrast to the primary sector, the secondary sector shows a significant positive relationship between PMTB and GDP, both in the short and long term. This result reinforces the view (Solow, 1956) and Kaldor (1967) that the accumulation of physical capital plays an important role in expanding industrial production capacity and accelerating regional economic growth. In the context of Islamic finance, the synergy between physical investment and sharia financing is getting stronger through instruments such as murabaha, ijarah, and industrial sukuk (Riaz et al., 2022; Yulitasari et al., 2024). However, the short-term impact of sharia financing on the industrial sector is still limited, reflecting the time lag between the financing process and economic output results (Nasution et al., 2022). For this reason, policies to strengthen the capacity of the halal industry, provide infrastructure, and integrate Islamic finance with regional industrialization strategies are the key to strengthening this sector in a sustainable manner.

Meanwhile, the tertiary sector showed the most responsive results to the expansion of sharia financing. Sharia financing has a positive and significant effect on the GDP of the services and trade sectors, demonstrating the effectiveness of Islamic financial intermediation in supporting consumption and service-based economic activities. These results are consistent with the theory of financial intermediation in Islamic economics Iqbal & Mirakhor, (2011), where a profit-sharing-based financial system expands the liquidity of the service sector while maintaining the principles of fairness and sustainability. The dominance of the role of the tertiary sector also reflects the shift of the regional economy towards a service-driven economy, where sharia financing is the main motor in supporting MSMEs, trade, and economic digitalization (Habibi et al., 2023; Junaidi, 2024).

Overall, the pattern of inter-sector relations shows that the influence of sharia financing is increasing as sectoral economic complexity increases. In the primary sector, the role of sharia financing is still limited because the production structure is traditional and high-risk. In the secondary sector, the

effects are starting to be seen in the long term through investment and project-based financing. Meanwhile, in the tertiary sector, sharia financing has played a real role in strengthening the regional economy because this sector has a high capital turnover and is supported by more mature financial instruments.

The implication of these findings is the need for a sectoral policy strategy that is integrated with the Islamic financial system. Local governments and Islamic financial institutions need to strengthen synergy through: (1) The development of Islamic rural finance and fintech for the primary sector; (2) Issuance of productive sukuk and industrial waqf programs for the secondary sector; and (3) Expansion of sharia MSME financing and digital services for the tertiary sector.

This kind of policy will ensure that Islamic finance plays a role not only as a source of capital, but also as an instrument of inclusive and sustainable development in accordance with the values of Maqasid al-Shariah. Thus, the results of this study confirm that the effectiveness of sharia financing in encouraging regional economic growth is highly dependent on the sectoral context, the efficiency of financial institutions, and the alignment of regional economic development policies with Islamic economic principles.

CONCLUSION

This research shows that sharia financing has a different influence on sectoral economic growth in Central Sulawesi Province. In the primary sector, sharia financing has not had a significant impact on GDP due to limited absorption and traditional economic structures. In contrast, the secondary sector responded positively in the long run, reflecting the role of sharia financing as a source of industrial investment funding. The tertiary sector showed the strongest and most significant influence, affirming the position of Islamic financing as a motor of economic growth through trade, services, and MSME activities.

Overall, the effectiveness of sharia financing is increasing in line with the economic transformation from the natural resource-based sector to the industry- and service-based sector. This shows that the role of Islamic finance in regional economic development is highly dependent on the structural readiness of each sector and the ability of financial institutions to distribute funds productively.

These findings imply the importance of strengthening sectoral policies based on Islamic finance, with an approach tailored to the characteristics of the primary, secondary, and tertiary sectors. Targeted optimization of sharia financing is believed to be able to encourage regional economic growth that is more inclusive, sustainable, and in line with the goals of economic development based on sharia values.

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