

## THE EFFECT OF FOREIGN DIRECT INVESTMENT (FDI) AND EXPORTS ON ECONOMIC GROWTH IN EAST NUSA TENGGARA (NTT) PROVINCE DURING THE PERIOD 2010–2024: A VECM APPROACH

Fransisco X. Lay<sup>1</sup>, Maria Indriyani H. Tiwu<sup>2</sup>, Rikhard T. C. Bolang<sup>3</sup>, Fransina W. Ballo<sup>4</sup>  
<sup>1,2,3,4</sup>Program Studi Ekonomi Pembangunan, Fakultas Ekonomi dan Bisnis,  
Universitas Nusa Cendana, Indonesia  
E-mail: [dickylay27@gmail.com](mailto:dickylay27@gmail.com)

### ABSTRACT

*This study aims to analyze the long-run relationship, effects, and dynamic interactions between Foreign Direct Investment (FDI), exports, and economic growth in East Nusa Tenggara (NTT) Province during the period 2010–2024. The research employs a quantitative approach using the Vector Error Correction Model (VECM) based on quarterly secondary data obtained from the Central Bureau of Statistics (BPS) and the Ministry of Investment/BKPM. The results indicate the existence of a long-run relationship among FDI, exports, and economic growth. Partially, FDI has a significant negative effect on economic growth with a coefficient of -0.057630, while exports have no significant effect. The findings also reveal that there is no strong causal relationship among the variables, and the adjustment process toward long-run equilibrium tends to occur slowly, as indicated by the Error Correction Term (ECT) value of -0.130392. In addition, the contribution of FDI and exports to economic growth remains relatively low compared to domestic factors. These findings suggest that the role of FDI and exports in promoting economic growth in NTT has not been optimal due to structural constraints such as low value-added production, weak sectoral linkages, and limited infrastructure.*

*Keywords: Economic Growth, Exports, Foreign Direct Investment, VECM*

### I. INTRODUCTION

Economic growth is one of the main indicators used to measure the success of regional development because it reflects the increase in production capacity, income, and public welfare. In the context of an open economy, economic growth is not only influenced by domestic factors but also by external factors such as Foreign Direct Investment (FDI) and exports. These variables play an important role in increasing capital accumulation, expanding production capacity, encouraging technology transfer, and strengthening aggregate demand. Therefore, FDI and exports are often considered strategic instruments in promoting sustainable economic growth, particularly in developing regions with structural limitations.

Foreign Direct Investment (FDI) is regarded as an important source of external financing capable of accelerating economic development through the addition of productive capital, technology transfer, managerial efficiency, and employment creation. According to the Solow-Swan growth theory, investment contributes to long-run economic growth through capital accumulation and productivity improvement. In addition, the Harrod-Domar theory explains that investment is a key determinant of economic growth because it increases production capacity and stimulates aggregate demand simultaneously. Therefore, the presence of FDI is expected to strengthen regional economic performance and improve competitiveness.

Besides investment, exports also play an essential role in economic growth. Export activities enable regions to expand market access to the international level, thereby

increasing production utilization and regional income. Through international trade, exports contribute to foreign exchange earnings and stimulate industrial development. The Heckscher-Ohlin trade theory explains that regions tend to export commodities that intensively use abundant production factors. In the context of East Nusa Tenggara (NTT), sectors such as agriculture, livestock, and fisheries possess comparative advantages that potentially support export performance and regional economic development.

However, empirical conditions in East Nusa Tenggara Province indicate that the contribution of FDI and exports to economic growth has not yet been optimal. Realization of Foreign Direct Investment (FDI) in NTT during the period 2015–2024 fluctuated significantly. Investment realization increased from Rp873.16 billion in 2015 to Rp1.86 trillion in 2017, but declined in subsequent years before rising again to Rp1.84 trillion in 2023. This condition indicates that the investment climate in NTT remains unstable and is still constrained by structural factors such as limited infrastructure, low industrialization, weak inter-sectoral linkages, and inadequate human resource quality.

Similarly, export performance in NTT also demonstrates fluctuating trends. Export values declined during the period 2017–2021 due to weakening global demand and disruptions in international trade activities. Although exports increased significantly after the COVID-19 pandemic, the export structure of NTT is still dominated by primary commodities with relatively low value added. Consequently, exports have not been able to provide a significant contribution to regional economic growth. This condition reflects the limited diversification and downstream industrial development within the regional economy.

Meanwhile, the Gross Regional Domestic Product (GRDP) at constant prices in NTT continued to grow from Rp56.77 trillion in 2015 to Rp78.04 trillion in 2024, despite experiencing an economic contraction during the COVID-19 pandemic period. The fluctuation of regional economic growth indicates that the economy of NTT remains vulnerable to both external and internal shocks. Therefore, understanding the relationship between FDI, exports, and economic growth becomes essential for formulating more effective regional development policies.

Several previous studies have examined the relationship between FDI, exports, and economic growth using various econometric approaches. Studies conducted by Pradhan et al. (2025), Rijoly et al. (2025), and Leasiwal et al. (2025) found the existence of long-run relationships between investment, trade, and economic growth. However, other studies indicate that the effect of FDI and exports is highly dependent on regional structural conditions. Bolang (2022) found that the relationship between FDI and economic growth in Indonesia is characterized by limited causality. Similarly, Alfaro et al. (2020) emphasized that FDI does not always generate positive impacts in regions with weak institutional and structural conditions.

Based on these conditions, this study aims to analyze the long-run relationship, effects, and dynamic interactions between Foreign Direct Investment (FDI), exports, and economic growth in East Nusa Tenggara Province during the period 2010–2024 using the Vector Error Correction Model (VECM). This approach is considered appropriate because it is capable of analyzing both short-run and long-run dynamics simultaneously, including the adjustment mechanism toward long-run equilibrium. The findings of this study are expected to provide empirical contributions to regional economic literature and

become a policy reference for improving the effectiveness of investment and export development strategies in East Nusa Tenggara Province.

## II. LITERATURE REVIEW

### *A. Open Economy Macroeconomic Theory*

Open economy macroeconomic theory explains how an economy interacts with other countries through international trade and capital flows. In an open economic system, national or regional output is not only determined by domestic economic activities but also influenced by external variables such as exports, imports, and foreign capital inflows. According to Mankiw (2016), economic openness allows integration between the goods market, financial market, and external sector, thereby making economic performance more responsive to global economic changes.

One of the important approaches in open economy theory is the Mundell-Fleming Model, which explains that economic equilibrium is influenced by the interaction between the goods market, money market, and international sector. In this framework, exports contribute directly to aggregate demand, while foreign investment increases productive capacity and capital accumulation. Therefore, exports and Foreign Direct Investment (FDI) are considered important determinants of regional economic growth, particularly in developing economies.

### *B. Harrod-Domar Growth Theory*

The Harrod-Domar growth theory emphasizes the importance of investment as the main driver of economic growth. Investment is viewed as a mechanism that simultaneously increases production capacity and aggregate demand. According to this theory, economic growth depends on the ability of an economy to generate savings and transform them into productive investment activities. A higher level of investment will increase capital stock and accelerate output growth.

In the context of regional development, Foreign Direct Investment (FDI) is considered an important source of capital accumulation capable of stimulating economic growth. Through additional capital and productive investment, FDI is expected to strengthen production activities and improve economic performance. Therefore, regions with higher investment realization are generally expected to experience faster economic growth.

### *C. Solow-Swan Growth Theory*

The Solow-Swan growth theory explains that long-run economic growth is determined by capital accumulation, labor growth, and technological progress. Unlike the Harrod-Domar approach, the Solow-Swan model assumes that economies tend to move toward long-run equilibrium or steady-state conditions. In this theory, technological advancement plays a crucial role in increasing productivity and sustaining economic growth over time.

Foreign Direct Investment (FDI) is closely related to this theory because foreign investment not only increases physical capital but also promotes technology transfer, managerial efficiency, and labor productivity improvement. Consequently, FDI is expected to contribute positively to economic growth, especially in developing regions that face technological and industrial limitations.

### *D. Heckscher-Ohlin International Trade Theory*

The Heckscher-Ohlin theory explains international trade patterns based on differences in factor endowments among regions or countries. According to this theory, a region tends to export commodities that intensively use abundant production factors and import goods that require scarce factors. Therefore, international trade enables regions to utilize their comparative advantages more efficiently.

In the case of East Nusa Tenggara (NTT), sectors such as agriculture, fisheries, and livestock are considered strategic sectors because they rely on abundant natural resources. Export activities in these sectors are expected to increase regional income, expand market access, and stimulate economic growth. However, the effectiveness of exports in promoting economic growth depends on the level of industrialization, value-added production, and export diversification.

#### *E. Relationship between FDI, Exports, and Economic Growth*

The relationship between Foreign Direct Investment (FDI), exports, and economic growth is dynamic and interrelated. FDI can increase production capacity, encourage industrial development, and improve export performance through technology transfer and capital expansion. On the other hand, export growth can create a more favorable investment climate by increasing market opportunities and economic profitability.

According to open economy theory, both FDI and exports contribute to economic growth through aggregate demand expansion and productivity improvement. However, the effectiveness of these variables largely depends on structural economic conditions such as infrastructure quality, industrial capacity, institutional effectiveness, and human resource development. Therefore, empirical analysis is necessary to examine how these relationships occur within the regional economy of East Nusa Tenggara Province.

### **III. RESEARCH METHODOLOGY**

This study employs a quantitative explanatory approach to analyze the relationship between Foreign Direct Investment (FDI), exports, and economic growth in East Nusa Tenggara (NTT) Province during the period 2010–2024. The study uses quarterly time series secondary data obtained from the Central Bureau of Statistics (BPS) and the Ministry of Investment/BKPM.

Economic growth is measured using Gross Regional Domestic Product (GRDP) at constant prices as the dependent variable, while Foreign Direct Investment (FDI) and exports are used as independent variables. All variables are transformed into natural logarithm form to improve data interpretation and analytical accuracy.

The analytical method used is the Vector Error Correction Model (VECM) because the variables are non-stationary at the level but cointegrated in the long run. The analysis procedure includes the Augmented Dickey-Fuller (ADF) stationarity test, optimal lag selection, VAR stability test, Johansen cointegration test, Vector Error Correction Model (VECM) estimation, Granger causality test, Impulse Response Function (IRF), and Variance Decomposition (VD).

The Vector Error Correction Model (VECM) is used to analyze both short-run and long-run relationships among variables, while the Error Correction Term (ECT) explains the adjustment process toward long-run equilibrium. All econometric analyses in this study are processed using EViews software.

#### IV. RESULT AND DISCUSSION

The results of this study indicate that all econometric testing procedures fulfilled the requirements for estimating the Vector Error Correction Model (VECM). The analysis was conducted using quarterly time series data on economic growth, Foreign Direct Investment (FDI), and exports in East Nusa Tenggara Province during the period 2010-2024.

The Augmented Dickey-Fuller (ADF) stationarity test shows that all variables were non-stationary at the level but became stationary at the first difference level. The probability values at level were 0,6624 for LNPDRB, 0,2986 for LNFDI, and 0,5596 for LNEKS. After first differencing, all variables became stationary with probability values below 0,05, indicating that the variables are integrated at order I(1).

The optimal lag selection test recommended lag 4 based on Akaike Information Criterion (AIC), Schwarz Criterion (SC), Final Prediction Error (FPE), and Hannan-Quinn Criterion (HQ). However, the model at lag 4 was unstable because the modulus value exceeded one. Therefore, lag 3 was selected because the largest modulus value was 0,968090, indicating that the VAR model was stable.

The Johansen Cointegration Test confirmed the existence of a long-run relationship among Foreign Direct Investment (FDI), exports, and economic growth. The trace statistic value of 61,41161 was higher than the critical value of 29,79707 with a probability value of 0,0000. Similarly, the maximum eigenvalue statistic of 36,08365 exceeded the critical value of 21,13162 with a probability value of 0,0002. These results indicate that the variables move together toward long-run equilibrium.

*Table 1. Summary of VECM Estimation Results*

| Vector Error Correction Estimates |            |             |           |             |
|-----------------------------------|------------|-------------|-----------|-------------|
| Component                         | Variabel   | Coefficient | Std.Error | t-statistic |
| Long Run Test                     | LNPDRB(-1) | 1.000000    | -         | -           |
|                                   | LNFDI(-1)  | -0.057630   | 0.00884   | -6.52131    |
|                                   | LNEKS(-1)  | -0.005231   | 0.01543   | -0.33909    |
|                                   | C          | -0.004616   | -         | -           |
| Error Correction                  | D(LNPDRB)  | -0.130392   | 0.13454   | -0.96920    |
|                                   | D(LNFDI)   | 48.70146    | 7.65649   | 6.36081     |
|                                   | D(LNEKS)   | -0.326430   | 4.18055   | -0.07808    |

The VECM estimation results show that Foreign Direct Investment (FDI) has a significant negative effect on economic growth in the long run with a coefficient value of -0,057630. This finding indicates that a 1% increase in FDI is associated with a decrease in economic growth by approximately 0,057630%. Empirically, this condition reflects that foreign investment in East Nusa Tenggara remains concentrated in primary sectors with weak inter-sectoral linkages and limited multiplier effects on the regional economy.

Meanwhile, exports have a negative but statistically insignificant effect on economic growth with a coefficient value of -0,005231. This result indicates that exports have not yet become a major driver of economic growth in East Nusa Tenggara Province. The export structure is still dominated by primary commodities with low value-added and high vulnerability to fluctuations in international commodity prices.

The Error Correction Term (ECT) value of -0,130392 indicates that approximately 13% of short-run disequilibrium is corrected toward long-run equilibrium in each period. However, the adjustment process tends to occur slowly because the ECT coefficient is statistically insignificant.

The Granger Causality Test results indicate that there is no strong causal relationship among Foreign Direct Investment (FDI), exports, and economic growth. This finding suggests that changes in FDI and exports do not directly cause changes in economic growth in the short run.

Furthermore, the Impulse Response Function (IRF) analysis shows that the response of economic growth to shocks in FDI and exports fluctuates during the initial periods before gradually reaching equilibrium. Variance Decomposition (VD) analysis also reveals that the largest contribution to fluctuations in economic growth originates from the economic growth variable itself, accounting for 95,03064% in the tenth period, while the contributions of FDI and exports are relatively small at 2,562544% and 2,406815%, respectively.

Overall, the findings indicate that the contribution of Foreign Direct Investment (FDI) and exports to economic growth in East Nusa Tenggara Province remains limited due to structural constraints such as low industrialization, weak downstream industries, limited infrastructure, and dependence on primary commodities. Therefore, improving the effectiveness of investment and export performance requires structural economic transformation, export diversification, infrastructure development, and enhancement of human resource quality.

## V. CONCLUSION

1. There is a long-run relationship between Foreign Direct Investment (FDI), exports, and economic growth in East Nusa Tenggara Province during the period 2010-2024.
2. Foreign Direct Investment (FDI) has a significant negative effect on economic growth, indicating that foreign investment in East Nusa Tenggara has not yet generated optimal multiplier effects on the regional economy.
3. Exports do not significantly affect economic growth because the export structure is still dominated by primary commodities with low value-added and limited industrial diversification.
4. The causality relationship among Foreign Direct Investment (FDI), exports, and economic growth is relatively weak, while the adjustment process toward long-run equilibrium tends to occur slowly.
5. The contribution of Foreign Direct Investment (FDI) and exports to economic growth remains limited due to structural constraints such as weak infrastructure, low industrialization, limited downstream industries, and dependence on primary sectors.
6. Regional economic policies should focus on strengthening industrial downstream development, improving infrastructure quality, enhancing human resources, and diversifying export products to increase the effectiveness of investment and exports in promoting sustainable economic growth.

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