

Role of Economic Sectors in Bali on Economic Growth of West and East Nusa Tenggara

Abyan Rai ^a, Fizza Anindhita^b

^aBadan Pusat Statistik Kabupaten Sumbawa, West Nusa Tenggara, Indonesia

* Corresponding author: abyan.raai@bps.go.id

<i>Artikel Info</i>	<i>Abstrak</i>
<p><i>Article history:</i> Received November 05, 2020 Revised December 05, 2020 Accepted December 10, 2020 Available online December 29, 2020</p>	<p><i>Bali is a province that has significant economic strength in various sectors. Bali has proximity to the West Nusa Tenggara and East Nusa Tenggara Provinces, and financial interaction can occur. This study analyzes the spillover effect of the Balinese economy on West Nusa Tenggara and East Nusa Tenggara. It looks at the West Nusa Tenggara and East Nusa Tenggara economies' response when the Bali economic sector experiences a shock. The method used is VECM using quarterly real GRDP data of 35 observations. This study found a positive relationship between the service sector and the Bali industry in West Nusa Tenggara's economic growth. The industrial Balinese industry also has a positive relationship with East Nusa Tenggara's economic growth. The spillover effect did not occur between the Bali industrial sector in general and the development of West Nusa Tenggara and the Bali service sector in general and East Nusa Tenggara's economic growth. The Balinese economy, which has a spillover effect on West Nusa Tenggara and East Nusa Tenggara's economic growth in several sectors, can be used as a reference for the government to make economic development policies.</i></p>
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INTRODUCTION

Regional development is an effort to equalize and disseminate products in the regions, aiming to reduce the difference in growth rates between areas. Regional development's success will support overall national success because regional development is an integral part of national development (Sibero, 1985). A restricted area's economic growth is related to the site's potential and economic characteristics and the linkages with other regions in the region.

Indonesia has a Master Plan for Acceleration of Indonesian Economic Expansion (MP3I), a regional planning document for Indonesia's economic growth. MP3I divides Indonesia's territory into six economic corridors. The division is based on the leading sectors in each region.

Bali and Nusa Tenggara corridor consists of three provinces: Bali, West Nusa Tenggara, and East Nusa Tenggara have been launched by the government to maximize the potential for tourism, fisheries, and livestock. These three provinces have geographic proximity, which allows for economic interaction. There are four financial centers in this corridor, namely Denpasar, Mataram, Lombok, and Kupang.

The economic interactions between Bali, West Nusa Tenggara, and East Nusa Tenggara are expected to create harmony in the financial field. However,

BPS data shows that only Bali and East Nusa Tenggara consistently have economic growth rates above the national growth from 2011-2018. Yet, gross regional domestic product (GRDP) from Bali and East Nusa Tenggara has a relatively large difference. Meanwhile, West Nusa Tenggara's economic growth rate has fluctuated and even negative in 2011, 2012, and 2018. This shows a significant difference in financial income between Bali and West Nusa Tenggara and East Nusa Tenggara.

Bali's economic condition, which is considered the center of growth in Bali and Nusa Tenggara regions, is expected to form a spillover effect on West Nusa Tenggara and East Nusa Tenggara. Leading Bali sectors, such as tourism, are expected to provide an abundance of economic growth in West Nusa Tenggara and East Nusa Tenggara in several sectors.

The spillover effect arises as a result of the growth poles. Growth poles can occur due to the effects of agglomeration, which can be in the form of input sharing, knowledge spillover, and local-skilled labor pooling, causing high economies of scale in the region (Jofre-Monseny et al., 2012). The spillover effect is the externality of agglomeration.

The spillover effect is divided into the spread effect and the backwash effect (Myrdal, 1957). The spread effect concept is that economic output from growth poles will directly influence economic growth in surrounding regions. Meanwhile, the backwash effect is the polarization of economic activity due to accumulation, such as the movement of labor, capital, and trade, which triggers a gap between the polar regions of economic growth and surrounding areas. The spillover effect explains a financial link between a sector's development in a place and its surrounding areas.

The results of previous studies also strengthen theories about the relationship between economic growth and the spillover effect. Suparta (2009) analyzed the spillover's impact from the economic development of DKI Jakarta and South Sumatra provinces on the economic growth of Lampung province. Using multiple linear regression, this study concluded that the relationship between DKI Jakarta and South Sumatra's financial activities provided a spillover effect on the economic growth of Lampung province. The study also concluded that price changes in DKI Jakarta and South Sumatra areas impacted economic growth in Lampung Province.

Unlike previous studies, this study looked at Bali's spillover effect on West Nusa Tenggara and East Nusa Tenggara through economic growth without any other variables. The method to be used is also different from previous research, namely using the VECM method. VECM can see Bali's spillover effect on West Nusa Tenggara and East Nusa Tenggara and the response to economic growth in West Nusa Tenggara and East Nusa Tenggara when Bali's economic growth is experiencing a shock.

This study aims to analyze Bali's economy's spillover effect on West Nusa Tenggara and East Nusa Tenggara in several economic sectors regarding its direct relationship and response to West Nusa Tenggara East Nusa Tenggara economies when Bali's financial industry is in shock. This study's results are expected to meet the needs of spillover effect analysis for Bali and Nusa

Tenggara regions, considering that research on the spillover effect is still rarely conducted empirically (Braniger and Niebuhr, 2005).

RESEARCH METHODS

Data Sources and Research Variables

This research was conducted using data series starting from the first quarter of 2010 to the third quarter of 2018. The number of observations from this study was 35 observations. All data used comes from the Central Bureau of Statistics (BPS). The following are the research variables used:

Variable	Operational Definition	Unit
PERBALI (X1)	Real GRDP from Bali Province which is total added value from agriculture, forestry, and fisheries sectors	
INDBALI (X2)	Real GDP from Bali Province is the total added value from manufacturing, energy supply, and construction sectors.	
JASBALI (X3)	Bali Province's real GDP is the total value added from trade, transportation, accommodation, and other services sectors.	Million Rupiah
PDRBWEST NUSA TENGGARA (Y1)	According to BPS, the real GRDP of West Nusa Tenggara province is from 17 sectors or categories.	
PDRBEAST NUSA TENGGARA (Y2)	According to BPS, the real GRDP of East Nusa Tenggara Province is out of 17 sectors or categories.	

Method of Analysis

This study uses the time series analysis method, namely vector autoregression. The analysis will focus on the causality relationship, impulse response function, and forecast error variance decomposition of West Nusa Tenggara and East Nusa Tenggara's economic growth with Bali's financial sector.

Vector Auto Regression

Vector autoregression (VAR) is a system of equations with n-variables consisting of the lag value of the variable itself, lag of other variables, and constant values. Sims developed the VAR model in 1980, which assumes that

all equation variables are endogenous variables (Enders, 2015). The VAR model is often used to identify the relationship between variables, project the variables in a time series, and analyze a variable's response when a shock occurs from other system variables.

To get the ideal VAR model, the first stationary testing is carried out. When all variables are stationary at the level, the appropriate VAR model is VAR in class. If all the variables are stationary in the first difference, the suitable VAR model is VAR in the first difference or VECM (at least one joint cointegration). VAR must also meet the VAR stability criteria and classical assumptions, namely non-autocorrelation, homoscedasticity, and multivariate normal.

Several previous studies have also used VAR to see the influence of a region's economic sector on its surrounding areas. For example, research conducted by Groenewold, Lee, and Chen (2007) and Takahashi (2009) which examined the spillover effect of a site using VAR or VECM. This study uses the VAR model to see Bali's economic sector's direct relationship to West Nusa Tenggara and East Nusa Tenggara's economic growth. The VAR model can also produce an impulse response function and forecast error variance decomposition, which is useful for achieving research objectives.

Due to the limited number of observations, this study uses two VAR or VECM models. The first model is a model between Bali's economic sector and economic growth in West Nusa Tenggara. The second model is a model between Bali's financial industry and economic development in East Nusa Tenggara. All research variables are transformed into natural logarithms. This effort is made to meet the criteria for a stable VAR model and meets classical assumptions.

Kausalitas Granger

This test aims to see the direct relationship between the independent variables, namely the sectoral economy of Bali Province, with the dependent variable, namely the economic growth of West Nusa Tenggara and East Nusa Tenggara. The following is the mathematical equation of the causality test (Gujarati and Porter, 2008):

$$Y_t = \sum_{i=1}^m a_i X_{t-i} + \sum_{j=1}^m b_j Y_{t-j} + U_{2t} \dots\dots\dots (1)$$

With:

- X_t : X variable in period t
- Y_t : Y variable in period t
- X_{t-1} : X variable in period $t-1$
- Y_{t-1} : Y variable in period $t-1$
- m : The amount of lag
- U_{1t}, U_{2t} : Confounding variables
- a, b : The coefficient of each variable

The following is the testing hypothesis for the Granger causality test:

- H_0 : $a_i = 0; i = 1, 2, \dots, m$
- H_1 : $a_i \neq 0; i = 1, 2, \dots, m$
- or
- H_0 : $b_j = 0; j = 1, 2, \dots, m$

$$H_1 : b_j \neq 0; j = 1, 2, \dots, m$$

The Granger causality test used the Wald test statistic. The following is the mathematical equation of Wald's test statistics (Gujarati and Porter, 2008):

$$W = \left(\frac{b_j}{se(b_j)} \right)^2 \sim \chi_{(1)} \dots \dots \dots (2)$$

Impulse Respons Function dan Forecast Error Variance Decomposition

Another analysis method uses the Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD). The IRF shows each endogenous variable's response over time to the variable's shock and other endogenous variables in the model. The shock given is usually one standard deviation from this variable (Juanda and Junaidi, 2012). FEVD is an analysis method to see changes in a variable from changes in error variance caused by other variables. Through FEVD, the strengths and weaknesses of a variable's influence on other variables can be known over a long time.

RESULT AND DISCUSSION

Data Stationarity Test

The data stationarity test is necessary to determine the correct VAR model. The data stationary test can be done by using the graph method or the unit root method. The stationary test was carried out to find out that the data was not influenced by time.

Table 2. The Result of Data Stationarity Test

Variable	<i>p-value</i> (level)	<i>p-value</i> (1 st difference)
LN_INDBALI	0.8819	0.00
LN_JASBALI	0.7709	0.00
LN_PERBALI	0.5789	0.00
LN_PDRBWEST	0.7008	0.00
NUSA TENGGARA		
LN_PDRBEAST	0.7901	0.00
NUSA TENGGARA		

The unit root test used was the Phillips-Perron test. This test is a development of the Dicky-Fuller (D.F.) procedure by allowing for error distribution. The P.P. test can accommodate errors that are dependent and heterogeneously distributed. The null hypothesis of this test is that the data are not stationary. If the p-value is less than alpha (0.05), then there is no unit root or stationary data.

Based on Table 2, it can be seen that the data is not stationary at the level. So it is necessary to differentiate and conclude that all research variables are stationary in the first differentiation.

Optimum Lag Selection

The lag length of the endogenous variables in the VAR or VECM system will be used as exogenous variables. Therefore, selecting the optimum lag is essential to estimate the VAR or VECM model. Also, the selection of lag needs to consider the possibility of autocorrelation and a decrease in freedom degrees.

Table 3. The Result of Lag Selection for the Bali-West Nusa Tenggara Model

Lag	FPE	AIC	SC	HQ
0	1.26E-10	-11.4402	-11.257	-11.3795
1	4.06E-13	-17.1902	-16.2741	-16.8865
2	2.67E-13	-17.6624	-16.0135	-17.1159
3	4.62e-14*	-19.55367*	-17.17185*	-18.76416*

Table 4. The Result of Lag Selection for the Bali-West Nusa Tenggara Model

Lag	FPE	AIC	SC	HQ
0	1.13E-11	-13.8579	-13.6747	-13.7972
1	1.77E-14	-20.3235	-19.4074	-20.0198
2	5.59E-15	-21.5295	-19.8805	-20.9829
3	1.73e-15*	-22.83748*	-20.45566*	-22.04797*

In determining the optimal lag, information is taken from the smallest AIC and H.Q. values, while the largest L.R. values are taken (Wei, 2006). The lag length is used to determine the size of the period of influence on an endogenous variable with the past and other endogenous variables.

Based on Table 3, the first equation where the endogenous variable is West Nusa Tenggara's GRDP, it can be concluded that the lag to be used is a lag of three. Likewise, for Table 4, where the endogenous variable is East Nusa Tenggara's GRDP, the optimum lag length is lag 3. This means that all variables affect each other not only in one period but up to the previous three periods.

VAR Stability Test

The VAR or VECM model to be built must have a root with a modulus of less than one. This provides evidence that the VAR or VECM model built is stable.

Table 5. Stability Test Results

Model Bali-West Nusa Tenggara		Model Bali-East Nusa Tenggara	
Root	Modulus	Root	Modulus
0.990196	0.990196	0.991988	0.991988
-0.050404 - 0.960242i	0.961564	-0.021037 - 0.960015i	0.960246
-0.050404 + 0.960242i	0.961564	-0.021037 + 0.960015i	0.960246
-0.071735 - 0.907546i	0.910377	-0.057701 - 0.917192i	0.919006
-0.071735 + 0.907546i	0.910377	-0.057701 + 0.917192i	0.919006
-0.873816	0.873816	-0.873367	0.873367
0.662790 - 0.472634i	0.814048	0.694556 - 0.471709i	0.839594
0.662790 + 0.472634i	0.814048	0.694556 + 0.471709i	0.839594
0.610245 - 0.382639i	0.720286	0.656245	0.656245
0.610245 + 0.382639i	0.720286	-0.643509	0.643509

Table 5 shows that Bali's economic sector and West Nusa Tenggara model, Bali's financial sector and East Nusa Tenggara model, all roots have an

absolute modulus value of less than one. This means that the two VAR or VECM models to be built in this study are stable.

Cointegration Test

Cointegration testing is performed using the Johansen Cointegration test. This study chooses the assumption that all data have interceptions and trends from the five deterministic trend assumptions. According to [Juanda and Junaidi \(2012\)](#), the Johansen Cointegration test's null hypothesis is that there is an r equation where r is the number of variables in the system ($r = 0, 1, \dots, r-1$). The Johansen Cointegration test has two test statistics, namely, trace and maximum Eigen.

Table 6. Cointegration Test Results with Trace Statistics

Model Bali-West Nusa Tenggara			Model Bali-East Nusa Tenggara		
Hypothesis : r	Trace Statistic	p-value	Hypothesis : r	Trace Statistic	p-value
None*	102.2037	0.000	None*	99.56421	0.000
At most 1*	53.73399	0.003	At most 1*	53.45782	0.003
At most 2	25.8421	0.0504	At most 2	19.42555	0.2564

Based on Table 6, the Bali-West Nusa Tenggara model and the Bali-East Nusa Tenggara model have sufficient evidence to state that there are at least two cointegration equations, a 5 percent alpha error level with trace test statistics. The same thing is also shown in Table 7, which states that at least the two models have two cointegration equations with the maximum Eigen test statistic at an alpha error level of 5 percent. Thus, the model to be built in this study is the VECM model for both the Bali-West Nusa Tenggara and Bali-East Nusa Tenggara models.

Table 7. Cointegration Test Results with Maximum Eigen Statistics

Model Bali-West Nusa Tenggara			Model Bali-East Nusa Tenggara		
Hypothesis: r	Max-Eigen Statistic	p-value	Hypothesis: r	Max-Eigen Statistic	p-value
None*	48.4697	0.000	None*	46.10639	0.001
At most 1*	27.89189	0.026	At most 1*	34.03227	0.003
At most 2	17.81301	0.0834	At most 2	13.64828	0.2786

Granger Causality Analysis

This study's causality test is the Pairwise Granger Causality Test using an alpha error level of 5 percent. The null hypothesis of the granger causality test is that there is no causality between variables. If the probability value is smaller than the alpha error value, the variable has a causal relationship.

Table 8. The causality of the Bali Economic Sector and West Nusa Tenggara GRDP

Variable	F-stat	Prob
LN_PERBALI→LN_PDRBWEST NUSA TENGGARA*	4.30914	0.0140
LN_PDRBWEST NUSA TENGGARA→ LN_PERBALI	2.92920	0.0532
LN_INDBALI→ LN_PDRBWEST NUSA TENGGARA*	3.42456	0.0325
LN_PDRBWEST NUSA TENGGARA→ LN_INDBALI*	3.44929	0.0317
LN_JASBALI→ LN_PDRBWEST NUSA TENGGARA*	4.42063	0.0126
LN_PDRBWEST NUSA TENGGARA→ LN_JASBALI	1.17376	0.3396

Statistically, Table 8 shows the variables of Bali's real GRDP in the agriculture, forestry, and fisheries sectors that affect the West Nusa Tenggara's GRDP. There is a one-way causality relationship between the GRDP of West Nusa Tenggara and Bali's real GRDP in the agricultural, forestry, and fisheries sectors at an alpha error level of 5 percent. For the variables of GRDP West Nusa Tenggara and real GRDP Bali in the processing industry, energy supply, and construction sectors statistically influence one another, it can be said that the two variables have a two-way causality relationship at the 5 percent alpha error level. Meanwhile, for the variables of GRDP West Nusa Tenggara and Bali's real GRDP, the trade, transportation, accommodation, and other services sectors have a one-way causality. Only the variables of the transaction, transport, housing, and other services sectors affect the West Nusa Tenggara GRDP variable at an alpha error level of 5 percent.

Table 9. The causality of the Bali Economic Sector and East Nusa Tenggara's GRDP

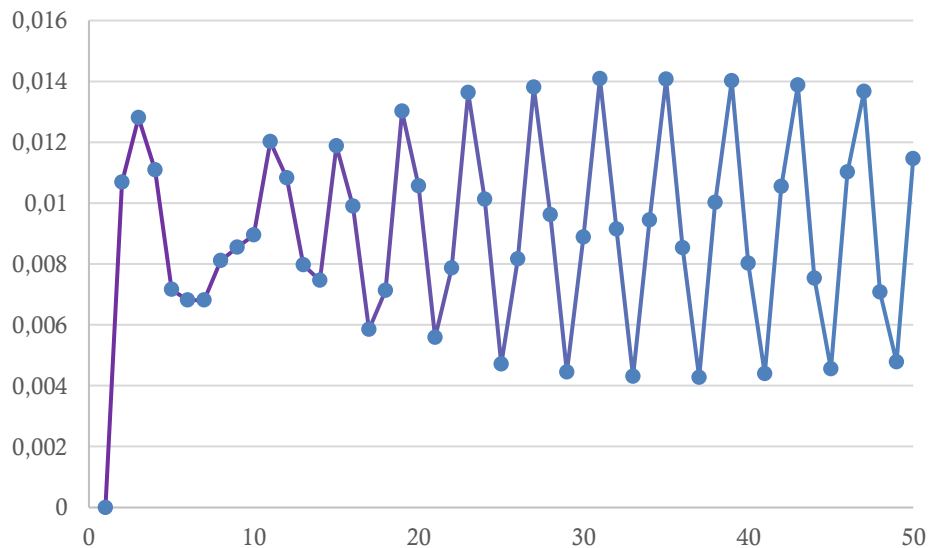
Variable	F-stat	Prob
LN_PERBALI→LN_PDRBEAST NUSA TENGGARA	0.24136	0.8666
LN_PDRBEAST NUSA TENGGARA→ LN_PERBALI*	7.45091	0.0010
LN_INDBALI→ LN_PDRBEAST NUSA TENGGARA*	2.82228	0.05
LN_PDRBEAST NUSA TENGGARA→ LN_INDBALI	1.20311	0.3290
LN_JASBALI→ LN_PDRBEAST NUSA TENGGARA*	17.1740	0.000
LN_PDRBEAST NUSA TENGGARA→ LN_JASBALI	2.89038	0.0554

Based on Table 9, the East Nusa Tenggara GRDP variable is statistically significant in influencing Bali's real GRDP in the agricultural, forestry, and fisheries sectors, whereas the opposite does not happen. There is only a one-way relationship between the two variables at an alpha error level of 5 percent. Meanwhile, a one-way relationship occurs from the Bali real GDP variable in the manufacturing sector, energy supply, and construction to the East Nusa Tenggara GRDP variable at an alpha error level of 5 percent. Bali's real GDP variable, the trade, transportation, accommodation, and other services sectors statistically significantly affected East Nusa Tenggara's GRDP at an alpha error level of 5 percent, but the opposite happened.

Impulse Response Function

The Impulse Response Function Test (IRF) aims to see the effect of shock from a series/variable on other variables. A shock will affect the variable itself and will also spread to other variables. This estimate is focused on the response of a variable to the shock of one standard deviation of the variable itself or other variables in the VAR model. This analysis provides the direction of the relationship between the magnitude of the influence between endogenous variables. The horizontal axis shows the period before the shock; the vertical axis shows the importance of the response or the rate of change in the disturbance variable's shock in the endogenous variable.

Figure 1. Graph of Response of West Nusa Tenggara's GRDP Against Shock in Bali Agriculture, Forestry and Fisheries Sector



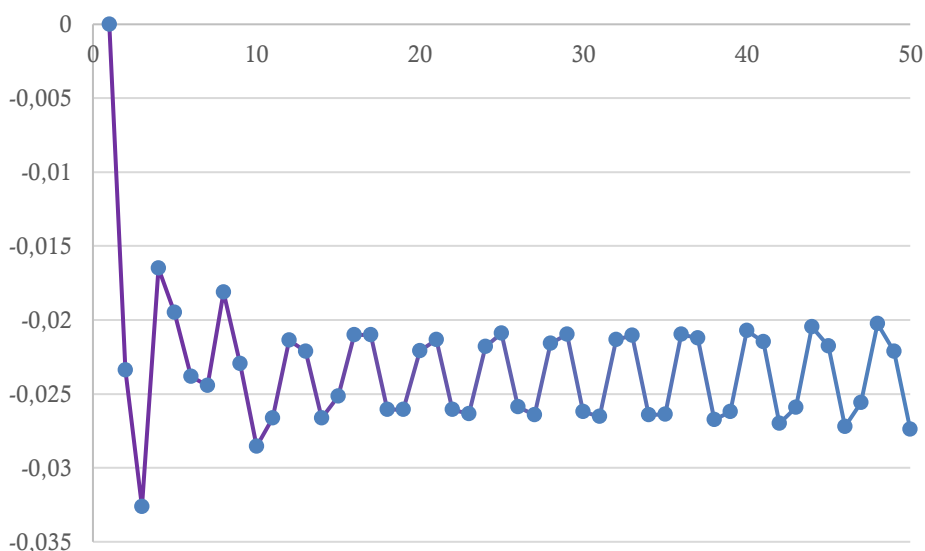
The agricultural sector is a sector that contributes significantly to the economy of Bali. The Bali government is currently working on being able to achieve self-sufficiency in food. Bali has good horticultural agricultural potential, which has various innovations to boost export figures. Bali is the province with the highest mangosteen exports in Indonesia, which can penetrate the Chinese market. Meanwhile, the potential for horticultural agriculture in West Nusa Tenggara is still small. The West Nusa Tenggara government wants to focus on developing horticultural agriculture because the

West Nusa Tenggara and national portraits are still far from expectations. The West Nusa Tenggara mangosteen commodity is exported via Bali because Bali already has an integrated packing house, an acceptable Chinese market requirement. The potential for horticultural agriculture in West Nusa Tenggara can also attract investors, especially Bali, to increase horticultural agricultural yields. An increase in Bali's economy as a growth center has created a spread effect that will increase the economy in its surrounding areas, namely West Nusa Tenggara.

On the other side, one of the efforts to optimize food self-sufficiency is to look at the agricultural sector from West Nusa Tenggara, which has succeeded in developing agriculture with the Gogo scaffolding system (Gora) dry land. Bali is also developing a rice intensification system (SRI) technique combined with jajar legowo and MA-11-based organic fertilizers in livestock and fish farmer groups in Pulagan. The interaction between Bali's agricultural sector and West Nusa Tenggara, which are geographically located close together, will trigger an increase in the West Nusa Tenggara economy when Bali's agricultural sector experiences a boost. This influence tends to be stable until the 15th period, then always fluctuates until the 50th period.

The Minister of Agriculture revealed that Bali could export up to billions of agricultural commodities a day; this can trigger the West Nusa Tenggara agrarian sector to increase production in food crops, horticulture, and livestock (Ermalia, 2020). The interaction of the two adjacent regions has created a spread effect for the West Nusa Tenggara economy.

Figure 2. Graph of the Response of West Nusa Tenggara's GRDP to the Shock in the Manufacturing, Energy Supply, and Construction Industry in Bali



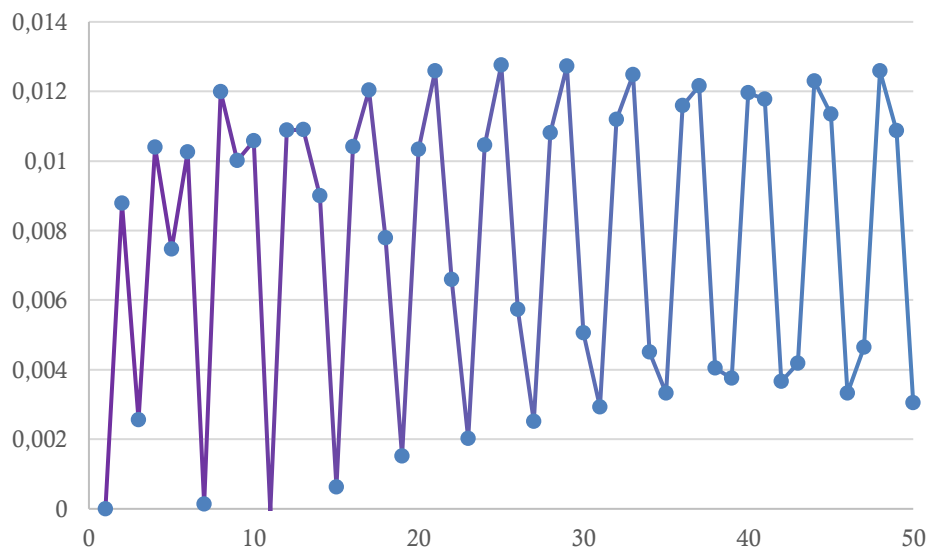
PDRB Bali in the manufacturing sector, energy procurement, and construction hurt the West Nusa Tenggara economy. The increase in Bali GDP in the manufacturing, energy supply, and construction sectors has more dominantly had a backwash effect on the West Nusa Tenggara economy.

An increase in Bali's GRDP in the manufacturing, energy supply, and construction sectors has an agglomeration effect that is having a polarizing impact on West Nusa Tenggara's GRDP. The growth of the driving industry and the dominant, dominant industry encourages agglomeration at the growth poles where they are located (Ridwan, 2016). This will lead to a concentration of activity through economic activity and resource flows. One of the things that happened was sharing input and demand for labor; this opened up job opportunities.

The manufacturing sector is a secondary sector that is very labor-intensive (Mutiara and Bendesa, 2016). The existence of this job opportunity will attract residents of the surrounding area to get work, including workers from West Nusa Tenggara. The increase in labor will encourage an increase in output, which will increase their economy. Improving economic growth requires the importance of human capital; through this human capital, there will be innovation and other capital development (Barro, 1991).

West Nusa Tenggara Province, which is also still developing the economy in the manufacturing, energy supply, and construction sectors, has not been able to keep up. According to Jhingan (2008), the backwash effect's magnitude compared to the spread effect causes a weak spread or spillover effect. This then led to Bali's GRDP in the manufacturing, energy supply, and construction sectors did not provide a spillover effect on the West Nusa Tenggara economy.

Figure 3. Graph of West Nusa Tenggara's GRDP Response to Bali's Trade, Transportation, Accommodation and Other Services Sector Shock

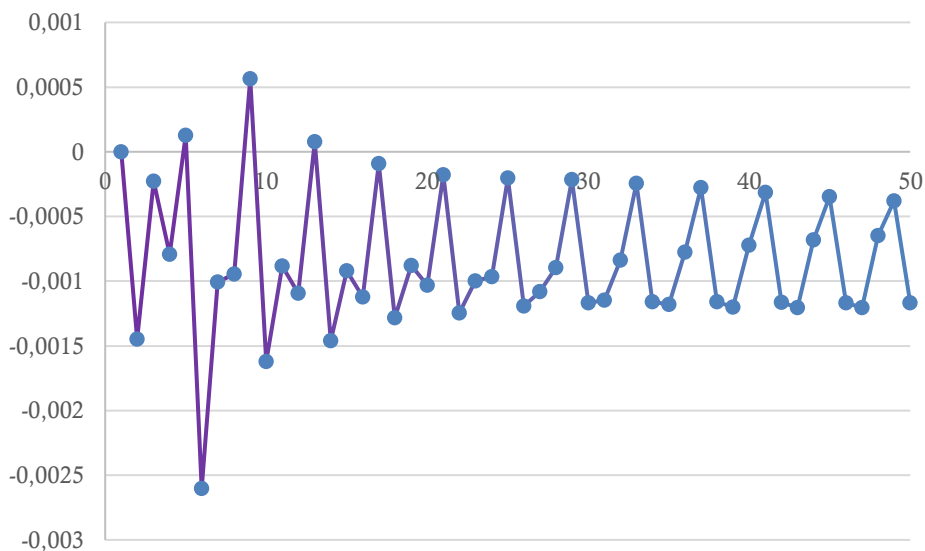


GRDP of Bali in the trade, transportation, accommodation, and other services sectors positively impacts the West Nusa Tenggara economy. Bali and West Nusa Tenggara's provinces have close geographic areas; there is direct access from various transportation modes, both land, sea, and air. If tourist visits in Bali Province increase, it can increase visits to West Nusa Tenggara as well. The ease of access from Bali to West Nusa Tenggara can improve West

Nusa Tenggara's economy. Many tourists visiting West Nusa Tenggara are an abundance of Bali's tourists.

Bali's tour agents also promote West Nusa Tenggara tourism on the island of Lombok and the island of Sumbawa; this visits West Nusa Tenggara even bigger (Arika, 2015). Also, several handicraft products from Lombok are sold overseas via Bali. One of the handicraft industries from Lombok, namely pottery, is exported via Bali (Sumiati, 2015). The high interest in this industry in Bali, which increases Bali's economy, increases industrial production in West Nusa Tenggara itself, increasing the economy of West Nusa Tenggara. So it can be said, the GRDP of Bali in the trade, transportation, accommodation, and other service sectors as the center of growth has a spread effect on the West Nusa Tenggara economy.

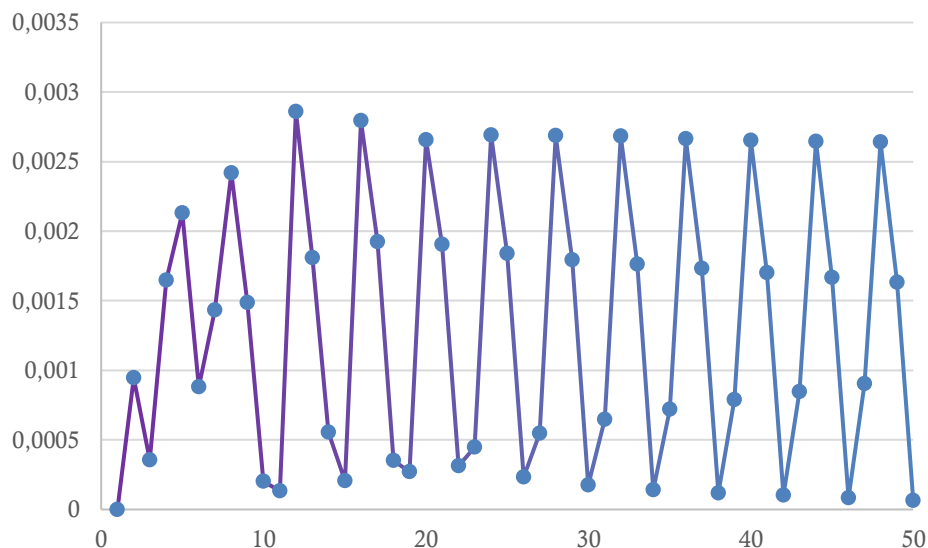
Figure 4. Graph of East Nusa Tenggara's GRDP Response to Bali's Trade, Transportation, Accommodation, and Other Services Sector Shock



In contrast to the West Nusa Tenggara economy, Bali's real GRDP in the trade, transportation, accommodation, and other services sectors has a relatively negative effect on the East Nusa Tenggara economy. To meet economic needs in the trade sector, most of Bali's government has provided it independently. For the East Nusa Tenggara provincial government, it is still importing from outside the province. This makes East Nusa Tenggara province's economic growth not proliferating.

In the tourism sector, the Provinces of Bali and East Nusa Tenggara's target market are dominated by foreign tourists. However, this has a backwash effect on the East Nusa Tenggara economy. When foreign tourist visits to Bali increase, visits to East Nusa Tenggara have decreased. Direct transportation from Bali to East Nusa Tenggara is still limited and costs a lot. Access by land and sea takes a long time; access by air still has limited flights. Thus, Bali's province has a backwash effect to East Nusa Tenggara, where developments in the growth center are detrimental to the surrounding areas because they will absorb resources in the surrounding area (Pasaribu et al., 2014).

Figure 5. GDRP Response Graph East Nusa Tenggara Against Shock Manufacturing Industry Sector, Energy Supply, and Bali Construction



GRDP of Bali in the manufacturing, energy supply, and construction sectors positively impacts the East Nusa Tenggara economy. Bali has a leading craft industry that uses sandalwood or its oil. One of the biggest sandalwood producing areas in East Nusa Tenggara (Suranto, 2011).

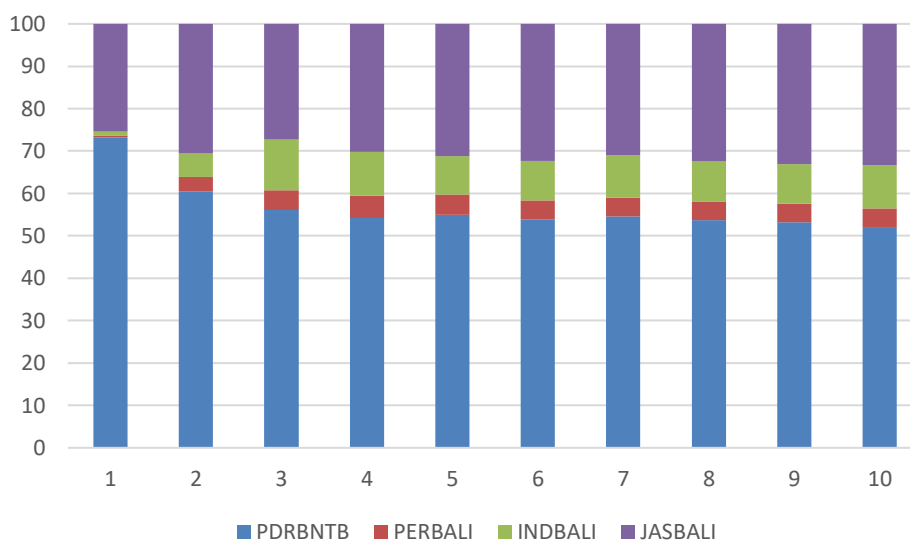
The weaving industry, a typical handicraft from East Nusa Tenggara, is also marketed in Bali (Leburaya, 2009). This product is getting a lot of enthusiasts in Bali. The existence of this large number of enthusiasts encourages the industry to increase its production, creating new job opportunities to improve the community's economy.

An increase in people's economy can improve the regional economy globally. This has led to a spread effect in which economic flows accompany Bali's economic growth as a growth center to the surrounding area, namely East Nusa Tenggara. Figure 5 shows this effect is fluctuating over a certain period.

Variance Decomposition

Variance Decomposition aims to predict the percentage contribution to each variable's variance due to changes in certain VAR system variables. Furthermore, it also looks at the magnitude of the shock variable's proportion or other variables to the observed variable. Figures 6 and 7 show the analysis of variance decomposition of the relationship between variables for the next ten periods.

Figure 6. West Nusa Tenggara's GRDP Variance Decomposition

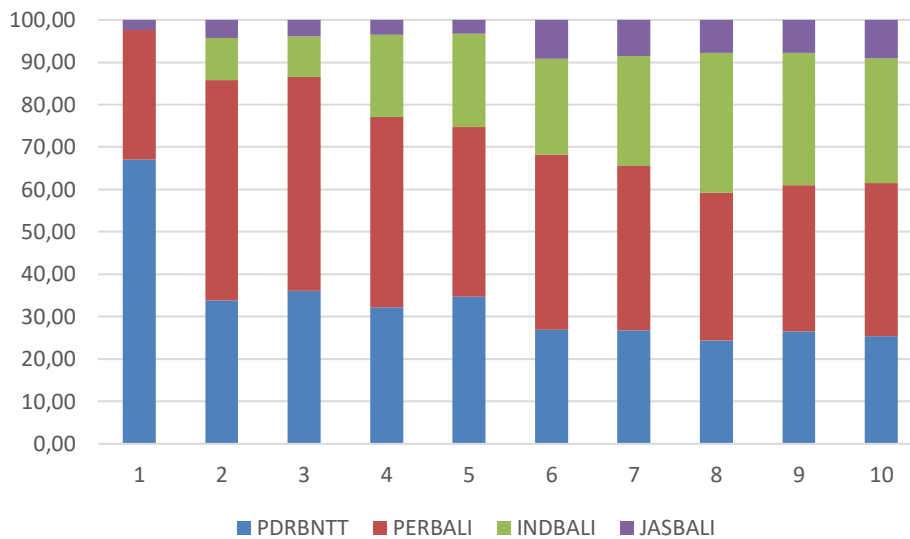


In the first period, the West Nusa Tenggara economy's size was influenced by the shock of West Nusa Tenggara's GRDP itself of 73.2 percent. In contrast, the effect of the real GDP shock in Bali was relatively large, namely 26.8 percent. The variables that had the most significant influence on Bali's real GDP's shock on the West Nusa Tenggara economy in the first period were in the trade, transportation, accommodation, and other services sectors by 25.4 percent. Meanwhile, the agriculture, forestry, fisheries, manufacturing, energy supply, and construction sectors are still below one percent. As time goes on, West Nusa Tenggara's GRDP's shock effect has decreased, and the external influence of Bali's real GRDP has increased. Until the 10th period, Bali's real GRDP to the West Nusa Tenggara economy was close to 50 percent. This indicates that the relationship between the provinces of Bali and West Nusa Tenggara, in the long run, will be able to help improve the economy of West Nusa Tenggara itself, especially in the trade, transportation, accommodation, and other services sectors.

When viewed from Bali's province's leading sector to Bali Nusa or the national economy by using the Location Quotient (L.Q.) analysis, the trade, transportation, accommodation, and other services sectors are sectors that contribute immensely a lot to the Balinese economy. Also, in the accommodation provision sector, Bali is one of the most visited tourist destinations.

Seen from the West Nusa Tenggara GRDP, the sectors contributing immensely to the economy are also in the trade, transportation, and other service sectors. Other sectors also contribute to increasing each period to the West Nusa Tenggara economy. This is evident from Bali's two economic sectors that can provide a spread effect on the West Nusa Tenggara economy. The proximity of an area to a growth center, followed by the large flow of resources received from the growth center to the region, will impact output distribution from the closest growth center to the surrounding area (Pasaribu et al., 2014).

Figure 7. East Nusa Tenggara's GRDP Variance Decomposition



In the East Nusa Tenggara economy, the first period was affected by the shock of East Nusa Tenggara's GDP, which was 67.02 percent. Meanwhile, the impact of the real GDP shock in Bali was also enormous at 32.98 percent. In the first period, the most significant influence from outside was Bali's real GRDP in the agricultural, forestry, and fisheries sectors. However, this influence did not significantly affect the East Nusa Tenggara economy.

In the long term until the 10th period, the shock PDRB East Nusa Tenggara's effect on its economy has decreased by 25.39 percent and is dominated by Bali's real GRDP of 74.61 percent. Bali's real GRDP that has the most influence on East Nusa Tenggara's economy is the manufacturing, energy supply, and construction sectors. The need for the fulfillment of the Bali industry is quite large from the province of East Nusa Tenggara, which has abundant raw materials, so this sector has the most significant influence compared to other industries, where the real GDP of Bali in this sector provides a spread effect on the East Nusa Tenggara economy, so that it can help in developing the East Nusa Tenggara economy.

CONCLUSION

This research has provided interesting findings from the initial goal is to analyze the spillover effect of economic growth in Bali to economic growth in West Nusa Tenggara and East Nusa Tenggara. Bali's agricultural sector's shock in general and Bali's service sector, in general, gave positive changes to West Nusa Tenggara's GRDP. Meanwhile, in general, the Bali industrial sector gave negative changes to West Nusa Tenggara's GRDP. Bali's economic sectors significantly influence West Nusa Tenggara's GRDP at an alpha error level of 5 percent. In general, Bali's agricultural sector has no significant effect on East Nusa Tenggara's GRDP. On the other hand, in general, the Bali service sector has made significant adverse changes to East Nusa Tenggara's GRDP, and the Bali industrial sector, in general, has provided significant positive changes to East Nusa Tenggara's GRDP.

Attention to the results of this research is essential for policymakers. Bali's positive influence on economic growth in West Nusa Tenggara and East Nusa Tenggara indicates that change is abundant in several economic sectors in Bali on economic growth in West Nusa Tenggara and East Nusa Tenggara. However, the negative impact of the development of several economic sectors in Bali on West Nusa Tenggara and East Nusa Tenggara's economic growth needs to focus on Bali's financial strength and economic development Nusa Tenggara and East Nusa Tenggara to slow down.

This research is limited only to the real GRDP variable without seeing the effect of other factors. This causes this study's spillover effect not to provide an optimal representation because other factors have not been measured. For further research, other factors need to be considered in finding the spillover effect.

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