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Regional Spillover Effect On Economic Growth: A Case Study Of Surabaya And Madura Island

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Abstract

This study aims to investigate the Spillover Effect Economic Activity Against Surabaya Madura region. The approach used in this study is a quantitative approach using panel data. The data was taken from regional data covering the City of Surabaya, Bangkalan Regency, Sampang Regency, Pamekasan Regency, and Sumenep Regency with a time series from 1999 - 2018. Then this study uses analysis Granger causality which aims to analyse the causal relationship between the economic activities of an area. with other areas. The results of data analysis using the test Granger causality and empirical comparison of the spillover effect of the economy of Surabaya to Madura Island show that a backwash effect occurs. Thus, it can be concluded that the Suramadu Bridge which is expected to support economic mobility and the spillover effect of the existence of the City of Surabaya as a growth center provides a spread effect to the Madura region as a peripheral that does not occur. The growth center effect in the Madura region produces a backwash effect.

Keyword: Spillover, Economic Growth,

INTRODUCTION

Endaryanto et al., (2018)explains that performance and economic development are goals that must be achieved by a region. One of the benchmarks in the success of regional economic performance and development is high economic growth as well as smaller inequality in income distribution and poverty. The economic basis theory states that the main factor that determines regional economic growth is the demand for goods and services from outside the area so that local resources will be able to generate regional wealth while at the same time creating job opportunities in the region which will then have an impact on reducing poverty rates (Kliping, 2012).

Data from the Central Statistics Agency of Indonesia shows that the GRDP value of East Java Province in 2018 is Rp. 39,587.92 thousand, or the second highest in Java. The magnitude of the value of the East Java Province GRDP cannot be separated from the results of development in level 2 areas or districts and the main city, Surabaya City, which is the center of growth as well as the provincial capital in East Java.

When viewed from the side of the economic growth rate which is centered in East Java Province, the City of Surabaya has the highest growth rate compared to other regencies/cities which in 2015 had an economic growth rate of 5.97 which increased in 2019 by 6.52. While the lowest is in the districts on Madura Island, which are mainly located in Bangkalan and Sumenep districts. In 2015 the economic growth rate in Bangkalan Regency was -2.66 and in 2019 it was 1.03. For Sumenep Regency in 2015 it was 1.27 and in 2019 it was 0.14.

Table 1. Economic Growth Rate of Regency/City Centralized in East Java Province 2015 - 2019

Year	Surabaya City	Gresik Regency	Lamongan Regency	Mojokerto Regency	Sidoarjo Regency	Bangkalan Regency	Sampang Regency	Pamekasan Regency	Sumenep Regency
2015	5.97	6.61	5.77	5.65	5.24	-2.66	2.08	5.32	1.27
2016	6	5.49	5.86	5.49	5.51	0.66	6.17	5.35	2.58
2017	6.13	5.83	5.52	5.74	5.8	3.53	4.69	5.04	2.86
2018	6.50	5.97	5.45	5.89	6.02	4.22	4.56	5.46	3.63
2019	6.52	5.41	5.44	5.81	5.99	1.03	1.42	4.92	0.14

Source: Central Bureau of Statistics

Further, in the era of decentralization In this case, the central government provides transfer funds to local governments that function as financial balancing between regions and increasing economic development through the General Allocation Fund (DAU) and the Special Allocation Fund (DAK) (Wardhana et al., 2013). From the existence of the General Allocation Fund (DAU) and the Special Allocation Fund (DAK) which tend to increase every year from each district on Madura Island, the local government should be able to improve economic performance and economic development in each of these districts given that with the DAU it is expected that the regions able to allocate to sectors that have the potential to encourage increased regional investment and have an impact on improving public services. Likewise, the existence of DAK is expected to reduce income inequality between regions because DAK is intended based on fields that become national priorities such as education, health and infrastructure.

Table 2. DAU and DAK on Regency on Madura Island in 2016-2018

Regency	**2016**		**2017**		**2018**	
	DAU	DAK	DAU	DAK	DAU	DAK
Bangkalan Regency	101224300	47854800	101224250	35419744	99446068	30831457
Sampang Regency	82795300	263276000	88791177	198499971	82544316	294215735
Pamekasan Regency	862936000	43322400	862935567	37716098	849764469	28912569
Sumenep Regency	1110488000	2255950000	1104878530	3255087240	1110487853	3305549200

Source: Central Bureau of Statistics

Therefore, the city of Surabaya, which is the center of economic growth and development in East Java Province, is also expected to have an effect on economic development in the surrounding area,

especially the Regency on Madura Island in accordance with Perroux's growth theory considering that the economic performance and development of the district on Madura Island is still too late compared to the previous one. other areas. Therefore, the East Java provincial government built infrastructure facilities in the form of the Suramadu Bridge. The construction of the Suramadu Bridge is expected to be an efficient and effective access to increase economic mobility which has an impact on significant economic growth and as a driver of economic development on Madura Island to be able to compete with other regions because it can be directly connected to the growth center of East Java Province, namely Surabaya City(Suprijati & Yakin, 2017). Therefore, in this study, researchers are interested in researching the Spillover Effect of Surabaya City's Economic Activities on the Madura Region.

METHODOLOGY

The approach used in this study is a quantitative approach using panel data. The data was taken from regional data covering the City of Surabaya, Bangkalan Regency, Sampang Regency, Pamekasan Regency, and Sumenep Regency with a time series from 1999 - 2018. Then this study uses analysis *Granger causality* which aims to analyze the causal relationship between the economic activities of an area. with other areas.

The data used in this study is the Gross Regional Domestic Product (GRDP) of Surabaya City and data on the economic sector in the Madura region (Bangkalan Regency, Sampang Regency, Pamekasan and Sumenep). The data observed in this study were for 20 years starting from 1998 - 2018. In more detail, the research hypotheses in the test analysis *Granger Causality* in this study are:

H_0 : There is no one-way causality of the GRDP variable in the City of Surabaya on the economic sector variables in Madura, which means that it will produce a *spread effect* or vice versa (*backwash effect*)

$$\sum_{i=1}^{n} \lambda_i \log(economic\ sectors_{Madura})_{t-i} = 0\ and \sum_{j=1}^{n} \delta_j \log\left(GRDP_{Surabaya\ \ City}\right)_{t-j} = 0$$

(no *spread effect*)

$$\sum_{i=1}^{n} \alpha_i \log(economic\ sectors_{Madura})_{t-i} = 0\ and \sum_{j=1}^{n} \beta_j \log\left(GRDP_{Surabaya\ \ City}\right)_{t-j} = 0$$

(no*backwash effect*)

H_1 : There is a one-way causality of the GRDP variable in the City of Surabaya to the economic sector variable in Madura, which means it will produce a *spread effect* or vice versa (*backwash effect*)

$$\sum_{i=1}^{n} \lambda_i \log(economic\ sectors_{Madura})_{t-i} \neq 0\ and \sum_{j=1}^{n} \delta_j \log\left(GRDP_{Surabaya\ \ City}\right)_{t-j} \neq 0$$

(*spread effect*)

$$\sum_{i=1}^{n} \alpha_i \log(economic\ sectors_{Madura})_{t-i} \neq 0\ dan \sum_{j=1}^{n} \beta_j \log\left(GRDP_{Surabaya\ \ City}\right)_{t-j} \neq 0$$

(*backwash effect*)

RESULTS AND DISCUSSION

The results of the test *Granger* in this study indicate that economic growth in the city of Surabaya does not have an impact on the economic sector in every district on the island of Madura, both in the industrial, agricultural and trade sectors. the *spread effect* on the Madura region or in other words provides a *backwash effect,* especially in the agricultural sector in Bangkalan Regency, the industrial sector in Sampang and Pamekasan Regencies and the trade sector in Sampang, Pamekasan and Sumenep Regencies.

Table3. Granger test Results

No	Variable	Results
1	GRDP Surabaya »Industry Sectorof Bangkalan: Pr(|F| > |F|) = 0.8895 GRDP Surabaya » Agricultural Sectorof Bangkalan: Pr(|F| > |F|) = 0.7384 GRDP Surabaya » Trade Sector of Bangkalan: Pr(|F| > |F|) = 0.2843 Industry Sectorof Bangkalan » GRDP Surabaya: Pr(|F| > |F|) = 0.9659 Agricultural Sectorof Bangkalan » GRDP Surabaya: Pr(|F| > |F|) = 0.0403 Trade Sector ofBangkalan » GRDP Surabaya: Pr(|F| > |F|) = 0.5727	Causes a *backwash effect* due to $\sum_{i=1}^{n} \alpha_i \log(economic\ sectors_{Madura})_{t-i} \neq 0\ and \sum_{j=1}^{n} \beta_j \log(GRDP_{Surabaya\ \ City})_{t-j} \neq 0$
2	GRDP Surabaya » Industry Sectorof Sampang: Pr(|F| > |F|) = 0.1368 GRDP Surabaya » Agricultural Sectorof Sampang: Pr(|F| > |F|) = 0.5553 GRDP Surabaya » Trade Sector ofSampang: Pr(|F| > |F|) = 0.3490 Industry Sectorof Sampang » GRDP Surabaya: Pr(|F| > |F|) = 0.0022 Agricultural Sectorof Sampang » GRDP Surabaya: Pr(|F| > |F|) = 0.9109 Trade Sector of Sampang » GRDP Surabaya: Pr(|F| > |F|) = 0.0543	Causes a *backwash effect* due to $\sum_{i=1}^{n} \alpha_i \log(economic\ sectors_{Madura})_{t-i} \neq 0\ and \sum_{j=1}^{n} \beta_j \log(GRDP_{Surabaya\ \ City})_{t-j} \neq 0$

3	GRDP Surabaya » Industry Sectorof Pamekasan: Pr(|F| > |F|) = 0.8486 GRDP Surabaya » Agricultural Sectorof Pamekasan: Pr(|F| > |F|) = 0.6430 GRDP Surabaya » Trade Sector ofPamekasan: Pr(|F| > |F|) = 0.9656 Industry Sectorof Pamekasan » GRDP Surabaya: Pr(|F| > |F|) = 0.0071 Agricultural SectorofPamekasan » GRDP Surabaya: Pr(|F| > |F|) = 0.9311 Trade Sector ofPamekasan » GRDP Surabaya: Pr(|F| > |F|) = 0.0756	Causes a *backwash effect* due to $\sum_{i=1}^{n} \alpha_i \log(economic\ sectors_{Madura})_{t-i} \neq 0\ and \sum_{j=1}^{n} \beta_j \log(GRDP_{Surabaya\ \ City})_{t-j} \neq 0$
4	GRDP Surabaya »Industry Sectorof Sumenep: Pr(|F| > |F|) = 0.7534 GRDP Surabaya » Agricultural Sectorof Sumenep: Pr(|F| > |F|) = 0.5628 GRDP Surabaya » Trade Sector of Sumenep: Pr(|F| > |F|) = 0.2084 Industry Sectorof Sumenep » GRDP Surabaya: Pr(|F| > |F|) = 0.3556 Agricultural Sector Sumenep » GRDP Surabaya: Pr(|F| > |F|) = 0.6182 Trade Sector of Sumenep » GRDP Surabaya: Pr(|F| > |F|) = 0.0541	Causes a *backwash effect* due to $\sum_{i=1}^{n} \alpha_i \log(economic\ sectors_{Madura})_{t-i} \neq 0\ and \sum_{j=1}^{n} \beta_j \log(GRDP_{Surabaya\ \ City})_{t-j} \neq 0$

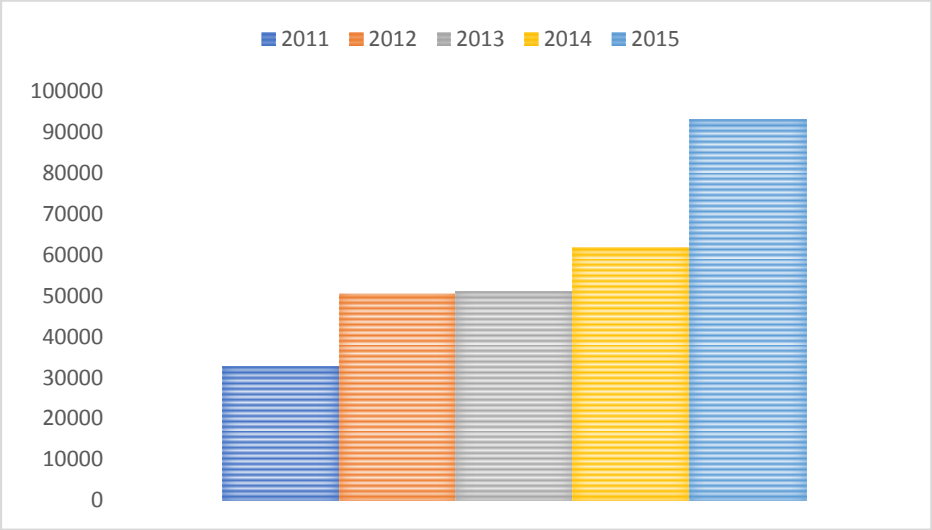
Source: Processed Data

The results of this study have similarities with previous researchers such asPasaribu et al., (2014)which prove that output growth, labor growth, and investment growth that occur in growth centers significantly have a *backwash effect* on the surrounding area in Kalimantan. According to him, growth centers will significantly impact the *spread effect* on the surrounding area if output growth, labor growth, and investment growth in growth centers are accompanied by economic flows to the surrounding areas. The development of growth centers in the future should be directed at efforts to increase trade transactions between regions in order to have a *spread effect*.Benedek & Christea (2014) dan Chiang (2018)also investigated if the economic concentration *(growth pole)* has a negative impact which will have an impact on increasing inequality in the area around the growth center and increasing inequality around metropolitan areas in Romania and Shanghai, China. ResearchersÁlvarez & Barbero (2016)stated that when spatial dependence is controlled,

the convergence of regional economic growth is predicted to occur with an increase of 4% per year.

The backwash effect that occurred on Madura Island was caused by the more advanced economic share in the Surabaya City area which is the center in East Java Province. The community feels more interested in carrying out economic activities in the city of Surabaya than on the island of Madura because in terms of accessibility it is easier and there is no need to cross the island which will increase the cost of travel again, causing many residents from every district on the island of Madura to mobilize to the city of Surabaya to carry out activities economy(Aji, 2014).

Figure 2. Total Mobility of Madurese Islanders in Surabaya City

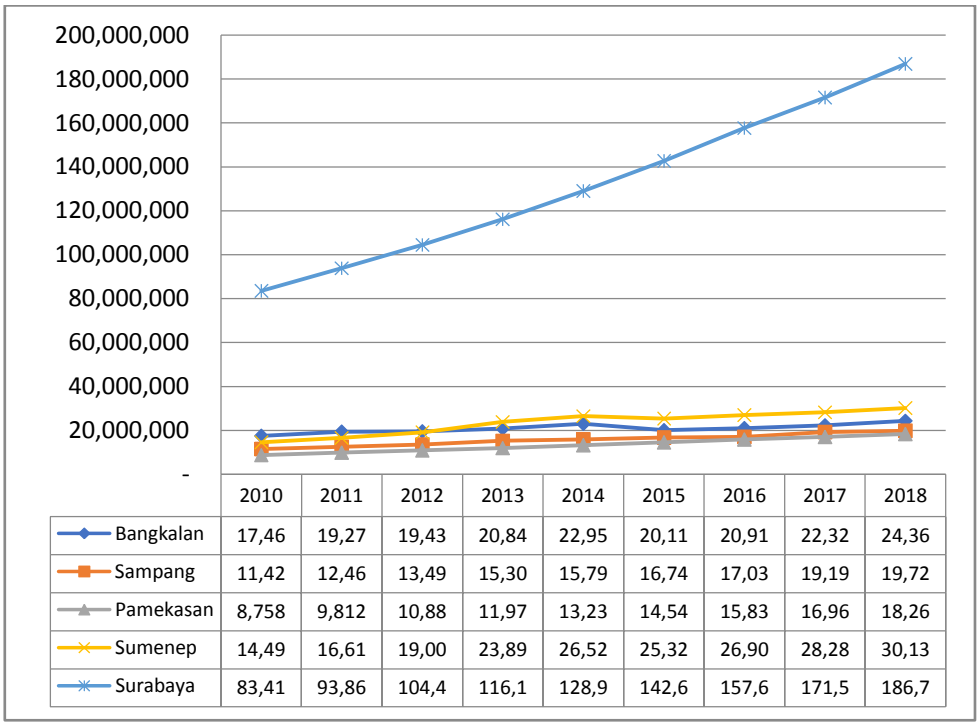


Source: Riyanta & Muertedjo (2017)

Figure 2 evident that the mobility of the population of Madura Island from 2011 to 2015 continues to increase every year. This shows that there is an increase every year the population of Madura Island carries out economic activities in the city of Surabaya. The population of Madura Island who mobilized to Surabaya City mostly worked as private employees by 51.06%, traders by 30.85%, and factory/building workers by 7.45%(Riyanta & Muertedjo, 2017).

In this study, the occurrence of a *backwash effect is* due to the conditions that occur on Madura Island also do not meet the criteria for the occurrence of a *spread effect.* According to Myrdal (1956) a growth center has a *spread effect* for the surrounding area if 1) there is a displacement of population settlements from the growth center to the surrounding area, 2) creates jobs for residents around the center, 3) reduces population unemployment, 4) increases population income. Based on Figure 2, it shows that in fact there is a migration/mobility of people from Madura Island to Surabaya City to find work and this mobilization activity increases every year because they also think that income on Madura Island is less able to meet their needs compared to. This can be seen in the total income of the population per capita on Madura Island from 2010-2018.

Gambar 3. GRDP per Capita ADHB Madura Region Tahun 2010-2018



	2010	2011	2012	2013	2014	2015	2016	2017	2018
Bangkalan	17,46	19,27	19,43	20,84	22,95	20,11	20,91	22,32	24,36
Sampang	11,42	12,46	13,49	15,30	15,79	16,74	17,03	19,19	19,72
Pamekasan	8,758	9,812	10,88	11,97	13,23	14,54	15,83	16,96	18,26
Sumenep	14,49	16,61	19,00	23,89	26,52	25,32	26,90	28,28	30,13
Surabaya	83,41	93,86	104,4	116,1	128,9	142,6	157,6	171,5	186,7

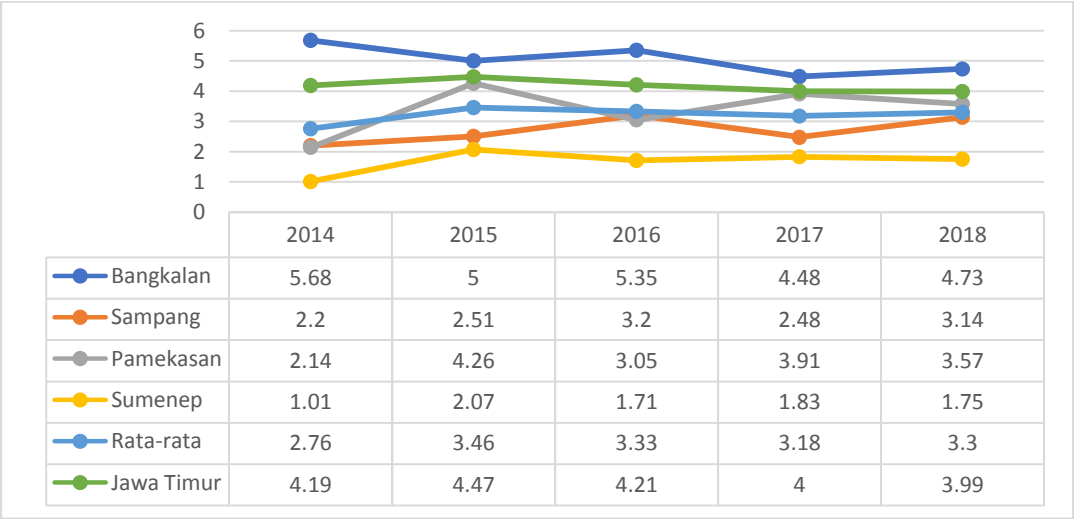
Source: Central Bureau of Statistics of East Java Province, 2018

Based on data from the Central Statistics Agency regarding Total Per capita Income from 2010 to 2018 above, it is known that the level of income per capita of 4 districts on Madura Island and the level of income in the city of Surabaya has increased every year. If seen in the graph above, it is clear that there is a clear difference between the total per capita income between the four districts on Madura Island and the per capita income level of the city of Surabaya. The income level of the four districts on Madura Island is much lower than the level of income per capita in the city of Surabaya. For example, in 2010, Pamekasan Regency became the district with the lowest per capita income level among the 4 districts on Madura Island with a value of 8,758,022 billion. Meanwhile, Sampang Regency is 11,427,326 billion, Sumenep Regency is 14,490,402 billion, and Bangkalan Regency is the regency with the highest per capita income level on Madura Island, which is 17,463,641 billion. Still in 2010, Surabaya City's per capita income was 83,418,765 billion.

In 2010 was the first year the Suramadu Bridge was established as the easiest access to cross to Madura Island and vice versa to Surabaya. It can be seen that in 2010 Bangkalan Regency also became the Regency with the highest level of per capita income on Madura Island because Bangkalan was the first district to be visited after crossing the Suramadu Bridge, so Bangkalan Regency became the first area to be affected by the economy of the Madura region. It can be tourism, socio-economic, and so on. However, in the following years, precisely in 2013, the highest level of per capita income on Madura Island has shifted to Sumenep Regency until 2018. This could be due to several factors, namely improving economic structure in Sumenep Regency, increasing other factors such as health, and life expectancy, improving the government system so that it can change the

economic pattern of its people, and so on. Meanwhile, Bangkalan Regency is the district with the second highest level of per capita income on Madura Island. Meanwhile, from 2010 to 2018 Pamekasan Regency became the district with the lowest per capita income level on Madura Island. Although every year the per capita income level of four districts on Madura Island increases, empirically with the existence of the Suramadu Bridge, the pattern of economic distribution from Surabaya to the four districts on Madura Island is still not felt. In fact, the impact of the Suramadu Bridge has actually increased the economy of the city of Surabaya because many Madurese people are urbanizing to the city of Surabaya or just doing activities that result in economic turnover in the city of Surabaya.

Figure4. Unemployment Rate 2014-2018

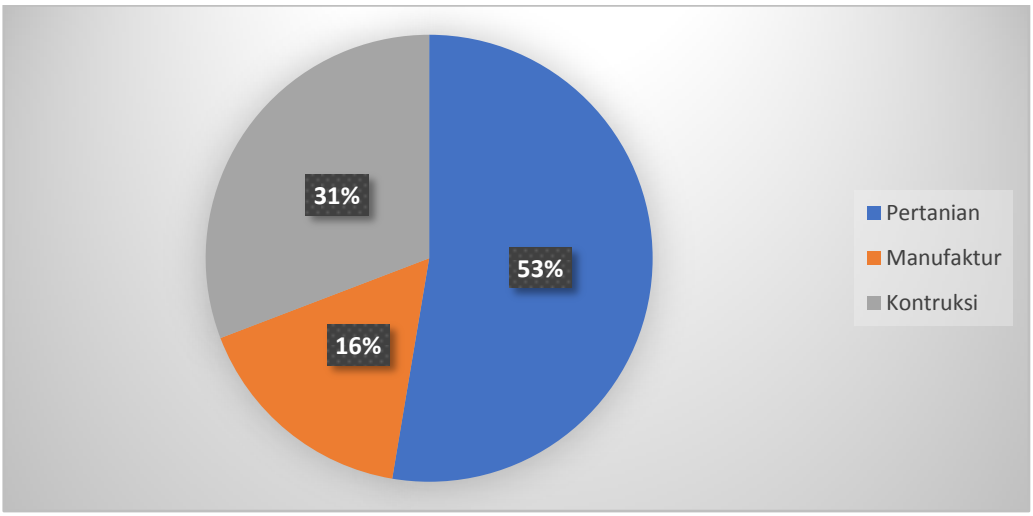


	2014	2015	2016	2017	2018
Bangkalan	5.68	5	5.35	4.48	4.73
Sampang	2.2	2.51	3.2	2.48	3.14
Pamekasan	2.14	4.26	3.05	3.91	3.57
Sumenep	1.01	2.07	1.71	1.83	1.75
Rata-rata	2.76	3.46	3.33	3.18	3.3
Jawa Timur	4.19	4.47	4.21	4	3.99

Source: Central Statistics Agency of East Java Province, 2018

The unemployment rate from 2014-2018 shows a number that fluctuates every year with the highest open unemployment rate on Madura Island in Bangkalan Regency at 4.73% and the lowest is in Sumenep Regency at 1.75% in 2018. Besides that , seen from the average unemployment rate on Madura Island, it also shows that the number continues to fluctuate from 2.76% in 2014, increasing to 3.3% in 2018. The high open unemployment rate is caused by unavailable or unavailable job opportunities. according to the job vacancies and educational background of the population as stated by the Malthusian population theory. Malthus argues that the population tends to grow indefinitely until it reaches the limit of the food supply, in this case it causes humans to compete with each other in ensuring their survival by looking for food sources, with this competition there will be some humans who are excluded and are no longer able to obtain food. In modern society, it means that the rapidly increasing population will produce more and more workers, but this is not balanced with the available job opportunities because the number of opportunities is small, so the population competes with each other for jobs and those who are excluded from the competition become unemployed.

Figure 5. Percentage of Population by Employment on Madura Island in 2018



Source: Central Bureau of Statistics of East Java Province by Regency/City, 2018

The picture above indicates that the population of Madura Island works more in agriculture, whereas in Malthus' theory, the population tends to grow geometrically while agriculture tends to grow arithmetically, which means that the population of Madura Island continues to increase but cannot be balanced. of agricultural productivity. This will have an impact on the low income level of the residents of Madura Island because in agriculture the law also applies *diminishing returns*. The law of *diminishing returns* explains that a continuous increase in labor (L) without being matched by an increase in the capital stock (K) will reduce the level of productivity produced(Ricardo, 1917).

CONCLUSSION

The results of data analysis using the test Granger causality and empirical comparison of the spillover effect of the economy of Surabaya to Madura Island show that a backwash effect occurs. Thus, it can be concluded that the Suramadu Bridge which is expected to support economic mobility and the spillover effect of the existence of the City of Surabaya as a growth center provides a spread effect to the Madura region as a peripheral that does not occur. The effect of the growth center in the Madura region produces a backwash effect.

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