THE REGIONAL ECONOMY IMPACT OF ECONOMIC ZONES: EVIDENCE FROM INDONESIAN MUNICIPALITIES

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ABSTRACT

The regional economy defines the national economy rate, and one of its main sponsors is an investment. Therefore, the government's strategy in the form of policy that improves the speed of acquisition is to establish economic zones in several regions completed with fiscal incentives and other investment conveniences to promote the respective areas to be new financial growth centres. This study aims to analyze the impact of the implementation of pro-investment policies at the regional level on economic growth, alleviation of unemployment, and poverty while also investigating other factors influencing the economic development of the corresponding regions. To measure the impact and analyze the investment policy. The objects of analysis were panel data from 451 municipalities in Indonesia between 2008 and 2015. Impact evaluation outcome using DD revealed that economic zones, one-stop service (OSS), and zonation positively and significantly impacted investment growth. Regarding 3SLS, education and government capital expenditures greatly affected the development of Gross Regional Domestic Product (GRDP). Meanwhile, diminution of investment, GRDP, wage, and employee education significantly increased the unemployment rate.

KEY WORDS

Economic zone, investment, economic growth, unemployment, poverty, impact evaluation.

Economists have long debated spatially targeted programs' potential benefits and distortions. More recently, the agglomeration economies have been rigorously identified that explain productivity advantages for firms in denser areas (Kline & Moretti, 2011). However, when the economic zone in Indonesia is more profound. Especially regarding its integrated economic development zones or *Kawasan Pengembangan Ekonomi Terpadu* (KAPET), Rothenberg et al. (2017), in their study, concluded that tax reduction only benefited the company and did not contribute to the government tax revenue. Moreover, the company's productivity improvement was not accompanied by sustainable improvement in the workforce. In general, all regencies/municipalities which applied the KAPET policy did not experience more rapid progress. However, Rothenberg et al. (2017) assumed that several factors were causing KAPET to not function at its best.

Since the New Order, several economic zones have been designated to prevent regional financial gaps. One example on the establishment of this economic zone is East Indonesia Zone or *Kawasan Timur Indonesia* (KTI) consisting of a number of islands covering Kalimantan, Sulawesi, Maluku, Papua, *Nusa Tenggara Barat* (NTB) and *Nusa Tenggara Timur* (NTT).

The above policy was then revitalized by Presidential Decree Number 9 the Year 1998 on the establishment of KAPET completed with fiscal treatment towards business people within KAPET regions.

The following arousing problem is whether the program runs as expected and can solve economic issues like a regional economic gap. Now, after almost 20 years since 14 KAPETs in KTI, the financial gap with West Indonesia Zone or *Kawasan Barat Indonesia*

(KBI), consisting of Java, Sumatra, and Bali only undergone a little progress which can result in the following figure.

KTI GRDP during 2004-2012 to the formation of GDP in Indonesia was within the range of 17 %, with a GRDP contribution improvement rate of as much as 0.04% per year. It is far from the initially preset expectation and goal of establishing KAPET. KAPET to actualize equitable development for all Indonesian regions by assisting the establishment of zones that serve as a prime mover for regional development.
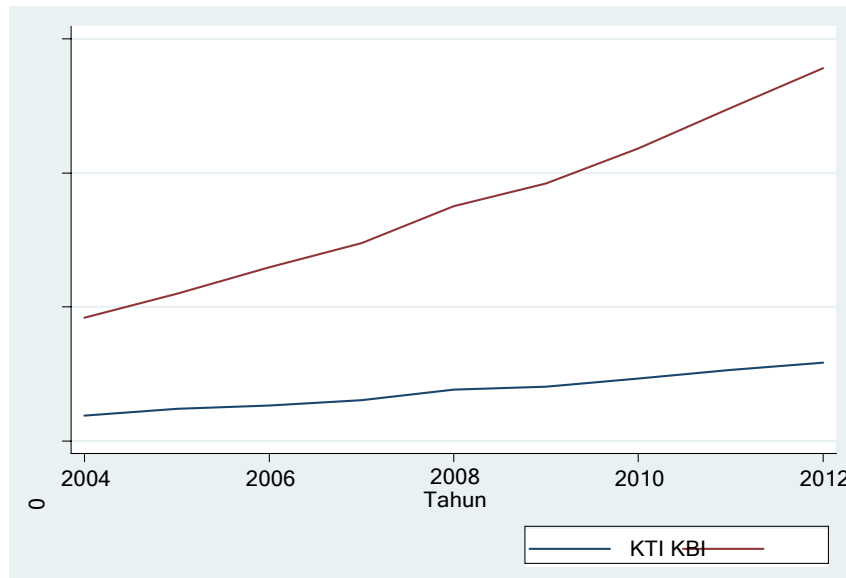

Figure 1 – Contribution of KTI and KBI on GRDP (Source: BPS RI, 2004-2012)

Another type of economic zone is bonded zone, to which Batam belongs. Since 2003, Batam has contributed significantly to regional and national economic growth. However, it undergoes a complicated problem after ten years of its transformation into Free Trade Zones and Free Ports (FTZ-FP). Several financial acts take place in Batam. In 2017, Batam's economic growth was 2.19%, while the inflation rate was 4%. In fact, in 2015, Batam's economic growth was 6.83% above the national growth rate. However, in 2016, it declined to 5.03% and, worse, 2.19% in 2017. This number in 2017 was the lowest since Kepri Province and the lowest in all Sumatra regions.

What had happened might have been triggered by the withdrawal of several foreign investors from Batam, which caused employment dismissal which reached more than 290.000 new unemployment in the first semester of 2017 as many foreign companies collapsed. Those foreign investors ran their business in the manufacturing and shipyard sectors. They stated that the global economy falloff hit their business in Batam.

The following section starts with a Literature Review and the historical background of Indonesia's economic zones. Section 3 provides a brief description of the dataset. Section 4 presents the methodological issue. Section 5 describes the analytical result of economic zone impacts. Finally, section 6 offers concluding remarks.

In order to figure out the impact of economy-zone policy in Indonesia, starting from KAPET, Bonded Zone, FTZ-FP, and SEZ, on investment, economy growth, unemployment, regional poverty, and other variables, this study is necessary to carry out to enhance the effectiveness of economy-zone policy and to evenly distribute the positive effect of the policy on local communities.

LITERATURE REVIEW

The agglomeration economies have been rigorously identified that explain productivity advantages for firms in denser areas (Kline & Moretti, 2011). The economic zone in

Indonesia more deeply. Especially regarding its integrated economic development zones or *Kawasan Pengembangan Ekonomi Terpadu* (KAPET), Rothenberg et al. (2017), in their study, concluded that tax reduction only benefited the company and did not contribute to the government tax revenue. Moreover, the improvement in the company productivity by sustainable progress in the workforce. In general, all regencies/municipalities which applied the KAPET policy did not experience a more rapid improvement. However, Rothenberg et al. (2017) assumed that several factors were causing KAPET to not function at its best. More comprehensively, Wang (2012), in his research investigating the effects of Special Economic Zones (SEZ) in China, found that SEZs increased investment, exports, and economic accumulation and significantly increased the income of local workers.

To see more deeply the impact of some economic zones, namely bonded zones, KAPET, FTZ-FP, and SEZ, on the regional economy. This study methodologically follows the instruction from Wang (2012) regarding impact evaluation and Barro (2000) regarding the analysis of estimated correlation among variables.

Background

In this section, some essential features of economic zones. Indonesia has four types of economic zones with fiscal facilities attached to the customs area: (1) Bonded Zones; (2) Integrated Economic Development Zones/KAPET; (3) Free Trade Zones and Free Ports/FTZ-FP; and (4) Special Economic Zones/SEZ. This paper combines all four types of economic zones where experiments have.

Bonded Zones

Government past policy still applies to actualize equal development in bonded zones. Referring to Government Regulation Number 22 in 1986 about Bonded Zones, areas with certain borders within Indonesian customs territory receive special treatment regarding customs. One of those unique treatments is that goods imported from either outside or inside customs areas of the Republic of Indonesia are not subject to business and tax or other state levies until the corresponding goods are brought outside for import, export, or re-export purposes.

Based on initial data from the Directorate General of Customs and Excise, there are 1,365 Bonded Zones with a whole area of 3,247,793,806 m^2. Most Bonded Zones in West Java for as many as 625 Bonded Zones, Central Java and DIY for as many as 232 Bonded Zones, and Banten in the third position for as many as 159 Bonded Zones. Bonded Zones was established in 1983 by the Minister of Finance and was known as Entrepot for Export Purpose (EPTE).

KAPET

KAPET is a geographical region with certain borders with the potential for rapid development and possessing leading sectors capable of promoting the economic growth of the areas and its surroundings; however, the developers usually need a big investment fund for it. Therefore, presidential Decree Number 120 in 1993 is about the inauguration board of KTI, which serves as the KAPET forerunner. This board has a task to initiate and formulate the concept of KTI establishment, including necessary policies to support its development.

Up to the present time, KAPET only consists of 14 regions which were determined within the period of 1996-1998 covering Biak, Natuna, Batulicin, Sasamba, Sanggau, Manado Bitung, Mbay, Parepare, Seram, Bima, Batui, Bukari, DAS Kakab, and Sabang.

FTZ-FP

We have begun with bonded zones and KAPET, which Fenda of international trade and agenda industry for export purposes and regional cooperation such as Sijori (Singapore, Johor, and Riau). The idea is to make several regions of Indonesia in the Malaka Peninsula the pillars of Singapore's free trade zones (FTZ). As a result, this FTZ now gets more crowded handling world trade traffic. President Susilo Bambang Yudhoyono (SBY), with an initiation from Singapore Prime Minister Lee Kuan Yew, improves the status of some bonded

zones and KAPET in Malaka Peninsula to be FTZ-FP.

Up to the present time, FTZ-FP only consists of 5 regions decided within time period of 2007-2017 covering Sabang, Batam, Bintan, Tanjungpinang, and Karimun.

SEZ

To improve investment competitiveness and stimulate regions in creating new economic centres in 2009, President SBY set Constitution SEZ number 39 the year 2009. SEZ progresses and results in 12 determined zones namely Tanjung Lesung, Sei Mankei, Palu, Bitung, Morotai, MBTK, Mandalika, Tanjung Api-api, Tanjung Kelayang, Sorong, Galang Batang, and Arun-Lhokseumawe. As a result, there are three new proposals when 8 SEZ regions have operated, and four areas are in the evaluation phase.

SEZs are areas with certain borders within the jurisdiction of Indonesia to carry out the economic function and achieve certain facilities. The process of SEZ is to develop business in the field of industry, trade, service, transportation, tourism, mining and energy, maritime and fishery, post and telecommunication, and many others.

DATASET

Detailed data contain information on economic growth, GRDP, investment, unemployment, poverty, economic zone, wages, education, dummy of OSS existing, and several essential variables. The data from the Ministry of Finance, Ministry of Home Affairs, Central Bureau of Statistics, Capital Investment Coordinating Board, Central Bank of Indonesia, and local governments.

Economic Zone

The economic zone is the ratio percentage of the financial site to the area of the municipality with fiscal policy in it (Wang, 2012) regarding bonded zones, KAPET, SEZ, and FTZ-FP. The determination of economic zones on existing regulations.
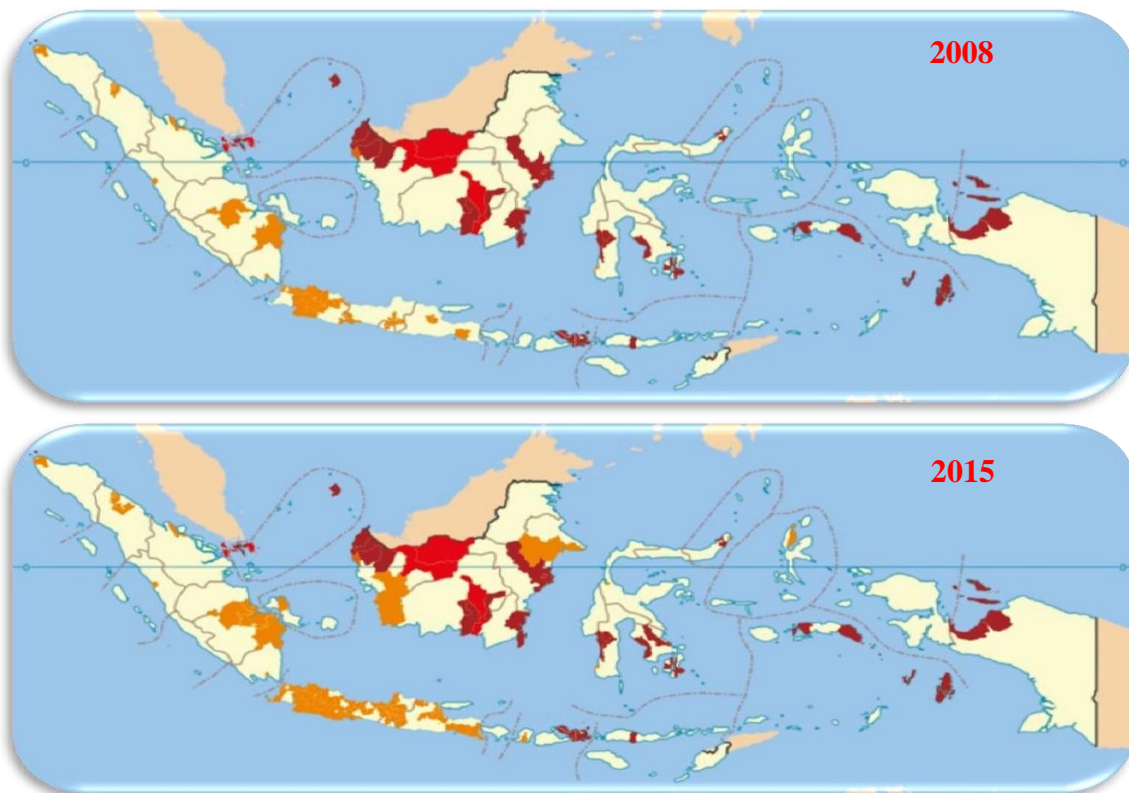
Color notes: orange = ratio 0-0.1, red = ratio 0.11-0.5, dark red = ratio 0.51-1

Figure 2 – Indonesia's economic zones between the periods 2008 and 2015 (Source: Directorate-General of Customs and Excise, National Secretary Board of SEZ; 2008-2015)

Based on the summary of regencies/municipalities data from 2008 to 2015, the average ratio of economic zones to the area of municipalities was 9.65% consisting of 133 towns with 451 economic zones from the entire cities in this study. Within the period between 2008 to 2015, there was an extension and increase in the number of economic zones in 14 provinces.

Investment

Investment is the percentage of foreign and domestic investment realization to GRDP at the municipality level.

Zones Period

Zones period (Per) serves as the control variable of zones regarding how long the zones have as economic zones. This fact acts as the time difference between old and new zones to enable the analysis of their heterogeneous effect (Wang, 2012).

Neighbouring Zonation

Neighbouring zonation (Zon) functions as the control variable of zones to the number of other nearby economic zones, which causes accumulated efficiency (diversion effect) on the municipal economic outcomes (Wang, 2012).

Education

Education level (Edu) by the average standard deviation of how long the formal education (MYS) of those men working in the labour force.

Government Expenditure

Government expenditure is the ratio percentage of government expenditure realization on GRDP.

Table 1 – Descriptive Statistics

Variable	Average	Min	Max
Growth (Gro)	5.93014	-28.18	107.07
GRDP (in billion)	15747.22	194	2000000
Investment (InvR)	0.37489	0	0.9968
Unemployment (Une)	6.09947	0	19.84
Poverty (Pov)	14.0813	1.52	51.91
Economic Zone (Kaw)	0.09650	0	1
DPTSP	0.7112	0	1
Employment (Emp)	237.058	4.793	4.823.858
Average Wage (Wag)	16881.22	5734.63	94314.33
Inflation (inf)	6.36067	0.2	21.39
Interest Rate (rat)	7.19	5.75	8.67
Average Education (Edu)	7.58887	1.49	12.38
Zones Period (Per)	1.93434	0	19
Neighbouring Zonation (Zon)	0.39855	0	8
Total observation: 3608			

METHODS OF RESEARCH

This study applied two research methods: the impact evaluation approach and the simultaneous panel regression analysis approach.

In evaluating the impact of the economic zone on investment and the other variables within 2008-2015. Double Difference (DD) was applied; At the same time in investigating the correlation between investment policy and macro variable. Researchers performed analysis using simultaneous panel regression method with structural modelling approaches 3SLS (Three Stage Least Squares) assisted by software *STATA 13.*

Double-difference (DD) was employed to evaluate the impact of the economic zone, which precisely measured the compelling benefits of responses toward policy intervention

happening within the research period (Khandker et al., 2010) The assumption is that the data of those regions shown treatment are nonrandomized with regulation-based determination.

Wang (2012) compared SEZ municipalities during different periods. The comparison showed that SEZ program invasion improved investment rate not merely by following the attack of SEZ location for companies and crowding out the domestic investment. On the contrary, the high investment rate in SEZ locations encouraged economic agglomeration and increased workers' income compared to the high local cost.

The result of difference-in- difference method shows that the regions with more SEZ are also proven better than the regions which only have one SEZ.

The following is the econometric used by Wang (2012):

$$Y_{ipt} = \alpha_i + \gamma_{pt} + S_{ipt}\delta + F_{ipt}\beta + \varepsilon_{ipt}$$

Thus, the DD equation model in this research looks at the treatment of economic zones in 2008-2015 (KawPer) on investment using the simple DD model:

$$lnInvR_{it} = \delta_0 + \delta_1 rKaw * Per_{it} + \delta_2 rKaw_{it} + \delta_3 Per_{it} + \delta_4 Zon_{it} + \delta_5 DPT_{it} + \delta_6 Wag_{it} + \delta_7 Edu_{it} + \text{s}$$

Table 2 – Result of Estimated Investment Using DD

Variable	Coefficient	Probability
Constanta	0.3312 (0.1768)*	0,061
Kaw*Per	0.0601 (0.0194)**	0,002
Zon	0.1048 (0.0189)***	0,000
Per	-0.02107 (0.0181)	0,245
rKaw	0.0057 (0.0009)***	0,000
DPTSP	0.2003 (0.0373)***	0,000
Edu	0.0666 (0.0457)	0,146
Wag	0.000026 (2.88e-06)***	0,000
Probability (F-Stat)	0,0000	

*Notes: Kaw*Per= Economic zones treatment within period; Per= Zone period; Zon= Neighboring zonation; Edu= Std. Dev. MYS male; rKaw= Economic zones ratio; DPTSP= dummy OSS; Wag= Average real wages; (*), (**), and (***): Significant at critical values 10%, 5%, and 1%.*

3SLS

To see the correlation between investment policy and macro variables- with economic zones ratio (rKaw) as the primary independent variable; dummy OSS (DPT), zones period (Per), and neighbouring zonation (Zon) as control variables; and investment ratio (InvR), economic growth (Gro), unemployment (Une), and poverty (Pov) as the dependent variable, the econometric model can be as follows:

$$InvR_{it} = \beta_0 + \beta_1 lnPDRB_{it} + \beta_2 lnPDRB^2_{it} + \beta_3 GovR_{it} + \beta_4 rKaw_{it} + \beta_5 Zon + \beta_6 DPT_{it} + \beta_7 Edu_{it} + \beta_8 \inf_{it} + \beta_9 rat_{it} + \text{s}$$

$$Gro_{it} = \alpha_0 + \alpha_1 lnPDRB_i + \alpha_2 lnPDRB^2_{it} + \alpha_3 InvR_{it} + \alpha_4 GovR_{it} + \alpha_5 rKaw_{it} + \alpha_6 Edu_{it} + \text{s}$$

$$Une_{it} = \gamma_0 + \gamma_1 lnPDRB_{it} + \gamma_2 lnPDRB^2_{it} + \gamma_3 InvR_{it} + \gamma_4 Wag_{it} + \gamma_5 Edu_i + \gamma_6 rKaw_{it} + \gamma_7 Per_{it} + \gamma_8 Emp_{it} + \text{s}$$

$$Pov_{it} = \theta_0 + \theta_1 lnPDRB_{it} + \theta_2 lnPDRB^2_{it} + \theta_3 InvR_{it} + \theta_4 rKaw_{it} + \theta_5 Edu_{it} + \theta_6 Emp_{it} + \text{s}$$

Index *i* shows the initials of regencies/municipalities in Indonesia, and index *t* shows the year of the panel data used in this research. The investment model (3.1), economic growth (3.2), and poverty (3.4) are a model proposed by Barro (2000), who raises the concept of economic convergence, which is complemented with primary and control variables of zones from the model by Wang (2012). Addition on the interest rate and inflation on investment model (3.2) from a model by Romer (1998). The poverty model (3.4) is an additional variable of workforce or labour by Fan et al. (2000).

Meanwhile, the model of unemployment (3.3) is an adaptation of Barro's model (2000)

combined with the dynamic model from Chang (2006) and Harris and Todaro (1970).

Table 3 – Estimated 3SLS Outcome

pendent Variable	Economic Growth/ GRDP (PDRB)				Investment Policy				Employment			Monetary	
	lnPDRB	lnPDRB²	Gov	InvR	rKaw	Per	Zon	DPTSP	Edu	Emp	Wag	Rate	Inf
Investment	4.941***	-0.188***	0.0869***		0.00635			0.05421.886***	0.602			0.684***	0.124
	1.521	0.0709	0.022		0.00623			0.141 0.322	0.469			0.230	0.090
Economic Growth	3.521***	-0.135***	0.1110***	-0.00467	0.00340*				0.626***				
	0.540	0.0241	0.00914	0.04079	-0.00193				0.148				
Unemployment	-1.418*	0.103***		- 0.2805**	-0.1651***	0.229***			-0.711***	-1.21e-06***	-4.68e-05**		
	0.823	0.0375		0.1245	0.00435	0.0309			0.212	-3.22e-07	-2.32e-05		
Poverty	-8.927***	0.278***		-0.08005	-0.00634				2.364***	3.77e-06***			
	1.058	0.0518		0.09232	0.00423				0.323	5.97e-07			
Obs.	3608	3608	3608	3608	3608	3608	3608	3608	3608	3608	3608	3608	3608

Notes: lnPDRB= GRDP growth; Gov= Government expenditure; InvR= Investment ratio; rKaw=Economic zone ratio; Per= Zones period; Zon= Neighboring zonation; DPTSP=dummy OSS; Edu=Std. Dev. MYS male; Emp= total workforce; Wag=Ave. real wages; Rate= Interest rate; Inf=Inflation. (*), (**), and (***): Significant at critical values 10%, 5%, and 1%

RESULTS AND DISCUSSION

The result of DD estimation with economic zones treatment from 2008 to 2015 signified that the existence of economic zones increased the investment rate by as much as 6.01% compared to those regions with no economic zones or was in idle status. It was due to the privileges attached to new economic zones, especially fiscal incentives, which effectively attracted investment. This fact is in line with the findings of several studies conducted by Carroll et al. (1998), Chen and Demurger (2002), and Wang (2012). However, calculations performed using 3SLS simultaneous panel estimation method indicated that establishing economic zones did not significantly affect investment. It occurred because of the status quo of several zones of which the idle status was not so practical to attract investors like what happened to most of KAPET, which is more than 90% of total economic zones in Indonesia. These regions were inaugurated in 1996-1998 but have been declared a vacuum in the last decade. Therefore, there was a difference between the two methods regarding how significant the effect of economic zones on investment was. The simultaneous panel regression estimation method collectively captures the correlation between dependent and independent variables from the existing structural models (Gujarati, 2004). On the other hand, DD precisely measures the adequate profits of the response towards policy intervention between those given treatment and those counterfactual sides during the research period (Khandker et al., 2010).

The Zon coefficient obtained for as much as 0.1048 indicated that adding adjacent zones would increase the ratio of investment to GRDP by 0.1%. However, unlike the estimation of 3SLS, Zon was not proven significant in the percentage of investment to GRDP since the development of zonation in 14 provinces during 2008-2015 did not significantly increase the investment ratio.

After that, the estimated 3SLS and DD outcome stated that OSS significantly impacted the growth of investment in municipalities. This fact goes along with studies by Gwartney et al. (2006) and Yu Chen et al. (2002), who mentions that the quality of institutions and efforts made to attract investors will increase the influx of investment to the regions significantly.

Along with findings from Barro (2000), education positively affects economic growth, in which each per cent increase in the standard deviation of male MYS would enhance economic development by as much as 0.63%.

Aligned with labour market theory from Romer (2011) in Advance Macroeconomics which states that when wages fall, and unemployment emerges, workers will choose their leisure over under-average wages until labour demand adapts to decent wages. This notion agrees with the finding of this research. They are revealing that if real wage (Wag) decreased by as much as Rp. 10,000, then the unemployment rate would increase by as much as 0.47%.

Another finding in line with employment theory is that education (Edu) determines job level. This study finds that when the standard deviation of male MYS in the labour force

decreased yearly, it would increase the unemployment rate by 0.71%. This finding also agrees with a study by Fazekas (2003) conducted in Hungary.

CONCLUSION

Capital as a production factor is crucial in the development period to attract foreign capital. Therefore, economic zonation has as an investment policy strategy in various countries. This study contributes to the long debate about the effectiveness of economic zones on regional economies measured by economic growth, employment rate decrease, and poverty decline.

The policy of economic zones package in Indonesia, in a particular point, needs to be assessed and evaluated on how far the expectation is considering its potential lost income and high cost of economic zone development. The realization needs to know how effective and efficient those policies are before other similar procedures. There is always a chance that after bonded zones, and then KAPET, FTZ-FP, and SEZ, respectively, other new zones emerge which are factually similar but different in terms of names and technical matters.

Treatment in economic zones with their accompanying privilege of fiscal incentive effectively attracts investment. Yet, particularly KAPET, established in 1996-1998 and has been a vacuum for the last decade, does not significantly affect the influx of investment. It happens the same with regional zonation of neighbouring zone addition which triggers agglomeration and will increase investment due to the supply and production chain around the zone.

OSS, economic growth, government expenditures, and interest rate had a significantly positive impact on investment development since adequate infrastructure and superstructure will provide more ease for the investors during the acquisition and production process.

The findings of this study prove that GRDP decrease, investment, labour's education level, and wage will theoretically increase the unemployment rate. And education (Edu) presents a positive impact on economic growth. Still, an improvement in the new workforce will foster poverty as local workers by non-local workers who indirectly cause poverty.

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