

Dilemma of Business Climate and The "Real Climate"

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Abstract

The role of business in advancing the economy and welfare is highly expected in the community. In the development of a business that occurs, it often sacrifices non-profit aspects, such as the environment. The indirect impact that can arise from business development is climate change. This study uses climate data and the number of industrial enterprises by type at the village level, to determine the effect of business on the climate that occurs. This study uses ordinary least square, to determine the role of each independent variable. The results of this study indicate that an increase in 1,000 of these types of businesses will result in an increase in temperature of 1 °C. Furthermore, an increase in 1,000 types of business will reduce rainfall by 11 to 64 mm. Government and community efforts are needed to maintain climatic conditions for the sustainability of the ecosystem.

Key words: climate; effort; rain; temperature

1. Introduction

The distribution of business in Indonesia is dominated by the real business sector. This domination causes the absorption of labor and at the same time advances the country's economy. Based on data from the 2016 Economic Census, it is known that Indonesia has more than 26 million businesses. This business sector has absorbed more than 78 million people, so that on average each business can absorb 3 people. Existing businesses in Indonesia contribute positively to the level of people's welfare. More than 1,300 trillion rupiah was spent by all businesses for remuneration to workers (BPS, 2017).

Business development is urgently needed, as a catalyst in the government's development program (Carree & Thurik, 2010; Haidar, 2012; Taiwo et al., 2012). The private sector is at the forefront of forming the business sector in society (Aliero et al., 2013; Mawdsley, 2015), because the government sector cannot absorb the productive population who are ready to work. Recently, the business development has been very significant. The efforts made by the community can be done flexibly according to the passion of the business actor (Cardon, 2008). In fact, not a few people have taken the initiative to leave the government sector, only to try their luck on the business that will be carried out. The rise of the business sector has no doubt about its benefits. However, every economic development will have an impact on other factors, one of which is climate.

Climate change that occurs in various parts of the world is the impact of the behavior / habits carried out by the community (Gifford et al., 2011; Van Aalst et al., 2008). Currently, various countries continue to strive to change the negative behavior of society to protect the environment (Guagnano et al., 1995; Kollmuss & Agyeman, 2002; Straughan & Roberts, 1999), so that indirectly this action will also have a positive impact on climate development in a region (Pruitt et al., 2011).

The exploration of resources carried out by business actors will indirectly have an impact on the environment, and at a later stage will have an impact on the climate (Duinker & Beanlands, 1986; Pagiola et al., 2005). The increase in the number of businesses coupled with population density, limited natural resources, and carried out en masse will certainly lead to a number of dynamics in the environmental ecosystem. (Costanza, 1996; Danielopol et al., 2003; Omer, 2008).

There are two climates in Indonesia, namely dry and rainy. In the dry season it can sometimes feel very hot, compared to several decades ago (Jennings & Magrath, 2009). Coupled with the pollution caused by the business sector, this adds to the perception of the public who are uncomfortable with the latest environmental conditions. On the one hand, the community feels very significant regional development, in addition, the community feels uncomfortable with the latest climatic conditions. This is quite significant in rural areas which tend to be more beautiful.

There have been many studies discussing economic development have an impact on the climate of a country (Chang et al., 2018; Xiao & Weng, 2007), but still limited to analyzing business development by type. Through this background, this study aims to determine the role of business in influencing climate conditions that occur in Indonesia. This study uses data at the village level. From the research, it is known that business development has a negative impact on changes in temperature and rainfall intensity in Indonesia.

2. Methodology and Data

The data used in this study are raw data from the 2018 PODES data collection, which describes business conditions according to the village level. The PODES data collection is carried out by BPS and is specifically designed to collect data that can describe conditions in rural areas and sub-districts, as well as prepare future censuses through the collected data and information. In addition, this study uses data on temperature and rainfall intensity, which comes from the BMKG. This study also uses control variables, namely the village bordering the sea. This control variable is intended to test the model (robust) (King, 1980). This research uses ordinary least square (OLS) research method, to determine the role of each type of business in the formation of temperature and rainfall. The models to be formed in this study are as follows:

$$\begin{aligned} \text{Temperature} = \alpha + \beta_1 \text{Ind}_{\text{wood}} + \beta_2 \text{Ind}_{\text{metal}} + \beta_3 \text{Ind}_{\text{cloth}} + \beta_4 \text{Ind}_{\text{stone}} + \\ \beta_5 \text{Ind}_{\text{webbing}} + \beta_6 \text{Ind}_{\text{food}} + \beta_7 \text{Ind}_{\text{others}} + \varepsilon \quad (1) \end{aligned}$$

$$\begin{aligned} \text{Rainfall} = \alpha + \beta_1 \text{Ind}_{\text{wood}} + \beta_2 \text{Ind}_{\text{metal}} + \beta_3 \text{Ind}_{\text{cloth}} + \beta_4 \text{Ind}_{\text{stone}} + \\ \beta_5 \text{Ind}_{\text{webbing}} + \beta_6 \text{Ind}_{\text{food}} + \beta_7 \text{Ind}_{\text{others}} + \varepsilon \quad (2) \end{aligned}$$

3. Results and Discussion

From the research results, it is known that business development has an impact on increasing temperature and decreasing rainfall intensity. From the results of the regression analysis in Table 1, it is stated that the wood goods industry, the pottery / ceramic / stone industry, and other industries have a significant positive effect on

temperature, either using control variables or not using control variables. The results of this study indicate that an increase in 1,000 of these types of businesses will result in an increase in temperature of 1 oC. This result is in line with previous research which states that increasing the effort will increase the temperature of the area around (Jones et al., 1986; Kumar & Hingane, 1988). Exposure to waste products from production will produce substances that have a negative impact on the climate, which will disrupt existing temperature conditions. In addition, in the production process, entrepreneurs often take the main production materials from nature. The disruption of natural ecosystems will also contribute positively to the increase in temperature in an area.

Table 1. Effect of Industry on Temperature

Industry Business	Temperature	
Goods originating from wood	0.001*** (0.000)	0.001*** (0.000)
Goods originating from precious metal or metal material	0.000 (0.001)	0.000 (0.001)
Goods originating from fabric/woven	0.000 (0.000)	0.000 (0.000)
Goods originating from earthenware / ceramic / stone	0.001*** (0.000)	0.001*** (0.000)
Goods originating from wicker made of rattan / bamboo, grass, etc.	0.000*** (0.000)	0.000*** (0.000)
Food and beverage industry	0.000 (0.000)	-0.000 (0.000)
Other industry	0.001*** (0.000)	0.001*** (0.000)
The village borders the sea		0.024*** (0.006)
Constant	27.412*** (0.003)	27.408*** (0.004)
Observations	81931	83,931
R-squared	0.001	0.001

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

If traced in depth, the wood products industry is obtained from plants. Plants are believed to help circulate water from the sky to the land through rain, until it returns to the sky through evaporation. The decreasing number of plants that are not matched by replanting will have an impact on increasing temperatures. Apart from that, the stone

equipment industry and the like, which dig into catchment areas will disturb water absorption and have an impact on arid conditions.

From the results of the regression analysis in Table 2, it is stated that the wood goods industry, cloth goods industry, stone goods industry, wicker industry, food and beverage industry, and other industries have a significant negative effect on rainfall intensity, either using control variables or not. using control variables. The regression results indicate that an increase in 1,000 of these types of businesses will result in a decrease in rainfall of 11 to 64 mm. This result is in line with previous research which states that increasing the effort will increase the temperature of the area around (Breznik & Stadelmann, 2002; González & Aristizábal, 2012).

Table 1. The Effect of Industry on Rainfall

Industry Business	Rainfall	
Goods originating from wood	-0.064*** (0.009)	-0.063*** (0.009)
Goods originating from precious metal or metal material	-0.009 (0.015)	-0.008 (0.015)
Goods originating from fabric/woven	-0.063*** (0.005)	-0.063*** (0.005)
Goods originating from earthenware / ceramic / stone	-0.024*** (0.006)	-0.024*** (0.006)
Goods originating from wicker made of rattan / bamboo, grass, etc.	-0.036*** (0.003)	-0.036*** (0.003)
Food and beverage industry	-0.011** (0.005)	-0.012** (0.005)
Other industry	-0.029*** (0.006)	-0.030*** (0.006)
The village borders the sea		0.683 (0.524)
Constant	181.703*** (0.162)	181.599*** (0.166)
Observations	83,931	83,931
R-squared	0.003	0.003

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Similar to the increase in temperature, the wood goods industry and stone equipment industry and the like have an indirect effect on decreasing rainfall. The use of chemicals in the manufacturing process of cloth goods will indirectly affect the decrease in

rainfall. Each fabric industry factory will produce waste production residue, which will unconsciously cause pollution and have an impact on the rainfall that occurs. The woven industry also has a negative influence, because the basic materials of this production are mostly obtained from nature.

Government efforts are needed in regulating regulations to maintain the sustainability of a good climate. In practice, environmental factors are often neglected, because the economic impacts arising from business activities are real. However, in the long term this condition needs to be anticipated, because it is possible that in the next few decades, unfavorable climatic conditions will actually hamper business.

In data processing, this study still uses temperature and rainfall intensity data at the station level, which are only a few in each province. For this reason, climate data at the village level are needed so that the research results can be more representative. In addition, further research can add control variables to determine the strength of the model. The addition of types of business in the industrial sector is possible for the variation in the roles of each type of industry on temperature and rainfall intensity.

4. Conclusion

Community unrest caused by global warming, without realizing it, can be caused by negative behavior / activities carried out by the community itself. In carrying out activities, people often ignore environmental factors that will indirectly have an impact on the climate. From the results of this study, information is obtained that business development has an impact on increasing temperature and decreasing rainfall intensity. This needs to be the attention of the government and society, to maintain the sustainability of a good climate.

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