

How Can Population Density Affect Economic Growth?

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Abstract: Population density is identical with the abundant supply of labor. Abundant labor will contribute to the production of goods and services, so that economic growth will increase. However, how the effect of population density on economic growth needs to be further investigated. The aim of this study is to know how the effect of population density on economic growth. Data analysis technique used is panel regression analysis method. The data analyzed include population density and economic growth of selected countries in the world in 2011-2015. The results of the study indicate that population density has significant effect on economic growth.

1 INTRODUCTION

Economic growth is one indicator of the success of a country's economic development. Economic growth illustrates that in an economy experienced an increase in national income. National income measures the extent to which a country's economy can produce goods and services over a period of time. This increase in the capacity to produce goods and services can be referred to as economic growth.

Most countries in the world, have a large target of economic growth to be achieved per year. It is expected that economic growth will continue to increase, although the increase is not so great but is not kept down.

The economic growth conditions of each country can be seen in Figure 1. Japan has the lowest average economic growth compared to other countries in the World, while China is highest. High economic growth depends on the productivity of a country in producing goods and services. Each country certainly has different potential in the availability of production factors, it can happen because of different natural and geographic characteristics. Some of the production factors used for production inputs include: land, natural resources, labor, capital and entrepreneurship.

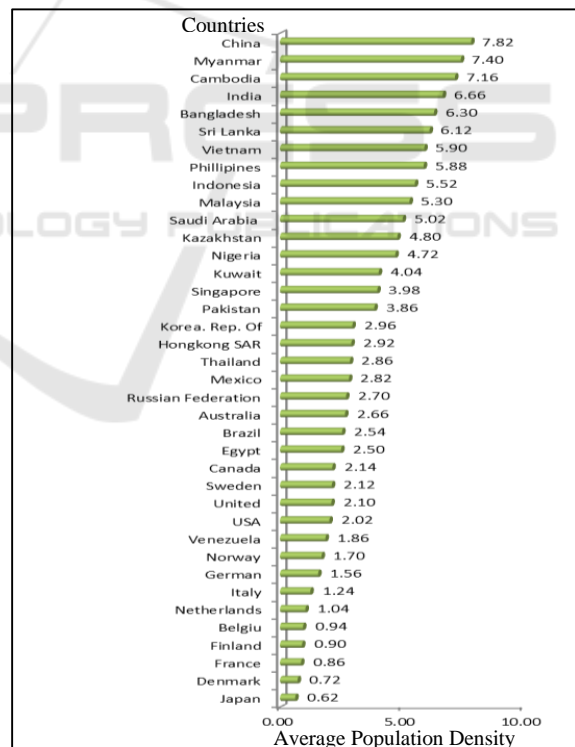


Figure 1: Average economic growth rate of selected countries at constant market price (percent), 2011-2015. Source: International Monetary Fund (IMF): "World Economic Outlook, April 2016"

Availability of manpower in a country, is one of the factors that influence the decision making company to be located in a country or in other countries in producing goods and services. Companies tend to choose production sites in countries that provide manpower with large quantities and good quality. It is of course related to the calculation of the costs to be incurred or the profit that will be obtained by the company.

Quantity of labor, will affect the amount of goods and services to be generated. The more manpower available, the more goods and services will be generated. This is in line with the production theory proposed by several economists, including von Thünen (1826), Turgot (1776), Smith (1776), Steuart (1767), Malthus (1815) and Ricardo (1817), Cobb-Douglas (1934), Arrow et al. (1961), and Leontief (1966). The large quantity of labor supply will result in lower wages, thus the company will incur minimal labor costs (Nicholson and Snyder, 2012: 320).

Good labor quality, will affect the efficiency in producing goods and services produced. A qualified workforce will produce goods and services effectively and efficiently. In accordance with the theory of production Solow (1957 in Nicholson and Snyder, 2012: 320) suggests that technical progress / technology as one of the factors that can increase output. The efficiency of this workforce will increase output, so the profit earned by the company will also increase.

The availability of labor in a country both in terms of quantity and quality encourages the formation of an economic concentration in a particular country. When there is concentration of the economy in a particular country, in addition to affect the company will also affect the decision of the workforce. Employment decisions, related to their choice to choose where they will work. The workforce in maximizing its utility will choose a job that gives a decent life.

Workers do not hesitate to move (migrate) to get more decent work than they work at home. However, the workforce must, of course, adjust its competencies to the qualifications of the requested workforce. This labor migration, will increase the population density in a particular country.

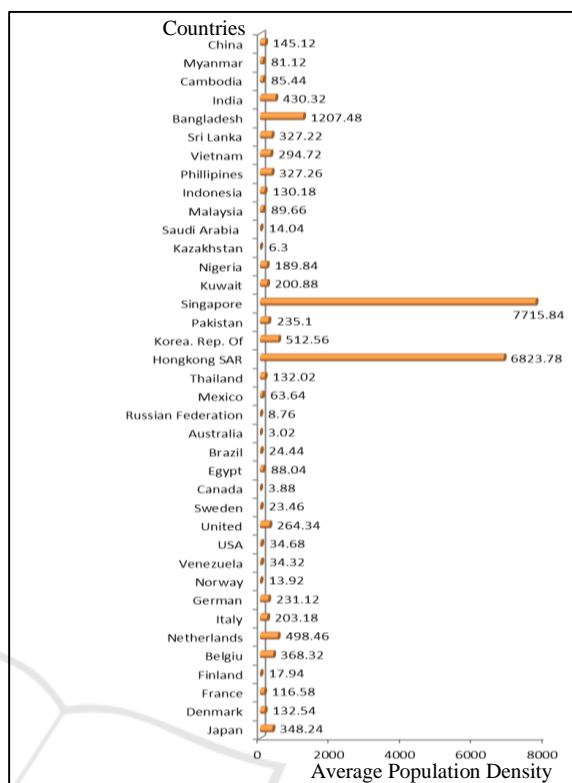


Figure 2: Average population density of selected countries (people per sq.km), 2011-2015.

Source: United Nations: "World Population Prospects: The 2015 Revision"

Population density in a country, related to labor demand and supply and identical to the availability of abundant labor. The availability of abundant labor will encourage increased output generated by the economy, in other words economic growth occurs. Illustrated in Figure 2, the country with the largest population density is Singapore and Hong Kong. Nevertheless the average economic growth of the two countries is not how high. Hong Kong's average economic growth is ranked 21st compared to 37 other countries, while the state of Singapore is ranked 24th. China has the highest economic growth rate, the average population density is ranked 21. On the other hand, the State Japan which has the lowest population growth rate, the average population density is ranked 31. Khotare (1999: 13) suggested that the rise in population growth of creating a positive effect on economic growth. But, Gilbert (2014: 126) find that population density has no statistically significant effect on productivity.

Some impacts need to be considered related to population density, including The Law of Diminishing Marginal Return. If this law applies, it means that increasing the number of workers

continuously, will not increase the output of the economy but will even reduce the output of the economy. This condition is caused by ineffective and efficient labor usage.

Population density plays an important role in harvesting societies, i.e. those that depend on agriculture and natural resources. Too high population density can make them poor due to low resource endowment per capita, low population density has a problem of too high per capita cost of building and maintaining infrastructure to collect and bring its resources to the market (Yegorov, 2015: 10).

Malthus (1978 in Skousen, 2005: 83) has a pessimistic thinking about the impact of population growth on the economy. Malthus argues that the growing population is growing according to geometric sequence. Rapid population increases will result in a high dependency ratio and will reduce the welfare of the people.

Cincotta and Engelman (1997: 5) suggested that the relationship between population growth and depressed economic performance is strongest among the poorest nations of the developing world. The growth of gross domestic product can be constrained by high dependency ratios, which result when rapid population growth produces large proportions of children and youth relative to the labor force. Because governments and families spend far more on children than the children can quickly repay in economic production, especially as modern schooling and health care replaces child labor, economists expect consumption related to children to retard household savings, increase government expenditure and ultimately cut into the growth of GDP. In many cases (in the developing world) lots of employment was being created, but not fast enough to match the rapid growth in the labor force.

The Law of Diminishing Marginal Return can be overcome with technical progress/technology according to the production theory proposed by Solow (1957 in Nicholson and Snyder, 2012: 320). Technical progress is not only related to capital but also the quality of labor. Quality of labor is related to education and skill of labor.

The aim of this study is to know how the effect of population density on economic growth. The data analyzed include population density and economic growth of several countries in the world in 2011-2015.

2 METHODS

This study is an exploratory research with quantitative method. The variables which studied: Population density and economic growth. Each variable is defined operationally as follows: 1) Population density is population density of selected countries in the world 2) economic growth is the increase in Gross Domestic Product of selected countries in the world. The type of secondary data obtained from the International Monetary Fund (IMF) and United Nations. Data analysis technique used is panel regression analysis method.

2.1 Econometric Model

The effect of population density on economic growth is investigated by employing the following model:

$$growth_{r,t} = b_0 + b_1 density_{r,t} + e_{1r,t}$$

where $growth_{r,t}$ is economic growth of country r at time t; $density_{r,t}$ is population density of country r at time t; b_0 is the constant; b_1 is the regression coefficient of population density variables; and $e_{1r,t}$ is the error term.

3 RESULTS AND DISCUSSION

This study was conducted to examine whether there is any effect of population density on economic growth. The proof is done using panel analysis method. The result of data analysis of 38 countries in the world is shown in Table 1.

Based on the results of the data, the calculated p value (t statistics) of 0.0307 is less than the critical p value, the null hypothesis is rejected. It can be concluded that the hypothesis related to the effect of population density on economic growth raised in this study is acceptable.

Important conclusions regarding the effect of population density on economic growth from this study is significantly population density negatively effect on economic growth. Population density Increases will decreases economic growth.

Table 1: Estimation equations of the effect of population density on economic growth on each countries.

<i>Estimation Equations</i>			
USA	: Growth =	- 5.139438 - 0.006952	*density
Saudi Arabia	: Growth =	- 2.282922 - 0.006952	*density
Australia	: Growth =	- 4.719530 - 0.006952	*density
Bangladesh	: Growth =	7.293546 - 0.006952	*density
Netherlands	: Growth =	- 2.895367 - 0.006952	*density
Belgiu	: Growth =	- 3.900064 - 0.006952	*density
Brazil	: Growth =	- 4.690624 - 0.006952	*density
Denmark	: Growth =	- 5.759142 - 0.006952	*density
Russian Federation	: Growth =	- 4.639627 - 0.006952	*density
Philippines	: Growth =	0.754498 - 0.006952	*density
Finland	: Growth =	- 6.375810 - 0.006952	*density
Hong Kong SAR	: Growth =	42.95653 - 0.006952	*density
India	: Growth =	2.250943 - 0.006952	*density
Indonesia	: Growth =	- 0.975548 - 0.006952	*density
United	: Growth =	- 3.462905 - 0.006952	*density
Italy	: Growth =	- 4.748072 - 0.006952	*density
Japan	: Growth =	- 4.359655 - 0.006952	*density
German	: Growth =	- 4.233841 - 0.006952	*density
Cambodia	: Growth =	0.353431 - 0.006952	*density
Canada	: Growth =	- 5.233552 - 0.006952	*density
Kazakhstan	: Growth =	- 2.556728 - 0.006952	*density
Korea.Rep. Of	: Growth =	- 0.877347 - 0.006952	*density
Kuwait	: Growth =	- 1.964061 - 0.006952	*density
Malaysia	: Growth =	- 1.477232 - 0.006952	*density
Mexico	: Growth =	- 4.138116 - 0.006952	*density
Egypt	: Growth =	- 4.288494 - 0.006952	*density
Myanmar	: Growth =	0.563400 - 0.006952	*density
Nigeria	: Growth =	- 1.360809 - 0.006952	*density
Norway	: Growth =	- 5.603756 - 0.006952	*density
Pakistan	: Growth =	- 1.906173 - 0.006952	*density
France	: Growth =	- 5.730092 - 0.006952	*density
Singapore	: Growth =	50.21788 - 0.006952	*density
Sri Lanka	: Growth =	0.994220 - 0.006952	*density
Sweden	: Growth =	- 5.117437 - 0.006952	*density
Thailand	: Growth =	- 3.622757 - 0.006952	*density
China	: Growth =	1.428310 - 0.006952	*density
Venezuela	: Growth =	- 5.301941 - 0.006952	*density
Vietnam	: Growth =	0.548289 - 0.006952	*density

The findings of this study mean that Malthus pessimistic thinking is still valid today. Population density in an area that is an economic concentration area (regional economic agglomeration) only creates a high dependency burden. This high dependency burden according to Cincotta and Engelman (1997: 5)

can be due to large proportions of children and youth relative to the labor force.

Furthermore, Cincotta and Engelman (1997: 5) suggested that government and families spend much more on children than the children can quickly repay in economic production. In many cases (in the developing world) many of employment was being created, but not fast enough to match the rapid growth in the labor force.

High dependency burden resulted in the enactment of The Law of Diminishing Marginal Return. Population growth does not create an increase in output, but instead will decrease output. Moreover the availability of inadequate public access, such as access to health and education. Empirically, most developing country societies enjoy poor public access, while developed country societies can enjoy better public access.

Good public access will increase labor productivity. Especially access to education and health. This is in accordance with the theory of human capital. Good education or skills will result in high labor productivity, meaning that the output produced is also more increased. Education and skills will improve technical progress in producing goods and services. Solow (1957 in Nicholson and Snyder, 2012: 320) mentions that The Law of Diminishing Marginal Return can be overcome with technical progress/technology according to the production theory.

The effect of population density that hampers economic growth, requires government policy. Population density is related to several things that affect such as: geographical area, population growth, population migration, and economic concentration in a region.

Geographical area related to the availability of natural resources in an area that can support human life. Humans tend to get close to the natural resources that can support their lives, for example: water availability, soil fertility, clean air, etc. Thus, if we do not want an increase in population density in a given area then the government should be able to provide access to adequate infrastructure and easy to get it related to basic human needs.

Population growth is related to the number of births of the population. Humans have a variety of thoughts about the value of children, the understanding of the meaning of a quality family needs to be emphasized to the community. Families with many children, but not supported by the family's ability to meet the basic needs of children, including education and health, will only become a burden of high dependence on the economy. In contrast to

families who have children who fit the ability of families to meet basic needs, then they will have a better quality of life. Government regulation related to population growth is needed, so that the public better understand the way that they can achieve prosperous life. Developed countries began to implement this population growth regimen.

Population migration is generally associated with the availability of employment, the availability of access to education, and the availability of other public access. In developing countries, the availability of employment, access to education and other public access is inadequate. These conditions, triggering populations that have the potential to migrate from developing countries to more developed countries. They think that they will have better prosperity in the destination country than settled in their home country. Thus will trigger the density of the population in the destination country.

Economic concentration in a region, related to the country in which a multinational company will operate and conduct its production activities. The company will choose production sites with several alternative options, including: close to factors of production, close to the market, good infrastructure access and easy permitting access.

Close to the factors of production, related to inputs to be used for production, both production materials and labor. Generally companies will choose close to production materials and with cheap labor wages. This is related to the prediction of revenues and expenses that must be issued company so that will give profit for the company. Close to the market associated with the ease of selling for the company. Good infrastructure is related to the ease of distribution of goods or services produced. Easy access permissions related to the ease of opening a business in a country. Economic concentration in a country will cause population density in a country, because people will migrate to the economically centralized country in the hope that their welfare will increase. Thus requires a common consensus that multinational companies not only operate in one particular country.

4 CONCLUSIONS

Important conclusions regarding the effect of population density on economic growth from this study is significantly population density negatively effect on economic growth. Population density increases will decreases economic growth.

The effect of population density that hampers economic growth, requires government policy. These policies include: provide access to adequate infrastructure and easy to get it related to basic human needs; Government regulation related to population growth; Availability of employment, availability of access to education, and availability of other public access in developing country; And requires a common consensus that multinational companies not only operate in one particular country.

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