Economic Growth of Indonesian Port Cities

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Abstract

The objective of this paper is to investigate what factors influence the growth of main Indonesian port cities. The analysis make use GLS to estimate the model using panel data from four major city in Indonesia (Surabaya, Jakarta, Makasar, and Medan) for period 1993-2001. This research found that growth in port cities in Indonesia determine by both manufacturer industries and the traffic of goods import.

Keywords : Growth, Cities, Agglomeration

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Introduction

The one striking issues of economic geography is the concentration of economic activity in cities. Generally, in many countries, their dominant cities have developed mostly at ports (Including Sea, river, and lake ports). Many geographers said that port represent the most convenient location for export and import. But, many economists argued that port cities seem to remain as an unsettled question. The investigation of this question was important not only for Intellectual interest but also for policy objective (Fujita and Mori, 1996).

In this paper, we analyze Indonesia case. We analyze it because Indonesia is the biggest archipelago country with dominant role of port cities. Base on Ray and Blankfeld Report (Ray and Blankfeld, 2002), Indonesia have four main port cities. The first one is Medan, which located in North Sumatra. Second, Jakarta, The nation capital of Indonesia, Third is Surabaya, located East Java. The last one is Makasar, located in Ujung Pandang. These four cities are the biggest cities in Indonesia. The size of economic activity in those cities is quite high. It indicated, the role of port cities in Indonesia is very important Indonesian economy. The domination of those port cities strengthen by Deichmann, Kaiser, Lall and Zallizi (2005) that said that over a longer time period, these factors may increase or decrease in importance. Initially, the conditions for the emergence of agglomeration economies might be due to natural endowment that historically encouraged early settlement and economic activity. These “first nature” geographies (Venables 2003; Burgess and Venables 2004) include sheltered harbors, natural resource endowments, access to inputs, proximity to markets and availability of basic infrastructure. The initial benefits can trigger a self-reinforcing process that leads to the emergence of urban-industrial agglomerations to a point where the initial advantage responsible for the growth of the center is no longer dominant. A well known example is New York City, which owed its early growth to its location near the mouth of the Erie Canal. Within 15 years of the canal’s opening the city had surpassed Boston and Baltimore as the busiest port in America. Today, very little of New York’s economic importance can be attributed to its port facilities.

In Indonesia, Java and particularly West Java's *Jabotabek* region has by far the highest concentration of manufacturing activity. Historically, Java's fertile volcanic soils supported high population densities, and by the 16th century the port of Sunda Kelapa intoday's Jakarta had established itself as an important trade hub. This in turn attracted the establishment of European trading posts and eventually the capital of the Republic of Indonesia. In the post-colonial period, Indonesia developed what some have called an economic system of "bureaucratic capitalism" where a high premium was on close access to members of the government. Large firms were often created by the state, by members of the government or military and their associates, or by ethnic Chinese businessmen. There was no prominent class of indigenous entrepreneurs, which might have created amore dispersed pattern of industrial development. These factors accelerated the agglomeration of economic activity near the seat of power in a highly centralized political system and resulted in the rapid growth of the manufacturing sector in the Jakarta region in the 1980s and early 1990s. By 1991 the manufacturing share of GDP in Indonesia exceeded that of agriculture and most of that was generated in western Java.Additional centers of manufacturing include Surabaya in Eastern Java – originally a Dutch center of naval industry. Two smaller manufacturing centers, Medan in Sumatra and Ujung Pandang (Makassar) in southern Sulawesi, also owe their existence largely to their role as regional trading posts.

Why those port cities became dominant? According to Fujita and Mori (1996), port have important role in the making of major cities. In other side, some economists have different perspective to explain why city grow. To answer this question, this paper organized in the following manner. In the second section there will be an analysis, starting from the existing economic literature, of the cities growth and port in particular. In the third section explain both data and methods. In methodological section, we start with identify of the factors as determining the growth of the cities by the theoretical contributions and by the empirical evidence, which will be analyzed with panel data regression. The fourth section is empirical result to corroborate whether the growth of four Indonesia port cities follows the

patterns mentioned. Specifically, the growth of the large cities in the period 1993-2001 is explained in this analysis in relation to the characteristics presented by these cities in 90's. The conclusion and the policy implication are presented in the fifth section.

2. Theoretical Framework

2.1 New Economic Geography

The label "new economic geography" is unfortunate in a number of respects. First, it raises hackles by claiming as novel that which some already considered to be well-known, but under-appreciated work. More importantly, the label gives no clear indication of the contents. This means that the same label might be used to describe quite different areas of inquiry. Finally, it is not clear what one should call later work that might supersede the current approach. However, in language as with agglomeration, there is often a gain from emulating the choices of predecessors. We therefore follow common usage in taking "new economic geography" (or NEG) to refer to theories that follow the approach put forward in Krugman's 1991 book (Krugman, 1991b) and, particularly his Journal of Political Economy article (Krugman, 1991a). While we do not wish to denigrate the contributions preceding and following these two pieces, their huge influence is an empirical fact. A Web of Science search shows that these two works received a combined total of over 800 journal citations from 1998 through the first half of 2002. Ottaviano and Thisse point out in their chapter of this Handbook that many of the ingredients of New Economic Geography were developed many decades before Krugman's 1991 paper. Indeed they suggest that the main contribution of NEG was to "combine old ingredients through a new recipe." Krugman and many of the other 1990s contributors to NEG gave little or no acknowledgement to its antecedents in regional science and location theory. Rather, they approached economic geography with perspectives developed from "new trade" theory. Indeed, the concluding section of Krugman (1979) anticipates many of the model elements and results that would appear over a decade later:

> *"...suppose that there are two regions of the kind we have been discussing and that they have the same tastes and technologies. There is room for mutual gains from trade, because the combined market would allow for both greater variety of goods and a greater scale of production. The same gains could be obtained without trade however, if the population of one region were to migrate to the other. In this model, trade and growth in the labor force are essentially equivalent. If there are impediments to trade, there will be an incentive for workers to move to the region which already has the larger labor force. This is clearest if we consider the extreme case where no trade in goods is possible but labor is perfectly mobile. Then the more populous region will o_er both a greater real wage and a greater variety of goods, inducing immigration. In equilibrium, all workers will have concentrated in one region or the other. Which region ends up with the population depends on initial conditions; in the presence of increasing returns history matters." Krugman (1979), p. 478.*

This quote shows that the main elements of the stories formalized in the 1990s economic geography literature had already been anticipated by Krugman in the late 1970s. Krugman certainly did not originate all the ideas currently associated with NEG. However, the approach he popularized drew heavily on his own earlier work on trade patterns.

Five essential ingredients distinguish NEG models from other approaches to understanding the geography of economic activity. We do not wish to imply that they were novel contributions of NEG or New Trade but rather that they are useful indicators for categorization.

1. Increasing returns to scale (IRS) that are internal to the firm. NEG models assume
2. a fixed, indivisible amount of overhead required for each plant. NEG models do not assume any pure technological externalities that would lead directly to external scale economies.
3. Imperfect competition. With internal increasing returns, marginal costs are lower than average costs. Hence, one cannot assume perfect competition because firms would be unable to cover their costs. The vast majority of the literature goes on to assume a particular market structure and accompanying functional forms for demand: Dixit and Stiglitz' (1977) model of monopolistic competition.

4. Trade costs. The outputs and inputs used by firms are trade able over distances but only by incurring costs. These costs are often assumed to be proportional to the value of the goods traded.
5. Endogenous firm locations. Firms enter and exit in response to profitability at each possible location. The assumption of increasing returns implies that firms will have an incentive to select a single production site and serve most consumers at a distance. If plant-level fixed costs were negligible, the firm would replicate itself everywhere (a la McDonalds).
6. Endogenous location of demand. Expenditure in each country depends upon the locations of firms. Two mechanisms for the mobility of demand have been proposed.
    (a) Mobile workers who consume where they work (Krugman, 1991).
    (b) Firms that require the outputs of their sector as intermediate inputs (Krugman and Venables, 1995).

Ingredients 1–4 all appeared in the New Trade literature, and in particular gave rise to the home market e_ects identified in Krugman (1980). With these assumptions, agglomeration can arise but only through the magnification of initial country size asymmetries. The key innovation of NEG relative to New Trade is assumption 5. Without 5, symmetric initial conditions lead to symmetric outcomes. With all five assumptions, initial symmetry can be broken and agglomerations can form through a process of circular causation. This is perhaps the basis for the Davis blurb on the back of Fujita at all. (1999) that, “the work is an even more radical departure from orthodoxy than the new trade theory of the 1980s.”

If NEG comprises models with these five ingredients, what are the competing explanations of economic geography? Empirical work testing NEG-based hypotheses benefits from the consideration of a set of plausible alternatives. Prominent alternatives to NEG include

- “Natural advantages” (see Ellison and Glaeser, 1997, 1999) or “locational fundamentals” (Davis and Weinstein, 2003) and the closely related “factor

proportions theory" (H-O). This approach takes the geographic distribution of productive resources as exogenous and uses it to explain the geographic distribution of production.

- • "Human capital externalities": Models in which the return to skill is higher in locations with larger numbers of skilled workers and these areas also attract larger numbers of employers of skilled workers. Marshall (1920) describes a mechanism. Formal models were developed along those lines in Krugman (1991b) for instance. Human capital externalities are central in Lucas' (1988) theory of economic development.
- "Knowledge spillovers": Producers benefit from spatial proximity of their counterparts in the same industry via flows of productive knowledge.

At its conclusion the authors of The Spatial Economy argued that a vital part of "the way forward" from their work would involve empirical examination of the "intriguing possibilities" raised by the new theory. They did not specify the form these examinations should take, nor has any consensus emerged on the empirical methods to be applied to NEG.

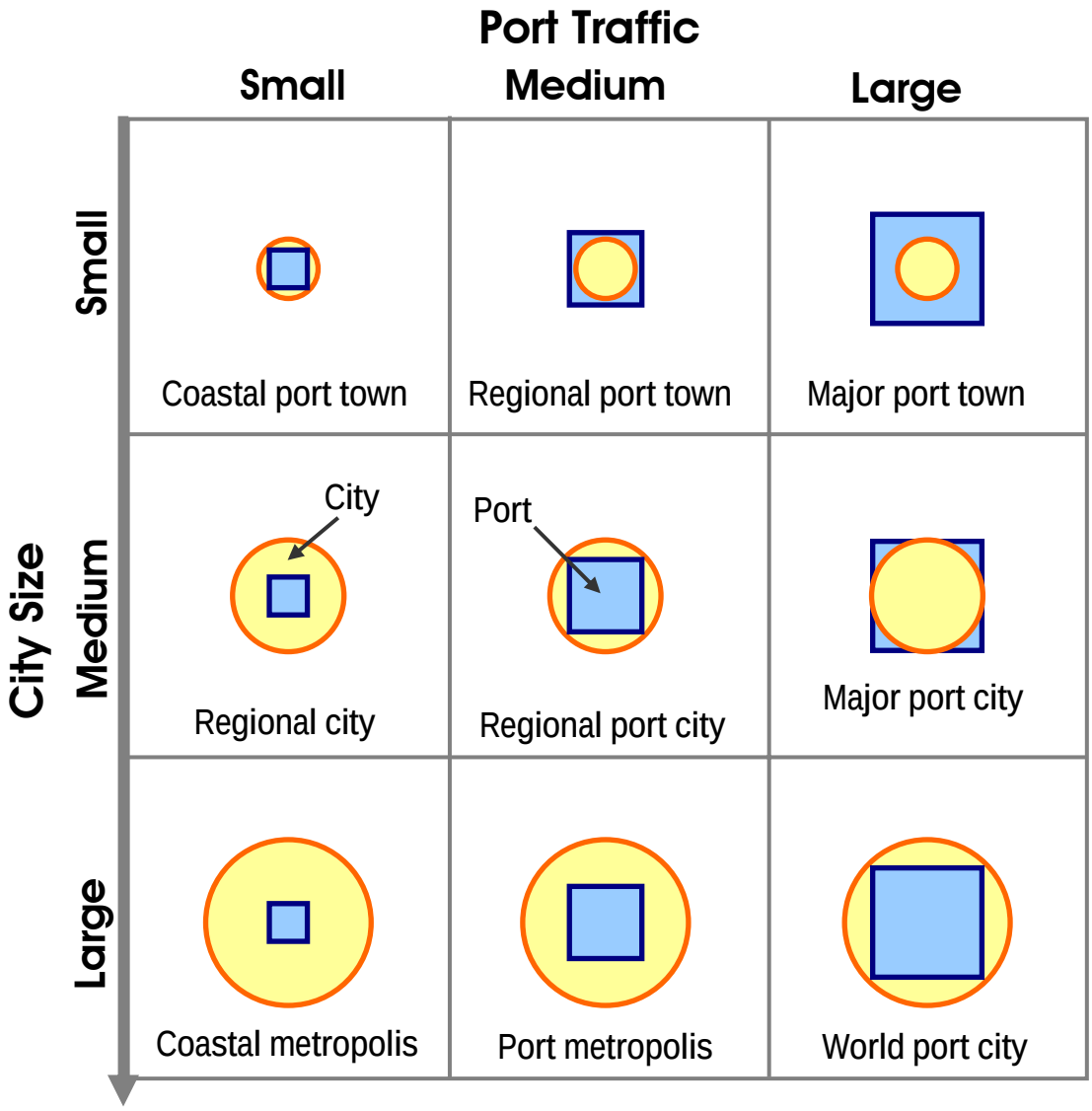
2.2 Relationship between Port and Cities

In this part of paper we will analyze using empirical literature that might be able to explain the relationship of port and cities. According to Fujita (Fujita and Mori, 1996) the cities formation is equally likely to be initiated at inland and port location. In this context, port cities have the extra advantages of transport access, they more likely to grow dominantly than non-port cities, and eventually some non-port cities may even be absorbed by port cities. This phenomenon can explain the relationship between port and cities location and open up our perspective about port cities.

As we speak a while ago, port cities have an advantages cause by they strategic geography for trade that eventually generates their growth. Rodrigue (1999) described, *typology of port cities* can explain the size of port cities that determined by their port traffic (See Figure 1). In that picture we can determine the type of port cities. It can also show us the relationship between port traffic that

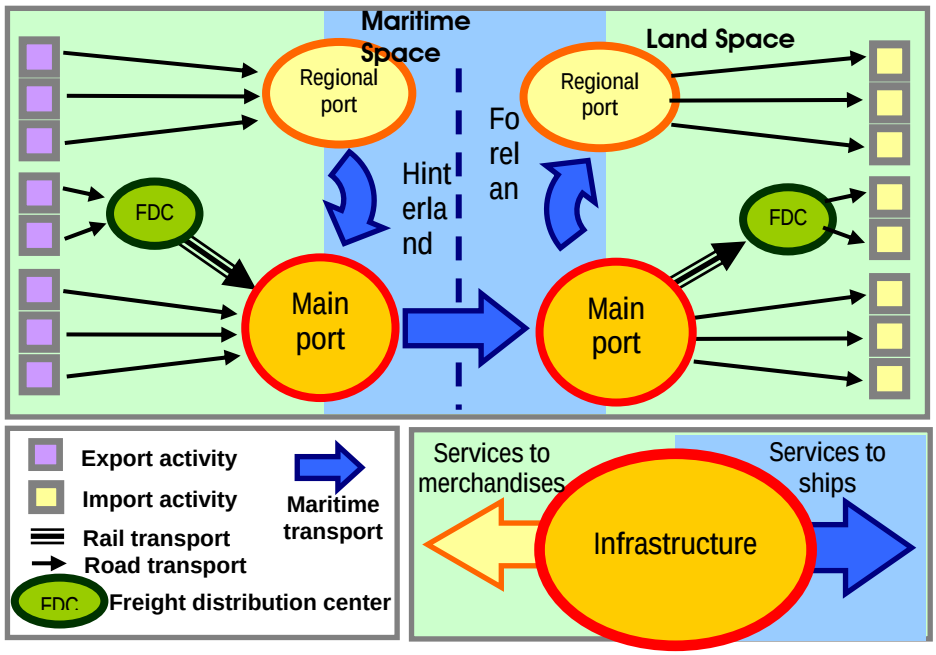
we assume as the economic activity at port that can be used to determined the type of port cities. Using Rodrigue typology we can assume that port traffic is factor in explaining the development of cities.

Figure 1. Jean-paul rodrigue " Typology of port cities"



2.3. Port Function in general

Ports have come to be associated with the public interest because of the concept that they should be accessible to all potential users and the benefits from the port should go to all citizens. Historically, countries such as France have maintained that ports should remain in the public sector while other countries such as England have allowed private dock companies to establish ports. According to French law, “public service” refers to services that are permanent, adapted to the needs of the user, and are to be provided equally to all users. Permanence refers to services to be provided without interruption. Equal provision argues against discrimination of individuals but not of situations. (ADB, 2000).



“Figure 2. Jean paul rodrigue port function”

Many port cities in general may be described as a centre of transportation and trade. The following statement can visualize using Rodrigue model (Rodrigeu,1999) that described a port function (Figure 2). The model can explain the role or we can tell it as a function of ports. We can see that there were two kind of port. The first one is the main port. The second one is regional port. The main port function is as a centre that served regional port and other activity that has connectivity with economic activity. Port is an infrastructure that creates

service to its users. Import or export activity needed service from the port. And because of it city with port generates large amount of services on their economy.

2.4. Port cities as growth pole

In real life, however, we often find that cities arise near rivers and coasts. It seems that many of these cities developed as transportation hubs or markets for interregional trade, since these locations provided better access to other regions. Thus, the geographical features of locations (differences in transportation costs relative to other regions) play an important role in determining the locations of cities (Atack and Passell (1994) Cronon (1991) discusses how advantages in transportation costs to the East made Chicago a commercial and transshipment center in the 19th century Midwest region of the United States (Cronon, 1991)

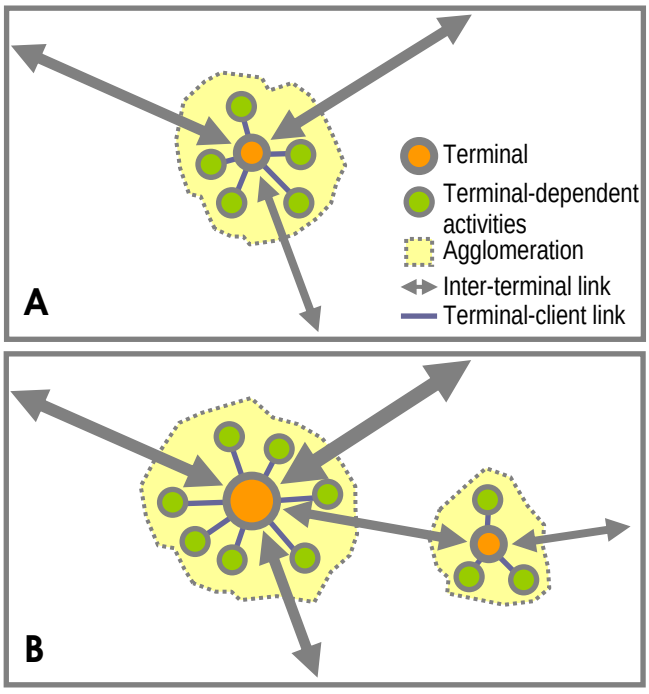


Figure 3. Terminal as Growth pole

Base on Geyer (2002), Cities in particular have two important roles to their surrounding. An urban center such as cities serves as a centre of its rural surrounding and as a mediator of interaction of the world outside. This statement may consider a city have a strong influence, force or power on their rural surrounding. According to centre and periphery analysis (Krugman 1991b), Port cities will be consider as a centre that have and important role to its periphery. From this statement we can assume that the rural surrounding have a strong dependency on the cities in particular. This statement is strengthens with Rodrigue (1999) who described that a terminal such as port cities has important roles in their rural surrounding. The advantages of transportation make the region that located near the port cities have a strong dependency on that port city because, not every cities have a transport access. This dependency creates and agglomeration of economic activity. The agglomeration of economic activity can generates trade and eventually, gaining growth.

3. Methodology

The objective of this paper is to investigate what factors influence the growth of main Indonesian port cities. In this section, we provide an estimation framework. We assume that a firm evaluates potential profits at alternative locations at each time period, and would consider the growth of the port cities rise because of the role of its port and location.

In this part of paper we try to explain the relationship between the growth of port cities and factor that cause by agglomeration such as manufacturer and the flow of goods in port that represent the economic activity at port (port traffic). From a theoretical literature that has been explain from the previous chapter we can form two models that based on a regression models.

- ✓ The growth in cities can be viewed as the GDRP of the cities. GDRP described the flow of goods and service in value at regions.
- ✓ Manufacturer industries can be viewed as the total of manufacturer labor in use at city. Because is to naïf to see it using the number of industries that located in the city to represent relationship with city growth.

- ✓ Port traffic viewed as the flow of goods at cities port. Whether export or import is required service from port. So, for this variable we can make an equation:

$$LB_{it} = \sum X_{it} + M_{it} \quad \text{.....(1)}$$

LB_{it} denote as the flow of goods at port in city *i* and time *t*. X_{it} denote as Export at port in region *i* and time *t.* M_{it} denote as Import at port in city *i* and time

From desirable literature we can form the first model to explain economic growth in cities that cause by industrial agglomeration and the flow of goods. As apriority we believe that all dependent variable all positively related to dependent variable. The model :

$$Y_{it} = \alpha_0 + \alpha_1 TKM_{it} + \alpha_2 LB_{it} + u_{it} \quad \text{.....(2)}$$

In equation (1) Y_{it} denote as the GDRP (PDRB) in city *i* at time *t*. TKM_{it} denote the manufacturer labor in use at city *i* and time *t*. and the not less important variable in the regression is LB_{it} denote as the flow of goods at port in city *i* and time *t*.

From the first model we could see the capability of manufacturer and the flow of good for explaining economic growth in port cities with the empirical result and from it we can se the phenomenon about economic growth in port cities that cause by the strategic location in accessing transportation under the frame work of Agglomeration and New Economic geography.

In light of these considerations, our approach to explain growth in port cities in this study is to estimate panel data uses generalized least square (GLS). Panel data give more informative data, more variability, less co linearity among the variable, more degrees of freedom and more efficiency.

Beside that panel data allow us to construct and test more complicated behavioral model than purely cross-section or time –series data (Baltagi,2002). We use the GLS approach because The GLS technique pays less attention to residual associated with high-variance observation (by assigning them a low weight in the weighted sum of square residuals it minimize). Notice that the OLS

estimating line gives a better fit to the data then the true relationship (Kennedy,1996) .

In this paper, we have used the data published at the city level by Indonesian central beureau of statistics. The countries data for this information is annual data. City data based of are: Surabaya, Jakarta, Makasar, and Medan. This countries are cross section identifiers in panel data which time series data set in analysis is 1993-2001.

4. Empirical Result

In Indonesia, there are many cities that developed according to the characteristic of the cities. Because of it, cities in Indonesia have many differences in several aspects. Big cities such as Jakarta, Medan, Makasar, and Surabaya that have geographical advantages (Water access) may have a big concentration of economic activities in their region. Other regions that have another advantages and disadvantages may development according to the needs of the region. Some regions that have many advantages will develop more gradually than other region that doesn't have many advantages. Base on Deichmann, Kaiser, Lall and Zallizi, (2005) Spatial concentration of economic activity occurs mainly because some regions have characteristics that attract more firms to be established there than in other regions. Big cities such as Jakarta, Medan, Makasar, Surabaya have some characteristic that attract many economic activity because in that cities have an advantages such water access that can be a convenient place for trade.

Based on Richard Blankfeld (2002) research on Indonesian port described that, there are four main port cities that served other regional port in Indonesia. That port is separated by four IPC (Indonesian port company).**IPC 1** is headquartered in Medan and has responsibility for the commercial ports of the three provinces of Aceh, North Sumatra and Riau. The corporation has 22 ports. The Riau port of Batam, just to the south of Singapore, is not included among the corporation ports. In 1991, the public port corporations were changed from a public corporation to state-owned company. **IPC II** is headquartered at Tanjung Priok, the port of Jakarta. The corporation has responsibility for commercial

seaports of eight provinces, namely, West Java, West Kalimantan, West Sumatra, Bengkulu, Jambi, South Sumatra, Lampung, and Bangka Belitung. IPC II has recently assumed control of the ports in Batam. **IPC III** is headquartered at Surabaya's port of Tanjung Perak. The corporation has ports in eight provinces, namely, East Java, Central Java, Bali, West Nusa Tenggara, East Nusa Tenggara, Central Kalimantan and Southern Kalimantan. The corporation has 19 ports with branch offices and 21 subsidiary ports. **IPC IV** is headquartered at the Ujung Pandang port of Makassar. The corporation has a total of 21 ports serving a huge area stretching from East Kalimantan to Irian Jaya, and including Sulawesi and the Maluku islands.

The function of port as an infrastructure in transportation generates agglomeration both manufacturer industries and the traffic of goods in ports. In such way, we can see that factor that influence growth in port cities are manufacturer industries and the traffic of goods in port. These analyses of course can not being perform in such way. We completed the analysis using the empirical result using a regression analysis.

The regression result in table 1 described that the model is good enough to determine the economic growth of major port cities in Indonesia

Variable	**Dependent**
Independent	**PDRB**
Constanta*	972165.4
t-stat	2.472403
(prob)	0.01
TKM	13.84071
t-stat	1.48174
(prob)	0.1479
LB*	0.147182
t-stat	9.654983
(prob)	0
F(prob)	0
R Squared	0.85313
Durbin Watson	1.523746

* = Significant at 1 %

Table 1. Regression result using GLS method

In table 1, we can see that the all variable, such as manufacturing labor and export-import activity at ports are highly significant simultaneously to influence and can be explaining PDRB of those port cities. The most importance of all, the model can make us see that the growth in port cities determine by both manufacturer industries and the traffic of goods in port. For manufacturing industries in small open economies that do not have influence on world prices, the higher the transport costs, the more that they will have to pay for imported intermediate goods, and the less likely they can compete in export markets. Countries with higher transport costs would also be less likely to attract foreign investment in export activities (Fujimura, 2004).

Partially, manufacturer industries are not significant, it only because the industrial agglomeration is optimum. The roles of these cities are not particular in manufacturing activity but provide service and trade activity, so could develop industrial performance of hinterland. In a dispersion theory, we can see the agglomeration of industries make the demand of land increase gradually. The increasing of land use demand for industries generates the price of land and eventually the compensating using land near agglomeration location is not logic any more.

As shown, transport costs may be an important barrier to trade and could have an important effect on income. The nature of services provided by shipping companies forces them to be transnational companies serving more than one country. In general, these companies have access to international capital markets and they are able to hire workers from all over the world, although under some restrictions sometimes (Clark, et al, 2004).

Findings from the economic geography literature and empirics (Redding and Venables, 2004; Limao and Venables, 2001) indicate significant gains to be exploited from reducing transport costs by investing in cross-border transport infrastructure and associated regional integration like ports. Practice in cross-border economic cooperation also indicates benefits from regional transport facilitation including the elimination of non-physical barriers such as standardization of customs procedure. On the other hand, both theoretical and

empirical literatures indicate asymmetric incidence of the benefits of regional integration (reducing barrier inter-region) among developing economies or among cities, necessitating mutually acceptable coordination and/or compensation arrangements.

Fujimura (2004) argued that transport infrastructure, such as port, via their impact on trade, is likely to affect cities' long-run rate of economic growth. Many empirical studies point to the positive impact of increased trade and openness on economic growth. They appear to share an understanding that one of the common threads in the "East Asian Miracle" stories is the openness of the economy and the virtuous cycle of increased trade, economic growth and investments in export-oriented manufacturing industries that are in comparative advantage.

According to Bairoch, (1985), the mere existence of cities may be viewed as universal phenomenon that's Importance slowly but steadily increase during the centuries proceeding sudden urban growth that appeared during the nineteenth century (Fujita and Thiese, 2002). Still about cities, Base on Geyer (2002), Cities in particular have two important roles to their surrounding. An urban center such as cities serves as a center of its rural surrounding and as a mediator of interaction of the world outside. This statement may consider a city have a strong influence, force or power on their rural surrounding. Fujita and Thiese said that there are two opposing types of forces, That is, *Agglomeration or centripetal forces and dispersion or centrifugal forces*. On Fujita and Thiese statement, we can generalize it on the two important roles of cities. Cities serve as a centre and as a mediator of interaction of the world outside because of the agglomeration forces.

Agglomeration forces generate from certain aspect like Fujita have said in his book Economics of agglomeration that trade theory to be the branch of economics that has paid most attention to the spatial dimension. The reason of this condition influence by the mobility of commodities shipped as well as changes in the mobility of factors who is affecting the location of industries, the geography of demands an eventually the pattern of trade. From this we can conclude that, a spatial advantage of cities can influence economic activity that generates trade.

Marsudi Djojodipuro (1992) makes a statement that Major city usually interest industrial location and because of it a major cities easily generates agglomeration. The gathering of the industries can makes external economies. In other words we can say that is agglomeration economies. This economization happen because many external factor can be consumed by industries in that cities; Such as geography advantages that bring a convenient place for trade (Export and Import). Example: Cities that located in port sites attract industries because it can reduce transportation cost. The emprics suggest that even if tariff and institutional obstacles are removed, the penalty of distance will continue to hold down the incomes of remote regions.

5. Conclusions

There are four main port cities that served other regional port or other islands in Indonesia. That port in those cities is separated by four IPC (Indonesian port company). **IPC 1** is headquartered in Medan **IPC II** is headquartered at Tanjung Priok, the port of Jakarta. IPC II has recently assumed control of the ports in Batam. **IPC III** is headquartered at Surabaya's port of Tanjung Perak. **IPC IV** is headquartered at the Ujung Pandang port of Makassar.

Manufacturing labor and export-import activity at those ports can be explaining and influencing PDRB of those port cities. Partially, manufacturer industries are not significant, it only because the industrial agglomeration is optimum. The roles of these cities are not particular in manufacturing activity but provide service and trade activity, so could develop industrial performance of hinterland

Cities with higher transport costs would also be less likely to attract investment in trade activities, because cities are provider and transitory of economic activity. Cities in particular have two important roles to their surrounding. An urban center such as cities serves as a center of its rural surrounding and as a mediator of interaction of the world outside. This statement may consider a city have a strong influence, force or power on their rural surrounding.

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