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**Urban Amenities and Regional Performance:  
Case Study of Indonesia****Titik ANAS***Padjajaran University and Presisi Indonesia***Widdi MUGIJAYANI***Presisi Indonesia***Estiana CAHYAWATI***Presisi Indonesia***Muhammad RIDHO***Presisi Indonesia*

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**Abstract:** *The aim of this paper is to evaluate the importance of urban amenities to economic development using Indonesia as a case study. Indonesia has rich micro-level data on urban amenities, which we group in this paper into 12 categories, namely education, health, religious, and shopping facilities; accommodations; banks; historical sites; recreation sites; restaurants; public transportation stations; modern shopping facilities; and gas stations. Using panel data of 2007 and 2014, we test how urban amenities affect regional development, proxied by employment and population growth. We show that education and shopping facilities significantly affect the growth of employment and population. We also found that the effect of the availability of education facilities is stronger in the regions with industrial parks.*

**Keywords:** firm-level data; globalisation; productivity

**JEL Classification:** F15; F23

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## **1. Introduction**

Studies found that urban amenities affect urban region performance. Nzaku and Bukenya (2005), Artz and Orazem (2006) and Carruthers and Mulligan (2007) found that urban amenities development affected incomes, employment, as well as population growth. Nzaku and Bukenya (2005) found that the differences in quality of life and amenities can explain a large portion of the trends in per capita income, employment, and population change across counties in the Southeast US. In the case of Indonesia, how amenities affect economic variables is currently under-researched. To the best of our knowledge, there are limited studies addressing this issue.

It is worth noting that urban amenities are defined as a set of public and private goods and services, which generate positive externalities for the resident and visiting population (Machado et al., 2013). It encompasses transportation and communication infrastructure, entertainment and sport activities, education and health facilities, housing and environment, and other activities that contribute to the resident's well-being.

Thus, there are two main research questions in this paper in terms of the dynamic analysis on the relationship between amenities and regional performance:

- (1) How did urban amenities develop in Indonesia between 2007 and 2014?
- (2) Does development of urban amenities regions correlate with regional performance?

The Village Potential Statistics (PODES), the Indonesia Database for Policy and Economic Research (INDO-DAPOER), and other data, as well as econometrics analysis, will be employed to address the research questions. This paper has the following structure: Part 2 highlights some previous literature reviews, Part 3 discusses data of the development urban amenities in Indonesia and methodologies; Part 4 discusses the results and findings, and the final part concludes this paper.

## **2. Dynamic Analysis on the Relationship between Amenities and Regional Performance**

### **2.1. Literature Review**

The dynamics analysis of regional economic performance and amenities provides an intuitive tool for studying changes in population, employment, and integrated amenities on regional economic performance. Steinnes and Fisher (1974) pioneered the development of its theoretical foundations, derived from the interdependencies of household residential and firm location choices. This view addresses the notion of whether 'people follow jobs' or 'jobs

follow people'. Most of the published literature analysing the relationships between regional economic performance and amenities concerns the US. There are some studies regarding other developed countries, such as Canada (Beckstead, Brown, and Gellatly, 2008; Ferguson et al., 2007) and Europe (Bosker and Marlet, 2006), with very few on developing countries.

In order to address this issue of causation and interdependency, Carlino and Mills (1987) constructed a now classic two-equation system. Since then, it has been widely used by several regional scientists to examine regional economic growth. Most of these studies demonstrate a positive relation between the integrated amenities and regional economic performance, whereby amenity-rich regions appear to have a positive and significant effect on regional growth, in comparison to amenity-poor regions. Most empirical studies found a positive relationship between amenities and economic performance, in particular employment and/or population, such as: Kim, et al. (2005), Bosker and Marlet (2006), Deller and Lledo (2007), and Ferguson, et al., (2007); the details are as follows:

Kim, et al. (2005) also investigated the relationships between amenities and regional economic development indicators. Using an aggregate factor score approach and a spatial error modelling approach, they found that the only amenity attribute that was positively related with one of regional economic development indicator was the presence of lakes. The other amenities were found to be insignificant at the county level. This finding implies that different types of natural amenities have different effects on regional economic development.

Bosker and Marlet (2006) examined growth differences between European cities using a simple ordinary least squares (OLS) regression to get estimates of the partial correlation of each individual variable within a certain subcategory. They found that the smaller, less dense, safer, amenity-rich cities with high levels of GDP per capita are growing the fastest. When a distinction is made between national, EU, and non-EU population growth, they also found that the EU non-nationals are concentrated in cities with high levels of human capital, and that non-EU population growth is determined by climate and employment structure.

Ferguson, et al. (2007) used weighted least squares (WLS) and a spatial error model to estimate the differential influence of natural and modern amenities on population change across age groups using artificial cohorts in all provinces (excluding the Northern territories) of Canada. They constructed violent crime rates, property crime rates, and distances to nine government/private services as a proxy for their accessibility. They found that in urban communities, amenities, and economic factors appear to be about equally important, while in rural communities, economics clearly dominates.

Deller and Lledo (2007) investigated the impact of amenities on regional performance indicators (e.g. population density, employment density and income growth) by estimating simultaneous equations of regional adjustment models wherein changes in population density, employment density, and the average annual wage are endogenously determined. According to this framework, the model is typically represented as:

$$(1) \quad P^* = f(E^*, I^* | \Omega^P)$$

$$(2) \quad E^* = g(P^*, I^* | \Omega^E)$$

$$(3) \quad I^* = g(P^*, E^* | \Omega^I),$$

where  $P^*$ ,  $E^*$ , and  $I^*$  are equilibrium levels of population, employment, and per capita income, respectively, and  $\Omega^P$ ,  $\Omega^E$ , and  $\Omega^I$  are a set of variables describing initial conditions and other historical information. Contained in the latter set of information are measures of amenity attributes. This formulation expands the Carlino-Mills framework by explicitly introducing income into the structural framework. They found that having more urban or built amenities has a significant positive impact on population and employment growth. Similarly, Nzaku and Bukenya (2005), and Artz and Orazem (2006) also used the general formulation from Carlino and Mills (1987).

Carruthers and Mulligan (2007) examined the growth within US metropolitan areas using regional adjustment models that characterize migration as a spatial response to economic opportunity in the form of employment, higher wages, other means of advancement, and personal preference for particular amenities. The methodology used a spatial two-stage least squares technique. They found that a natural amenity index positively influences population density, employment density, and income growth due to amenities' influence on real estate values.

In Indonesia, Suryadarma, et al. (2006) found that inequality persists between urban and rural areas, particularly in dimensions such as the difference in access to education and health facilities; education and health outcomes; voice and political participation; and income and consumption between people based on region of residence and ethnicity. Meanwhile, Mulyana (2014) asserted that urbanisation in Indonesia is triggered by economic developments, notably in industry and services sectors, that tend to locate in large cities due to the availability of utilities such as water supply, electricity, seaports and airports, concentration of skilled labour, and markets. Moreover, the World Bank (2019) explored the challenges and opportunities associated with Indonesia's urbanisation, highlighting that urban amenities are still difficult to access in some areas including urban areas that are more developed. Many urban areas in

Indonesia have similar issues such as congestion and inequality, even in some smaller cities.

## 2.1. Data

The data for the amenities by regency/city (*kabupaten/kota*) in Indonesia were taken from PODES, which was surveyed in 2007 and 2014, for amenities variables; and INDO-DAPOER from the World Bank for regional economic performance. Population is proxied for attractiveness of cities to residents, while employment growth is used as a proxy of economic performance. Meanwhile, the amenities indicators available can be categorised into:

- (1) education facilities,
- (2) health facilities,
- (3) religious facilities,
- (4) shopping facilities,
- (5) accommodations,
- (6) banks,
- (7) historical sites,
- (8) recreation sites,
- (9) restaurants,
- (10) public transportation stations,
- (11) modern shopping facilities, and
- (12) gas stations.

For 2007–14, while most amenities in Indonesia experienced an increasing trend, which implies an improvement of their quantity, primary schools did not. One of the reasons for this is the school regrouping policy or the merger of some schools into one: for example, in academic year 2013–14, there were 18 primary schools in Semarang (Central Java Province) that were merged into nine schools (Ratnaningsih et al., 2017). Meanwhile, restaurants also experienced a significant decrease during that period, in part due to the change in their definition and the consumer tax, which was also considered in the latest period. On the other hand, indicators that increased significantly were accommodation, shopping facilities and junior high schools, as shown in Table 1. This paper also considers religious facilities, since Indonesians are among the most religious people in the world (The Jakarta Post, 2020); thus, the distance from their residence to the religious facilities may affect surrounding population density. Although there were some improvements in terms of quantity of urban amenities during that period, amenity inequality persists between urban and rural areas, as found by

Suryadarma, et al. (2006). The different level of amenity quality in urban and rural regions also became an issue in Indonesia (Diana et al, 2013; World Economic Forum, 2016).

To simplify the analysis, we grouped some amenities facilities into more general categories: for example, education facilities comprise primary, junior, and high schools, as well as universities, while health facilities comprise hospitals, public health centres, and polyclinics. Religious facilities are mosques, church, temples, and other religious facilities. Shopping facilities include traditional markets, minimarkets, and small shops. Moreover, hotels and guest houses are part of accommodation facilities indicators.

**Table 1: Descriptive Statistics of Amenities in Indonesia, in Regency/City Level: 2007 and 2014**

Amenities	2007			2014			Growth
	Min	Max	Mean	Min	Max	Mean	
Primary School	16	2,190	364.7	15	2,310	362.4	-0.6
Junior High School	3	639	88.5	8	866	107.2	21.1
Senior High School	1	233	36.1	2	321	42.2	16.9
University	0	101	8.1	0	124	8.9	9.9
Education Facilities	30	6,953	863.3	51	8,340	1,013	17.4
Hospital	n.a.	n.a.	n.a.	0	72	4.9	n.a.
Public Health Centre	n.a.	n.a.	n.a.	3	114	21.7	n.a.
Polyclinic	n.a.	n.a.	n.a.	0	592	25.4	n.a.
Health Facilities	n.a.	n.a.	n.a.	46	6,876	1,068	n.a.
Religious Facilities	44	19,361	1,823	36	19,253	1,895	3.9
Shopping Facilities	10	38,583	5,763	115	61,382	7,001	21.5
Accommodations	0	818	38.3	0	805	47.7	24.7
Banks	n.a.	n.a.	n.a.	1	731	54.8	n.a.
Historical Sites	n.a.	n.a.	n.a.	0	151	13.5	n.a.
Recreation Sites	n.a.	n.a.	n.a.	0	110	11.5	n.a.
Restaurants	0	2,083	124.2	0	1,068	73.7	-40.7
Public Transportation Stations	n.a.	n.a.	n.a.	0	27	3.1	n.a.
Modern Shopping Facilities	n.a.	n.a.	n.a.	0	117	8.4	n.a.
Gas Stations	n.a.	n.a.	n.a.	0	95	11	n.a.

Source: The authors' compilation.

## 2.2. Methodology

This paper adopts the Carlino-Mills growth model from the study undertaken by Deller and Lledo (2007) to see whether amenities have an impact on regional economic performance in Indonesia. Equations (1) and (2) calculate the impact of the amenities on regional economic performance considered in this study. The model is an OLS, which is commonly used in a dynamics analysis that can be expressed as:

$$\text{Emp Growth}_{t-x} = \sum \text{AMENITIES}_t + \varepsilon_t \quad (1)$$

$$\text{Pop Growth}_{t-x} = \sum \text{AMENITIES}_t + \varepsilon_t \quad (2)$$

where Pop Growth and Emp Growth are the population and employment growth of the region, respectively. The amenities variables are: (1) education facilities; (2) health facilities; (3) religious facilities; (4) shopping facilities; and (5) accommodations;  $\varepsilon$  is the error term. Scatterplots between amenities indicators and performance accommodate indicators that are excluded in the model and to elaborate the estimation result.

## 3. Results and Discussion

Table 2 shows the regression result for the employment growth model (Model 1-2). This paper includes amenities listed in the descriptive table in the model; however, only two types of amenities, i.e. education and shopping facilities (positive and significant at 1%), consistently affect employment growth. In terms of coefficients, education facilities have a higher coefficient than shopping facilities, which implies that education facilities play a more important role for residents in choosing their residencies and workplaces, proxied by population and employment growth. This is in line with the previous empirical findings, such as Beckstead, Brown, and Gellatly (2008).

Urban areas in Indonesia commonly have better access to urban amenities including universities. Similarly, most sectors that have higher job creation are in urban areas. Adding the dummy of industrial parks in a region shows a consistent result for both amenities variables, meaning the presence of industrial parks affects employment. This finding is in line with Mulyana (2014), that urbanisation is driven by high employment growth. In addition, religious facilities and accommodation facilities are insignificant in our regression results; therefore, we dropped the variables from the models.

We also consider the alternative model using population growth as the dependent variable (Model 3). The result shows a similar pattern for education and shopping amenities. However, the dummy of the industrial park result becomes insignificant, and the other

amenities variables are still insignificant. If we run fewer variables, only education and shopping facilities for example, the result changes and all amenities' variables become insignificant. This implies some econometric issues such as multicollinearity may occur. The other possible argument is the evidence that urbanisation in Indonesia is triggered by developments in the industry and services sectors, which tend to locate in large cities due to the availability of amenities. The relationship between population growth and amenities may be indirect; thus, the more appropriate variable is employment growth.

**Table 2: Regression Results of Employment Growth and Population Growth for 2007–14**

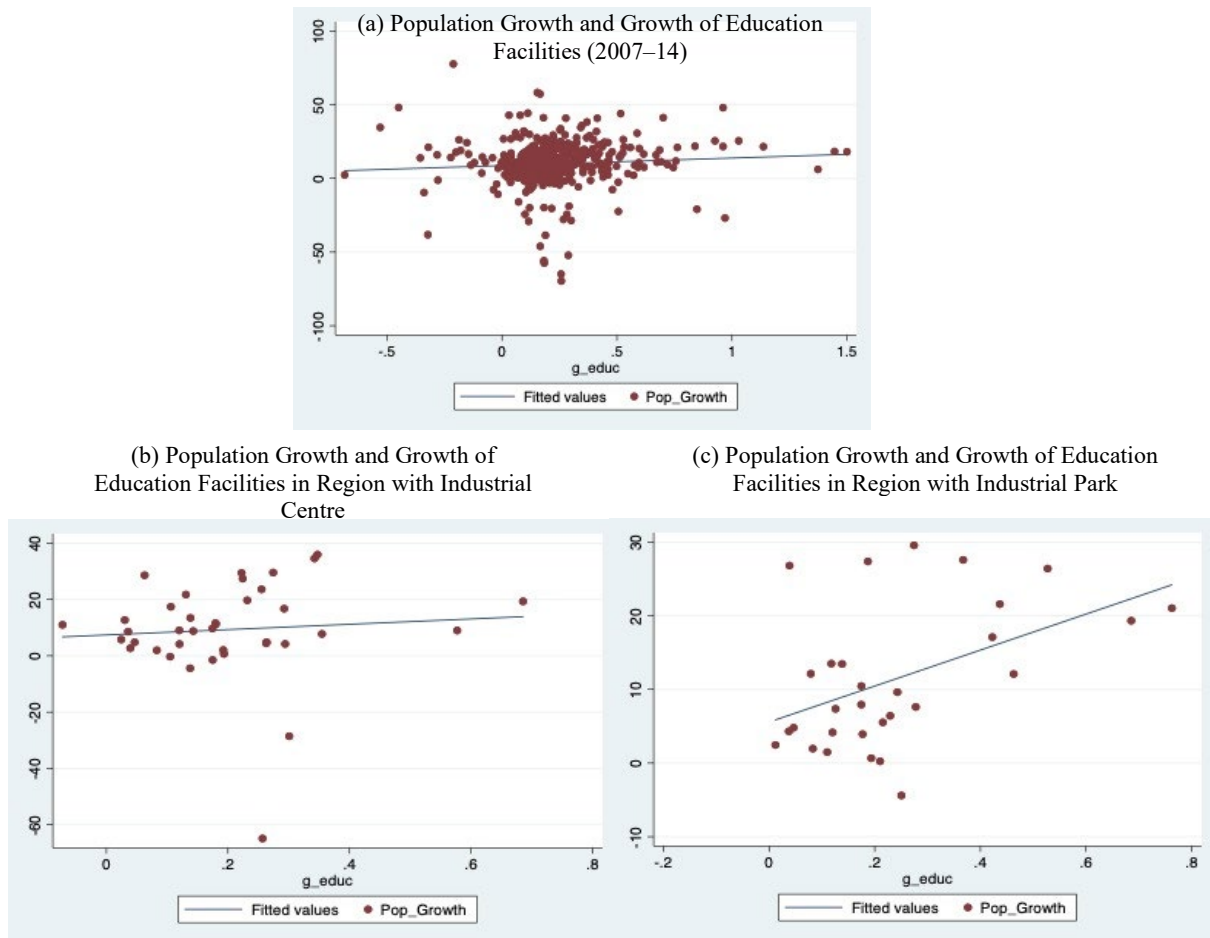
	(1) <b>g_emp</b>	(2) <b>g_emp</b>	(3) <b>g_pop</b>
g_educ	0.310*** (5.93)	0.294*** (5.66)	6.617* (1.84)
g_shop	0.082*** (3.57)	0.082*** (3.61)	3.064* (1.89)
industrypark		0.049** (3.19)	-1.261 (-1.37)
g_religion			1.007 (0.17)
g_accom			0.184 (0.37)
_cons	0.0697*** (3.83)	0.0610*** (3.35)	7.918*** (6.76)
N	432	432	400

Source: The authors' compilation.

To elaborate the result, this paper also shows the possible correlation between the existence of industrial parks and education facilities using a scatterplot. This relationship is also confirmed, as the slope of the graph for regions with industrial parks is steeper than the line of regions without industrial centres (Figure 1). This might be due to industrial park establishments requiring more educated workers and facilities for their families. To support industrial parks, government as well as private sector can provide better education facilities.



**Figure 1: Population Growth and Growth of Education Facilities, 2007–14**

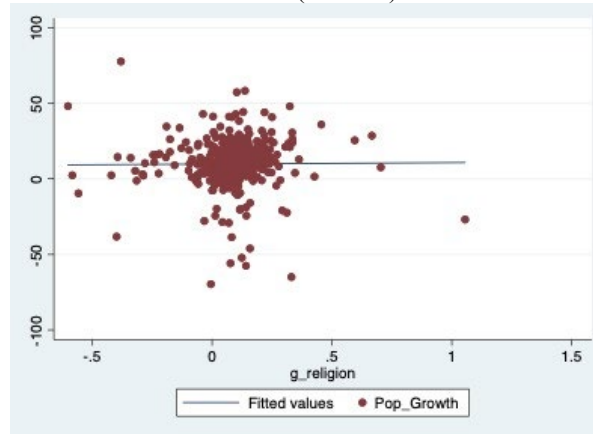


Source: Authors' calculation.

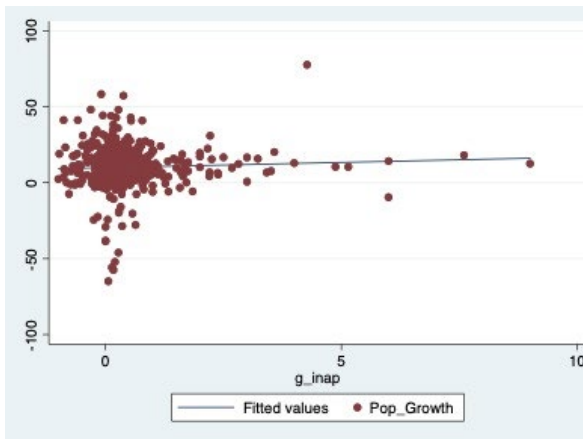
Figure 2 (a), (b), and (c) show the results of a scatterplot with an overlaid linear prediction plot between population growth and growth of religious facilities, healthcare facilities, and shopping facilities showing how their correlations are not really clear. This supports the findings from the regression model. Further investigation such as urban/rural analysis and other disaggregation analysis are required.

**Figure 2: Population Growth and Growth of Amenities, 2007–14**

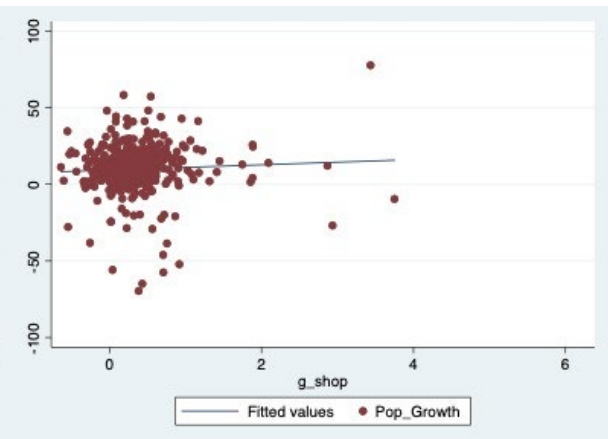
(a) Population Growth and Growth of Religious Facilities (2007–14)



(b) Population Growth and Growth of Health Care Facilities (2007–14)



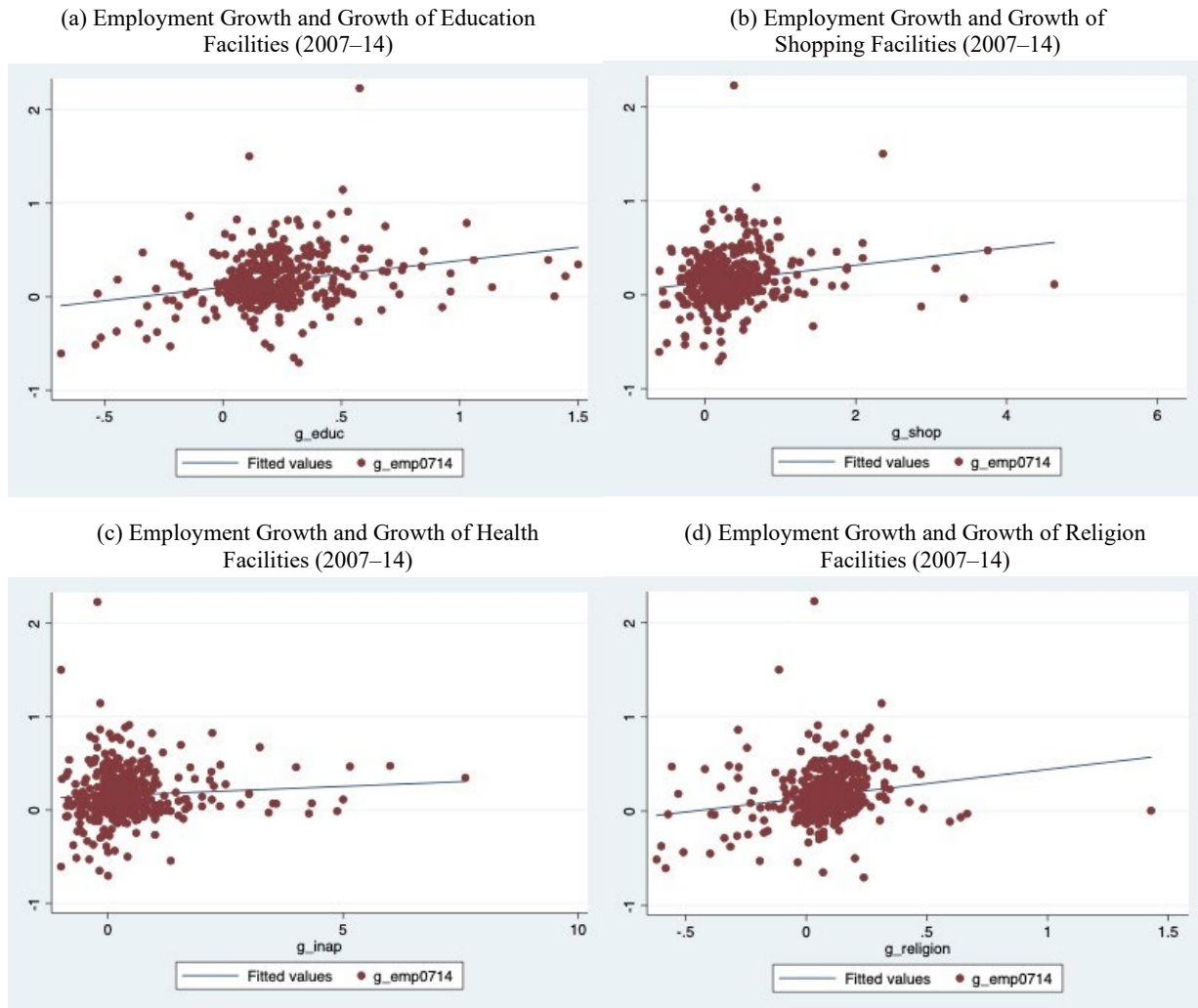
(c) Population Growth and Growth of Shopping Facilities (2007–14)



Source: Authors' calculation.

Changing the dependent variable with employment growth, the correlations between urban amenities and employment growth are relatively clearer. Both education and shopping facilities have a positive and significant relationship, which is in line with the estimation result. Correlation between the growth of health care facilities and that of employment is not clear because the capacity of health care in Indonesia is still limited in terms of the number of hospitals, clinics, and healthcare workers. An interesting finding is a positive correlation between employment growth and religious facilities. Religious facilities are usually provided in the offices or industries to accommodate the workers' needs.

**Figure 3: Employment Growth and Growth of Amenities, 2007–14**



Source: Authors' calculation.

#### 4. Conclusion

In terms of the dynamic relationship between amenities and regional performance in Indonesia, the empirical results indicate that there is a positive and significant correlation between employment growth with education and shopping facilities. Meanwhile, the development of health care facilities in Indonesia is still limited, so its correlation in this study is not clear. The other urban amenities we test are insignificant in affecting both employment and population growth. This study also shows the inequality of urban amenity availability. Most urban amenities variables are widely available in urban areas in Java.

This study shows that urban amenities indeed have a positive correlation with employment growth, which, in turn, increases regional performance. This study shows there is

a direct relationship between amenities and economic performance variables.

We use individual urban amenities variables to test their impact on regional performance, while most studies use urban amenities indices. This method allows identifying which variables of urban amenities have a higher effect. Nevertheless, there are several limitations that warrant discussion. First, the development of the amenity measures, an improvement over variables using indices, could improve the relationship of the amenities. In essence, we selected a handful of variables from a long list in the dataset. Second, this study assumes that the region is the correct unit of analysis and explicitly assumes that there is no spillover across regency and city. Third, the method used in the study is still basic OLS; exploring the other methods may provide better analysis. Moreover, different economic performance variables can be explored, besides population and employment; for example, inflow migration may be more reflective of the effect of the attractiveness of urban amenities on people's movement decisions.

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