What is The Role of Land Value in The Urban Corridor?

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Abstract. The high movement causes traffic congestion and indicates high movement intensity along the corridor. The higher attraction of the land use will encourage the higher attraction of movement and economic values in the location. This attraction is also affected by the high mobility in the corridor supported by available transport infrastructure. Thus this causes land values become increase significantly. Land use along the corridor can be seen as commercial function because this activity is able to survive in the premium location. The purpose of this research is to identify the effect of land use change toward land values in the commercial corridor. This research used positivistic method with descriptive analysis. The result shows that the land values change in commercial use in the corridor has different pattern of land use change pattern according to physical condition and land use which causes highly economic attraction. The new commercial land is influenced by the distance to city centre or CBD (Central Business District). Land use and public facilities that have local and city scope services do not give the significant impact to land values change.

Keywords: Urban Corridor, CBD, Location Analysis, GIS, Land Use

1. Introduction

The high number of movements in corridor has caused traffic congestion that indicates the high intensity of movements on the land along the corridor. The higher land use attraction on the land, the higher trip generation and economic attraction in those locations. This attractiveness is also supported by transportation infrastructure that can enhance the accessibility and mobility in the corridor.

The land use along the corridor can be seen as commercial function because this activity function is able to survive in the premium location. When it comes to urban areas, land values increase will be much related to strategic site (location factor) that associated with the ease of broad range or access to transportation system and its location to other land uses or urban configuration [1]. Thus, land value change becomes one of the factors of land use change and both have strong linkages. The closer or the easier access to corridor will certainly give impact on land value rise.

The corridor space that plays to connect city centre to surrounding small towns has apparently encouraged more problems. These problems are caused by feedback relationship (interrelationships) between both of them that result in human migration flows, goods and services among them. The major issue occurred is transportation problem and land use change rapidly happened in the corridor space. The purpose of this study is to identify the effect of land use change toward land value in the commercial corridor. Which in turn, this land value will hold land market mechanism toward functional change and physical land in the corridor. On the other hand, intensity of development in the corridor should be biased handled in order to avoid the bottle neck occurrence [2] that will cause many problems for the main city and surrounding areas which can eventually decrease the urban economic value.

2. Urban Commercial Corridor

The corridor space usually develop to be regions with high frequency of movements due to availability of main transportation network dan make the corridor as commercial area [3]. Corridor, according to Duany and Plater-Zyberk [3] in The New Urbanism is the liaison and also the separation between residential neighborhoods and districts that should not just be a remaining space but become an urban element characterized by the appearance of continuity. Duany and Plater–Zyberk [3] noticed the role of corridor in relation to desa-kota that plays as magnet in urban dynamic. The activity between these two elements enable the high movements in both. These high activities which encourage corridor to become a dynamically inclined space following the growth of both magnetic element [4]. Corridor is an element that accommodates the relationship between two elements with mutual support. Krier [5] argued that in the case of a corridor study linking several new towns and access to a main city will have an increased role beyond just circulatory connections.

Along its development, there are commercial corridors or commercial strips as urban and sub-urban connections that accommodate high-speed vehicles. In relation to this function, buildings on commercial corridors are built with sufficient "setback" for the vehicle parking lot. According to Manning [6] this phenomenon was also found in commercial corridors that connect the new city. The temporary building was seen to fill the space between the permanent functions that have been previously filled such as the industrial function.

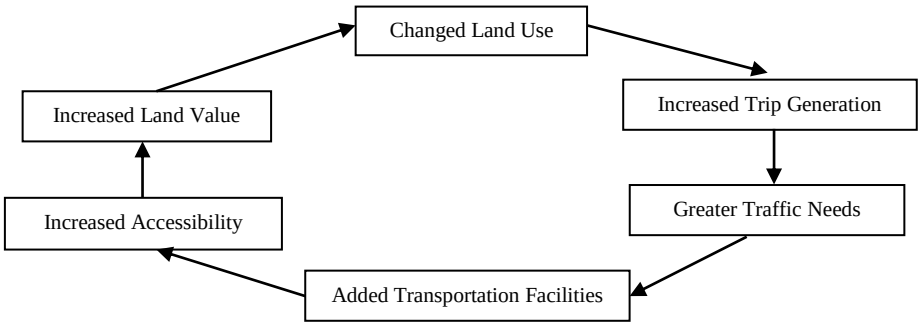
The length of trip led to a high movement in the corridor as a hub of the city center with urban periphery. The problems of infrastructure constraints in this corridor area are called as the bottleneck of corridor issue [7]. At the same time, many people enter the corridor because of the time to go and get home from work is almost the same. On the other hand, the provision of public transport facilities and infrastructure services have no different from regular hours. These differences make the prominent disparity between transport demand and fully services during high traffics [2].In Minner and Shi's research [8] commercial corridors is a common element in a city known as linear commercial in which within the corridor consist of commercial property built on land close to and oriented to the main road, arterial road or other highways. Commercial corridor is also called as habitat for local businesses and the region targeted for redevelopment. With spatial analysis in research conducted by Minner and Shi [8] found that local businesses tend to thrive in regions along commercial corridors that are located close to the city center.

2.1. Land Use Change

Land use is every form of human intervention to the land in order to accommodate the various life needs of both material and spiritual [9]. Most experts agree that land change is a consequence or impact of economic growth and cities, high urbanization, population change and increased activities in urban areas.The main factors causing land use change [10] are population, land value, and transportation system. The change of these three main factors will cause the changes in the activity system and spatially embodied in the form of land use patterns. While Wu and Silva [11] explained

land change is driven by combined factors or spatial and non-spatial factors that spur the process of dynamics of land change with the interaction among factors occured. At the same time, the process of urbanization in cities and changes in physical, social and ecosystem aspects resulting from the impact of urban growth triggered land change.

In terms of land use change in the corridor, Arnott, Palma, and Lindsey [7] stated that the urban corridor grew out of the development of a decentralized metropolitan area. Residential growth to suburbs or urban periphery and daily commuting movements between sub-urban to city center (bottle neck corridor). Consequently, those movements caused bad congestions during rush hour which result in the in-efficiency of urban economy. Hence, it is necessary to adapt and expand the efforts to handle the congestion problem by providing persuasive solution such as telecommunication facilities support, computers, electricity network and public facilities. Eventually the corridor grew into a commercial area along the urban corridor that became the commuting line.



Source : Adapted from J. Paquette (1980) in [12]

Figure 1. Land Use Cycle and Transportation

A land use change will lead to an increase trip generation. This rise will lead to increased level of accessibility that will lead to an increased land value in the area. The increasing land value will eventually lead to the emerge of activities that compatible with the condition in region. Thus it can trigger the development of high rise building intensity on the land. When transportation access to the activity space (land parcel) is improved, then the activity space will be more interesting and usually become more developed. With the development of space activities, it will also increase the need for transportation. This increase then causes an overload transport that must be addressed.

2.2. Land Value

The advantage of having a good connection in the high accessible area will lead to increased land value [13]. Commercial properties or commercial buildings have the most expensive land value, followed by single-family residences, multi-family housing, and condominiums. For commercial purposes, properties close to the station reap the high premium and positive land value. This is consistent with the economic theory that commercial property generally raises demand due to accessibility benefits and its proximity to major transportation facility. This is supported by Bocarejo which shows that the introduction of the BRT (Transmilenio) transport system in Bogota, Colombia that has had positive influence to the value of commercial properties. The farther the commercial area with Transmilenio corridor or BRT system station, the lower the land value in the commercial area [14] Cervero [13] added that there was no evidence that rail investment caused land value change, but hedonic price results show a strong relationship between proximity to the transit system and land value. The strong relationships found due to reflection from substantial differences in land use, modes and corridor, revealed that government policies and decisions have an important role in creating land use and land value [13,15–17].

In contrast, Balchin & Pierre [18] explained that the demand for land is a reflection of the benefits or needs emerging from the use of some land by the communities as potential users. The greater the benefits derived from land use in these locations for various purposes, the higher the land price or the land rent. Thus, the bid-rent curve of the commercial area will have sharp bid-rent curve because it has the highest degree of accessibility. In contrast, the bid-rent curve of settlement areas shows the sloping curve. Hence, it can be concluded that changes in infrastructure provision have a significant effect on the land use change.

3. Methodology

This research used positivistic approach with quantitative technique and descriptive statistical analysis. Descriptive analysis was used to analyze the effect of land use change in spatial configuration that influence the land value along the corridor by examining the relationship land value changes as an indication of the urban corridor development. Land use data used Landsat Data in the period years of 1993, 2004, 2011 and 2015. To ilustrate our approach, two corridors were selected in Seemarang as the case study. The chosen places represent the typical urban and suburban environtmens: Corridor of Semarang – Ungaran dan Corridor of Semarang – Mranggen. The knowledge used include type of land use, transportation network provision and service in the corridor, land value, physical change (non-built area to built environment); functional changes (residential to non-residential); spatial changes (small to large area), economic social change (non-commercial to commercial sector such as industrial, trade and service sectors); demographic sector (low population density to high population density).

4. Results and Analysis

4.1. The Effect of Urban Land Configuration to Land Value

Spatial configuration in the Corridor of Semarang-Ungaran and Corridor of Semarang-Mranggen shows the existence of public facilities with regional and national scope. Thus, its existence gives important influence to land value in those corridors. In Corridor of Semarang Ungaran is influenced by Diponegoro University which is a national university and become an influence to development of residential and service centers in Tembalang and Banyumanik Regions. These service centers include education, health and transportation. While Corridor of Semarang Mranggen is influenced by urban settlement area in Pedurungan and Pucang Gading Region. In addition, the proximity to the CBD become the major influence for comprehensive public facilities provision in this corridor.

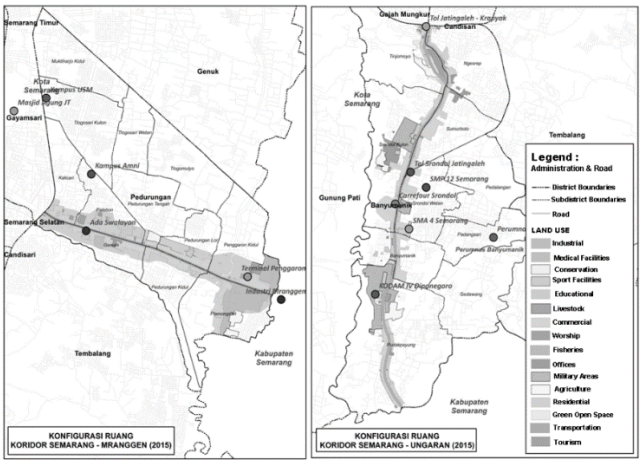


Figure 2. Spatial Configuration Corridor of Semarang-Ungaran and Corridor of Semarang Mranggen

4.1.1. Distance to City Centre

Simpang Lima is one of Central Bussiness Districts in Semarang. There are various activities in this areas such as trading, offices until entertainment activities. Simpang Lima become one of movement attractions for communities in and out of city. Distance to Semarang City Center will certainly affect the land value in the corridor. Based on this case, then the land value is selected as sample and analyzed its relationship with the distance to the city center. It can be seen from the graph that the land value on the property closest to the city center is more expensive than the property land value which is farthest from downtown.

Figure 3. Activity Points in Corridor of Semarang-Ungaran and Semarang-Mranggen

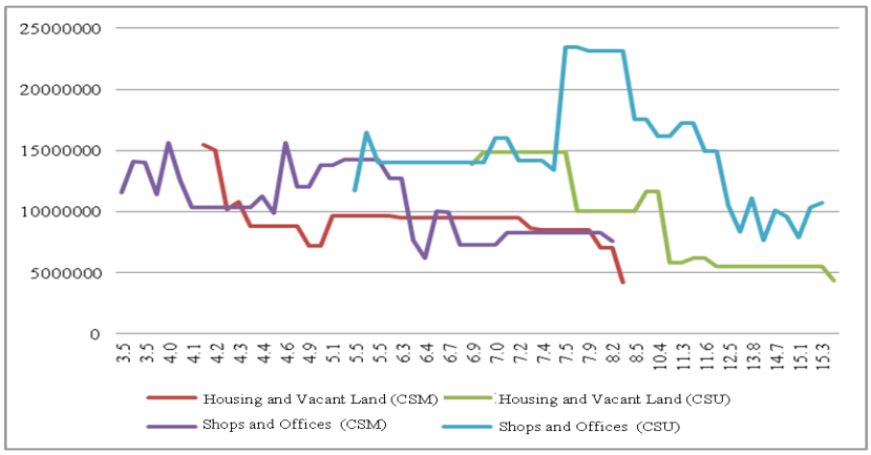


Figure 4. Fluctuation of Land Value toward Distance to City Centre

However, the graph also shows fluctuations of land value in the corridor where some properties with closer distance are cheaper (5.9 km) than the property further away from the city center (6.4 km). Corridor of Semarang-Mranggen has a land value pattern inversely proportional to the distance to CBD. The farther away from the city centre, the land value will decrease significantly. There is a difference of land value between shops and housing function. There is an increase of land value in the ADA Supermarket due to shophouses and Superindo market which became the trigger of crowd and human attraction. The land value rise in the area located in the intersection between Brigjen Sudiarto street and Soekarno Hatta artery road. Hence, there is no road median in this area and it enables people to access and reach the location in opposite direction without having to rotate. The increase of land

value is about 30%, not as much as the land value happened in activity centers in Corridor of Semarang Ungaran.The housing function and vacant land do likewise, the pattern of land value shows declined considerably as further away from the city center.

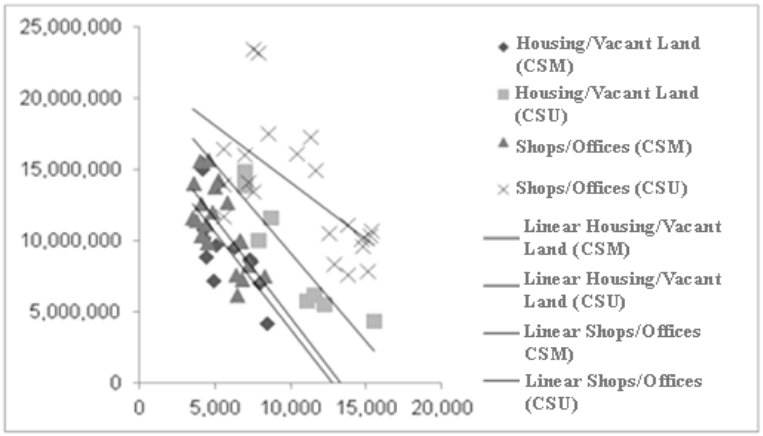


Figure 5. The Relationship between Land Value and Distance to CBD

There is prominent difference between land value for shops/offices use and housing/vacant land use in the corridor of Semarang Ungaran. The difference is almost 2 times higher between the land value for housing/vacant land compared to land value for the shop / offices. However, pattern of the two graphs still show almost the same. The land value climbed gradually at the Setiabudi road junction (corridor road) with Prof. Sudharto Road. Moreover, the land value rise caused by redevelopment program in the surrounding ADA Supermarket which is the entrance of toll road and T-junction connecting with Banyumanik residential area. The graph of housing and vacant land is steeper than the shop/offices due to economic value for housing/vacant land has small value. Thus the distance to city center has big influence on the land value.

4.1.2. Distance to Traditional Market

Beside CBD or city centre, activities in marketplace can influence land value. Market is divided into traditional and modern market. Gayamsari traditional market is located in the west of corridor of Semarang-Mranggen near the toll gate while Jatingaleh traditional market is located in the northern corridor of Semarang-Ungaran near the toll gate.

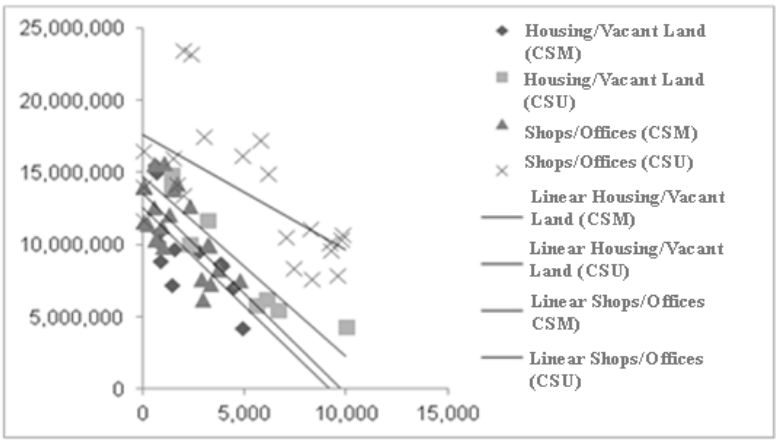


Figure 6. The Relationship between Land Value and Distance to Traditional Market

Figure above shows the dramatic decline of land value due to the far distance of properties from traditional market. The trendline of both shops/offices and housing/vacant land is predicted that it will

be same and remain stable in the corridor Semarang-Ungaran. However, when we viewed in detail, the land value goes down due to its location near traditional market particularly in Jatingaleh. The traffic congestion, slums and inconvenience condition surround the market make this area less attractive.

4.1.3. Distance to Modern Market

Modern market located in the corridor is Superindo. Superindo was built in the narrow street in the Semarang-Ungaran while another superindo was well-developed in main road of Semarang-Mranggen. Both corridors show the high land value for housing/vacant land if those properties located near modern market. The trendline tends to decrease continuously as far away as modern market and it indicates that land value of property is completely affected by the distance to modern market.As is presented in the chart shows the function of shops/offices is influenced by the distance to the modern market. Unlike the case in the Corridor of Semarang Mranggen with the graph shows a downward tendency. Sample of shops/offices buildings found at the surrounding modern market and there is slight difference of land value eventhough the distance is not equal.

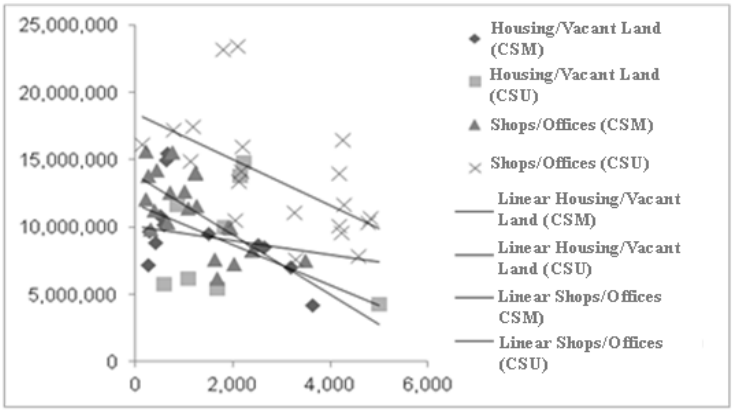


Figure 7. The Relationship between Land Value and Distance to Modern Market

4.1.4. Distance to Shopping Mall

There are many Shopping Malls are built in both corridors. ADA Supermarket Majapahit is located in the west of Semarang-Mranggen and Giant Central City while ADA Banyumanik and Carrefour Srondol are located in Semarang Ungaran. Each shopping center has different carrying capacity and services. There is an obviously difference from both the graphs. The graph represents inverse relationship between land value and distance to shopping mall in Semarang Ungaran. The land value slumped moderately as it closes to shopping malls (for housing.vacant land) while shops/offices has a positive relationship with the distance to shopping mall. When those located far from shopping mall, the land value will collapse sequentially.

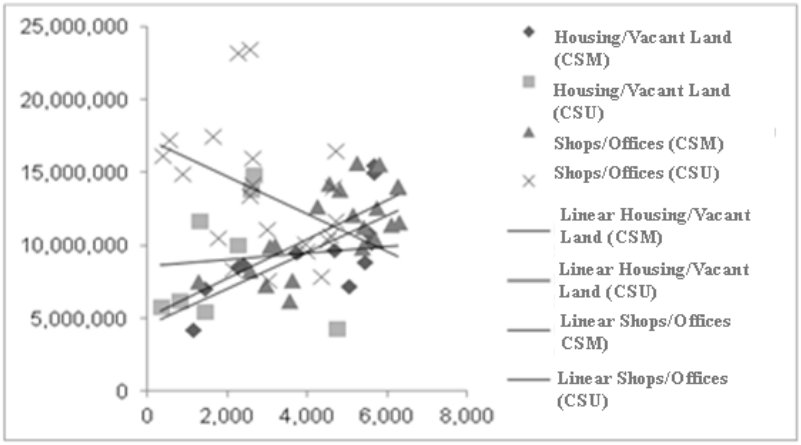


Figure 8. The Relationship between Land Value and Distance to Shopping Mall

4.1.5. Distance to University

Diponegoro University is the national college located 2,8 km away from Semarang-Ungaran while University of Semarang built 4,1 km away from Semarang Mranggen. Both universities are typically different. However, those colleges affect noticably toward land value change.

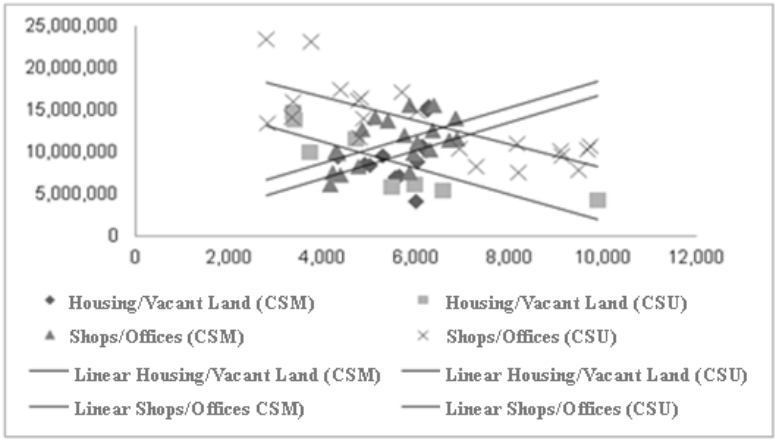


Figure 9. The Relationship between Land Value and Distance to University

Shops/offices are more commonly found than housing/vacant land in Semarang Ungaran corridor. Both lines indicate a downfall which means that the further away from the university has cheaper land value. University is as the main factor affecting the land value in Semarang Ungaran. Unlike in Corridor of Semarang Mranggen, University of Semarang plays as an attraction of human movement. Housing/vacant land is less commonly found around this corridors. In contrast, there are many shops/ retail buildings built arround the corridor. The graph ilustrates that land value is not influenced by University of Semarang because the value tends to drop sequentially when it is far away from the college.

4.1.6. Distance to Police Office

Police office is selected as one of factors affecting land value in both corridors. The nearest distance to police office is 1,8 km away from Semarang-Ungaran corridor while police office in Semarang-Mranggen is located in Pedurungan near artery road Soekarno-Hatta. Both corridors have

the same trendline. The land values tend to decline when the properties located near police office. As the scatter plot suggest random distribution of each sample. The linear line fall significantly due to far distance to police office. Thus, police office has slight influence to land value change.

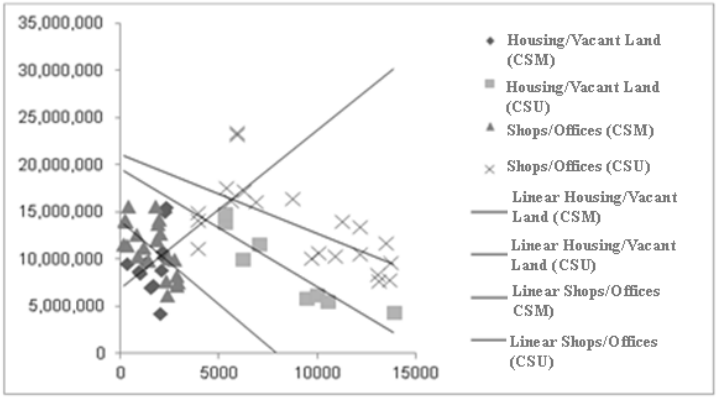


Figure 10. The Relationship between Land Value and Distance to Police Office

However, housing/vacant land in corridor of Semarang Mranggen tends to rise swiftly when it is located far away from police office. It can be concluded that police office has no influence on land value in both corridors. In conclusion, there is different pattern of land value for housing/vacant land and for shops/offices. The land value for housing/vacant land is tied to surrounding public facilities while shops/offices land value generated from its economic attraction. The land use of Diponegoro University in Semarang-Ungaran is the most predominant factor affecting land price. Furthermore, the distance to CBD or city center affecting land price generally eventhough shopping centers or modern markets also play important role in this case.

4.2. The Effect of Transportation Facility Toward Land Value

4.2.1 Distance to Toll Gate

The toll gate of corridor Semarang Mranggen is located near Gayamsari traditional market while corridor of Semarang Ungaran is located in ADA supermarket. Housing/vacant land has extremely low prices while shops/offices have high prices because shops/offices built in the commercial area. The entrance toll in the corridor of Semarang-Mranggen is located in front of Gayamsari. The existence of toll is accessible to connect and reach many places. The terminal, bus stops,station, bridges are less influential due to high use of motorized-vehicles and those transport facilities give nothing to land value change. The graph below illustrates that the high land value of properties in both corridors are mostly found at the proximity to toll gate. Both properties represent the same trendline.

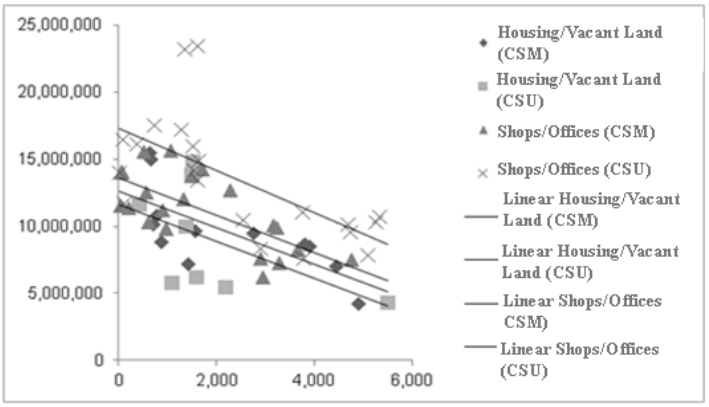


Figure 11. The Relationship between Land Value and Distance to Toll Gate

Although the toll gate gives impact on land value, there is a different pattern of land value in both corridors. For instance in corridor of Semarang-Ungaran where the land value goes down significantly due to traffic congestion and unaccessible condition around the toll gate. As a whole, the existence of toll gate gives enormous impact on land value change of all properties.

4.2.2 Distance to Bus Station

Public transport station in corridor of Semarang –Ungaran is called as Banyumanik Bus Station categorized as type C while bus station in corridor of Semarang Mranggen is Terminal Penggaron categorized as type B. The effect of bus stop on land value shows negative correlation that means the farther the property site from terminal the land value will be increasing except for shops/offices in corridor of Semarang-Ungaran because modern marketplace, shopping cemters such as ADA Supermarket and Carefoure are nearby.

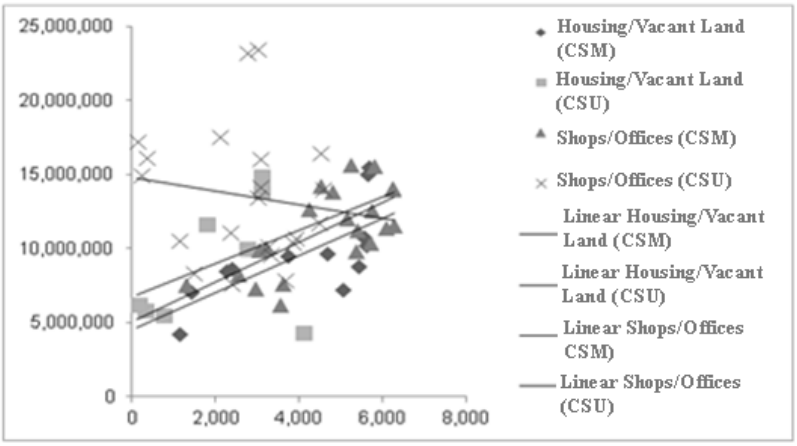


Figure 12. Land Value toward Travel Time to Terminal

4.2.3 Distance to Footbridge

The footbridge in the corridor of Semarang-Ungaran is located in Terminal of Banyumanik while another footbridge of Corridor Semarang-Mranggen is located in ADA Majappahit Supermarket. Footbridges are usually built near activity centers and this will therefore gives impact on land value due to shopping activities.

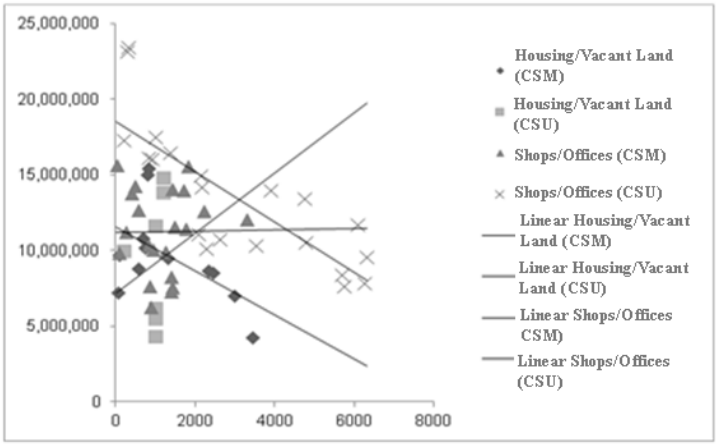


Figure 13. Land Value toward Travel Time to Footbridges

4.2.4 Distance to Bus Stop

Transportation system has a big role in daily human movements. Land value is also affected by accessibility aspect such as travel time and transportation cost. Shuttle bus in the selected corridors play role as supporting transportation infrastructure in those areas. The majority of travel time to bus stop from each property is 5 – 10 minutes. The longest time to reach bus stop is 16 minutes while the shortest time to reach bus stop is 1 minute from the whole samples. Thus, it can be concluded that the land value for the majority of properties located in the place with shortest time to reach bus stop around 2 millions – 25 millions per square meter. The scatter plot illustrates a decline linear graph along the increasing travel time. However, the downward trends for two type of properties are different. Shops/offices line tend to decline significantly compared to housing/vacant land. Furthermore, there no correlation between travel time to shuttle bus/bus stop and land value in corridor of Semarang – Mranggen.

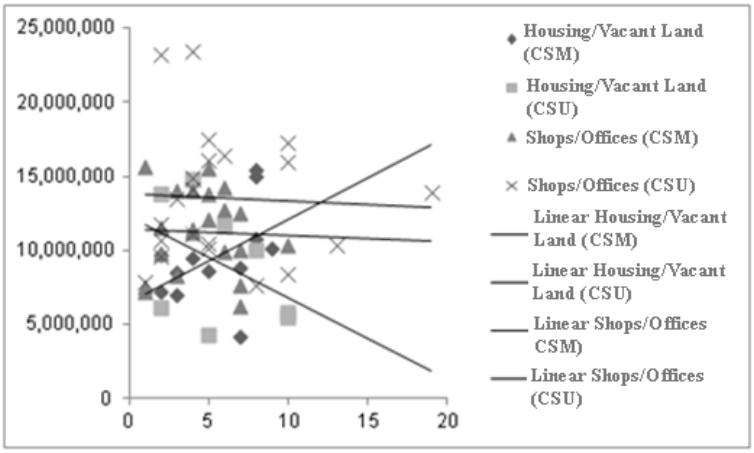


Figure 14. Land Value toward Travel Time to Bus Stops/Terminal

4.2.5 Parking Lot Area

The availability of parking lots has important impact on land value. Public parking lots affect the rise of land values in both corridors. However, the restricted parking lots in the corridor of Semarang-Mranggen recently causes unavailable parking area. The effect of restriction of parking lots causes shops and retail buildings are not managed well compared to building with parking lots.

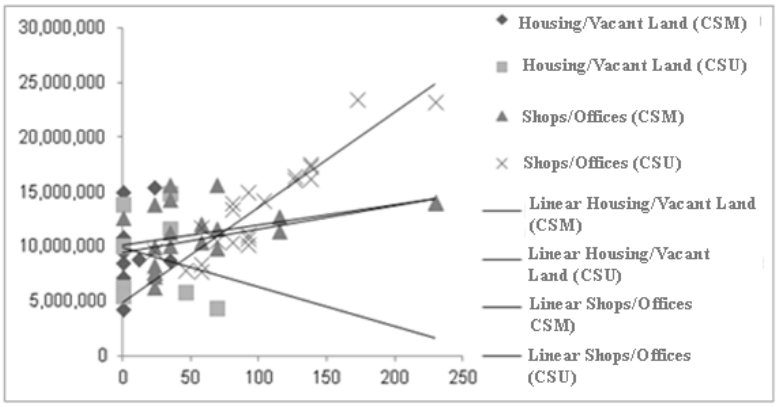


Figure 15. The Relationship between Land Value to Parking Lot

As can be seen in the scatter plot, there is a strong correlation between land value and parking lots located in shops/offices in both corridors. The number of parking lots which are able to accomodate more vehicles can raise the land value of shops/offices. In conclusion, the high dependency of motorized-vehicles, the existence of toll road give significant impact on land value. The provison of parking lots surround the properties used as attraction to encourage high land value in those areas. In contrast, public transportation infrastructure such as terminal, bus stops and footbridge give no impact on land value.

4.3. The Correlation between Land Value Change and Land Use

According to activity point above, it can be clearly seen that the activity points in corridor of Semarang-Mranggen located in traditional market of Gayamsari, ADA Supermarket Majapahit and Terminal Penggaron while in corridor of Semarang-Ungaran located between Prof Soedharto Street until the Toll Gate of Jatingaleh and the crossroads of Terminal Banyumanik. Land use changes between two corridors show the different pattern such as figure below:

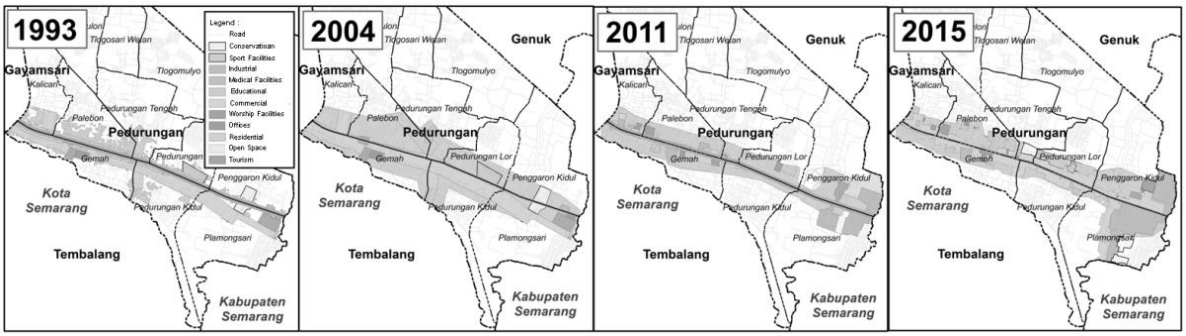
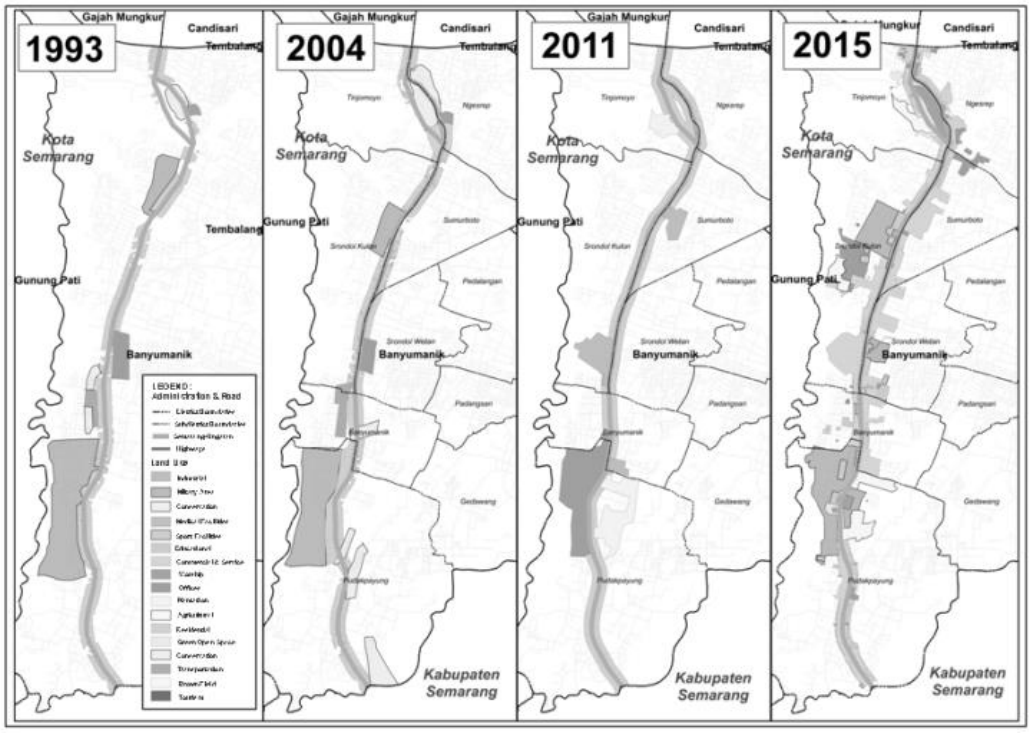


Figure 16. Land Use Change in Corridor Semarang-Mranggen in period years 1993-2004-2014-2015

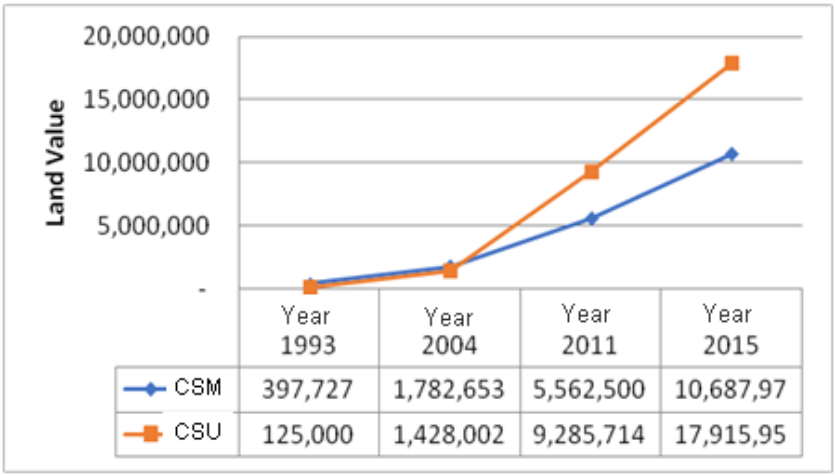


Source: Landsat Map 1993, 2004, 2011, 2015

Figure 17. Land Use Change in Corridor of Semarang Ungaran in the year 1993-2004-2014-2015

Corridor of Semarang Mranggen consists of many subdistricts such as Penggaron, Penggaron Kidul, Pedurungan Kidul, Pedurungan Tengah, Pedurungan Lor, Gemah, Palebon and Kalicari. The land use shows the prominent change from conservation and residential use to industrial use located in the eastern part of this corridor. The building density and the high intensity of public activities can be seen from traditional market of Gayamsari to Supriyadi junction. At this meeting point with Supriyadi lane connecting the corridor to Regional Trade Center of Pasar Johar and the Artery Street of Soekarno hatta is called as an outer ring road of Semarang. In addition, Supriyadi Street also connects to large-scale housing of perumnas Tlogosari with population density of 14,488 people/km2. Corridor Semarang – Ungaran consist of many subdistricts located in Kecamatan Banyumanik.The activity point sentralized in between Prof. Soedharto Junction untill toll gate of Banyumanik and Sukun Junction. The junction point located in Prof. Soedharto Street is aimed as connecting road to Diponegoro University causes the high land value at this point.

Furthermore, the toll gate of Banyumanik connects Terminal Kaligawe from the eastern part of Semarang and Terminal Mangkang from the west of City. The toll gate also connects the region to the southern part of Semarang such as Solo and Yogyakarta. Near to the toll booth is a Toll Road junction that connects to a large-scale settlement Perum Perumnas Banyumanik and also develops residential and residential development developed by other developers.We examined many properties such as warehouses, factories, homes, shops, shophouses and vacant lots. The land values for each sample is various start from 4,3 millions - 23 millions rupiah. The percentage of average land value around 69% per year while The percentage of average land value just about 30% per year in corridor of Semarang – Mranggen. The land value changes can be seen from the graph below:



Source: Suara Merdeka 1993, 2004 dan Primary Survei 2011-2015

Figure 18. Land Value in Corridor of Semarang Ungaran and Corridor of Semarang Mranggen in the year 1993-2004-2011-2015

The average land value in corridor of Semarang-Mranggen in the year 1993 was Rp 397.727 per square meter while at the same year in corridor of Semarang-Ungaran was Rp 125.000 per square meter. The land value in corridor of Semarang-Mranggen was higher than the land value in corridor of Semarang Ungaran because Semarang-Mranggen located near Semarang city centre (CBD). In 2004, both corridors had the same land value but in 2011, those move upward significantly with different percentage changes. The land value in corridor of Semarang Ungaran was higher than Semarang Mranggen. In 2015, the land value in Corridor Semarang Ungaran skyrocketed far above Corridor Semarang Mranggen. The difference between the values around 80%.The land value changes in both corridors can be seen from the table below:

Table 1. Land Value and Land Use in Corridor of Semarang Ungaran and Corridor of Semarang Mranggen in the year 1993-2004-2011-2015

Land Use	Year 1993		Year 2004		Year 2011		Year 2015	
	KSM	KSU	KSM	KSU	KSM	KSU	KSM	KSU
Land Price	397,727	125,000	1,782,653	1,428,002	7,500,000	9,285,714	9,687,976	17,915,958
Residential	1,137,918	677,576	965,048	1,708,482	738,399	1,635,657	203,251	1,214,071
Trading & Services	554,097	-	680,856	524,313	869,387	597,138	1,125,474	876,856
Military Areas		474,899		474,899		474,899		474,899
Industrial	37,679		533,123		533,123		812,184	
Public Facilities	-	-	243,086	51,420	281,204	51,420	281,204	193,289
Conservation	734,644	1,606,639	42,225	-	42,225	-	42,225	-

Source: Suara Merdeka 1993, 2004 and Primary Survey

The residential land use in 1993 - 2015 in both corridors decreased gradually. The drastic decline was located in the Corridor Semarang Mranggen. Residential land use changed into industrial and services use. The large changes in the main corridor was followed by the land use behind the corridor. The land use change that encourage several construction caused the lack of green space. Hence, the land value drop considerably due to the bad impact environmentally. The lack of green space in in corridor of Semarang Mranggen located in along the river (Watershed), while in the corridor of Semarang Ungaran located in Gombel Hills. It can be seen that along the connecting road will develop into premium area with high values and it will apply land use mechanisms in along the corridor. The land will be transformed into the land use with certain economic value that commonly known as commercial use.

5. Conclusion

According to the analysis above that the land value is divided into two categories such as commercial property and non commercial property. Commercial property consist of high economic activities that can pay a high land value. While non-commercial property is used for personal interests that give no economic value for both landowner and property manager. Both commercial and non-commercial properties, both have different responses and characteristics toward urban space configuration and the existing transport infrastructure.

Both commercial and non-commercial properties are influenced by distance to city centre and human activities out of corridor (commuting activities). The result is in accordance with Land Rent [19,20] and Bid Rent Teories [18,21] that the land value increase the road junction to human activity centers (such as University) and toll gate to Perumnas residential areas in both corridors. Non-commercial properties have highly sensitive characteristic toward space configuration changes compared to commercial properties because non-commercial properties have no economic attraction and it is necessary to have sufficient access to public facilities or other high-attractive land uses. Thus, non-commercial land value is influenced by surround public facilities and accessible road. On the other hand, the toll gate, bus stops, terminal and footbridges have no effect on land values.

This condition is very unique when compared with some theories or studies in other countries that most land values are affected by the proximity to public transportation facilities. However, those theories seem impossible to apply in Indonesia due to high dependence on private cars or motorized-vehicles and only very few people who use public transportation. Public transport in Indonesia is only

used by captive movement or urgently certain conditions. The bad services and condition of public transport is usually dirty, unmanaged and unconfortable for disabled people need to be improved.

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