Supply Chain Strategy for Determining Factors of Land Value Zone and Regional Tax Purpose in Medan City, Indonesia

Khaira Amalia Fachrudin[1*], Elisabet Siahaan[1], Imam Faisal Pane[2]
[1] *Faculty of Economics and Business, Universitas Sumatera Utara, 20155 Medan, Sumatera Utara, Indonesia.*
[2] *Faculty of Engineering, Universitas Sumatera Utara, 20155 Medan, Sumatera Utara, Indonesia.*
[1]*khaira@usu.ac.id*

***Abstract*- Global supply chains have a distinct geography that involves the dimensions of production, distribution and consumption. This geography, at the heart of many sourcing strategies, is often neglected by supply chain managers, or at least scholars investigating supply chain management. The land investment has a positive impact on boosting a region's financial strength through a Rural and Urban Land and Building Tax (PBB-P2) burden. The amount of PBB-P2 payable is determined using the Sales Value of Taxable Object (SVTO) in the relevant Land Value Zone (LVZ). However, the value of SVTO is lower than and is not proportional to the land market value. This study aims to identify the land value zone and determine the factors that influencing land value zone and regional tax purposes in commercial zones with the highest SVTO in Medan, Sumatera Utara, Indonesia. This quantitative analysis tested using multiple regression and performed by Statistical Package for Social Science (SPSS-20). The result of this study showed that location has a positive and significant effect on the land value zone, while the land area has a negative and significant effect. Appropriate location can save energy thereby increasing the land value zone. It implies that decision-makers must consider location when determining land value zone and establishing the SVTO.**

Keywords- *Land market value, regional tax, supply chain strategy, rural and urban land and building tax, land value zone.*

1. Introduction

Global supply chains are thus characterized by a growing level of integrated services, finance, retail, manufacturing and distribution. This integration is favored by improved transport and logistics, efficient exploitation of regional comparative advantages and a transactional environment supportive of the legal and financial complexities of global trade The land is one type of property investment [6],[19] which can generate the highest returns [7] which incurs a tax burden. Early before 2009, the Rural and Urban Land and Building Tax (PBB-P2) in Indonesia had managed by the central government. As Law Number 28 of 2009 was officially issued, the tax has managed by the local governments. PBB-P2 is determined based on the Sales Value of Taxable Object (SVTO), which is the average price obtained from a reasonable sale and purchase transaction in each Land Value Zone. Land Value Zone is a geographical zone consisting of one or more tax objects that have the same average market value [15]. The TOSV value set by the Medan City government is far lower than the market value, the government took this policy because they consider the financial capacity of the community. However, this amount has varied in its percentage, especially for land on which the shop house lies. For example, there are two shophouses in a prestigious location in Jalan Gatot Subroto which have the same SVTO value of IDR 10,455,000. One has a land market value of IDR 21,186,181 per meter and another has a land market value of IDR 29,130,437 per meter. The percentage of SVTO compared to the land market value is 49% and 36%, respectively, but for a shophouse in Perniagaan street, the percentage is at 10.53%.

In the meantime, there are two shophouses in Merbabu and Thamrin streets have located in the same location with the same neighborhood and SVTO of IDR 10,455,000, but with a different land area of 100 square meters and 72 square meters respectively. The road width in front of them also differs by 8 meters and 10 meters respectively. Their respective land market value is IDR 14,633,300 per meter and IDR 33,861,111 per meter. There are two shophouses located in Sutomo street which has a road width of 10 meters with different SVTO values of IDR 10,455,000 and IDR 12,195,000 respectively, their land market value is IDR 26,166,667 and IDR 29,271,154 respectively. The other two shophouses have the same land area of 70 square meters, but the one in Jalan Sutomo has a TOSV as much as IDR 10,455,000 and the one in Raden Saleh street has a SVTO value of IDR 12,195,000. Their land market values are IDR 28,298,929 per meter and IDR 22,323,174 respectively. These preliminary data indicate that location, land area, road width, and neighborhood may affect land market value.

Following previous studies, they stated that land values such as location, land area, planning use, and other neighborhood characteristics affect land values in China [3]. Als, the only high-income consumer can buy [8]. Further, the distance to the bus stop, light rail station, and commuter rail station found to affect land value [17]. Also, the road width has a positive and significant effect on land values as it gives

good access, likewise population density, transportation and flood-free environment have a significant and positive effect on land values [18]. A similar study by Topcu,, found the location, physical characteristics of a building, the built environment surrounds that building, externalities of the land and the accessibility affect land value and neighborhood characteristics affect house prices [4]. The Neighborhood characteristics for a housing complex consisting of environmental quality, sports and leisure facilities, and convenience of life.

By looking at the gap in previous studies, this study tried to consider the variable of market value such as location, land area, road width, and neighborhood could affect land values that have not empirically studied in business areas in Medan City, Sumatera Utara, Indonesia. In order to get empirical results, it is necessary to study the effect of location, land area, road width, and neighborhood on land values in this business area comprehensively. The objective of this study is for the policymakers to be able to determine market values more precisely, to set the SVTO value more accurately, and to conduct urban planning more effectively.

2. Literature Review

2.1 Land Value

The global geography of consumption is highly important as it drives the structure that most supply chains are servicing. Land or an area (site) is an unattractive surface that has distinctive physical characteristics from one lot to another. Each land has a unique characteristic. Location wise, a land is unique for it can not be moved from one place to another, thereby no land has the same location. Each land parcel is unique, and the prominent characteristic of all real estates is a fixed location [1]. A land is affected by several processes, including its physical condition, location, and socioeconomic factors. A climate influences the decision to use the land; topography; trends in economics, population, technology, and culture; the distribution and density of natural resources, and population centers. Further, value is an economic concept [1] defined as an opinion of the economic benefits over the ownership of an asset, or the price that is most likely to be paid for an asset in exchange - thus the value is not a fact [12]. Land value is a measurement of land-based on land economic capability in terms of its economic productivity and strategicness.

Urban land value is determined fundamentally by its location attributes [16]. Ozdilek explained the value of land from the perspective of classical economics, neoclassical economics, geographical, social, and political approaches. From a classical economic point of view, the value of land estimated from its rental value. From the neoclassical economic point of view, the value of land-based on its utility. While from geographical, social, and political approaches, the value of land depends on geographical, social, and political decisions, such as zonation.

2.2 Land Market Value

Market value is an estimated amount of money that can be obtained from an exchange of an asset or liability at the valuation date, between the buyer who is interested in buying and the seller who is interested in selling in a bond-free transaction with a proper marketing strategy where both parties act based on their understanding, prudence and without coercion [12]. Thus, we can say that land market value defined as an estimated amount of money that obtained as a result of land exchange on the valuation date between the interested land buyers and sellers in a bond-free transaction with a proper marketing strategy on the principles of understanding, awareness, and without coercion.

2.3 Factors That Affect Value

Value is affected by the interaction of social, economic, governmental, and physical forces. Social forces are things related to population, law, order, and lifestyle options while economic forces are the economic base of the region and community, price levels, inventory of available vacant and improved properties, and existing rental patterns and property prices. In the meantime, governmental forces are national, state, and local tax laws and policies; transportation networks; local zoning; and building codes. Besides, the environmental factors are transportation systems and the nature and desirability of the immediate area surrounding a property. The value of a property is influenced by supply and demand, utility, scarcity, transferability [1]. In addition to that, there are several essential characteristics relating to value, including the real property rights appraised, location, other physical characteristics such as size, layout, and quality of construction, economic characteristics such as rent levels and financing terms, legal characteristics such as land use and zoning restrictions.

Four interdependent economic factors create value, namely utility, scarcity, desire, and effective purchasing power. These four factors interact in the marketplace and influence the relationship between supply and demand [1]. The utility is the ability of a product to satisfy a human need, want, or desire. The effect of utility on value relies on the characteristics of the property, such as size, design, location, time, and distance relationship. Scarcity defined as the present or anticipated supply of an item relative to the demand for it. The land is something that is needed but rare. Desire covers business needs such as a place to sell or produce goods and services. Effective purchasing power is the ability of individuals or groups to participate in the market in order to get goods and services using cash or equivalent. A valid opinion of

the value of a property is an accurate valuation of the market's ability to pay for the property.

2.4 Valuation Approach

There are three approaches in property valuation: the market approach, the income approach, and the cost approach [10]. A market approach is an approach that uses sales data of property that are comparable or almost comparable to the object of valuation, based on a comparison process. Income approach considers the revenues and costs associated with the valued property and estimate the value through the capitalization process. Cost approach determines the value of the property by assessing the cost of the land and the cost of replacing the new development on it with comparable utility or adapting the old property with the same usage without considering the costs due to development delays and overtime costs. For old property, the cost approach takes into consideration physical depreciation, functional obsolescence, and other external obsolescence.

2.5 Location, Land Area, Road Width and Neighborhood

The geographical location of the land is unique and affects its value. Location plays a critical role in house prices [11] and other property values. Location is ruled under the concept of 3L, which is location, location, and location. The land area is the total area of land under ownership. The land area has a negative relation to land value [2]. It can be analogous to bulk purchasing at a lower price. A neighborhood is defined as an area that has specific general population characteristics and land use. The neighborhood can be seen from boundaries, such as rivers, lakes, railroad tracks, parks, or major throughways. Even shopping patterns may be used to define a neighborhood [13]. When determining the location of the property, consumers will prioritize the environment and public facilities and services offered by the property's neighborhood [5]. Indicators that can be used for environment neighborhood include reputation, pollution level and view [14], while for housing, the neighborhood indicators that can be used are neighborhood environmental quality, neighborhood convenience of life, and neighborhood sports and leisure facilities [5].

2.6 The Development of Hypotheses

The value of property is influenced by economic factors, social factors, regulatory factors, and physical factors [1]. In this study, the economic and regulatory factors were not used as a variable since this study conducted in commercial areas serving as an economic hub. Further, the physical factors used as the variable were location and land area. Governmental factors used as a variable, but this research is driven by the fact that TOSV value is not determined based on actual market value. The location uses appropriate site development indicators from Green Building Council Indonesia, namely: Basic Green Area, Site Selection, Community Accessibility, Public Transportation, Bicycle, Site Landscaping, Micro Climate, Storm Water Management [9]. For social factors, this study consider the variable Neighborhood. It is an essential factor in determining land value. Road width is a part of a neighborhood, but in this study, road width was not included as a separate variable considering that road width is vital in determining a land value in Indonesia. Based on these considerations, the following hypotheses were proposed (i) Location has a positive and significant effect on land value, (ii) Land area has a negative and significant effect on a land value, (iii) Road width has a positive and significant effect on a land value and (iv) Neighborhood has a positive and significant effect on a land value

2.7 Research Framework

This study used location, land area, road width, and neighborhood as the variables to estimate the land value of shophouses in the business area in Medan City, Sumatera Utara, Indonesia by considering the supply chain management with the following model:

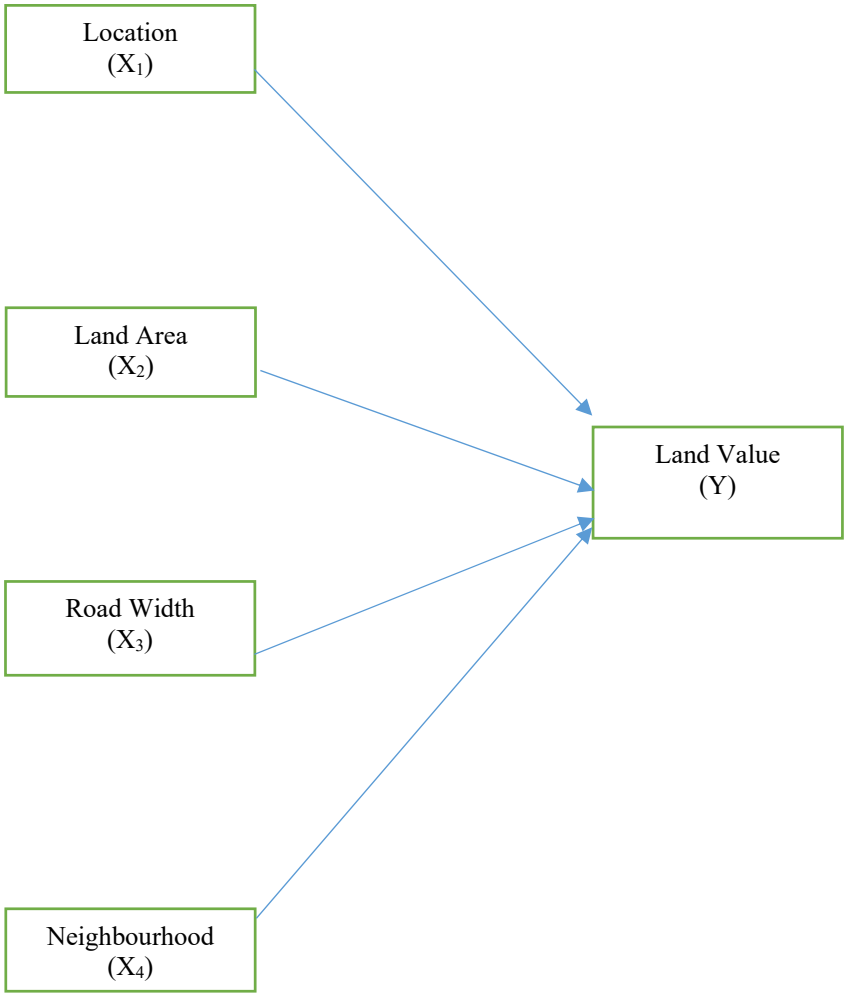

Figure 1. Research Framework

3. Methodology

The population in this study was a land value zone with TOSV values of more than ten million (IDR). The target population was land value zone where there stand shop houses and occurs a sales or offer transaction over a shophouse. The samples taken were saturated samples of all 100 shophouses. The object of research was the shop house land value. The value of the shophouse obtained from market approach evaluation, then this value is extracted by reducing the market value of the building in order to get the value of the land. The variables in this study and their operational definitions as well as their measurements as seen in Table 1 below:

Table 1. Definition of operational variable and its measurements

	Variable(s)	Definition(s)	Measurement(s)
	Land Value	The value of land in millions of rupiah	Millions of Rupiah
1	Location	The location uses appropriate site development indicators, namely: Basic Green Area, Site Selection, Community Accessibility, Public Transportation, Bicycle, Site Landscaping, Micro Climate, Storm Water Management [9]	Interval scale 1 = Medium 2 = good 3 = Very Good
2	Land area	The land area of a land object	Square meter (m^2)
3	Road width	Road width in front of the land	Meters (m)
4	Neighborhood	Surrounding environment including business activities, traffic density, prestige, cleanliness, and pollution levels	Interval scale 1 = Medium 2 = good 3 = Prestigious

4. Results and Discussion

4.1 Descriptive Statistics

The lowest land value is IDR 12.791.667/m^2, the highest value is IDR 115.840.000/m^2, and the average value is IDR 35.857.789/m^2 with a standard deviation of IDR 17.209.545/m^2. The lowest score of location is 1 (medium), the highest score is 2 (Good), and the average location score is 1.78 with a standard deviation of 0.43. It means that the location in this study does not meet all Green Building Council Indonesia's criteria for the green ship. The criteria that have not met entirely are Micro Climate and Storm Water Management. The lowest land area is 36 m^2, the highest value is 240 m^2, and the average is 99.4 m^2 with a standard deviation of 36.2 m^2. The lowest road width is 4 m, the highest is 20 m, and the average is 9.27 m with a standard deviation of 3.26 m. The lowest score of the neighborhood is 1 (medium), the highest score is 3 (prestigious). The neighborhood around the properties here is quite good, but only 19 % are prestigious. The initial inputted data did not indicate that residual data do not meet the assumption of normality, therefore the data were transformed into logarithms. Classical assumption test on the transformed data are as follows:

1. Residual Normality Test - Kolmogorov-Smirnov Statistics test showed a p-value of 0. 200 (> 0.05), indicating that the residual normality assumption is met.
2. Multicollinearity Test - The tolerance Value of each variable is 0.893; 0.996; 0.855; and 0.781, which is greater than 0.1. The VIF values are 1,119; 1,004; 1,169; and 1,280 respectively, which is less than 10. It indicated that no multicollinearity occurred.
3. Heteroscedasticity Test - With the Glejser test, it found that the significance value of each t-test was 0.646; 0.066; 0.152; and 0.189 which is higher than alpha 5%. It indicated that the data were free from heteroscedasticity.
4. The autocorrelation test is not performed as the data used were cross-sectional.

The model goodness of fit shows an F significance of 0.000 (<0.05) which indicates that the model used is feasible. The R^2 value of 0240 showing that the variability of the independent variable can explain the variability of a land value by 24%. The significance of t-test is presented in table 1 below:

Table 2. The Result of Hypotheses testing

Independent Variable	Coefficient(s)	Phi Value
Constant	8.051	0.000
Log (Location)	0.644	0.000
Log (Land area)	-0.340	0.007
Log (Road width)	-0.027	0.836
Log (Neighborhood)	0.063	0.682

Note: Log of land value is obtained, land values calculated by finding an antilog, which is 10 log land values

$$Y^{head} = 8.051 + 0.644\ X_1 - 0.340\ X_2 - 0.027\ X_3 + 0.063\ X_4 + \mu$$

Whereas, Y = log of land value, X_1 = log of location, X_2 =log of land area, X_3 = log of road width and X_4 = log of neighborhood

4.2 Discussion

The results of the analysis using multiple linear regression showed that location has a positive and significant effect on land value. The finding of this study is in line with Kiel and Zabel (2008) and 3L concept. The right location and easy access is the perfect indicator for a business place. Due to the limited availability of land, the land value in this area is quite high. A relatively scarce land is a fundamental factor of value (Apraisal Institue, 2013). Land in this area is high demand and harnessed for the business place. People's purchasing power in this good neighborhood makes the land value high. In this elite business location, there are no sale and purchase transactions of shophouses because the owner earns a relatively large amount of profits from his business at this location. The shop owner who rents out his shophouse in the best location gets a high return on investment.

The land area has a negative and significant effect on land value. These results are in line with the findings of Bjorklund and Wilhelmsson (2006) which found that the higher the land area, the smaller the value per meter. Further, Road width has no significant effect on land market value. It might because this wide road is not supported by high prestige. The neighborhood has no significant effect on land market value and regional tax purposes. Both findings do not seem with the previous study conducted by Sutawijaya (2004) and Brrown and Uyar (2004). When it comes to choosing their business locations, business owners indeed take into account business activities, traffic density, prestige, cleanliness, and pollution levels. However, there are also people interested in less prestigious locations.

5. Conclusion

Global supply chains have a distinct geography that involves the dimensions of production, distribution and consumption. This geography, at the

heart of many sourcing strategies, is often neglected by supply chain managers, or at least scholars investigating supply chain management. In conclusion, this study found that the location and land area have a significant effect on land values, whereas road width and neighborhood do not have a significant effect. It suggested that local governments should consider these variables in determining the SVTO value so that the estimated value is correct, and the regional income from PBB-P2 will increase. Other policies on urban planning should also take into account a location factor. Less optimal building in this good location, such as houses in business areas, need to be optimized through the highest and best use studies. The strategies that could be made by the local governments in determining the Sales Value of Tax Objects (SVTO) has the following chains: (i) determine the market value of land by taking into account the location and land area. Furthermore, (ii) determine the Land Value Zone at a certain percentage of the Sales Value of the Tax Object, for example 60% of SVTO. Thus, the tax applied will be fairer.

6. Acknowledgments

The authors gratefully acknowledged that the present research is funded by the Directorate of Research and Community Service Directorate General of Strengthening Research and Development Ministry of Research, Technology and Higher Education under research funding agreement and community service for the fiscal year 2019, with contract number 106/UN5.2.3.1/PPM/KP-DRPM/2019.

References

[1] Appraisal Institute. "*The Appraisal of Real Estate. 14th Edition*" United States of America, 2013.
[2] Bjorklund, K., Dadzie, J.A., and Wilhelmsson, M, "*Offer Price, Transaction Price, and Time-on-Market*" Property Management Journal, vol 24, No. 4, pp. 415-426, 2006.
[3] Bao, H. X. H., Glascock, J. L., Zhou, S. Z., & Feng, L, *"Land Value Determination in an Emerging Market: Empirical Evidence from China",* International Journal of Managerial Finance, vol 10, No. 2, pp. 180-199, 2014.
[4] Brown, K. H., & Uyar, B, "*A hierarchical linear model approach for assessing the effects of house and neighborhood characteristics on housing prices*" Journal of Real Estate Practice and Education, vol 7, No. 1, pp. 15-24, 2004,
[5] Chang, Lee Chun., & Lin, Hui-Yu, "*The Impact of Neighborhood Characteristics on Housing Prices – An Application of Hierarchical Linear Modeling*", International Journal of Management and Sustainability, vol 1, No. 2, pp. 31-44, 2012.
[6] Eckert, J. K, "*Property Appraisal and Assessment Administration*" IAAO. Chicago Illinois, pp. 151-180, 1990.
[7] Fachrudin, K.A., and Fachrudin, H. T, "*The Effect of Green Home, Green Behavior, and Livability on the Financial Incentive in Medan City, Indonesia"*, IOP Conf. Series: Materials Science and Engineering, vol 180, pp. 1-6, 2017.
[8] Foster, B., Wahyu, A. P., Reyta, F., & Saputra, J, "*The Role of Smarthome Technology for Improving Supply Chain and Perceived Value on Housing Retailer*", Int. J Sup. Chain. Mgt, Vol 8, No. 4, 894, 2019.
[9] Green Building Council Indonesia, "*Greenship Homes untuk Bangunan Baru*", 2013.
[10] International Valuation Standards Council, "*International Valuation Standards*", London, 2019.
[11] Kiel, K. A., & Zabel, J. E, "*Location, location, location: The approach to house price determination",* Journal of Housing Economics, vol 17, No. 2, pp. 175-190, 2008.
[12] Komite Penyusun Standar Penilaian Indonesia, "*Kode Etik Penilai Indonesia dan Standar Penilaian Indonesia"*, Edisi VII. Jakarta, 2018,
[13] Kyle, R. C. "*Property Management. Ninth Edition: Dearborn",* United States of America, 2013.
[14] Leonard, T., Powell-Wiley, T. M., Ayers, C., Murdoch, J. C., Yin, W., & Pruitt, S. L, "Property values as a measure of neighborhoods: an application of hedonic price theory", *Epidemiology (Cambridge, Mass.)*, vol *27*, No. 4, pp. 518-524, 2016.
[15] Menteri Keuangan Republik Indonesia, "*Peraturan Menteri Keuangan Republik Indonesia Nomor 208/PMK.07/2018 tentang Pedoman Penilaian Pajak Bumi dan Bangunan Perdesaan dan Perkotaan*", 2018.
[16] Ozdilek, U, "*Land Value - Seven Major Questions in the Analysis of Urban Land Values.a",* The American Journal of Economics and Sociology, vol 70, No. 1, pp. 30-34, 2011.
[17] Son, K. "*Regression Model Predictinng Appraised Unit Value of Land in Fransisco County from Number of and Distance to Public Transit Stops Using GIS*", Dissertation, Texas A&M University, 2012.
[18] Sutawijaya, A, "*Analisis Faktor Faktor yang Mempengaruhi Nilai Tanah sebagai Dasar Penilaian Nilai Jual Objek Pajak (NJOP) PBB di Kota Semarang*", Jurnal Ekonomi Pembangunan, vol 9, No. 1, pp. 66-78, 2004.
[19] Topcu, M. "*Accessibility Effect on Urban Land Values"*, Scientific Research and Essay, vol 4, No. 11, pp. 1286-1291, 2009.