B

ANALYZING THE GAP BETWEEN VERTICAL HOUSING DEMAND AND SUPPLY IN MAGELANG CITY, INDONESIA: A SEM ANALYSIS

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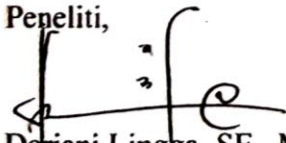Fakultas Ekonomi
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ii

Analyzing the Gap between Vertical Housing Demand and Supply in Magelang City, Indonesia: A SEM Analysis

SUMMARY

The growing population has led to an increasing demand for housing in Magelang City, Indonesia, especially for the lower income societies. Considering the population density, housing in form of vertical houses has been an urgent need for Magelang City. It turns out the government and the societies have different perspectives on vertical housing. On one side, the government's decision in building five vertical houses in Magelang City is an offer for a decent house for the lower income households. On the other side, the target group of societies has not yet responded to the government's offer as expected. Even though the low income societies cannot afford a decent house, they still decide not to live in the provided vertical houses. This indicates that there is gap between vertical housing demand and supply in Magelang City.

Many questions arise as a result of this phenomenon. Is vertical house really the right solution to overcome the housing problem for lower income societies in Magelang City? Does the government still need to continue the on-going plans for building new vertical houses? What are the causes of the low demand for vertical housing in Magelang City? What attempts should be undertaken by the government to attract the societies' interest in utilizing the vertical houses optimally? This research analyses the gap between vertical housing demand and supply in Magelang City to acquire analysis results which will answer the questions above.

The scope of analysis for this study is as follows:

1. How do social economy and perception factors affect the target societies' decision over whether or not to choose vertical house to live in?

2. How do price, promotion and facilities factors affect the occupancy level of the current available vertical houses?

3. How does the current occupancy level affect the target societies' decision over whether or not to choose vertical house to live in?

This paper applies SEM to analyze the gap between vertical housing supply and demand in Magelang City, Indonesia. The data is gathered using questionnaires distributed to
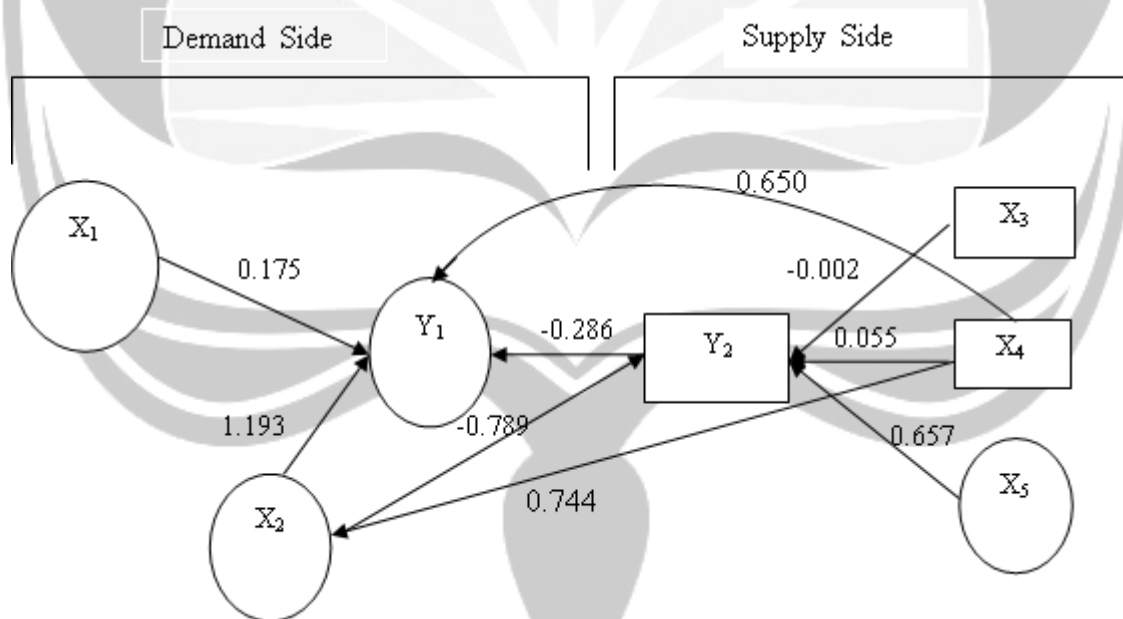
100 respondents as the target of housing aid in Magelang City. The analysis is conducted using four latent variables: social economy, perception, promotion and decision and applying Confirmatory Factor Analysis (CFA) with additional three variables in the supply side: price, facilities and occupancy.

The data is analyzed using *Structural Equation Model (SEM)* instrument and employing M Plus Program as the analysis media. The *Structural Equation Model* of this research is as follows:

$$Y_1 = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 Y_2 + \varepsilon_1$$

$$Y_2 = \beta_0 + \beta_1 X_3 + \beta_2 X_4 + \beta_3 X_5 + \varepsilon_2$$

Where α_0 and β_0 are constants, $\alpha_1, \alpha_2, \alpha_3, \beta_1, \beta_2, \beta_3$, are coefficients of the related variables, α_1 and α_2 are error standards, X_1 is Social economy, X_2 is Perception, X_3 is Rent (Price), X_4 is Promotion, X_5 is Facility, Y_1 is Decision and Y_2 is Occupancy. Based on the SEM estimation result we find the signs of the estimated parameter of each variable as shown by the following figure:

Hypothesis 1

Social economy variable has insignificant effect on decision. Meanwhile perception variable has positive and significant effects on societies' decision over whether or not to choose vertical house to live in. Based on the probability value on the estimation, perception is the

variable which most significantly affects the societies' decision in choosing vertical house. When the societies have positive perception on vertical house, they are likely to choose to accept the offer to live in vertical house. In contrast, their decision is not effected by their social economy status.

Hypothesis 2

While price and promotion have insignificant effect on the occupancy level of vertical houses, facilities variable significantly affects the occupancy level of the current available vertical houses. Based on the estimation result, the occupancy level of the current available vertical houses is not affected by their prices and the promotion attempted by the local government. Instead it is affected by the available facilities in the vertical houses. The positive coefficient of the facilities variable indicates that the more complete a vertical house facility is, the more people will choose it. It is proven by the fact that the vertical house with more complete facility has more tenant than the other does.

Hypothesis 3

Occupancy level has a negative but insignificant effect on the societies' decision over whether or not to choose vertical house to live in. It implies that the societies' willingness to live in vertical house is not affected by how many persons live in the vertical housing.

From the demand side, the societies' decision in choosing vertical house is affected by their perception on vertical houses. Meanwhile from the supply side the occupancy level of vertical house is affected by its facilities. These two variables then explain the gap between supply and demand of vertical housing. The government has conducted many attempts including setting proper price, providing facilities and doing promotions. But what really affect the societies' decision in choosing vertical house is their perception. Then the low demand of vertical houses might have been caused by the societies' misperception on vertical house. Analysing promotion and perception, we obtain a positive and significant effect of promotion on perception. Thus, promotion could be a solution to correct the societies' perception about the vertical house.

Contents

Analyzing the Gap between Vertical Housing Demand and Supply in Magelang City, Indonesia: A SEM Analysis

Abstract

The growing population has led to an increasing demand for housing in Magelang City, Indonesia, especially for the lower income societies. Despite the efforts of the local government to provide housing aid through vertical housing, the demand for vertical houses is still relatively low, proven by the low occupancy level of the current available vertical houses. This paper applies SEM to analyze the gap between vertical housing supply and demand in Magelang City, Indonesia. The data is gathered using questionnaires distributed to 100 respondents as the target of housing aid in Magelang City. The analysis is conducted using four latent variables: social economy, perception, promotion and decision and applying Confirmatory Factor Analysis (CFA) with additional three variables in the supply side: price, facilities and occupancy. This paper shows that from the demand side, the societies' decision in choosing vertical house is affected by their perception on vertical houses. Meanwhile, from the supply side the occupancy level of vertical house is affected by its facilities. These two variables then explain the gap between demand and supply of vertical housing in Magelang City.

Keywords: Housing Demand, Housing Subsidy, SEM Analysis, Vertical Housing

Chapter 1. Introduction

Population growth in Magelang City tends to increase every year which leads to a growing demand for urban housing. While the urban land is constant, the population keeps growing. The increasing number of buildings and the functional shifting of habitation areas into trading areas have caused lands for housing get narrower.

Looking from population density according to regency/city in the Province of Central Java, Magelang City is positioned in the third most populous city although it is also the smallest city in Central Java. According to the data of Magelang City Population Projection in 2010-2020, Magelang City with a total area of 18.120 km^2 had a total population of 120.995 inhabitants in 2015 and population growth of 0.52 percent. The population density in 2016 was 5.519 per km^2. In 2020, the population in Magelang City is predicted to reach 122.538 inhabitants.

According to the data of Magelang City in Numbers 2017, about 8.79 percent of the population are from lower income category. This group of societies are relatively unable to obtain a decent house. This fact is proven by the results of Susenas survey in 2011-2016, such that only about 67.23 percent of the households live in their own houses, while the rest 32.77 percent live in rented houses. This shows a high need for housings especially for the households who do not yet have their own houses.

According to the Ministry of Health of Republic of Indonesia, the ideal extent of floor per person is a minimum of 8 meter square. Meanwhile, according to the World Health Organization (WHO) and American Public Health Organization (APHA) using an adjusted standard for Indonesian, the minimum extent of floor per person is 10 meter square (BPS, 2015). In fact, according to the survey of Susenas from 2013 to 2016, the average percentage of societies in Magelang City living in unideal houses amount about 9.7% according to the standard of the Ministry of Health and 15,84% according to the standard of WHO and APHA.

This problem needs the government attention to prevent it from interrupting economic stability and hindering the attempt of achieving societies' prosperity. It is government's responsibility to provide social security to the societies.

Rented vertical housing (Rusunawa) is one of the solutions to overcome housing problems in urban areas, especially for lower to middle income societies.

According to the Legislation Act No.1 2011 about Housing and Settlement, one of the goals of organizing housing and settlement areas is to guarantee the realization of affordable and decent housings in healthy, safe, harmonious, tidy, well-planned, integrated and sustainable environments.

In response to the societies' need for housings, the government of Magelang City has already provided a housing aid in form of rented vertical houses (Rusunawa) for the societies. At the moment, two vertical houses are available and three others are being planned to be built in three years ahead. This kind of housing is aimed at helping the lower income families and the societies with physical disabilities. However, both of the available vertical houses which are ready to use are not yet utilized optimally as they are supposed to be. The societies' demand for vertical housing is still lower than their actual need for houses. It is shown by the capacities of the available vertical houses which are not fully occupied at the moment. According to the circular letter of the Ministry of Public Works, each vertical house can accommodate 280 persons.

Considering the population density, housing in form of vertical houses has been an urgent need for Magelang City. It turns out the government and the societies have different perspectives on vertical housing. On one side, the government's decision in building five vertical houses in Magelang City is an offer for a livable house for the lower income households. On the other side, the target group of societies has not responded to the government's offer yet as expected. Even though the low income societies can not afford a decent vertical house, they still decide not to live in the provided vertical houses. This indicates that there is gap between vertical housing demand and supply in Magelang City. Many questions arise as a result of this phenomenon. Is vertical house really the right solution to overcome the housing problem for lower income societies in Magelang City? Does the government still need to continue the on going plans for building new vertical houses? What are the causes of the low demand for vertical housing in Magelang City? What attempts should be undertaken by the government to attract the societies' interest in utilizing the vertical houses optimally? This research analyses the gap between vertical housing demand and supply in Magelang City to acquire analysis results which will answer the questions above.

1.1. Scope of Analysis

1. How do social economy and perception factors affect the target societies' decision over whether or not to choose vertical house to live in?
2. How do price, promotion and facilities factors affect the occupancy level of the current available vertical houses?
3. How does the current occupancy level affect the target societies' decision over whether or not to choose vertical house to live in?

1.2. The Purpose

1. To show how social economy and perception factors affect the target societies decision over whether or not to choose vertical house to live in.
2. To show how price, promotion and facilities factors affect the occupancy level of the current available vertical houses.
3. To show how the current occupancy level affect the target societies decision over whether or not to choose vertical house to live in.

1.3.   The Benefits

The results of this research are expected to benefit the following parties:

- The regional government of Magelang City

  As a recommendation in developing the next vertical housings by taking into account the social-economy aspect, target societies' perception, and the current occupancy level of the available vertical houses.

- The other regional/city governments

  As a recommendation in developing vertical housings in the future by making use of this research analysis results about vertical housing demand and supply gap in Magelang City.

- The central government

  As a consideration in determining the strategy of providing housing aid for the societies especially for The Ministry of Social Works.

Chapter 2. Literature Review

2.1.   Literature in Vertical Housing

The Act 16 1985 about Vertical Housing explains that vertical house is a multilevel building in an area, divided into several parts and functionally structured in vertical or horizontal direction, and consists of units which can be owned and used separately, especially as a shelter, equipped with shared facilities and land.

The research field of housing studies is not homogenous (Clapham et al., 2012). There is a lot of literature discussing housing policy and programs. The ones about housing pro-grams mainly discuss the effects of the programs on various aspects, such as the effects of housing programs on access (Hunt, 2009; Horn, Ellen, and Schwartz, 2013; Baum-Snow and Marion, 2009), the effects of housing programs on residential mobility (Jacob and Ludwig, 2012; Lubell, Shroder and Stefan, 2003), and the effects of housing program on labour supply (Currie and Yelowitz, 2000).

Housing policy often has a strong political decisions tendency (Kohl, 2015; Malpass, 2011) such as decline in public expenditures for housing subsidies (Hodkinson et al., 2013; Scanlon et al., 2015), social market economy (Kemeny et al., 2001; Rhodes & Mullins, 2009) and unique role of non-profit housing providers. Kadi and Ronald (2014) show that housing policy in different forms is primary matter to municipal system. Many studies also focus on

the economic dimension of housing and examine national housing markets through quantitative analysis (Bourassa et al., 2010; OECD, 2015; Wehrmüller, 2014).

Owens (2015) analyzes the impact of subsidized housing on poverty concentration. He uses longitudinal data of the United States from 1977 until 2008. Hui (2010) analyzes customer satisfaction of one residential property in Hong Kong. He uses structural equation model with two latent variables. He finds that service and management quality have significant positive effect on customer satisfaction. Service quality is a crucial latent variable such that its effect is higher than management quality.

Ong (1998) involves a research about housing subsidy in California to investigate the relationship between housing assistance and employment. He argues that when housing assistance increases, employment decreases.

2.2.   Hypotheses

1. Social economy and perception have positive and significant effects on societies' decision over whether or not to choose vertical house to live in.
2. Price, promotion and facilities factors significantly affect the occupancy level of the current available vertical houses.
3. Occupancy level has a positive and significant effect on the societies' decision over whether or not to choose vertical house to live in.

2.3. Variable Definitions

Social Economy is the status of the respondent related to social and economic aspects, and is explained by monthly income, family expenditure, the number of dependant, the ownership status of the house they are currently living in, duration of occupancy in the current house, electricity usage and source of drinking water.

Perception is the target societies' response or opinion about the current available vertical houses and the planned upcoming vertical houses. This variable is explained by how complete the information about the vertical houses they get, number of relative(s) using vertical house, how they perceive the price and the comfort level of the current available vertical houses, what they feel about the administrative process of the registration procedure to be a tenant in the vertical house and whether or not the vertical houses implementation has been on target in their opinion.

5

Promotion is the attempts of the local government to introduce as well as to promote vertical house to the society as the target housing aid. Decision is the reaction of the respondents on the offer whether or not they are willing to live in a vertical house.

Chapter 3. Research Method

3.1. Population and Sample

The population of this research is the lower income group of societies in Magelang City. It is in accordance with the target recipient of housing aid. The total population of Magelang City in 2015 was 120.995 persons. According to the data of Magelang City in Numbers 2017, about 8.79 percent of the population are from lower income category. Hence, the population number of this research is 10.636 persons.

This research uses 100 samples. This number is obtained using Slovin formula as follows:

$$n = \frac{N}{1 + Ne^2}$$

where:

n = the number of samples

N = the number of population

e = *error term*

With a population of 10.636 persons and an error term of 10 percent, using the Slovin formula, we obtain that the the required number of samples is 99.06 which is rounded to 100.

The sampling method used in this research is *purposive sampling* since the sample of this research is not measurable.

3.2. Research Instrument

The instrument used to acquire the primary data from respondents is questionnaire. The questionnaire will be used as a guide in a structured interview with the respondents.

3.3. Measurement Scale

This research uses nominal scale with the method of questionnaire measurement using Likert scale. All the obtained information through the questionnaire is measured using Likert scale which ranges from 1 to 5 (1 = strongly disagree to 5 = strongly agree).

6

3.4.   Method of Analysis

The methods used in this research are quantitative and qualitative methods. The data collected through the questionnaire is analyzed using *Structural Equation Model (SEM)* instrument and employing M Plus Program as the analysis media.

The framework of the *Structural Equation Model (SEM)* formulation is shown by the following figure:
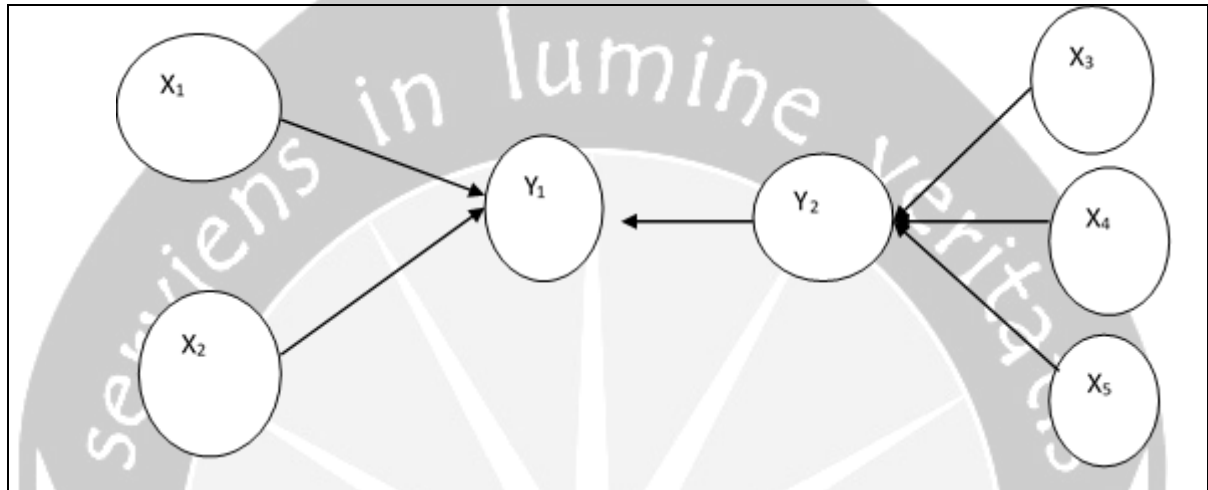
With   : X_1 = Social economy

X_2 = Perception

X_3 = Rent (Price)

X_4 = Promotion

X_5 = Facility

Y_1 = Decision

Y_2 = Occupancy

The *Structural Equation Model* of this research is as follows:

$$Y_1 = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 Y_2 + \varepsilon_1$$

$$Y_2 = \beta_0 + \beta_1 X_3 + \beta_2 X_4 + \beta_3 X_5 + \varepsilon_2$$

Where α_0 and β_0 are constants, $\alpha_1, \alpha_2, \alpha_3, \beta_1, \beta_2, \beta_3$, are the coefficients of the related variables, and α_1 and α_2 are the error standards.

Chapter 4. Result and Analysis

4.1.   Profile of Magelang City

Magelang City is located in Province of Central Java, Indonesia. The total population in 2016 was 121.291 persons with a population growth of 0.56 percent based on BPS data. The region of Magelang City is divided into three districts, namely Central Magelang, North Magelang and South Magelang with a total area of 18.120 km^2.

Population density in Magelang City is 5.515 per km^2. By comparing it to other regions in the Province of Central Java, Magelang City is the third most populous region (Welfare indicator of Magelang City in 2016).

Table 1. Population and Density in Magelang City in 2011-2016

Year	Total Population of Magelang City	Population Density (km^2)			
		Magelang City	South Magelang	Central Magelang	North Magelang
2011	119,210	6 579	5 808	8 503	5 843
2012	119,647	6 603	5 829	8 534	5 864
2013	120,158	6 631	5 854	8 570	5 890
2014	120,615	6 656	5 876	8 602	5 913
2015	120,592	6 675	5 893	8 625	5 930
2016	121,293	6 694	5 909	8 649	5 947

Source: Indonesia Population Projection 2010-2035

Based on the data above, the most populous district in Magelang city is Central Magelang followed by North Magelang and South Magelang.

4.2.   Profile of Respondent

From the 100 respondents surveyed in Magelang city, 66.4 percent of them are of lower income category with family income lower than Rp 2.000.000 per month. About 76.3 percent have monthly family expenditure of less than Rp 2.000.000. On average, each respondent has 3.14 dependants. While only 30.9 percent have self-owned houses, most of them, namely 36.3 percent live in relatives' or inherited houses, and 22.7 live in rented houses. About 61 percent of them have been living in their current houses for more than seven years. Roughly 75 percent of them have already had their own well as the source of drinking water.

When it comes to perception on vertical housing, 27.3 percent of the respondents do not have sufficient information about the current vertical houses in Magelang City. While 33.6 percent of the respondents say that the current rent price of the vertical houses is moderate, according to 46.4 percent of them it is relatively cheap. Moreover, the perception of 84.6 percent of the respondents on the vertical houses' comfort level ranges from comfortable to moderate. Despite the relatively easy administration process for the registration as is perceived by most of the respondents, 89.2 percent of them agree that the vertical house implementation has not been on target as it is expected to be. In other words, according to most of the respondents the vertical houses have not yet properly reached the goal to help the poor in obtaining a decent house.

4.3.   Analysis

A SEM analysis comprises two parts: measurement model and structural model. In the measurement part, we conduct a factor analysis on the latent factors which are measured by observed variables. This part is aimed at obtaining the best model to proceed to the structural part. In the structural part, we do a full regression on the model that is already built based on the measurement part.

4.3.1.   Measurement Model

This part is also known as Goodness of Fit (GOF) test with the purpose to get the best model of the each construct of latent variables that are measured by observed variables. In this study we examine four constructs, namely social economy, perception, promotion and decision as latent variables, using Confirmatory Factor Analysis (CFA). The basic consideration for using CFA instead of EFA (Explanatory Factor Analysis) is that our model uses an indicator to load multiple factors.

a.   *Social Economy Variable*

Social economy variable is latent variable that is measured by seven observed variables, namely income, expenditure, number of dependant, house ownership, duration of occupancy, electricity usage and drinking water source. Generally, the ratio for χ^2/df (*degree of freedom*), the goodness-of-fit index (GFI), the comparative index (CFI), the root mean square error of approximation (RMSEA), and the normal-fit index (NFI) have been used to verify the appropriateness of SEM (Molenaar et al., 2000; Wong & Cheung, 2005; Cho, 2009).

Hu and Bentler (1999) proposed criteria for an indication of good model-data fit using these indicators: the value of CFI is larger than 0.95, SRMR is smaller than 0.08 and RMSEA is smaller than 0.06. Moreover, the chi-square test, reporting the model chi-square value with its degrees of freedom in addition to the other fit indices, is recommended.

For social economy variable, the value of the CFI is 0.653, the SRMR is 0.140, and the RMSEA is 0.238. It implies that the model solution can be considered proper because there are no out-of-range parameter estimates and the standard error estimates are of similar magnitude (see table below).

Table 2. Goodness of Fit Measurement of Social Economy Variable

GOF indicator	Recommended level of GOF	Estimated Value of GOF
SRMR	<0.08 indicates the most acceptable model	0.014
CFI	0 (Not fit) to 1 (perfectly fit)	0.653
RMSEA	<0.10 indicates the most acceptable model	0.238

The table below presents the results for the measurement components of our model (i.e. a confirmatory factor analysis). The first column displays the standardized parameter estimates, which represent the loading factors between the latent constructs and the observed indicators. The R-square values which indicate how much of the variance are explained by the factors. The P-Value indicates how significant the observed variables explain the latent variable.

Table 3. The Loading Factors of Social Economy Variable

Variable	Stand. Estimate	R square	P-Value
Social Economy			
Income	1.000	0.944	0.000
Expenditure	0.726	0.778	0.000
Number of dependant(s)	-0.228	0.052	0.024
House ownership	0.366	0.079	0.003
Duration of occupancy	-0.239	0.052	0.020
Electricity usage	0.035	0.011	0.291
Drinking water source	-0.272	0.052	0.021

The higher values of standardized estimates in the measurement model suggest better indications of the observed variables in estimating the latent variable. The income variable has the highest standardized estimate which is confirmed by the significant P-Value.

Meanwhile, the electricity usage variable has the lowest standardized estimate and becomes the only variable with insignificant P-Value.

b. *Perception Variable*

The perception variable is a latent variable that is measured by six observed variables, namely information, number of relative(s) using vertical house, price, comfort, administration process and vertical house targeting.

Table 4. Goodness of Fit Measurement of Perception Variable

GOF indicator	Recommended level of GOF	Estimated Value of GOF
SRMR	<0.08 indicates the most acceptable model	0.157
CFI	0 (Not fit) to 1 (perfectly fit)	0.647
RMSEA	<0.10 indicates the most acceptable model	0.297

According to the table above, we can conclude that the model's GOF is at moderate level which is shown by the CFI value.

Table 5. The Loading Factors of Perception Variable

Variable	Stand. Estimate	R square	P-Value
Perception			
Information	0.981	*0.962*	0.000
Relative using vertical housing	*0.874*	*0.764*	0.000
Price	-0.221	*0.049*	0.028
Comfortable	0.280	*0.078*	0.003
Administration process	-0.226	*0.051*	0.023
Vertical house targeting	0.108	*0.012*	0.285

The information variable is shown by the variable with the most significant P-Value and highest standardized estimate. Meanwhile, the vertical house targeting variable has the lowest standardized estimate and the only variable with insignificant P-Value.

c. *Promotion Variable*

The promotion variable is a latent variable that is measured by five observed variables, namely Socialization about the Upcoming planned Vertical House, Societies' involvement in

the vertical house development, Government socialization, Frequency of socialization, and Type of Promotion.

Table 6. Goodness of Fit Measurement of Promotion Variable

GOF indicator	Recommended level of GOF	Estimated Value of GOF
SRMR	<0.08 indicates the most acceptable model	0.159
CFI	0 (Not fit) to 1 (perfectly fit)	0.665
RMSEA	<0.10 indicates the most acceptable model	0.383

According to the table above, we can conclude that the model's GOF is at moderate level which is shown by the CFI value.

Table 7. The Loading Factors of Promotion Variable

Variable	Stand. Estimate	R square	P-Value
Promotion			
Government Planning	0.974	0.949	0.000
Involve	0.880	0.774	0.000
Government socialization	-0.225	0.051	0.025
Frequency of socialiazation	0.282	0.079	0.003
Type of Promotion	-0.229	0.053	0.020

Based on the table, we can conclude that all the observed variables can estimate the latent variable well which is proven by the significant P-Values of all variables.

d.   Decision

For the decision variable, the Goodness of Fit Measurement shows a perfectly fit model with all the observed variables having significant P-Values as shown by the following tables.

Table 8. Goodness of Fit Measurement of Decision Variable

GOF indicator	Recommended level of GOF	Estimated Value of GOF
SRMR	<0.08 indicates the most acceptable model	0.00
CFI	0 (Not fit) to 1 (perfectly fit)	1
RMSEA	<0.10 indicates the most acceptable model	0.00

Table 9. The Loading Factors of Decision Variable

| Variable	Stand. Estimate	R square	P-Value
Decision			
Needs	*0.904*	*0.818*	*0.000*
Respond	*0.949*	*0.900*	*0.000*
Willingness	*-0.233*	*0.054*	*0.018*

4.3.2. Structural Equation Model

After the model specification on the measurement part, we have three exogenous latent variables, one endogenous latent variable, two exogenous observed variables, and one endogenous observed variable. In this part, we will do a full regression on all the models altogether. The GOF of the full model is at a good fit level as shown by the following table:

Table 10. Goodness of Fit Measurement of the Full Model

GOF indicator	Recommended level of GOF	Estimated Value of GOF
SRMR	<0.08 indicates the most acceptable model	0.179
CFI	0 (Not fit) to 1 (perfectly fit)	0.379
RMSEA	<0.10 indicates the most acceptable model	0.01

In general, the results of the full SEM regressions are as expected. Based on the estimation result we find the signs of the estimated parameter of each variable as shown by the following figure of SEM estimates:
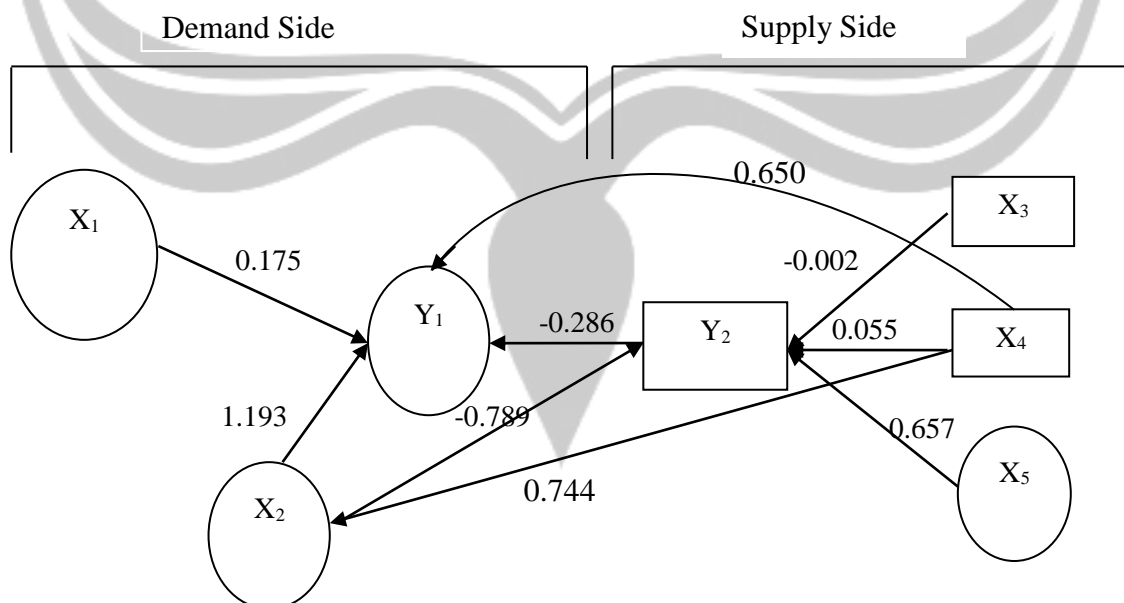
4.3.3. Hypotheses Testing

The SEM regression estimation of the full model is shown by the following table.

Table 11. Regression Estimation the Full Model

Variabel			Estimation Value	Probability
Decision (Y1)	on	Social Economy (X1)	0.175	0.288
Decision (Y1)	on	Perception (X2)	1.943	0.020
Decision (Y1)	on	Occupancy (Y2)	-0.265	0.168
Decision (Y1)	on	Promotion (X4)	0.650	0.117
Occupancy (Y2)	on	Perception (X2)	-0.789	0.449
Occupancy (Y2)	on	Price (X3)	-0.002	0.915
Occupancy (Y2)	on	Promotion (X4)	0.005	0.887
Occupancy (Y2)	on	Facility (X5)	0.657	0.000
Perception (X2)	on	Promotion (X4)	0.744	0.008

Hypothesis 1

Social economy variable has insignificant effect on decision. Meanwhile perception variable has positive and significant effects on societies' decision over whether or not to choose vertical house to live in. Based on the probability value on the estimation, perception is the variable which most significantly affects the societies' decision in choosing vertical house. When the societies have positive perception on vertical house, they are likely to choose to accept the offer to live in vertical house. In contrast, their decision is not effected by their social economy status.

Hypothesis 2

While price and promotion have insignificant effect on the occupancy level of vertical houses, facilities variable significantly affects the occupancy level of the current available vertical houses. Based on the estimation result, the occupancy level of the current available vertical houses is not affected by their prices and the promotion attempted by the local government. Instead it is affected by the available facilities in the vertical houses. The

positive coefficient of the facilities variable indicates that the more complete a vertical house facility is, the more people will choose it. It is proven by the fact that the vertical house with more complete facility has more tenant than the other does.

Hypothesis 3

Occupancy level has a negative but insignificant effect on the societies' decision over whether or not to choose vertical house to live in. It implies that the societies' willingness to live in vertical house is not affected by how many persons live in the vertical housing.

From the demand side, the societies' decision in choosing vertical house is affected by their perception on vertical houses. Meanwhile from the supply side the occupancy level of vertical house is affected by its facilities. These two variables then explain the gap between supply and demand of vertical housing. The government has conducted many attempts including setting proper price, providing facilities and doing promotions. But what really affect the societies' decision in choosing vertical house is their perception. Then the low demand of vertical houses might have been caused by the societies' misperception on vertical house. Analysing promotion and perception, we obtain a positive and significant effect of promotion on perception. Thus, promotion could be a solution to correct the societies' perception about the vertical house.

Chapter 5. Concluding Remarks

Through the analysis on the gap between vertical housing supply and demand in Magelang City, Indonesia, we find that perception significantly affects the societies' decision in choosing vertical house from the demand side. From the supply side, we find that facilities availability determines the occupancy level of vertical houses. Thus, we can conclude that the low demand on vertical houses, shown by the low occupancy level of the current available vertical houses, is caused by a misperception that the societies have about vertical houses. Despite the attempts of the government in providing decent housing, the societies are still reluctant to live in a vertical house for what they perceive it to be. The positive and significant effect of promotion on perception suggests that that promotion could be a solution to correct the societies' perception. From the analysis, we can imply that socialization and promotion are amongst the most important things that the government should do in order to successfully implement vertical housing as a solution to urban housing problem.

Publication Plan

This paper is expected to be published in *Bulletin of Indonesian Economic Studies* or *Croatian Economic Survey*.

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A. Social Economy Characteristic of Respondents

- Income

Income Per Month	Percent
Rp 5.000.100 or more	5.5
Rp 4.000.100-5.000.0000	1.8
Rp 3.000.100-4.000.000	9.1
Rp 2.000.100-3.000.000	17.3
Rp 1.000.100-2.000.000	45.5
Less than Rp 1.000.000	20.9
Total	**100.0**

- Expenditure

Expenditure Per Month	Percent
Rp 5.000.100 or more	1.8
Rp 4.000.100-5.000.0000	8.1
Rp 3.000.100-4.000.000	3.6
Rp 2.000.100-3.000.000	10.0
Rp 1.000.100-2.000.000	44.5
Less than Rp 1.000.000	31.8
Total	**100.0**

- Number of dependants

Number of Dependant	Percent
5 orang or more	20.0
4 persons	24.5
3 persons	29.1
2 persons	12.7
1 persons	3.6
None	2.7
Total	**100.0**

- **House Ownership**

House Ownership	Percent
Others	1.8
Self-owned	30.9
Inheritance/Relative's	36.3
Government's/Company's	0.9
Rented	22.7
Total	**100.0**

- **Duration of Occupancy**

Duration of Occupancy	Percent
Less than 3 years	22.7
3.1-5 years	4.5
5.1-7 years	4.5
More than 7 years	60.9
Total	**100.0**

- **Water Source**

Air minum	Percent
Retail water	7.3
Self-owned well	74.5
PDAM (Provided by the government)	18.2
Others	100
Total	**100.0**

B. Respondents' Perception on Vertical Housing

- **Knowledge about Vertical housing Information**

Information of Vertical housing	Percent
No	27. 3
Yes	72.7
Total	**100.0**

- **Price**

Price	Percent
Very expensive	7.3
Expensive	6.4
Moderate	33.6
Cheap	46.4
Very Cheap	6.4
Total	**100.0**

- **Comfort Level**

Comfortable	Percent
Very Uncomfortable	7.3
Uncomfortable	6.4
Moderate	56.4
Comfortable	28.2
Very Comfortable	1.8
Total	**100.0**

- **Administration Process**

Administrative Process	Percent
Very complicated	0
Complicated	2.7
Moderate	73.6
Easy	16.4
Very easy	7.3
Total	**100.0**

- **Targeting**

Targeting	Percent
On Target	3.9
Moderate	6.9
Out of target	89.2
Total	**100.0**