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### Income Inequality and Access of Housing

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**Abstract:** Increasing income inequality potentially affect every dimension of human life, including opportunity to access housing. With more people have less income, it will hard for them to provide adequate dwellings, in term of per capita floor area. The small per capita floor area indicates households inability to provide better living condition for their family member. This research explores the relationship between income inequality and access of housing in Indonesia. We found that more unequal income drives to difficulties to obtain larger per capita floor area. The effect is quite different between population in Java Island and outside of Java Island. As income inequality rises in Java Island, less people will have less than 7,2 square meter per capita. On the other hand, as income inequality rises in outside of Java Island, more people will have less than 7,2 square meter per capita.

**Keywords:** Income inequality, housing, per capita floor area.

### INTRODUCTION

Increasing income inequality gives negative impacts to economy. It may prevents households ability to have adequate living condition (Zhang, Jia, Yang, 2016; Zhang, 2015). As little amount of income ready to spent, households have to prioritize their allocation. As a result, housing positioned in last number of monthly budget.

Households only can afford a relatively small house area for them. They have to live in “city ants” (Zhang, 2015), a place where households live in small dwellings. In big cities, gentrification plays role in pushes poor people out from their areas (The Institute for Children and Poverty, 2009). They must search new dwellings, and unfortunately, most of them cannot maintain their living standard. With wider gap between rich and poor, income inequality is getting worse. Only few people can afford to live in relatively big house and a huge amount of people must live in “city ants”. This potentially creates bigger problems:

health (Tunstall, *et. al.*, 2013), life (Yap, 2015), big disparity in education sector (Gingrich and Ansell, 2014), and better living condition (Baslevent and Dayioglu, 2004). Thus, it is urge to explore relationship between income inequality and access of housing.

## METHODOLOGY

This research used Statistik Perumahan dan Permukiman (Statistic of Housing) published by Indonesian Statistic Agency. The data are compiled from National Social and Economy Survey. We employ 20 years data, dated from 1996 to 2016.

We give concern to use data of proportion of households who have less than 7, 2 square meter per capita floor area. This measurement is decided by BPS since the first *susenas*, to measure households living of standard. The higher the number indicates households inability to give better living condition.

Income inequality is proxied by Gini Coefficient. Gini Coefficient is a statistical measurement intended to represent the income distribution in one country or region. Gini coefficient valued 0 to 1, where Gini Coefficient of 0 represents perfect equality, where each populatin received same amount of income. Otherwise, Gini Coefficient of 1 expresses maximal inequality, where only one person has all the income and the rest have nothing. A Gini Coefficient that ranged from 0 to 0,3 is categorized light income inequality. A coefficient that ranged 0,3-0,5 is categorized moderate inequality. Lastly, a coefficient that valued 0, 5 to 1 is grouped in high inequality.

## LITERATURE REVIEW

### Measuring Income Inequality

Income inequality commonly counted based on the calculation of the disposable income from all sources, after taxes and transfers, among households, with adjustments for differences in household composition (Pop, 2015). Eurostat, for example, uses household disposable income, which is measured by summing up all monetary incomes received from any sources by each member of the household (including income from work and social benefits) plus income received at the household level, and deducting taxes and social contributions paid (EUROSTAT, 2010).

There are several types of inequality measurement (Pop, 2015). Firstly, range. This summarizes the difference between the highest and lowest observations of the distribution. The main limitation of this measure reside in the fact that it only uses information on two values from an entire dataset. Secondly, range ratio. It is calculated by dividing the value at a certain percentile by the value at a lower percentile. Like the range, range ratios only look at two distinct data points, throwing away the great majority of the data, reason why these measures are the lest preferred. Thirdly, coefficient of variation, which is defined as the standard deviation of a variable divided by the mean. It is fairly easy to compute and it uses all the information available. The downside is that it can take any values from zero to infinity.

Next, Gini coefficient. It calculation is derived from the Lorenz Curve, which is plotted by ranking the observations (e.g. individuals or households) from the lowest to the highest, based on the variable of interest (e.g. income). Next step is to plot the cumulative proportion of the population on the horizontal axis and the cumulative proportion of the income variable on the vertical axis. Mathematically, the Gini

coefficient is equal to double the area between the equality diagonal and the Lorenz curve derived from the data, and has an interval ranging from 0 (perfect equality) to 1 (the case when only one member of the population holds all its resources).

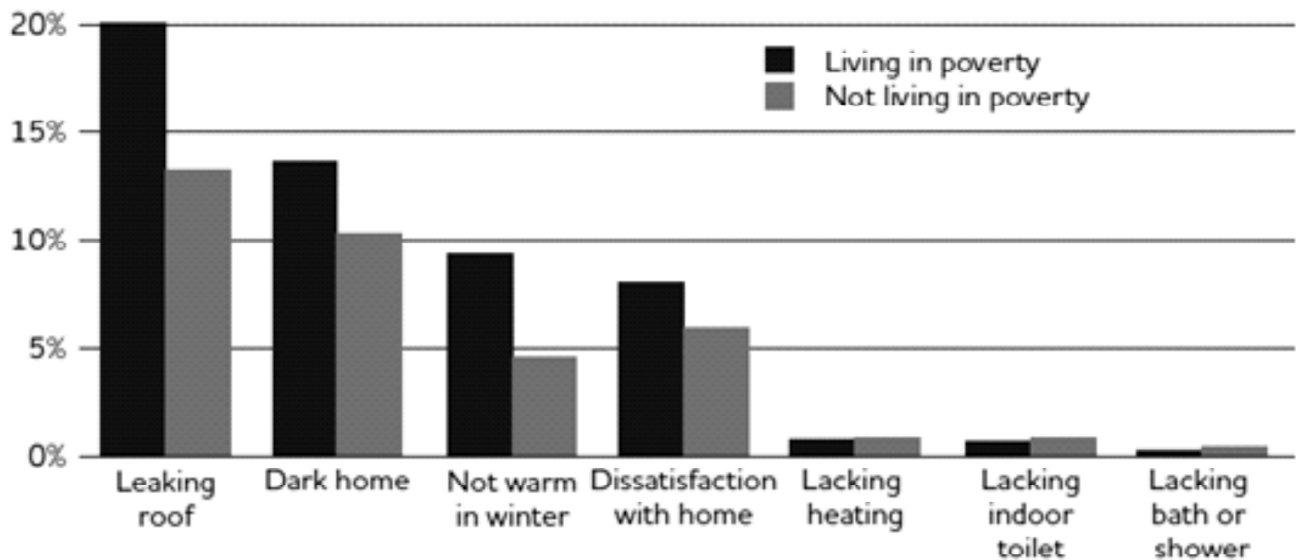
Another group of inequality measures are based on Generalised Entropy (GE) theory. A measure of inequality derived from these principles is the Theil Index, which seeks to quantify the level of disorder within a distribution. It has the advantage of being additive across different subgroups or regions in the country. The Theil index, however, does not have a straightforward representation and lacks the appealing interpretation of other measures. In addition, it cannot be used to directly compare populations with different sizes and group structure.

### **Income Inequality and Access of Housing**

Income inequality plays important role in well-being. Worse income inequality leads to worse well-being (Pop, 2015). Thus, reducing income inequalities is the key to create better, healthier, more successful societies (Wilkinson and Pickett, 2006).

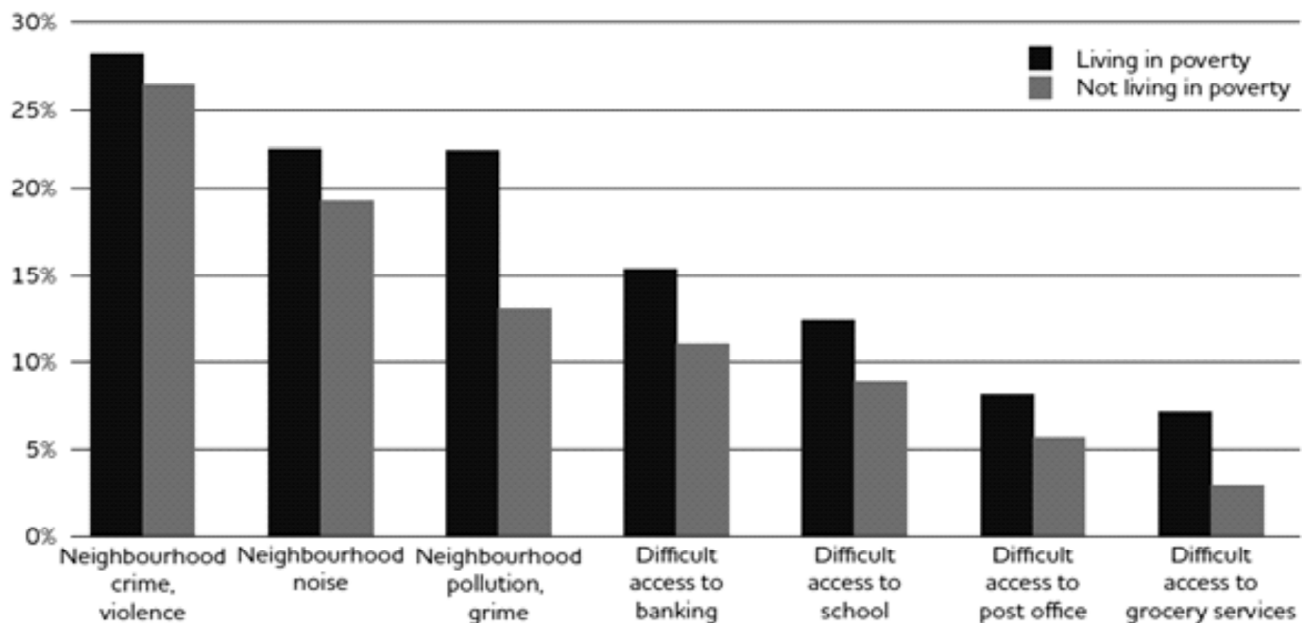
Tunstall, *et. al.* (2013) stated poverty affects housing circumstances appears stronger than evidence that housing circumstances affect poverty. Nonetheless, it appears that low-cost, decent-quality housing, in an attractive job market could make a substantial contribution to increasing disposable income, preventing material deprivation and maintaining work incentives. Also, Tunstall, *et. al.* (2013) stated that there is substantial evidence to show that poor housing conditions affect some aspects of child development and elements of adult health. The link between health, and income and employment is less established, although this is probably partly due to the complexity of proving cause in such a broad field.

Problems related to decent house is positively related to poverty. For example leaking roof, dark home, not warm in winter, and dissatisfaction with home. Figure 1 shows many housing problems in UK in 2009.



**Figure 1: Housing Quality Problems of Those Living in Poverty and Not Living in Poverty, UK, 2009**

Source: Lelkes and Zolyomi (2009) in Pop (2015).



**Figure 2: Neighbourhood Quality Problems of Those Living in Poverty and Not Living in Poverty, UK, 2007**  
 Source: Lelkes and Zolyomi (2009) in Pop (2015).

Also, poverty prevents households to select appropriate neighbourhood that support their live. Figure 2 expresses neighbourhood quality problems in UK.

From figure 2 we can see more than a quarter of households complaining about crime and violence in their neighbourhood. Noise and pollution significantly higher in those who living in poverty comparing to those who are not living in poverty.

### EMPIRICAL ANALYSIS AND RESULTS

In period of 1996-2016, in Indonesia, 13,42 of its population live in dwelling that have less than 7,2 square meter per capita (Badan Pusat Statistik, 2014). From table 1, provinces with highest proportion of households who have less than 7,2 square meter per capita are Papua (43,74%), Nusa Tenggara Timur (33,30%) and Nusa Tenggara Barat (27,67%). All of them are in outside of Java Island. On the other hand, provinces in Java Island who have highest proportion of households that have less than 7,2 square meter per capita are Jakarta (27,50%), Jawa Barat (14,00%) and Banten (13,72%). Jawa Tengah and Yogyakarta are both provinces who have least proportion of households that have less than 7,2 square meter per capita in Indonesia, with 3,91% and 4,33% respectively.

**Table 1**  
**Percentage of Households Who Have Less than 7,2 Square Meter Per Capita, 1996-2016**

Province	1996	2010	2016	Average
Aceh	20,45	16,40	13,22	16,88
Sumatera Utara	23,31	17,75	13,21	18,33
Sumatera Barat	21,44	16,62	12,81	17,27

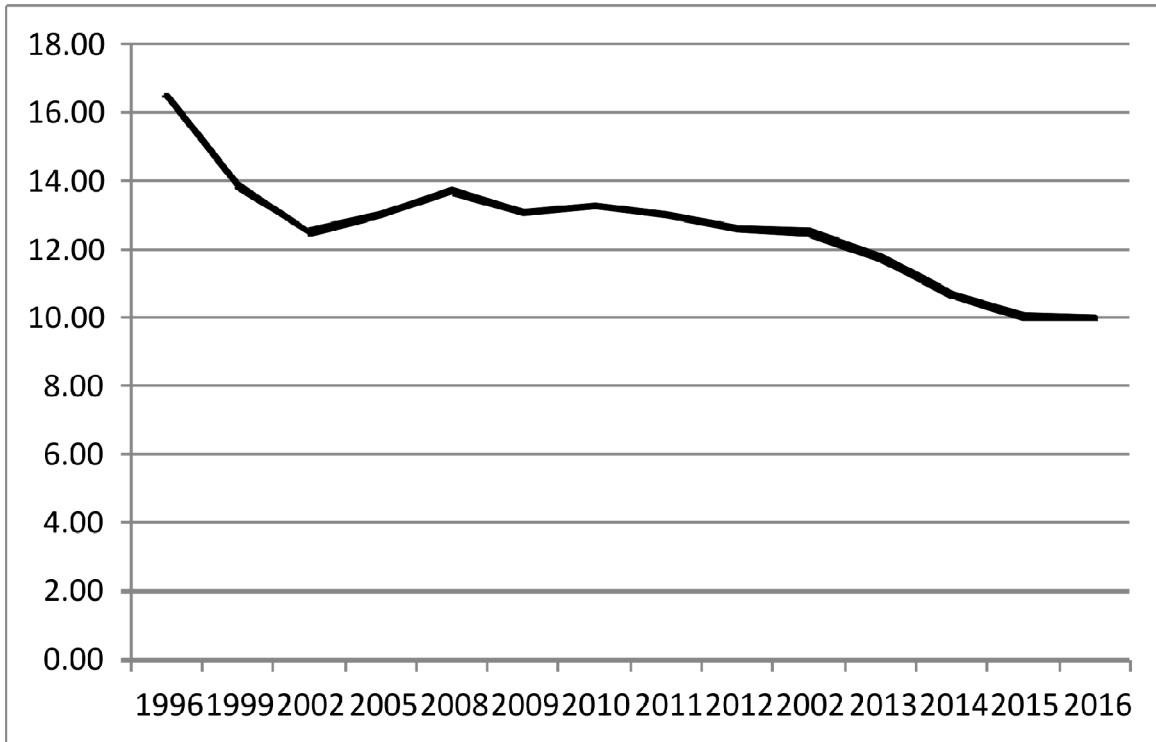
Contd. table 1

*Income Inequality and Access of Housing*

<i>Province</i>	<i>1996</i>	<i>2010</i>	<i>2016</i>	<i>Average</i>
Riau	20,08	12,62	9,54	14,11
Jambi	21,58	11,68	8,18	13,22
Sumatera Selatan	26,21	20,58	15,21	20,92
Bengkulu	24,01	15,60	10,08	17,34
Lampung	15,49	7,05	4,70	9,92
Kepulauan Bangka Belitung	–	9,27	5,41	8,83
Kepulauan Riau	–	12,18	6,34	15,45
DKI Jakarta	23,53	34,67	29,72	27,50
Jawa Barat	17,66	13,89	10,16	14,00
Jawa Tengah	5,85	3,21	2,89	3,91
DI Yogyakarta	6,04	5,44	4,16	4,33
Jawa Timur	8,58	5,94	4,87	6,85
Banten	–	15,80	11,23	13,72
Bali	20,91	16,82	11,44	18,32
Nusa Tenggara Barat	38,37	22,46	14,40	27,67
Nusa Tenggara Timur	39,22	29,77	22,29	33,30
Kalimantan Barat	29,87	17,37	10,95	19,73
Kalimantan Tengah	18,57	16,54	10,12	15,46
Kalimantan Selatan	20,88	12,66	10,76	15,02
Kalimantan Timur	21,47	15,33	9,82	15,14
Kalimantan Utara	–	–	12,93	12,93
Sulawesi Utara	27,36	18,33	14,26	19,53
Sulawesi Tengah	22,81	19,59	13,35	19,71
Sulawesi Selatan	17,24	11,43	9,33	13,68
Sulawesi Tenggara	20,54	16,78	12,95	17,82
Gorontalo	–	21,50	17,60	21,38
Sulawesi Barat	–	24,20	14,72	21,80
Maluku	19,98	25,13	17,38	22,88
Maluku Utara	–	14,71	10,10	12,92
Papua Barat	–	24,40	17,73	23,20
Papua	38,27	55,93	39,69	43,74
Total	16,48	13,27	10,05	13,42

*Source:* Badan Pusat Statistik (2014)

From figure 3, there is a declining trend in percentage of households who have less than 7,2 square meter per capita in Indonesia. in 1996, there was 16,48 percent of households who live in less than 7,2 square meter per capita. The trend is drastically decreasing in period of 1996 to 2002. Then, the figure significantly rose to 13,72 percent in 2008. Then, it slightly decreasing to 10 percent in 2016.



**Figure 3: Trend in Percentage of Households Who Have Less than 7,2 Square Meter Per Capita in Indonesia, 1996-2016**

Source: Data Processed.

In period of 1996-2006, income inequality in Indonesia, which proxied by Gini Coefficient is categorized as moderate (0,38). Papua and Yogyakarta are provinces with highest Gini Coefficient (0,40 each). On the other side, Province of Bangka Belitung has the lowest Gini Coefficient (0,28). In Java Island, provinces with worst income distribution are, consecutively, Yogyakarta, Banten, Jakarta, Jawa Barat, Jawa Timur, and Jawa Tengah.

**Table 2**  
**Gini Coefficient, 1996-2016**

Province	Gini Coefficient			Average
	1996	2010	2016	
Aceh	0,26	0,3	0,33	0,30
Sumatera Utara	0,3	0,35	0,32	0,32
Sumatera Barat	0,28	0,33	0,33	0,32
Riau	0,3	0,33	0,35	0,33
Jambi	0,25	0,3	0,35	0,31
Sumatera Selatan	0,3	0,34	0,35	0,33
Bengkulu	0,27	0,37	0,36	0,33
Lampung	0,28	0,36	0,36	0,35
Kep. Bangka Belitung	–	0,3	0,28	0,28

Contd. table 2

<i>Province</i>	<i>Gini Coefficient</i>			
	<i>1996</i>	<i>2010</i>	<i>2016</i>	<i>Average</i>
Kep. Riau	–	0,29	0,35	0,33
DKI Jakarta	0,36	0,36	0,41	0,37
Jawa Barat	0,36	0,36	0,41	0,37
Jawa Tengah	0,29	0,34	0,37	0,34
DI Yogyakarta	0,35	0,41	0,42	0,40
Jawa Timur	0,31	0,34	0,4	0,35
Banten	–	0,42	0,39	0,38
Bali	0,31	0,37	0,37	0,35
Nusa Tenggara Barat	0,29	0,4	0,36	0,34
Nusa Tenggara Timur	0,3	0,38	0,34	0,34
Kalimantan Barat	0,3	0,37	0,34	0,34
Kalimantan Tengah	0,27	0,3	0,33	0,30
Kalimantan Selatan	0,29	0,37	0,33	0,33
Kalimantan Timur	0,32	0,37	0,32	0,34
Kalimantan Utara	–	–	0,3	0,30
Sulawesi Utara	0,34	0,37	0,39	0,35
Sulawesi Tengah	0,3	0,37	0,36	0,34
Sulawesi Selatan	0,32	0,4	0,43	0,38
Sulawesi Tenggara	0,31	0,42	0,4	0,37
Gorontalo	–	0,43	0,42	0,39
Sulawesi Barat	–	0,36	0,36	0,34
Maluku	0,27	0,33	0,35	0,33
Maluku Utara	–	0,34	0,29	0,32
Papua Barat	–	0,38	0,37	0,39
Papua	0,39	0,41	0,39	0,40
Indonesia	0,36	0,38	0,40	0,38

*Source:* Badan Pusat Statistik (2014).

The trend in Gini Coefficient in Indonesia in 1996-2016 is showed in figure 4. There was a moderate increase of Gini Coefficient, from 0,36 in 1996 to 0,40 in 2016. There was a fluctuation in period of 1996-2005 when Gini Coefficient fell from 0,36 in 1996 to 0,31 in 1999. Then, Gini Coefficient climbed to 0,36 in 2005. Next, the index was relatively steady until the end of observation.

Observing Gini Coefficient in provinces in Indonesia, Papua, together with Yogyakarta, has the worst income distribution in Indonesia because of many factors. Mostly caused by natural resource ownership. The ownership demand skillful management, which only owned by non-indigenous population. In conducting their business, they need support from local authorities, which potentially, in indirect way, enrich them. In contrary, Yogyakarta also has to worse income distribution caused by its long history of Javanese kingdom. Until now, wealth is accumulated among royal families, who inherit properties, land, or business unit,

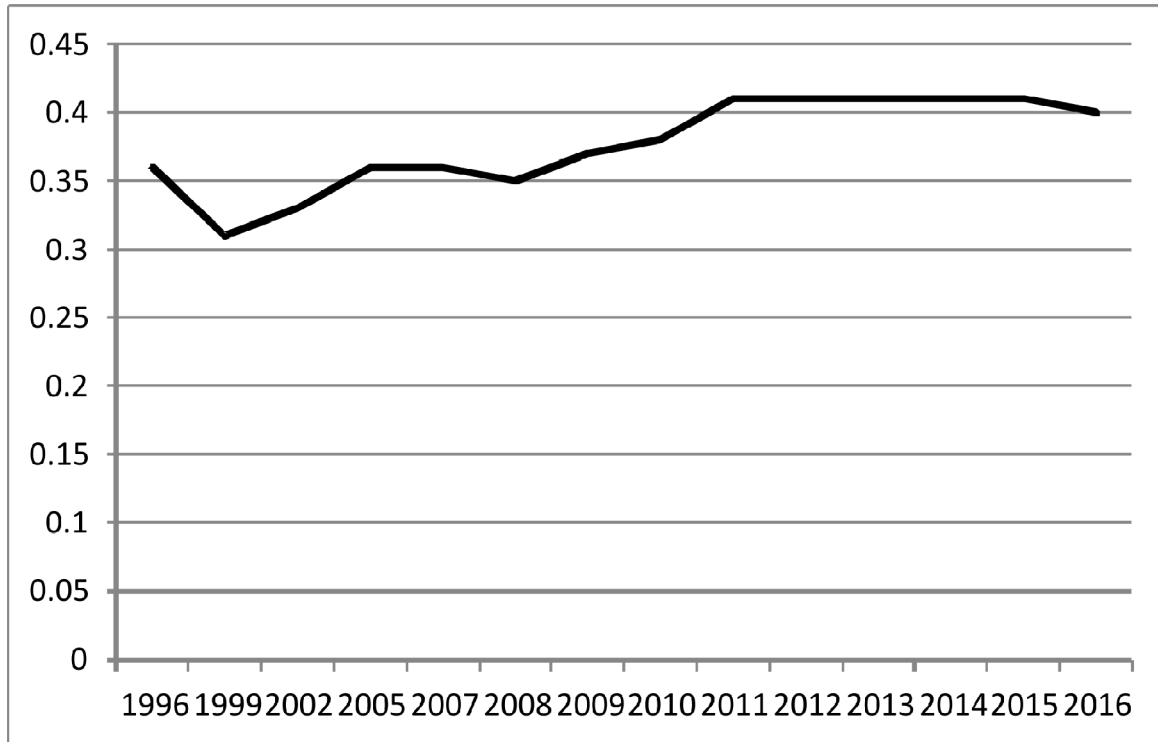


Figure 4: Trend in Gini Coefficient in Indonesia, 1996-2016

Source: Data Processed.

collaborated with pure businessmen. They accumulate income far above common people. Those political inequality may results development and wealth inequality. This is similar to findings of Acemoglu, Bautista, Querubin, and Robinson (2007) and World Resource Institute (2007).

We found that there is a positive relation between income inequality and proportion of households who have less than 7,2 square meter per capita floor area. As income inequality worsened, there will be more households cannot afford houses—in term of adequate per capita floor area. A 0,01 point increase of Gini Ratio will increase 0,05 percent of households who have less than 7,2 square meter per capita floor area. Those shrink house size not only exist in Indonesia, but also in China (Zhang, 2015), the U.S. (Wilson and Boehland, 2005), and Africa (Glewwe and Van Der Gaag, 1990)

Table 3  
Income Inequality and Access of Housing

Independent Variables	Dependent Variables				
	Percentage of Households	Percentage of Households in Java Island		Percentage of Households Outside of Java Island	
C	1,168793	20,47708	19,20217	0,326404	0,546284
Gini Coefficient	0,050305	–	–47,81085	–	2,079752
Gini Coefficient in Java Island		–44,56564	–		–
Gini Coefficient outside of Java Island		–	–	2,735297	–
R-squared	0,000049	0,088614	0,033485	0,294320	0,152722

Source: Data Processed.



We split our focus areas into two parts: Java Island and Outside Java Island. As unequal attention between Java Island and outside Java Island, it may lead to big difference in development capacity between those areas (Soseco, 2010). Using same technique, income inequality in Java Island has bigger effect on access to housing comparing to outside of Java Island, but in reversed way. A 0,01 point of rise in Gini Coefficient among provinces in Java Island will reduce 44,5 percent of households who have less than 7,2 square meter per capita. On the other hand, the effect is higher if we use Indonesian Gini Coefficient (47,8 percent).

There is a positive relationship between income inequality and percentage of households outside of Java Island. A rise of 0,01 point in Gini Coefficient will result in an increase of 2,73 percent of households who have less than 7,2 square meter per capita (Gini among provinces outside Java) and 2,07 percent of households who have less than 7,2 square meter per capita (Gini among provinces in Indonesia).

The negative relationship between income inequality and percentage households who have less than 7,2 square meter per capita in Java Island is caused by many factors. People in Java Island do unique respond facing higher inequality. They reduce family size, postpone having children, or even postpone a marriage. In big cities, families tend to move to vertical housing, which provides better facilities, than force themselves to build landed house which has skyrocketing price. By taking those actions, they still able to provide adequate living space for their families.

The contrast condition exists in provinces outside of Java Island. Income inequality will reduce their ability to obtain adequate living space. The competition—expressed in income inequality—is likely less felt among population comparing to they who live in Java Island. Also, related to limited information and existing condition, they still do not want to reduce family size. Manpower is still likely needed comparing to technology. This worsened by high building material price which results their inability to expand or buy new house.

In general, Indonesian population experiencing higher income inequality which leads to more people are not able to obtain adequate minimum per capita living space. But the effect is different, between population in Java Island and outside of Java Island. Therefore, it is suggested that government take control of this condition. Since housing supply mostly provided by private enterprises, they tend to construct new residency by profit-oriented. Government, who has state-owned company that specialized in providing affordable house (Perum Perumnas), must interfere, through providing affordable houses. Because of lack of land banks, the projects must be directed to build vertical housing, not only landed house. Thus, minimum per capita floor area can be enhanced.

## CONCLUSIONS

A rise of income inequality in Indonesia will prevent access of housing. The more Gini Coefficient rises, the more households who have to live in less than 7,2 square meter floor area per capita. The effect is different between population in Java Island and outside of Java Island. There will be less people in Java Island who have 7,2 square meter per capita as income inequality rises. On the other hand, there will be more people in outside of Java Island who have 7,2 square meter per capita as income inequality. It is important for government to interfere by providing affordable housing so that more households can live in adequate dwellings.

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