Inequality in Household Real Estate Ownership and the Effect of Property Taxes on Income Inequality in Thailand

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ABSTRACT

The Thai government replaced property taxes on real estate with land and building tax in an effort to increase local government revenue, improve tax administration, and reduce land concentration and price speculation. However, housing and farming properties valued at less than 50 MB, which represents 99.96% of all real property in Thailand (DLA, 2018) are exempted. This study applies Shorrocks Index decomposition by income quintile, region and municipal area to measure income and asset inequality in Thailand over the period of 2007-2017. Thai household income and assets data were taken from the Socio-economic Survey (SES), which is standardized with national statistics. The analysis is done under three scenarios: (1) previous property taxes, (2) land and building tax, and (3) land and building tax without exemptions. Inequality of assets was higher than income inequality throughout the period, and it was found that the majority of inequality stemmed from inequality in Bangkok and other urban areas. The empirical results support the concept that land and building tax, as the new tax regime, can generate much higher revenue for local government and better reduce inequality; however, if land and building tax is levied on all property regardless of value, it would generate much higher revenue, and the household tax burden would be rather small.

Keywords: Property Tax, Wealth Concentration, Income Inequality, Subgroup Decomposition

1. Introduction

In 2019, Credit Suisse has estimated that the wealthiest 10% of the population in Thailand own 76.6% of the assets, while the top 1% owns 50.4% (Credit Suisse, 2019). As we are discussing the real estate tax, this paper focuses specifically on the distribution of real estate in Thailand. The Gini Coefficient of title to land is 0.886 for 2012[1]. Based on land distribution by decile, the top 10% holds 61.48% of titled land, while the lowest 10% holds only 0.07%. The Gini Coefficients of real estate for

[1] The author's calculation from the title to land data of 2012, collected by the Land Department of Thailand (Laovakul, 2013).

business and agricultural purposes are 0.882 and 0.884, respectively, while the Gini coefficients of income were 0.511, 0.497, and 0.485 in 2006, 2007, and 2009, respectively (Laovakul, 2013, 2016).

Despite the rising wealth share of the wealthiest 1% around the world, the bottom 75% globally still own around 10% of total wealth (UNU-WIDER, 2020). The middle class mainly gains their wealth through rising house prices, while the wealth of the rich comprises mainly real estate and financial assets (Alvaredo, Chancel, Piketty, Saez, & Zucman, 2017), which are potential sources of passive income. Therefore, when the rich save and invest more, the result is an increase in income inequality, which hampers long-term economic growth.

In 2011, the lands larger than 100 rai comprised only 0.03% of the total number of registered real property deeds, whereas plots smaller than 14 rai comprised 94.4% of the total number of deeds[2]. Possessing title to land also has a positive relationship with household income. Past research has shown that 70% of the 1st (lowest) quintile group in Thailand owned less than 20 rai, while 68% of 5th quintile owned more than 20 rai (Ananapibut, 2012).

Apart from pre and post market resource allocation such as education and occupation training and strong labor unions, land and building tax, which has a progressive structure and covers both land and infrastructure, can be an effective tool for the government to redistribute economic gains, reduce price speculation, and stimulate investment. ,

The objective of this study is to compare the efficacy of land and building tax (LBT) and the previous property tax regimes, local development tax (LDT) and building and land tax (BLT). This research focuses on two functions of property taxes: (1) a revenue source to local government, and (2) a wealth redistributive measure that affects income inequality. This study applied Shorrocks index subgroup decomposition by income class on the Socioeconomic Survey data (SES) of Thai household income and assets over the period of 2007-2017[3].

The motivation for this study comes from drawbacks of previous property taxes in Thailand, which comprised the LDT and BLT. LDT has an outdated tax base and regressive tax structure, while BLT is very high and subject to double taxation (along with income tax). Moreover, people manage to avoid paying these property taxes. As a result, local governments in Thailand hardly collect enough revenue to finance needed infrastructure and public services (Laovakul & Phijaisanit, 2008; Techarungnirand, 2003). The local budgets are heavily subsidized by the central government; thus,

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2 The Title Deed documents includes certificate utilization (NS. 3) and (NS. 3 K) from 399 land department offices.

3 The data on the value of household assets in the Socio-Economic Survey (SES), conducted by the National Statistical Office (NSO), first became available in 2006.

effective implementation of a decentralized policy cannot be achieved. In addition, as the cost of holding such property is low, rich people accumulate their wealth in real assets, resulting in concentration of land wealth, and price speculation.

In order to solve these problems, the Thai government replaced those previous property taxes with LBT and started to collect this tax on August 1st, 2020. This new property tax provides advantages over previous property taxes. First, LBT is levied on the combination value of land and infrastructure. Second, it covers all types of real estate, including unused land, in order to stimulate efficient land use. Third, it is expected to increase revenue for local governments, supporting the decentralization policy. Fourth, the higher tax liability should increase citizen participation and local government administration transparency. One significant issue, however, is that, under the current LBT regime, the government exempts tax for dwellings and farming property valued at less than 50 million baht in an effort to relieve the tax burden.

As mentioned earlier, this means that most real property is exempted under this new tax. For this reason, the analysis in this study is done under three scenarios ;(1) previous property tax regimes (LDT and BLT), (2) land and building tax with exemption, and (3) land and building tax without exemption. The last, hypothetical, scenario illustrates how much revenue could be raised, and how much it could affect inequality in Thailand compare to the current statutory conditions and the existing property taxes. Such an empirical result can contribute to the formation of policy for future tax reforms.

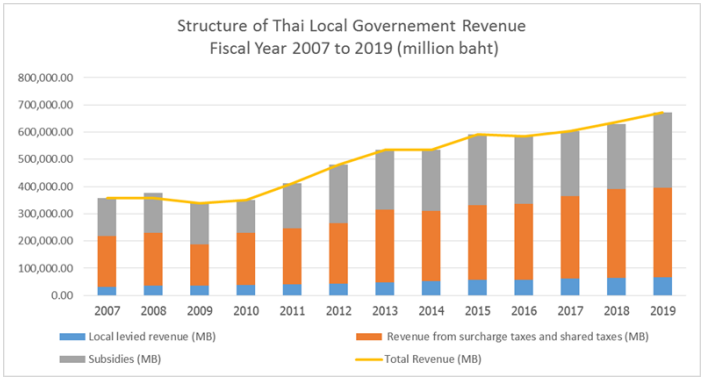
This study contributes to the field by demonstrating the real estate concentration among the Thai population by monetary value, which is the basis of the new tax LBT. The value of income and real assets from SES data is adjusted with the national statistics to mitigate the problem of under-surveying of high income households. Wealth and income inequality of Thai household are analyzed using Shorrocks Index (I2) decomposition by income class to measure changes in income inequality before and after taxes. The empirical results from this study provide numerical evidence on the problem of wealth concentration, and a comparison of the property tax efficacy.

In the next section, we discuss the literature review regarding property taxes in Thailand to explain the current issue. The third section discusses research methodology and Shorrocks Index (I2) subgroup decomposition. The fourth section describes household income and asset statistics for the period of 2007- 2017. Then, the paper discusses empirical results from each scenario, and discusses changes in income distribution and inequality, estimated household tax burden and effective tax rates, and the estimated revenue for local governments. The paper then finishes with the conclusion and research contributions.

2. Literature review

Local government revenue in Thailand comes from four sources: Locally-levied revenue, surcharge tax, shared tax, and central government subsidies. In the 2019 fiscal year, locally-levied revenue contributed only 9.93% of total revenue. LDT and BLT contributed 0.14% and 5.30% of total revenue, respectively. The rest of local government revenue came from the central government (48.99%) and from surcharge taxes and shared taxes (41.08%). Such high financial dependency of the local budget on revenue from the central government could hamper decentralization efforts.

Figure 1 The Structure of Thai local government revenue, fiscal years 2007 to 2019



Source: Department of Local Administration (http://www.dla.go.th/work/money/index.jsp)

Property taxes previously levied on real estate that were collected by local government in Thailand up to 2019 comprised LDT and BLT. LDT was levied on land for agricultural purpose and residential areas. Tax revenue from LDT was extremely low due to outdated assessment prices (1978-1981), and a progressive tax structure. The BLT rate was very high (12.5% of annual fee) and double taxation with personal income tax could be incurred. It was also subject to enforcement by the local authorities. This led to an unrealistically low tax revenue when compared to the overall economy (MOF, 2018; Techarungnirand, 2003).

The Land and building tax bill was approved on June 7, 2016 but it was postponed and revised many times due to conflicts of interest and concerns of major business holders. It is expected that this new tax regimen will help reduce inequality thanks to its progressive tax structure and tax collected from unused land, and that, further, it will increase efficacy and government revenue, and increase citizen participation.

The tax base is calculated using the appraisal value of land and facilities (if any). The tax is levied on land and buildings, including apartment units. However, land for farming owned by households that valued at less than 50 million Baht, and primary residences valued at less than 50 million Baht are exempted. Public land that is not used for business purposes, such as embassies or the common areas of the residences are also exempted. The revenue department mentioned that this new tax is not going to negatively affect those in need as 99.99% of farming area and 99.96% of main residences are exempt (DLA, 2018). The government started collecting LBT on August 1st, 2020.

Table 1 Land and building tax structure for 2020 and 2021

Property Value (million Baht)	Tax rate (%)	Accumulate Tax Burden (Baht)
Land for farming purpose (owned by business unit)		
0-75	0.01	<7,500
75-100	0.03	<30,000
100-500	0.05	<250,000
500-1,000	0.07	<700,000
>1,000	0.1	>1 million
Residential Property		
0-50	0.02	<10,000
50-75	0.03	<22,500
75-100	0.05	<50,000
>100	0.1	>100,000
Unused Land and others (Business, Industry, and Others)		
0-50	0.3	<150,000
50-200	0.4	<800,000
200-1,000	0.5	<5 million
1,000-5,000	0.6	<8 million
>5,000	0.7	>35 million

Source: The Ministry of Finance (2018)

Remark:

1) Thai government exempts land and building tax on the following properties

- Land for agricultural purposes owned by individuals or local governments value at 50 MB or less
- Main residential property valued at less than 50 MB and other residential property valued at less than 10 MB

2) All house and condominium units are taxed as residential property. Houses and condominiums registered for business purposes, like shops, restaurants, or Airbnb are taxed at the same rate as business units.

3) Tax on unused land is increased by 0.3% every 3 years, but not greater than 3% in total.

3. Methodology

This paper compares the changes in inequality and tax revenue between the previous property tax regime and LBT. The analysis is done under three scenarios, as follows:

1) Local development tax (LDT) and Building and land tax (BLT)
2) Land and building tax with exemption (LBT)
3) Land and building tax without exemption (LBTWE)

The land and building tax revenue estimates, with and without exemption, are based on the standardized value of household assets reported in the SES of 2007-2017. Then the values are compared with the LDT and BLT revenue statistics reported by the DLA.

3.1 Inequality Index

This study aims to demonstrate income and wealth inequality in Thailand over the period of 2007-2017. This 11-year period was chosen to demonstrate the change in wealth concentration in the country. This study applies Shorrocks Index (I_2) to measure income and wealth inequality. The total population from the SES is divided into subgroups according income level, community type, and region. Shorrocks index (I_2) decomposition by population subgroup is employed to measure the inequality between income quintiles (Sarntisart, 2011; Shorrocks, 1984, 2013).

Let there be population N. The household vector of wealth is w_i (i=1, 2,…,N) with average value equal to μ. In this study, we applied Shorrocks index, which is one of the Theil index family[4]; in which a=2 (this index is also known as coefficient of variation) is $I_2 = \left[\frac{1}{2N}\right] x \sum_{i=1}^{N} \left[\left(\frac{w_i}{\mu}\right)^2 - 1\right]$. Therefore, $I_2 = \left[\frac{1}{2}\right] xCV^2$.

[4] The general form of Thiel index family is $I_a = \left[\frac{1}{N}\right] x \left[\frac{1}{a}(a-1)\right] x \sum_{i=1}^{N} \left[\left(\frac{w_i}{\mu}\right)^a - 1\right]$ for a not equal to 0 or 1

However, the aggregate inequality value derived from Gini Coefficient or other index alone is not enough to explain the inequality. Households with same level of income can have very different levels of assets. It is worth studying whether inequality is more prevalent within a given income level or between different income levels.

The population from the SES is divided according to their household income, community type (urban/rural), and region. For static decomposition, we divided the total population into mutually exclusive m subgroups, m_i (i =1, 2, 3). Shorrocks index decomposition when a=2 is as follow

$$I_2 = \sum_{m=1}^{M} p_m b_m I_{2m} + \left(\frac{1}{2}\right) \sum_{m=1}^{M} p_m [b_m^2 - 1]$$

p_m stands for population share of subgroup m (n_m/N) and b_m stand for relative share of income/wealth of subgroup m (μ_m/μ). The within-group component measures the variation of wealth among people in the same subgroup. The between-group component reflects the wealth inequality between population subgroups. The between-group component uses subgroup mean income as a representative. It is possible to think of the between-group components as $I_2(\overline{w}^1, \overline{w}^2, \ldots, \overline{w}^m)$.

The LBT rate is uniform across country. This study includes dwellings, and farming and business properties owned by households, and assumes that property tax is paid by the owner. The inequality reduction of property tax is measured by $R_t = \left(\frac{I_{post} - I_{pre}}{I_{pre}}\right) x\ 100$ where R_t is the inequality reduced by each property tax regime (t= LDT, BLT, LBT), I_{pre} equals income inequality of pre-tax income, and I_{post} equals income inequality of post-tax income.

4. Data

The main data source of this study is the socioeconomic survey data (SES) of 2007, 2011, and 2017, which include information on both household income and assets. It is anticipated that the degree of asset inequality will be found to have increased during the period of study, and these assets generated capital gains due to price appreciation, and generated capital income such as interest, dividends, and rents. Rising asset inequality could lead to persistent income inequality despite economic growth. This paper focuses on the value of real estate in order to analyze the property tax on real estate.

Household income from SES is calibrated with National Income Account (NI) provided by BOT according to their sources. Values of household real estate for dwelling and other purposes are adjusted according to the value of Land Title in Thailand as of July 2019, provided by the Land

Department of Thailand, and the value of land and infrastructure in the business sector from the 2007 and 2017 Industrial Census, and the 2011 Business and Industrial Census conducted by the National Statistical Office (NSO). This process mitigates the under-surveying problem of the high income group. LDT and BLT from the statistics of the Department of Local Administration (DLA) are allocated according to the ratio of their farm and rental incomes, respectively. Land and building tax liabilities are calculated from the standardized value of household income and assets to compare the change in inequality and tax revenue.

The value is reported in real terms, using 2015 as the base year (2015=100).

Table 2 reports the average values of household annual income and real estate property from 2007 to 2017. In those 11 years, average household income increased from 386,477 Baht to 446,130 Baht annually, with a growth rate of 1.45% per year, while the average value of real property increased from 1,362,328 Baht to 1,786,395 Baht, with a growth rate of 2.75% per year. The value of real estate property was found to be around 3.5-4 times the value of annual income. In the first scenario, in which we analyze previous property taxes, which is the sum of LDT and BLT, average household tax burden was less than 1,200 Baht per annum throughout the period, with an effective tax rate of 0.16%[5].

Table 2: Household income and asset statistics from SES for 2007, 2011, and 2017

Variable	Mean			Growth Rate (%)		
Year	2007	2011	2017	2007-2011	2011-2017	2007-2017
Number of households	43,055	42,083	43,210			
Total household income	386,476.80	393,316.70	446,129.90	0.44	2.12	1.45
Value of housing	791,078.60	739,661.20	936,685.40	-1.67	4.01	1.70
Value of farming property	250,939.50	296,958.00	366,598.40	4.30	3.57	3.86
Value of business property	320,309.70	351,994.80	483,111.10	2.39	5.42	4.20
Value of total real estate property	1,362,328.00	1,388,614.00	1,786,395.00	0.48	4.29	2.75
Previous property taxes						

5 The effective tax rate equals property tax burden divided by total household income.

Local development tax (LDT)	16.38	65.17	48.69	41.24	-4.74	11.51
Building and land tax (BLT)	806.57	805.78	1,067.71	-0.02	4.80	2.84
Total property tax (LDT+BLT)	822.95	870.95	1,116.41	1.43	4.22	3.10
Estimate land and building tax	1,188.71	1,442.69	1,757.95	4.96	3.35	3.99
Estimated land and building tax without exemption	1,374.09	1,623.08	1,946.51	4.25	3.07	3.54
Post tax income						
Post LDT & BLT income	385,653.90	392,445.70	445,013.50	0.44	2.12	1.44
Post LBT income	385,288.10	391,874.00	444,371.90	0.42	2.12	1.44
Post LBTWE income)	385,102.70	391,693.60	444,183.40	0.43	2.12	1.44
Number of negative income households (without exemption)	39	134	133			
Average effective tax rate (%)	2007	2011	2017	Average effective tax rate (%) 2007-2017		
LDT + BLT	0.21	0.22	0.25	0.23		
LBT	0.31	0.37	0.39	0.36		
LBT(without exemption)	0.36	0.41	0.44	0.40		

In the second scenario, even government would exempt main dwellings and farming property valued at less than 50 million Baht, meaning 99.99% of real property is exempted. Still, LBT would have generated higher revenue than LDT and BLT combined. Local government could have raised 1,758 Baht per household instead of 1,116 Baht from LDT and BLT in 2017. The estimated land and building tax revenue increased by 3.99% per year. The effective tax rate decreased to 0.12% because most homeowners and farm owners would not have been taxed. 90.28% of tax revenue

would have been paid by high income households (the quintile distribution of household income, real estate, and tax burden will be discuss in the next section).

In the third scenario, where all real estate property is included regardless of value, the average tax liabilities per household would have been 1,947 Baht in 2017, which is higher than in the second scenario. The revenue would have increased by 3.54% per year, with an effective tax rate of 0.17%. With higher growth rate, LBT can better keep pace with asset price appreciation and development.

As there are less than 1% of households with the negative income, even if all real property would have been taxed, most of the households should be able to contribute to their local government revenue. Instead of exemptions based on property value, the government may offer tax relief or postpone tax payments for those in need, like retired persons, people who receive inheritance, or those who live in area with development projects that create fast appreciating property values, or households facing losses from their farm or business activities[6]. People can also choose to sell their property and use the realized gains to invest in other assets that yield higher returns.

The simulation suggests that LBT would be a better choice than the previous property taxes (LDT and BLT) in many aspects. LBT would raise more tax revenue, cover a wider range of property, and reduce tax avoidance. Although the tax burden would rise, it would still be less than 1% of household annual income, even if all property were subjected to taxation. Therefore, LBT should not significantly affect household purchasing power. Local governments can use this tax revenue to finance local public services, which in turn, raising the value of surrounding properties. The higher tax burden would deter price speculation and would stimulate practical land use and investment, resulting in economic growth. The government can offer special tax relief for those in need, such as a retired person who owns the property and does not have enough money to pay the tax (Collier, Glaeser, Venables, Manwaring, & Blake, 2017).

Table 3 shows the quintile distribution of income and real property. Thai households in the SES are divided into 5 subgroups according to annual household income. Over the 2007-2017 period, the income share of the top 20% decreased from 54.89% to 53.53%, and the share of real estate dropped slightly from 58.80% to 55.29%. The income share of the bottom 20% income increased from 4.19% to 4.90%, and the share of real estate increased from 6.16% to 7.15%. This paper includes

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6 In 2006, the National Statistical Office (NSO) started to record negative income from farm and business profit. In this study, we replace those values with zero. However, some households are subjected to land and building tax, so they do not have enough income to pay tax liabilities. This also results in higher effective tax rates in the first (lowest) income quintile.

only properties for dwelling, farming or business purposes. If the data of unused land is included, the share of real estate among the top 20% might be higher. The average income of the first quintile equaled 93,984 Baht, while the average income of the fifth quintile equaled 1,092,072 Baht. The average value of real property of households in the first quintile equaled 501,398 Baht, while it is equaled 4,343,956 Baht for those in the fifth quintile. The share of income and real estate property gradually increases from the first to fourth quintiles, but spikes up to greater than 50% in the top quintile. Low and middle income households were left behind because they lacked financial literacy and received lower returns on investment than did the top quintile.

Table 3 Household income and asset distribution by income quintile, from SES of 2007, 2011 and 2017

	Mean				Ratio			
Year	2007	2011	2017	Average	2007	2011	2017	Average
Household annual income								
Q1	81,002.68	91,083.64	109,307.60	93,797.97	4.19	4.63	4.90	4.57
Q2	156,363.50	168,262.90	200,502.10	175,042.83	8.09	8.56	8.98	8.54
Q3	244,025.50	254,052.30	303,741.90	267,273.23	12.63	12.92	13.62	13.06
Q4	390,421.70	390,921.90	463,974.10	415,105.90	20.20	19.88	20.80	20.29
Q5	1,060,641.00	1,062,289.00	1,153,287.00	1,092,072.33	54.89	54.02	51.69	53.53
Real estate property								
Q1	419,385.20	446,704.20	638,104.90	501,398.10	6.16	6.43	7.15	6.58
Q2	585,882.20	614,496.50	875,839.90	692,072.87	8.60	8.85	9.80	9.08
Q3	764,147.20	723,507.30	1,055,187.00	847,613.83	11.22	10.42	11.81	11.15
Q4	1,037,091.00	1,070,961.00	1,424,450.00	1,177,500.67	15.22	15.42	15.95	15.53
Q5	4,005,314.00	4,087,490.00	4,939,063.00	4,343,955.67	58.80	58.87	55.29	57.65

Source 1.Socio-economic Survey, 2007, 2011, and 2017 conducted by NSO

2. Value of land titles issued by the Land Department of Thailand as of July 2019

3. 2007 and 2017 Industrial Census conducted by the National Statistical Office (NSO)

4. 2011 Business and Industrial Census conducted by the National Statistical Office (NSO)

5. Local government revenue statistics, 2006-2017 from the Revenue Department (RD)

5. Result

5.1 Inequality

This study compares inequality of total household annual income and asset distribution. The redistributive impact is analyzed by comparing pre- and post-tax income inequality after applying the three scenarios: previous property tax, LBT, and LBT without exemption[7]. First, the inequality of pre- and post-income and real estate values are measured using Shorrocks Index (I_2). The Gini Coefficient is used as a benchmark with authorized data. In the second part, inequalities within and between income quintiles are measured using Shorrocks Index subgroup decomposition.

Table 4: Income and wealth Inequality from SES of 2007, 2011, and 2017

Inequality Index	Gini Coefficient			Shorrocks Index (I2)		
Year	2007	2011	2017	2007	2011	2017
Total income	0.479	0.484	0.461	1.478	2.601	1.237
Post LDT + BLT	0.497	0.484	0.461	1.476	2.552	1.239
Post LBT	0.496	0.483	0.459	1.436	2.421	1.232
Post LBTWE	0.496	0.483	0.459	1.436	2.421	1.232
Total real estate	0.735	0.727	0.729	22.571	59.084	12.110

Table 4 shows the comparison of income inequality using Gini Coefficient and Shorrocks index (I_2). The Gini Coefficient and Shorrocks Index value of inequality move in the same direction. The Gini Coefficient of household income conforms with the values from Thailand's Poverty and Inequality report (NESDC, 2017). Unlike the Gini Coefficient, which ranges between zero to one, The maximum value of Shorrocks index (I_2) depends on the population and is more sensitive to changes in the upper level of the distribution and is aggregately decomposable (Sarntisart, 2011; Shorrocks, 2013).

Income inequality rose from 1.478 in 2007 to 2.601 in 2011, and dropped to 1.237 in 2017. Empirical research suggests that the labor movement, education attainment, and technological disruption affect income inequality. An increase in income inequality over the period of 2007-2011 could have resulted from much higher wages of high-skilled labor, or an accumulation of assets that

7 Post property tax income = Total income - LDT - BLT
Post land and building tax income = Total income - LBT liabilities
Post land and building tax income (without exemption) = Total income - LBT liabilities (without exemption)

generated unearned income. The higher income of people in the manufacturing and service sectors and agricultural sector also grew apart. A decrease in income inequality over the 2011-2017 period could have resulted from a diminishing wage gap among low-skilled labor; however, a wage gap between high-skilled and low-skilled labor persisted. Technology replaced some routine jobs of low and middle-skilled labor, driving wages down (Wasi, Paweenawat, Ayudhya, Treeratpituk, & Nittayo, 2019).

The empirical result indicates that real estate property was more poorly distributed than income. Real estate inequality rose from 22.571 to 59.084, and then dropped to 12.110 over the same three periods. Apart from the factors mentioned above, wealth concentration contributes to persisting inequality (Alvaredo et al., 2017; Saez & Zucman, 2016). Real estate ownership, especially in developing countries, signifies wealth. Real estate generates unearned income and provides better financial access for owners. Unequal financial access is one of the factors that causes rising income inequality (Jeong, 2008; Paweenawat & McNown, 2014).

The post-tax income distribution changed very slightly due to the fact that the former property tax and new LBT burdens are pretty small compared to household income, and the fact that the majority of property is exempted.

Table 5: Inequality decomposition by income quintile from SES of 2007, 2011, and 2017

Redistributive Impact (%)	Gini Coefficient			Shorrocks Index (I2)		
	2007	2011	2017	2007	2011	2017
Property taxes	3.76	0.00	0.00	-0.14	-1.88	0.16
Land and building tax	3.55	-0.21	-0.20	-2.84	-6.92	-0.40
Land and building tax (without exemption)	3.55	-0.21	-0.20	-2.84	-6.92	-0.40

The redistributive results from Shorrocks index is larger than those of Gini Coefficient. This is due to the fact that Shorrocks index is sensitive to change in the upper tail of the distribution (Sarntisart, 2011; Shorrocks, 2013). More than half of real property is owned by people in the top income quintile, so the majority of property taxes are paid by households in this group.

The redistributive impact of LBT with and without exemption is higher than that of property taxes (LDT & BLT). In 2007, LBT reduced income inequality by 2.84%, while property taxes reduced inequality by 0.14%. In 2011, LBT drove down inequality by as much as 6.92%, while property taxes reduced the income gap by 1.88%. In 2017, LBT lowered inequality by 0.4%, whereas property taxes increased inequality by 0.16%. The simulation results suggest that LBT can better reduce inequality because it is collected from real estate owners, who tend to have higher incomes than non-owners. In addition, the tax structure is more progressive than the previous property taxes (LDT and BLT). However, the redistributive impact of LBT does not significantly differ whether or not there is an exemption on farming and housing property. This is due to the fact that the LBT rate is very low. For example, without exemption, a house owner would have to pay 200 Baht per 1 MB of the house value, up to 50 MB.

Table 6: Inequality decomposition by income quintile from SES of 2007, 2011, and 2017

Household data	Total income			Total Real Estate		
Year	2007	2011	2017	2007	2011	2017
I_2	1.478	2.601	1.237	22.571	59.084	12.11
Q1	0.03	0.02	0.05	0.06	0.06	0.32
Q2	0.02	0.01	0.03	0.17	0.12	0.58
Q3	0.04	0.02	0.05	0.55	0.12	1.26
Q4	0.17	0.08	0.17	2.36	0.31	2.09
Q5	71.61	84.74	71.5	94.72	98.58	92.46
Between	28.13	15.13	28.21	2.13	0.82	3.3

Tax regimen	Post LDT & BLT			Post LBT			Post LBT without exemption		
Year	2007	2011	2017	2007	2011	2017	2007	2011	2017
I_2	1.476	2.552	1.239	1.436	2.421	1.232	1.436	2.421	1.232
Q1	0.03	0.02	0.05	0.03	0.02	0.05	0.03	0.02	0.05
Q2	0.02	0.01	0.03	0.02	0.01	0.03	0.02	0.01	0.03
Q3	0.04	0.02	0.05	0.05	0.02	0.05	0.05	0.02	0.05
Q4	0.17	0.08	0.17	0.17	0.08	0.17	0.17	0.08	0.17
Q5	71.62	84.48	71.61	70.92	83.72	71.6	70.92	83.72	71.6
Between	28.11	15.38	28.09	28.81	16.14	28.11	28.81	16.14	28.1

There is greater variation of asset distribution than income for people in the same quintile. More than 70% of income inequality come from inequality within an income class, while more than 95% of wealth inequality occurs within the same income quintile. People may earn the same amount of income, but the value of their assets is much more varied. The panel data on income and assets could provide a better movement between income classes as a result of capital gains and capital income. The majority of the within-group component occurred in the top income quintile. However, previous property taxes have very little impact on changes in subgroup income distribution. LBT does slightly better than property taxes in reducing income inequality within the subgroup.

Table 7: Inequality decomposition by municipal area from SES of 2007, 2011, and 2017

Household data	Income			Total Real estate		
Year	2007	2011	2017	2007	2011	2017
I_2	1.478	2.601	1.237	22.571	59.084	12.11
Urban	70.42	86.59	69.36	93.51	98.15	91.9
Rural	25.63	11.96	29	6.03	1.75	7.9
Between	3.95	1.45	1.63	0.46	0.1	0.2

Tax regimen	Post LDT & BLT			Post LBT			Post LBT without exemption		
Year	2007	2011	2017	2007	2011	2017	2007	2011	2017
I_2	1.476	2.552	1.239	1.436	2.421	1.232	1.436	2.421	1.232
Urban	70.35	86.35	69.36	70.35	85.6	69.18	69.53	85.6	69.18
Rural	25.72	12.19	29.02	25.72	12.88	29.21	26.45	12.88	29.21
Between	3.94	1.47	1.62	3.94	1.53	1.61	4.02	1.53	1.61

Table 7 reports the inequality decomposition by municipal area. From Table 7, it can be seen that the majority of inequality occurred in Bangkok and the central region. The inequality decomposition by municipal area indicates that most economic development is still concentrated in the municipal area. More than two-thirds of income inequality stemmed from inequality in the urban areas. The rising income inequality over the 2007-2011 period could have resulted from rising inequality in the urban areas from 70.42% to 86.59%. Furthermore, when income inequality in the

urban area decreased to 69.36% in 2017, income inequality also decreased. Income inequality between urban and rural areas also decreased over the 2007-2011 period, which signified better and more decentralized development. Both the previous property tax regime and LBT had almost no effect on income inequality. Almost all inequality in real estate ownership was contributed by households in the rural areas.

Table 8: *Inequality decomposition by region from SES of 2007, 2011, and 2017*

Household data	Income			Total Real estate		
Year	2007	2011	2017	2007	2011	2017
I_2	1.478	2.601	1.237	22.571	59.084	12.11
Bangkok Metropolis	52.22	63.58	28.15	80.04	95.34	77.81
Central	16.87	11.91	37.75	8.16	1.26	5.69
North	9.35	3.66	4.87	8.01	0.45	8.24
Northeast	8.7	8.41	10.74	1.73	1.04	2.54
South	6.94	9.5	14.61	0.97	1.57	4.77
Between	5.92	2.94	3.88	1.09	0.34	0.95

Tax regimen	Post LDT & BLT			Post LBT			Post LBT without exemption		
Year	2007	2011	2017	2007	2011	2017	2007	2011	2017
I_2	1.476	2.552	1.239	1.436	2.421	1.232	1.436	2.421	1.232
Bangkok Metropolis	52.13	64.71	28.15	50.98	61.9	27.72	50.96	61.08	27.71
Central	16.93	10.3	37.8	17.39	12.61	38.09	17.4	12.61	38.09
North	9.39	3.72	4.86	9.5	3.91	4.83	9.51	3.91	4.83
Northeast	8.7	8.6	10.74	8.96	9.06	10.79	8.96	9.06	10.79
South	6.96	9.68	14.61	7.17	10.25	14.76	7.17	10.25	14.77
Between	5.89	2.98	3.84	6	3.08	3.82	6	3.08	3.81

Table 8 displays the inequality decomposition of pre- and post-tax income and real estate among Thai households by regional area, which comprises Bangkok, central region, north region, northeast region, and southern region. Over the 2007-2011 period, more than half of income inequality occurred in Bangkok, followed by the central region. The majority of inequality occurred within this region.

An increase in income inequality over the 2007-2011 period could have resulted in higher inequality in the Bangkok area. This may have been caused by the concentration of urban development in Bangkok. The southern and northern regions were the areas with the least income inequality in 2007 and 2011, respectively. However, in 2017, the top source of inequality changed from Bangkok to the central region. Income inequality also decreased as income equality in Bangkok decreased. The rising inequality in the central region could have resulted from rapid economic development. As Thai economy became more dependent on export and import activities in the eastern seaboard area, which is the center of the import-export industries, it drew in foreign direct investment to build manufacturing sites in this area. The change in inequality prompted us to investigate the effect of the construction of the Eastern Economic Corridor (EEC)[8] on income inequality in Thailand, looking for significant changes resulting from this project.

Both previous property taxes (LDT & BLT) had almost no effect in income inequality, while LBT would have reduced inequality to a very small degree. The ultra-high property values in Bangkok would have result in higher tax burden for the rich people, who own the majority of real estate property. Real property was much more concentrated in Bangkok than was income. More than 80% of the inequality in real estate value stemmed from Bangkok. Land prices in Bangkok's central business area rapidly appreciated due to higher economic growth and price speculation. Amidst low interest rates, many residential projects were built, and people bought these properties in search of higher returns from their savings, and due to price speculation, which created a false demand. The pattern of inequality in real estate also conformed to changes in income inequality.

8 The Eastern Economic Corridor includes Chonburi, Rayong, and Chachoengsao provinces

5.2 Tax Liabilities

Table 9: Household property tax liabilities by income quintile from SES of 2007, 2011 and 2017

Year	Mean				Ratio			
Previous property taxes	2007	2011	2017	Average	2007	2011	2017	Average
Q1	93.61	104.60	212.42	136.88	2.27	2.40	3.81	2.83
Q2	165.84	174.69	305.89	215.47	4.03	4.01	5.48	4.51
Q3	262.35	247.88	519.18	343.14	6.38	5.69	9.30	7.12
Q4	427.09	444.70	827.45	566.41	10.38	10.21	14.83	11.81
Q5	3,166.00	3,382.98	3,717.60	3,422.19	76.94	77.68	66.59	73.74
Land and building tax								
Q1	34.10	52.07	75.18	53.79	0.57	0.72	0.86	0.72
Q2	64.21	66.33	156.96	95.84	1.08	0.92	1.78	1.26
Q3	175.94	103.24	225.96	168.38	2.96	1.43	2.57	2.32
Q4	324.69	277.88	610.59	404.38	5.46	3.85	6.95	5.42
Q5	5,344.77	6,714.06	7,722.16	6,593.66	89.92	93.08	87.84	90.28
Land and building tax (without exemption)								
Q1	102.27	125.70	157.35	128.44	1.49	1.55	1.62	1.55
Q2	155.05	163.20	255.14	191.13	2.26	2.01	2.62	2.30
Q3	292.72	216.72	345.21	284.88	4.26	2.67	3.55	3.49
Q4	488.66	444.02	781.82	571.50	7.11	5.47	8.03	6.87
Q5	5,831.97	7,165.89	8,194.21	7,064.02	84.88	88.30	84.18	85.79

Table 9 shows the distribution of tax liabilities among Thai households in 2007, 2011, and 2017. Property statistics are from the local government revenue data collected by the revenue department (RD). LBTs with and without exemption are calculated from the value of household assets, which include housing, farming, and business property.

The empirical results suggest that LBT could reduce income inequality more than property taxes because the top income quintile contributes a greater portion of total tax revenue. 73.74% of property taxes were paid by households in the top quintile, while 90.28% of LBT would have been paid

by people in the top quintile. Among households in the top income quintile, LBT payment would have been twice that of the previous property tax regime. Their property tax burden increased from 3,166 Baht to 3,422 Baht over the 2007-2017 period, while the LBT burden would have increased from 5,345 Baht to 6,594 Baht over the same period. Moreover, if all property is included, the tax burden would have increased from 5,832 Baht to 8,194 Baht. Tax burden for the remaining 80% was lower under LBT; thus, it benefits people in the lower income distributions.

From the empirical results, LBT would not affect household purchasing power, even if all real property were included without exemption. The government should address the importance of tax revenue that must be used to pay for local public services and infrastructure that eventually increases the well-being of residents and raises the surrounding property values. The policymakers should communicate and provide administrative transparency to increase citizen participation. Governments can increase the tax rate for the real estate properties with ultra-high values, like those in the metropolitan area of Bangkok or industrial areas, or tax unused land to raise tax revenue, reduce speculation, and, at the same time, decrease income inequality.

Table 10: Effective tax rate (%) by income quintile from SES of 2007-2017

Tax regimen	Post previous property taxes				Post land and building tax				Post land and building tax without exemption			
Year	2007	2011	2017	Average	2007	2011	2017	Average	2007	2011	2017	Average
Q1	0.12	0.11	0.19	0.14	0.04	0.06	0.07	0.06	0.13	0.14	0.14	0.14
Q2	0.11	0.1	0.15	0.12	0.04	0.04	0.08	0.05	0.1	0.1	0.13	0.11
Q3	0.11	0.1	0.17	0.13	0.07	0.04	0.07	0.06	0.12	0.08	0.11	0.11
Q4	0.11	0.11	0.18	0.13	0.08	0.07	0.13	0.09	0.13	0.11	0.17	0.14
Q5	0.3	0.32	0.32	0.31	0.5	0.63	0.67	0.6	0.55	0.67	0.71	0.64

Table 10 shows the effective tax rate of property tax burden on total household income. From the empirical result, the effective tax rate of the previous property taxes (LDT & BLT) was slightly regressive among the first to fourth quintiles. The average effective property tax rate decreased from 0.14% in the lowest quintile to 0.12% in the second quintile, and then increased to 0.13% in the third

and fourth quintiles. Then, it rapidly increased to 0.31% in the top income quintile. The effective tax rate of LBT with exemption is lower than those of property taxes for 80% of household in the income distribution because more than 99% of properties are exempted. The effective tax rate in the first three income quintiles varied between 0.05- 0.06%, and increased slightly to 0.09% in the fourth quintile. However, if the LBT would have been enacted, the effective tax rate for the top income quintile would have increased to 0.60%. The effective tax rate was continuously increasing from 0.50% to 0.60% for the top income quintile over the 2011-2017 period.

Farming property and houses are the main assets for low and middle income households (Armour, Burkhauser, & Larrimore, 2013). If all housing and farming property were included, regardless of their value, the effective tax rate would be doubled for people in the first to fourth quintiles. The effective tax rate ranged from 0.11% to 0.14% among the 80% in the lower distributions. The effective tax rate of the top income group would increase slightly from 0.60% to 0.64% if all properties were taxed.

Table 11: Estimated tax revenue (billion baht)

Estimated tax revenue		(Billion Baht)	
Year	2007	2011	2017
Local development tax (LDT)	0.30	1.30	1.04
Building and land tax (BLT)	14.70	16.10	22.80
Previous property taxes (LDT and BLT)	15.00	17.40	23.90
Land and building tax	21.6	28.80	37.6
Land and building tax (Without exemption)	25.00	32.40	41.60

Table 11 reports the estimated LBT revenue compared to the revenue of the previous property tax regime. The estimated revenue from LDT and BLT increased from 15 billion Baht in 2007 to 23.9 Billion Baht in 2017. LBT revenue would have increased from 21.6 billion Baht to 37.6 billion Baht over the same periods. The estimated value shows that revenue from LBT is almost double the revenue from LDT and BLT combined. If LBT had been enacted in 2017, local government revenue would have increased by13.7 Billion Baht. The revenue is estimated to increase more sharply over the 2011- 2017 period, which shows that LBT can better match the changes in real estate prices. If all real property

had been taxed, local government revenue would have risen from 25 billion Baht in 2007 to 41.6 billion Baht in 2017.

With LBT, local authorities would have more revenue to finance local public services and infrastructure in order to better meet the needs of each jurisdiction. Moreover, the higher tax burden encourages the residents to participate in local government policy formation and to insist on local government transparency.

6. Concluding remarks and research contribution

Wealth inequality in Thailand is much greater than income inequality. Real property that is the source of income is concentrated in the top income quintile and households in more developed areas, while the redistributive impact of real estate taxes is very limited. Shorrocks index decomposition demonstrates that majority of wealth and income inequality occurred within the top income quintiles, in urban areas, and in metropolitan Bangkok. Property taxes in Thailand are not effective in financing local needs or reducing inequality because real estate tax liabilities are very small. The quintile distribution of effective tax rates calls for an even more progressive tax structure, especially for ultra-high value property and unused land. The effective tax rate is less than 1%, even if all exemptions are lifted, thus LBT may be applied to all households without hurting their purchasing power.

The limitation of this study is that unused property is not included due to lack of data availability. As there are vast amounts of unused land held by very high income groups, and because the unused properties are subjected to higher progressive tax rates, the redistributive impact of LBT could be much higher than predicted in the empirical results. The study periods of 2007, 2011, 2017 may not fully reflect the current situation, but they are chosen according to availability property taxes revenue statistic at the time of the study, which was during the transition period from the previous property taxes to the LBT.

This study supports the use of LBT because it covers all types of property and would generate much higher revenue for local governments. It would better reduce income inequality since land distribution is concentrated among high income households and in more developed areas. The cost of holding a piece of land would reduce price speculation and stimulate practical land use and investment. The universal tax base would reduce tax avoidance and increase local government revenue. However, it should also be noted that the tax burden may deter low and middle income people from owning real estate, which could lead to higher wealth concentration. Instead of tax exemptions based on property value, the study suggests that tax relief should be considered based

on specific situations, such as retired people, beneficiaries of inheritance, businesses incurring losses, or residents in areas of rapid growth (with rapidly rising property values). The government may consider providing financial support or credit access for people in these groups to enable them to develop or invest in their property.

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