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A RESEARCH INTO THE IMPACT OF PROPERTY TAXES ON POPULATION DISTRIBUTION AND SOURCES OF REVENUES IN VIETNAM

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Abstract: *This paper aims to review the basic theoretical issues about the impact of property taxes on population distribution and its contribute to the increase of state budget revenues. Using of quantitative methods, the research has pointed out the fact that the relationship between the out-migration status and property taxes is reversely proportional, while that between immigration rates and property taxes is two-way. Both relationships have latency; the increase in property taxes leads to the rise of local immigrants. In addition, property taxes are not decisive factors affecting socio-economic issues. In the long run, property tax rates remain almost unchanged, while property tax revenues and real estate market are constantly varying, influenced by socio-economic management policies, the increase population, industrialization, and urbanization.*

Keywords: *property tax, population distribution, budget revenues, impacts.*

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INTRODUCTION

Property tax is the common name of taxes which imposes on the ownership or the property rights. Property taxes are commonly applied to regulate the use of social assets, especially the finite quantities. The implications of property taxes covered in this study include:

Firstly, property tax affects the distribution of the population.

According to Oates, W.E. (1969), a person will maximize the utility benefits of the public service scheme against the cost of tax liability and they choose to become a residence for that public service (this is the benefit of paying the public service fee). From this perspective, the tax liability of an individual (by the sum of the taxable value of a house or land multiplies by the property tax rate) becomes the cost of living in the locality, or in other words, the tax liability is understood as the price for using and consuming local public goods and services. It is the current value of the future stream of benefits from public services corresponding to the current value of tax payments.

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The general equilibrium approach to this problem indicates that if the locality raises the property tax ratesin order to expand the output of public services, the estimated rental income (after deducting costs) for the property ownersmay not be reduced or may increase. Thus, if the local residents choose to evaluate the public service programs, at the same time underestimate other criteria like tax rates and net income from renting houses, the asset value will be higher in that local area. Corresponding to that, the public service packages will be more attractive. Households making use of high quality public service products are likely to reside in the areas that satisfy their needs; as the result, the value of the property will also increase in the areas that can offers high quality services. Conversely, if the expenditure plans of local have no effect on locational decisions, the value of local wealth will depend on spendings features, in case the demand and the supply of local assets do not depend on the local expenditure plans.

Land use has become a prominent environmental policy issue due to the negative effects of the increasing urbanization on biodiversity and land value. Dispersing land use patterns may increase energy use or transport with negative impactson environment. Property taxes, in some respects, are a type of tax on land and land use rights, so they work as a tool that influences land use patterns. Property taxes can help reduce the pressure of land development or divert directly to areas whose infrastructure is well developed. Property taxes are designed to help with land use planning and reducing the impacts of transportation and energy use on the environment.

The result of property taxes in land use depends on the design and is useful for distinguishing between different types of property taxes. Taxes on land only push up the cost of gainingland and encourage the most effective use of land. The higherthe land value is, the more developed the land is. For example, the land with modern infrastructures and public services, etc is likely to cost much higher. Thus, land taxes often promote . The impact of traditional property taxes (also called double taxes) on land and assets attached to land has a less noticeable effect on land use. If the burden from taxes is passed on to consumers, seeking for smaller house is a trend along with a rise in house prices. Property taxes can promote urbanization because they reduce the ratio of capital to land and the number of housing unit per unit of land area and population density.

Property transaction taxes have a negative impact on sustainable land use, as they encourage the purchase of low-cost land, away from city centers and transportation infrastructure. This tax discourages transactions that can help make land use more efficient. Even taxes on property transactions promote the purchase of undeveloped land at prices that are comparable in developed areas.

For taxes on land and houses (double taxation), the tax on the land is higher than the tax on the hous. That often promote the use and development of land, but at the same time affecting the urbanization and the unclear density. A high property tax will reduce the urban expansion.

Taxes on land use have a greater effect on land use efficiency than taxes on land values, especially where land values are low. Germany proposes a land use tax that will differentiate land tax rates depending on the land used and the associated environmental costs.

The type of tax levied on land development aims to internalize the negative environmental externalities caused by land use. Another proposal is to tax the added value of land in the area after re-planning for some reasons. Because basically most of the land value is substantially increased due to re-zoning, studies often argue that these benefits should be taxed. Spatial planning is the most commonly used tool for various land use purposes. In some countries, this tool is used to expand the city, then property tax is an additional factor, not an alternative.

Secondly, property taxes affect the State revenue.

Besides revenue from other taxes, the income from property taxes plays an important role in the total State revenue of countries. The property tax revenue represents sustainability due to its stability and frequency.

Taxes on land and assets are the smallest source of revenue for all countries. For example, with developing countries like Mexico, Colombia, Philippines, Nicaragua, South Africa, ect., it only accounts for about 0.4% of GDP and about 2% of total State revenue. However, property taxes are an important source of local revenue, especially to developing countries. Regarding local taxes, in the 1990s, real estate taxes accounted for 40% of total local taxes in developing countries, 35% (raise from 30% in the previous decades) in developed countries, and only about 12% in transition countries. At the same time, real estate taxes sponsored more than 10% of local expenditure in developed and developing countries,less than a half of those in transition countries. In OECD countries, property taxes are an important source of revenue and account for a relatively high proportion of GDP such as Canada (4.1%), United States (2.9%) and Australia (2.5%). To get this revenue, it largely depends on the tax bases, tax rates and management.

The dependence on property taxes as a revenue source of local authority varies across regions. There are many factors affecting it such as:expending responsibilities of local authority, other available tax revenues, the freedom of local governments in relation to the use of tax revenues, the size and growth of tax bases, the ability of local governments to enforce taxes, etc. The effects of property taxes also vary in different countries, depending on the context, the goals, and the reform orientation. In Ontario, Canada, property tax reforms have resulted in equality improvements among residential property; however,they have not brought about significant changes in equity among different property types or in non-home assets. The limitation of tax increase in housing, commerce and industry has lengthened the inequality in the tax system. The tax system now is much more complex than it used to be in the past, and leads to the increasing oflocal

government control the imposing taxes on various types of properties. As a result, tax system reforms will bring about tax stability, but with fair and simple costs. In the UK, although assets are valued at the market price and in a specific price range, market value is estimated at a particular time and remains unchanged for many years, which leads to an increase ininequality. Therefore, tax reforms in the UK have brought about fairness in the cost of ownership, and have been accepted widely by residents. Tax reform in Indonesia has led to increased tax revenues. The policy and the framework of administrative have been simplified to be more equal and easier to administer. Besides increasing revenues, administrative costs and tax compliance also decreased.

The methods used by local governments to increase the sources of revenues might have an impact on *natural conditions, development status and density*. Local governments can influence urban forms, not only with planning tools but also with financial instruments. In some circumstances, both of them work together, but in others, they might have the opposite influences (Slack, 2002). Property taxes are a financial tool that can have a clear effect on land use, especially in urban areas. In terms of influencing development densityfor example, increasing property taxes will lead to a density fall. When a tax is levied on the assessed value of an asset, any investment that increases the value of the property will raise the assessed value, and thus create a higher taxable asset. Higher property taxes reduce the incentive to develop real estate projects such as single-family dwellings instead of condominiums. But to compensate, taxes on land will provide a motivation for a greater density of assets attached to land.

LITERATURE REVIEW

Economists develop three basic theories about the impact of property taxes: traditional views, modern views, and the beneficial view.

The traditional view towards property taxes origins from Simon and Netzer. This view reflects that imposing property taxes on surplus land has a tendency to decrease. That conclusion is based on the hypothesis that the distribution of income for housing drops as the whole income arises. Simon and Netzer applied a partial equilibrium approach to analyze taxes, focusing on the effects of raising tax on a local housing market. From this approach, it is supposed the “open economy” standard in which national capital is fixed. This reveals that local revenues is not the subject of real estate taxes because the capital over a long period of time moves from the jurisdiction until the local after-tax return is equal to the national value. As a result, the tax burden is caused by local factors and/or consumers, and the traditional view defines that all of the burden of local consumers is in the form of higher housing prices. The traditional view points our that property taxes are ineffective, which reduce the size of local housing stocks and the burden from it relative to housing consumption (and thus partially become regressive or proportional to the income).

The new perspective on property taxes was provided by Thomson, Mieszkowski before it was rebuilt by Mieszkowski and colleagues. This view analyzes the general equilibrium of a country's legal sphere and considers that both its capital and its land within all jurisdictions are fixed assets. This view points out that property taxes distorting local capital use lead to a misdistribution of the nation's capital through local authorities. Mieszkowski (1972) emphasized that the traditional views on partial equilibrium analysis of property taxes are very ambiguous because they are not practical that property taxes have been applied in almost all localities and to most capital (including non-housing one).According to Harberger's general equilibrium model of tax rates for property taxes analysis, the economy model plays as a national fixed capital stock and has two types of localities: localities with high tax rates and those with low tax rates. Under this circumstance, Mieszkowski pointed out that property tax rates which in excess of the national average can push capital from the area with high tax rates to that with lower ones. The difference in property taxes results in an inefficient distribution of resources among localities. Mieszkowski highlighted that the modifications in property taxes can have effects on the form of raising prices of houses and goods. Different from the traditional view, the new viewpoint underlines that there is a tendency for the influence of property taxes to increase generally. This is supported by the fact that income taxes primarily reduce pay from capital, equal to the average tax rates. According to Mieszkowski, because the high-income residents holds a majority of the capital, the part of profit tax on any income tax represents a "continuous increase" from the new perspective.

The third view on property taxes is the viewpoint of interest, which extends the analysis of the new perspective, accompanying the benefits that property owners derive from property taxes. According to Halmilton, Fischel and White, if the supply of public services is considered as the good policy, the new perspective assumes that the government should provide services with promotions to take advantage of land in high demand areas so that the benefits of public services could outweigh the damage caused by property taxes. The viewpoint of interest stated that the jurisdictions will contribute to the financial zoning process in which the value of the allowable buildings within the jurisdiction will be limited to some minimum value. This view is an innovation of Tiebout's local government model (1956). Tiebout ignores local property taxes and instead focuses on benefits taxes per capita. After Tiebout, Hamilton assumes that it is acceptable for individuals to select on demand for public services which include local tax expense packages. In addition, Hamilton (1975) assumes that home values are homogeneous in localities and can meet the housing service package needs. He also shoulders that the minimum home value has been available. Under the aforementioned hypothetical conditions, individuals may not purchase houses with the price below the minimum value and must not be dependent to take advantages from public services without paying taxes. Hamilton has expanded this model to be more

realistic, in which home values are not homogeneous. He assumes that all goods are fully developed, housing stocks remain unchanged. In addition, he said that although some goods are not homogeneous in housing consumption, homogeneous goods are also available for both housing and public services. That implies there is no individual who is willing to pay any property taxes in excess of the benefits received, as the choice of homogeneous goods is always available. In these cases, Hamilton describes that it is "perfect opportunity" to turn property taxes into benefits, at least in the long-term equilibrium (but not at the time of tax changes and recorded in value asset)

The latter view of interest was extended by Fischel William to consider commercial and industrial property taxes. Considering property taxes as a body tax or expense on public service users from a viewpoint of interest helps avoid concerns about an increase or decrease in property tax from both traditional and new perspectives based on the relationship between property taxes and the supply of public services.

Besides the theoretical studies on the impact of property taxes on socio-economy, there are many empirical studies on this issue.

According to the research of Oates, W.E. (1969) on "The effects of property taxes and local public spending on property values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis", a person would maximize the utility from public service program versus spending tax liability and they choose to be a residence for that public service (this is the benefit of paying taxes). From this perspective, the tax liability of an individual (that is, the taxable value of a house or land multiplied by the property tax rate) becomes the cost of living in the locality, or in other words the tax liability is like the price for using and consuming local public goods and services. It is the present value of future benefits from public services corresponding to the present value of tax payments.

Coleman A (2009) studied the impact of fiscal policy when New Zealand introduced a tax on land values with data in the period from 2004 to 2006. The data from the study presents the separate value of land and properties attached to land. The study points out that when increasing the property tax rate by around one percent, the budget revenue increased by 0.549%. *Research by Richard M.rid & Enid Slack* (2002) through studying and synthesizing from 25 studies on property taxes in 25 countries of 5 regions: OECD, central and eastern Europe, Asia, Africa, and Latin America confirms the potential contribution of property taxes to local government budget revenues, highlighted that property taxes are vital to the budget revenue. Specifically:

METHODOLOGY

To assess the impact of property taxes on population distribution and revenue

source, the study uses two main impact assessment methods: (1) VAR model: used to assess the impact of property taxes on population distribution (2) Panel data model: used to assess the impact of property taxes on revenue source.

(1) *VAR Model:*

The original VAR model that Sims (1980) first introduced with two variables and one step delay, is in the following form:

$$y_{1t} = a_{10} + a_{11}y_{2t} + a_{12}y_{1(t-1)} + a_{13}y_{2(t-1)} + \varepsilon_{1t}$$

$$y_{2t} = a_{20} + a_{21}y_{1t} + a_{22}y_{1(t-1)} + a_{23}y_{2(t-1)} + \varepsilon_{2t}$$

Or in matrix form:

$$y_t = A + A_0 y_t + A_1 y_{t-1} + \varepsilon_t$$

In that, "y_{it}" is the stop string; random errors "□1t", "□2t" are white noise and are not correlated with each other.

This model is suitable for evaluating correlationn and short-term forecasting, and easy to apply in Vietnam for analyzing the two-way relationship between property taxes and the affected variable.

(2) *Panel data model: includes Random Effects Model (REM) and Fixed Effects Model (FEM)*

The random effects model (REM), also known as error components model (ECM): considers the problem of differences among individual analytical objects over time contributing to the model. The model is in the following form:

$Y_{it} = \beta_1 X_{it1} + \beta_2 X_{it2} + \nu_i + \varepsilon_{it}$ với i = 1, 2, …, N và t = 1, 2, …, T

The reliability tests of the REM model:

- Test of the heteroscedasticity: Similar to the FEM model, because the REM estimation procedure also has OLS regression, it is necessary to test the variance of the error of change. However, this procedure requires a relatively large number of observations to have enough degrees of freedom for the test to calculate critical test values. In research, there were mostly not enough years of observation or were unbalanced in data (missing year) as the require of the estimation software, so it was impossible to calculate the variance test value of error in some specific cases.

- Correlation test: like FEM model

Model selection test: Different from FEM, REM model does not allow to use small sample tests t - test or F - test but to use large sample tests likelihood ratio test, Wald test, Multiplier test ...). The H_0 hypothesis shows that the error of the Pooled OLS estimates does not include the deviations between the objects $s_{□}^2 = 0$ so the classical linear regression model is appropriate. Hypothesis H_1 is $s_{□}^2 \neq 0$, the

random effects model is appropriate. The rejection condition is similar to in the FEM model.

*The Fixed Effects Model (FEM)*is an extension of the classical linear regression model, given by: $Y_{it} = \beta_1 X_{it1} + \beta_2 X_{it2} + \nu_i + \varepsilon_{it}$. Where $\mu_{it} = \nu_i + \varepsilon_i$

Assume that all net effects of unobserved factors on Y for object i (unchanged over time) are a fixed parameter, denoted by a_i. The fixed impact model can then be rewritten to:

$$Y_{it} = \beta_1 X_{it1} + \beta_2 X_{it2} + a_1 + a_2 + ... + a_N + \varepsilon_{it}$$

The reliability test of the FEM model:

- Test the variance of error of change: Because this model is an extended version of the classical linear regression model, it is necessary to test the problems of variance of change error. If a model has a variance change, the estimates are still linear, non-linear but inefficient, and the F and T tests will be invalidated.

- Self-correlation test in the model: When estimating with panel data with a relatively large number of objects (from 10 or more objects) and a relatively small number of survey periods (less than 10), the consideration The autocorrelation problem is often overlooked because the data is not large enough to analyze the process of generating noise errors. However, with data with large observation period, it is quite possible to test the autocorrelation problem in FEM model.

In the study, the majority used panel data with a small number of subjects (income - expenditure by regions, in 5 income groups, and in 10 localities) and in the relatively short observation time (with data from VLSS, the maximum observation time is 9 observations corresponding to the period 2000 - 2016, with other data about 8 observations), so the procedure of self-correlation test for table data in the study will be omitted for some specific circumstances (due to an insufficient observations to calculate).

RESULTS AND DISCUSSIONS

Assess the impact of property taxes on population regulation

To approximate the relationship between property taxes and population issues, a causal relationship analysis is conducted through Granger test to detect the correlation among factors to be considered. The results of the Granger test will be the basis for choosing the impact analysis model format.

Granger test was conducted in 2012 - 2017 in 63 provinces and cities, among related variables including: external migration rate (xuatcu,%), urban population (thanhthi, billion people), population growth rate (tyletagds,%), non-agricultural land use tax (thuets, billion dong), immigration rate (nhapcu). Variables are tested

for stationarity and stopping at the root level (the minimum sample size significance level is 90%). Granger test results present the fact that the test variables all have a two-way causal connection, the local migration / immigration rate is the cause of the variation of local property tax and vice versa, the property tax is the cause of migration / immigration rate fluctuations.

The result of the two-way causal relationship test between population status and property taxes:

Pair wise Granger Causality Tests			
Sample: 2012 2017			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
TYLETANGDS does not Granger Cause XUATCU	252	0,14941	0,8613
XUATCU does not Granger Cause TYLETANGDS		0,23386	0,7916
DTHANHTHI does not Granger Cause XUATCU	189	1,07075	0,3449
XUATCU does not Granger Cause DTHANHTHI		3,34221	0,0375
DTHUETS does not Granger Cause XUATCU	186	2,28155	0,1051
XUATCU does not Granger Cause DTHUETS		1,80730	0,1670
DTHANHTHI does not Granger Cause TYLETANGDS	189	1,06822	0,3457
TYLETANGDS does not Granger Cause DTHANHTHI		1,07581	0,3432
DTHUETS does not Granger Cause TYLETANGDS	186	0,89803	0,4092
TYLETANGDS does not Granger Cause DTHUETS		2,65229	0,0732
DTHUETS does not Granger Cause DTHANHTHI	186	1,79407	0,1692
DTHANHTHI does not Granger Cause DTHUETS		0,57112	0,5659
NHAPCU does not Granger Cause THUETS	186	1,40445	0,2431
THUETS does not Granger Cause NHAPCU		1,56565	0,1994

The stop test results:

Panel Unit root test (common)	Statistic	Prob.	Cross - sections	Obs
Thuế tài sản (thuets)				
Levin, Lin & Chu t*	-26,6639	0	62	310
Tỷ lệ tăng dân số (tyletagds)				
Levin, Lin & Chu t*	-295,836	0	61	305
Xuất cư (xuatcu)				
Levin, Lin & Chu t*	-4,24603	0	63	315
thành thị (thanhthi)				
Levin, Lin & Chu t*	-4,24603	0	63	315
Tỷ lệ nhập cư (nhapcu)				
Levin, Lin & Chu t*	-3.52395	0	63	315

From the Granger test and the stop test, the variables stop and have a causal relationship of 90% - 95%. Therefore, the VAR estimation method is used to estimate the causal relationship among variables. The estimation model is in the form:

With j = (1,...,63); t = (2012,..., 2017), i is the delay received value 2 according to the testing standards.

The result of latency selection

VAR Lag Order Selection Criteria						
Endogenous variables: LOG(THANHTHI) LOG(XUATCU) LOG(TYLETANGDS) LOG(THUETS)						
Exogenous variables: C						
Sample: 2012 2017						
Included observations: 186						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-865,0149	NA	0,134356	9,344246	9,413617	9,372358
1	297,6335	2262,789	5,94e-07	-2,985307	-2,638452*	-2,844748
2	334,1977	69,58981*	4,76e-07*	-3,206427*	-2,582089	-2,953421*
3	345,7375	21,46649	5,00e-07	-3,158467	-2,256646	-2,793015
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

The VAR model shows that there is a statistically valuable relationship between the rate of local external-migration and the total amount of local non-agricultural land use taxes. Testing the stability of the model reveals that the solutions of the model are in the circle unit, the VAR model ensures stable and suitable conditions for analysis use.

The results estimate the relationship between property taxes and population

Vector Auto regression Estimates				
Included observations: 248 after adjustments				
Standard errors in ( ) & t-statistics in [ ]				
	LOG(THAN-HTHI)	LOG(XUAT-CU)	LOG(TYLE-TANGDS)	LOG(THUETS)
LOG(THANHTHI(-1))	1,010205	0,010748	-0,108636	-0,257449
	(0,05544)	(0,57148)	(0,34327)	(0,23478)
	[18,2220]	[0,01881]	[-0,31647]	[-1,09654]
LOG(THANHTHI(-2))	-0,016889	0,019970	0,086837	0,291910
	(0,05470)	(0,56387)	(0,33870)	(0,23166)
	[-0,30875]	[0,03542]	[0,25638]	[1,26010]
LOG(XUATCU(-1))	0,023794	0,645138	0,037966	0,025662
	(0,00673)	(0,06941)	(0,04170)	(0,02852)
	[3,53359]	[9,29412]	[0,91055]	[0,89986]
LOG(XUATCU(-2))	-0,011723	0,171904	-0,031667	-0,080149
	(0,00776)	(0,08002)	(0,04807)	(0,03288)
	[-1,51013]	[2,14825]	[-0,65882]	[-2,43798]
LOG(TYLE-TANGDS(-1))	0,018566	0,015482	0,980056	-0,032242
	(0,01099)	(0,11327)	(0,06804)	(0,04654)
	[1,68966]	[0,13668]	[14,4043]	[-0,69285]
LOG(TYLE-TANGDS(-2))	-0,008720	-0,053118	0,008215	0,027229
	(0,01145)	(0,11801)	(0,07088)	(0,04848)
	[-0,76169]	[-0,45012]	[0,11589]	[0,56163]
LOG(THUETS(-1))	0,024132	0,189740	0,035301	0,925799
	(0,01241)	(0,12795)	(0,07685)	(0,05256)
	[1,94423]	[1,48297]	[0,45933]	[17,6126]
LOG(THUETS(-2))	-0,019068	-0,232522	-0,033132	0,076388
	(0,01231)	(0,12690)	(0,07623)	(0,05214)
	[-1,54890]	[-1,83226]	[-0,43464]	[1,46515]
C	0,034149	-0,015815	0,101789	-0,094837
	(0,02422)	(0,24962)	(0,14994)	(0,10255)
	[1,41018]	[-0,06335]	[0,67885]	[-0,92476]
R-squared	0,987668	0,499646	0,918783	0,984939

The results of VAR model stability testing:

Roots of Characteristic Polynomial	
Endogenous variables: LOG(THANHTHI)	
LOG(XUATCU) LOG(TYLETANGDS)	
LOG(THUETS)	
Exogenous variables: C	
Lag specification: 1 2	
Root	Modulus
0,997863	0,997863
0,989890 - 0,010444i	0,989945
0,989890 + 0,010444i	0,989945
0,816314	0,816314
-0,294459	0,294459
0,030797 - 0,093154i	0,098113
0,030797 + 0,093154i	0,098113
-0,016342	0,016342
No root lies outside the unit circle. VAR satisfies the stability condition.	

Adjusting of the two equations of property and emigration tax from the VAR model harvests the following results:

LOG(THUETS) = 0,05*LOG(THANHTHI(-2)) - 0,0605*LOG(XUATCU(-2)) + 0,3896*LOG(THUETS(-1)) + 0,743*LOG(THUETS(-2)) - 0,119*LOG(THUETS(-3)) - 0,244

LOG(XUATCU) = 0,409*LOG(XUATCU(-1)) + 0,276*LOG(XUATCU(-2)) + 0,209*LOG(XUATCU(-3)) - 0,0713*LOG(THUETS(-1)) - 0,1065

OLS estimation results for tax and external-migration models:

Biến độc lập: LOG(XUATCU)				Biến độc lập: LOG(THUETS)			
Variable	Hệ số	Thống kê t	Prob.	Variable	Hệ số	Thống kê t	Prob.
LOG(XUATCU(-1))	0,409	5,809	0,000	LOG(THANHTHI(-2))	0,050	2,271	0,024
LOG(XUATCU(-2))	0,276	3,228	0,002	LOG(XUATCU(-2))	-0,060	-2,231	0,027
LOG(XUATCU(-3))	0,209	2,631	0,009	LOG(THUETS(-1))	0,390	3,944	0,000
LOG(THUETS(-1))	-0,071	-3,599	0,000	LOG(THUETS(-2))	0,743	6,113	0,000
C	-0,106	-0,737	0,462	LOG(THUETS(-3))	-0,119	-2,078	0,039
R-squared	0,498			C	-0,244	-2,130	0,035
	R-squared			0,986			

From the results of the estimation model, the local emigration status and the property tax have the negative inverse relationship, and this relationship has a certain lag. A higher 10% of total property tax revenue in the previous period will reduce the out-migration rate of the locality at 0.7% in the following period. Assuming that the proportion of non-agricultural land use tax reaches 0.4% of GDP, that means the total revenue of non-agricultural land use tax increases by 10 times (1000%), the rate of outward-migration will decrease by about 70%, equivalent to out-migration rate in 2017 was 1.11/1000 local people (down from 3.7 / 1000 local people); meanwhile, an increase of 10% in the out-migration rate in the previous two periods will reduce the total property tax revenue by 0.6%, so if the out-migration rate decreases by 70%, the non-agricultural land use tax revenue after 2 periods will increase by 4.2%, this impact is very small compared to the effect of the increase in property taxes on reducing the rate of local emigration. The estimation results also show that the urban population is positively related to the total property tax, so it can be thought that the out-of-country population are people with low-value assets or may be the poor, people in rural areas, disadvantaged, low-income people or in special cases are entitled to housing tax exemption, so when the out-migration rate of people in this case decreases, their residential land assets also only contribute to the very small increase of non-agricultural land use tax revenue; When these people leave the country, there will be 2 cases in their residential properties: (i) the property is not sold or transferred to other people, so the local property tax revenue is stable (ii) the property is the residential land which is sold to others and local governments have to deduct a portion of the budget (including one from non-agricultural land taxes) to support these people in building houses (housing subsidies), thus reducing the future non-agricultural land use tax revenue. In addition, an increase in property taxes in one locality leads to the increase in housing prices and the expectations of rising living standards (increased housing demand) or the local potential for better growth in the future, via, the local emigration will decrease.

The estimated results are as follows:

LOG(NHAPCU) = 0.408*LOG(NHAPCU(-1)) + 0.293*LOG(NHAPCU(-2)) + 0.241*LOG(NHAPCU(-3)) + 0.0798*LOG(THUETS(-2)) - 0.712

LOG(THUETS) = 0.077*LOG(NHAPCU(-1)) - 0.091*LOG(NHAPCU(-2)) + 0.887*LOG(THUETS(-1)) + 0.127*LOG(THUETS(-2)) - 0.0031

The estimated results of the relationship between taxes and immigration:

Biến độc lập: Log(N-HAPCU)	Hệ số	Thống kê t	Prob.	Biến độc lập: Log(THUETS)	Hệ số	Thống kê t	Prob,
LOG(NHAPCU(-1))	0,408	6,004	0,000	LOG(NHAPCU(-1))	0,077	3,848	0,000
LOG(NHAPCU(-2))	0,293	3,674	0,000	LOG(NHAPCU(-2))	-0,091	-4,397	0,000
LOG(NHAPCU(-3))	0,241	3,688	0,000	LOG(THUETS(-1))	0,887	17,130	0,000
LOG(THUETS(-2))	0,080	3,090	0,002	LOG(THUETS(-2))	0,127	2,477	0,014
C	-0,7122	-7,563	0	C	-0,003	-0,120	0,905
R-squared	0,718204			R-squared	0,985334		

The estimation results present the fact that between the immigration rate and the property tax have a two-way relationship, this relationship has a certain latency: an increase in the total property tax of the two previous periods will increase the proportion of local immigrants in the current period; The total long-term (2-period delay) influence of the immigration rate reduces the local property tax income. However, the increase effect is stronger than the decrease one, therefore, in general for the local immigrant problem, the increase in property taxes has an impact on increasing the number of local immigrants . With this test result, it can be acknowledged that the majority of external-migrants or immigrants are from low social status. Cities with high and increasing property taxes (under constant tax rates) attract immigrants (the coefficient modification between the immigration rate with the property tax and the emigration rate with the property tax is positive). Additionally, as the outcome of estimating the relationship between property tax and housing price / construction cost above (property tax reduces the price of housing / construction costs), the results of estimating the relationship between local residential status and property tax can be understood practically is: (1) the reduction of local housing prices / housing costs has become more attractive, thus encouraging migrated population from more expensive localities and increasing the proportion of migrants (the coefficient of effect of the property tax on immigration is higher than the effect of the property tax on immigration), (2) under constant tax rates, housing prices / construction costs fall or remain constant but the increase in total property tax revenue raises expectations about the potential of local economic development, and expectations for supplying employment and incomes have increased, consequently increasing the number of immigrants at the same time reducing the proportion of external-migrants in the

locality, (3) Both external-migration and immigration have a negative effect on property tax revenues, However, immigration status does greater property tax reduction, so it can be seen that the external -migration population is "higher" than the immigrant population and the migration problem is not positive for property tax revenues, and at the same time, an increase in total property tax revenue of locality also surges immigration (at a lower level), so further effective property tax policy reforms are needed to stabilize the population through: (1) adjust property tax rates to ensure a stable real estate market among localities and ensure income distribution in each locality, (2) create a uniform development among localities to increase locally jobs, increase incomes and reduce the divergence of development between localities, and(3) re-regulate local real estate markets to ensure a balance of housing costs among localities.

Assess the impacts of property taxes on local property tax revenues

a. Calculation method:

Property tax revenues = Property tax base x Property tax rates

Actual property tax revenue (land, houses) will vary by region and area, so the calculation equation is as follows:

$$R_{(L_i,t_j)} = TB_{(L_i,t_j)} \text{ x } TR_{(L_i,t_j)}$$

$$R_{(L_i,t_j)} = P_{(L_i,t_j)} \text{ x } S_{(L_i,t_j)} \text{ x } TR_{(L_i,t_j)}$$

$$\sum R_{(L_i,t_j)} = \sum \left[P_{(L_i,t_j)} \; x \; S_{(L_i,t_j)} \; x \; TR_{(L_i,t_j)} \right]$$

$$\Rightarrow \sum R_{(L_i,t_j)} = \sum \left[\varepsilon_{ij} P_{(L_i,t_j)} \; x \; S_{(L_i,t_j)} \; x \; TR_{(L_i,t_j)} \right]$$

[Option without adjusting the tax rate]

$$\Rightarrow \sum R^{Y}_{(L_i,t_j)} = \sum \left[\varepsilon_{ij} P^{Y}_{(L_i,t_j)} \; x \; S^{Y}_{(L_i,t_j)} \; x \; TR^{Y}_{O(L_i,t_j)} \right]$$

[Option of applying tax rate or adjusting tax rate]

$$\underline{\Delta R_{(L_i,t_j)}} = \underline{\Delta P \text{ x } \Delta TR}$$

In which: $R_{(L_i,t_j)}$ is the property tax revenues from residential area of region i at time j; $P_{(L_i,t_j)}$ is the price of lands (houses) in area i at time j; $S_{(L_i,t_j)}$ is the area (land) in region i at time j; $TR_{(L_i,t_j)}$ is the statutory tax rate on land (house) in region i at time j; ϕ_{ij} is the land price adjustment coefficient in area i at time j; $TR^{Y}_{O(L_i,t_j)}$ is the tax rate according to the modified plan on land (house) in area i at time j

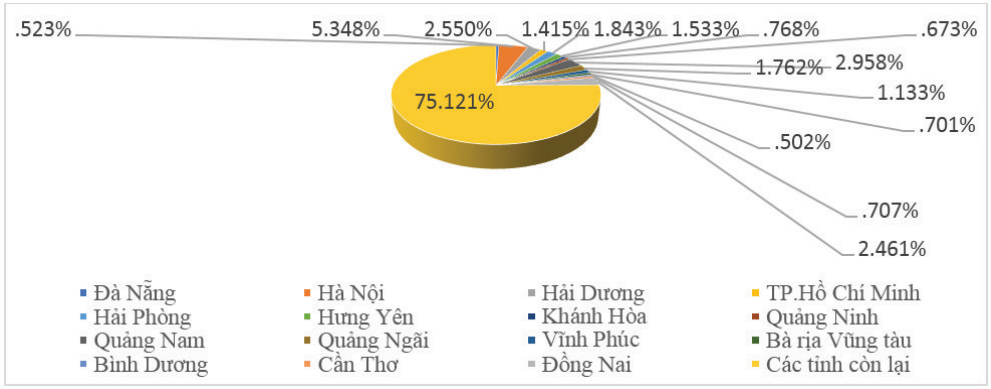
Describe data on land area and land prices

- For land area

The land area in rural zones and urban zones accounts for 77.73% and22.23% of the total land area in the country respectively (Source calculated according to data provided by the Tax Policy Department).

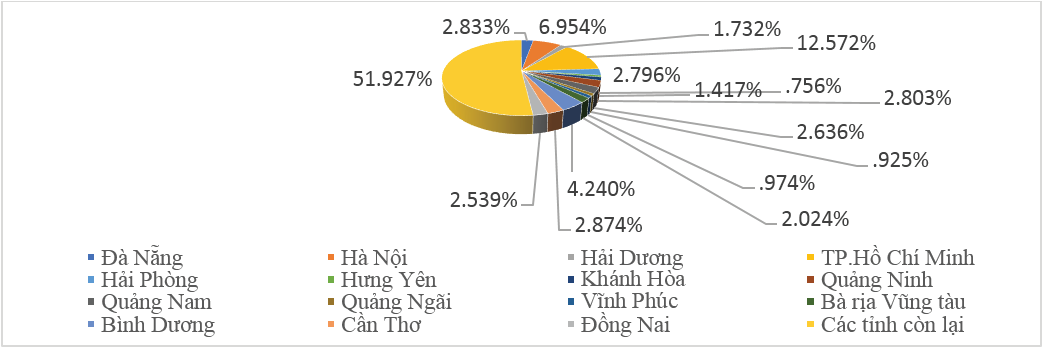
Taxable residential land in rural areas amounting to 65.5% and urban areas standing at 34.5%compared to the total taxable residential land area nationwide.

Figure 1. Proportion of land area in rural areas in some localities to total land area in rural areas across the country (%)



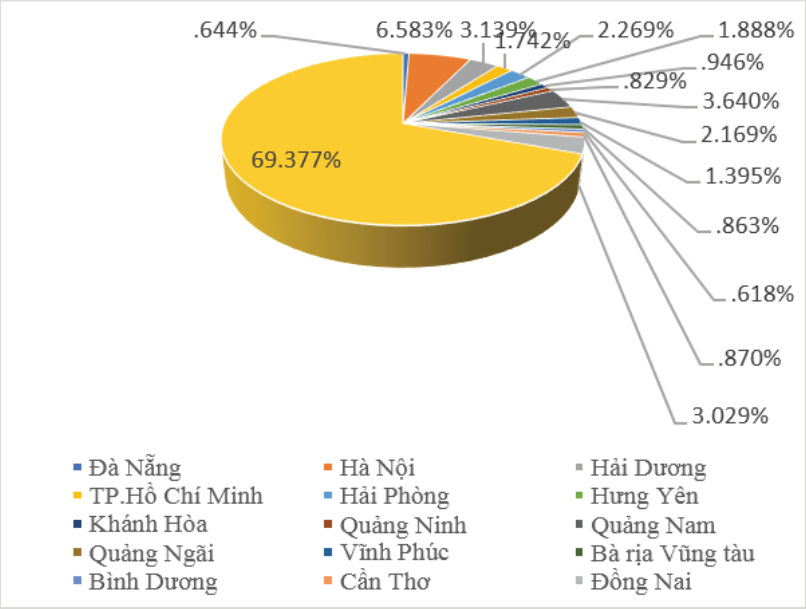
Source: Calculated according to data provided from the Tax Policy Department

Figure 2. Proportion of land area in urban areas in some localities compared to total land area in urban areas across the country (%)



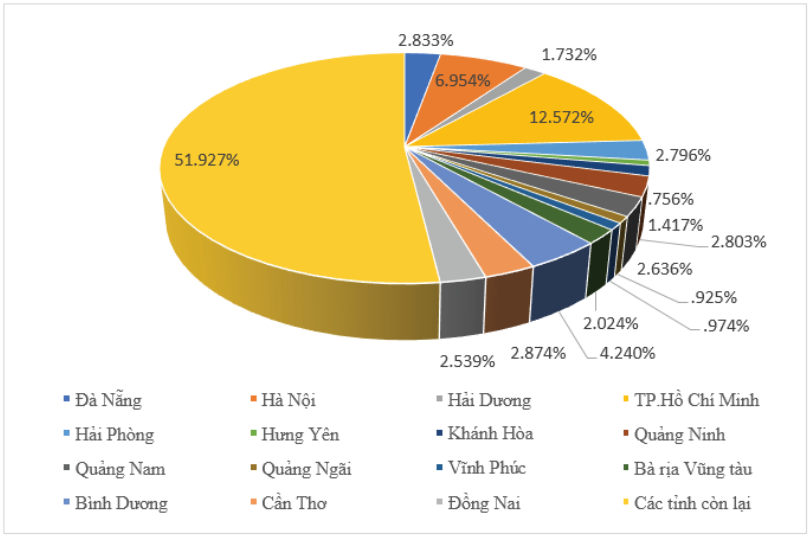
Source: Calculated according to data provided from the Tax Policy Department

Figure 3. Proportion of taxable residential land in rural areas to some localities compared to total taxable residential land in rural areas (%)



Source: Calculated according to data provided from the Tax Policy Department

Figure 4. Proportion of urban area taxable land in some localities to total urban area taxable land area (%)

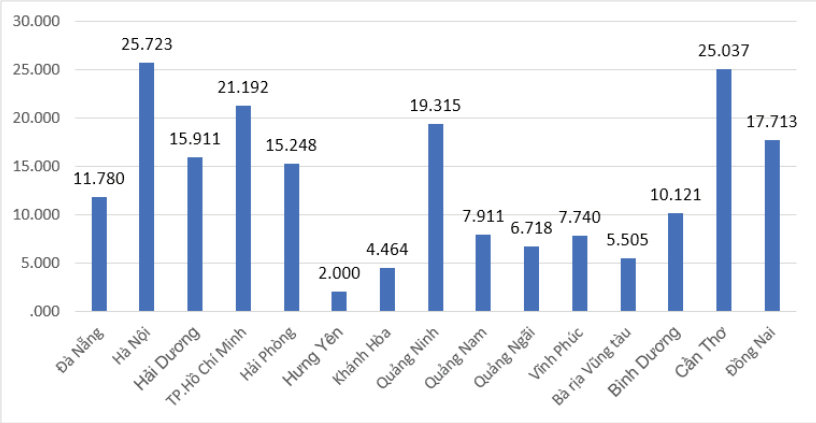


Source: Calculated according to data provided from the Tax Policy Department

- For land prices

According to the actual survey in the market of 15 selected provinces, the price of urban residential land is from 2 times to 25 times higher than that of rural land depending on each locality.

Figure 5. Comparison between urban / rural land prices in some localities Unit: How much is the price of urban land compared to the price of rural land (calculated on a local average)



Source: Calculated according to data provided from the Tax Policy Department

a. ***Regarding revenue from non-agricultural land use tax***

Table 1. Proportion of excise tax revenue in some localities to total revenue from excise tax in the whole country (%) for the period from2012 to 2017

Local / year	2012	2013	2014	2015	2016	2017
Đà Nẵng	2,45%	2,56%	2,64%	2,69%	3,06%	3,93%
Hà Nội	22,62%	23,86%	24,46%	24,99%	27,23%	26,31%
Hải Dương	2,61%	2,23%	2,28%	2,38%	1,88%	1,63%
TP. Hồ Chí Minh	10,87%	13,79%	13,14%	12,30%	13,48%	17,86%
Hải Phòng	5,63%	4,55%	4,66%	4,62%	4,61%	4,19%
Hưng Yên	2,09%	1,84%	1,77%	1,99%	1,85%	1,80%
Khánh Hòa	1,40%	1,13%	1,05%	1,00%	0,93%	0,94%
Quảng Ninh	2,53%	2,47%	2,45%	2,48%	2,38%	2,33%
Quảng Nam	0,38%	0,52%	0,48%	0,50%	0,41%	0,40%
Quảng Ngãi	0,40%	0,42%	0,42%	0,42%	0,35%	0,28%
Vĩnh Phúc	1,53%	1,54%	1,51%	1,58%	1,43%	1,34%

Bà rịa Vũng tàu	2,33%	2,81%	2,62%	2,82%	2,91%	2,85%
Bình Dương	4,16%	3,76%	3,92%	4,03%	4,11%	4,19%
Cần Thơ	1,72%	2,00%	1,96%	1,87%	1,99%	1,70%
Đồng Nai	4,02%	4,09%	4,27%	4,25%	4,44%	3,64%

Source: Calculated according to data of the Ministry of Finance

Table 2: Proportion of revenue from residential land in urban and rural areas to total revenues from agricultural land use tax in some localities (%)

Local	**2015**	**2016**	**2017**	**2018**
Đà Nẵng				
Total revenue	100%	100%	100%	100%
Revenue from residential land	47,21%	76,68%	81,93%	82,97%
Revenuefromnon-agricultural production and business land	52,79%	23,32%	18,06%	16,98%
Revenue from other non-agricultural land	0%	0%	0,01%	0,05%
Hà Nội				
Total revenue	100%	100%	100%	100%
Revenue from residential land	53,18%	99,99%	99,90%	99,67%
Revenues from non-agricultural production and business land	46,82%	0,01%	0,10%	0,33%
Revenue from other non-agricultural land	0%	0%	0%	0%
Hải Dương				
Total revenue	100%	100%	100%	100%
Revenue from residential land	82,38%	86,98%	78,79%	84,36%
Revenues from non-agricultural production and business land	17,62%	13,01%	21,19%	15,61%
Revenue from other non-agricultural land	0%	0,01%	0,02%	0,04%
TP. Hồ Chí Minh				
Total revenue	100%	100%	100%	100%
Revenue from residential land	82,51%	82,99%	81,34%	87,39%
Revenues from non-agricultural production and business land	17,43%	17,01%	18,66%	12,60%
Revenue from other non-agricultural land	0,06%	0%	0%	0,01%
Hải Phòng				

Total revenue	100%	100%	100%	100%
Revenue from residential land	73,05%	74,39%	72,42%	81,31%
Revenues from non-agricultural production and business land	26,95%	25,58%	27,56%	18,69%
Revenue from other non-agricultural land	0%	0,03%	0,02%	0%
Hưng Yên				
Total revenue	100%	100%	100%	100%
Revenue from residential land	30,00%	78,77%	81,43%	86,12%
Revenues from non-agricultural production and business land	70,00%	21,23%	18,53%	13,87%
Revenue from other non-agricultural land	0%	0%	0,04%	0%
Khánh Hòa				
Total revenue	100%	100%	100%	100%
Revenue from residential land	83,19%	81,53%	87,54%	85,80%
Revenues from non-agricultural production and business land	16,81%	18,47%	12,17%	14,20%
Revenue from other non-agricultural land	0%	0%	0,29%	0%
Quảng Ninh				
Total revenue	100%	100%	100%	100%
Revenue from residential land	56,64%	61,48%	55,91%	63,87%
Revenues from non-agricultural production and business land	43,36%	38,52%	43,79%	36,06%
Revenue from other non-agricultural land	0%	0%	0,30%	0,07%
Quảng Nam				
Total revenue	100%	100%	100%	100%
Revenue from residential land	97,21%	84,44%	84,04%	84,11%
Revenues from non-agricultural production and business land	2,79%	15,28%	15,88%	15,86%
Revenue from other non-agricultural land	0%	0,28%	0,08%	0,03%
Quảng Ngãi				
Total revenue	100%	100%	100%	100%
Revenue from residential land	8,96%	99,97%	99,92%	88,88%

Revenues from non-agricultural production and business land	91,04%	0,03%	0,06%	10,33%
Revenue from other non-agricultural land	0%	0%	0,02%	0,78%
Vĩnh Phúc				
Total revenue	100%	100%	100%	100%
Revenue from residential land	33,91%	71,82%	70,36%	71,43%
Revenues from non-agricultural production and business land	66,09%	28,17%	29,64%	28,57%
Revenue from other non-agricultural land	0%	0,01%	0%	0%
Bà rịa Vũng tàu				
Total revenue	100%	100%	100%	100%
Revenue from residential land	68,79%	50,04%	82,07%	82,03%
Revenues from non-agricultural production and business land	31,21%	49,96%	17,93%	16,42%
Revenue from other non-agricultural land	0%	0%	0,01%	1,55%
Bình Dương				
Total revenue	100%	100%	100%	100%
Revenue from residential land	19,68%	59,93%	66,45%	71,64%
Revenues from non-agricultural production and business land	80,32%	40,06%	33,50%	28,34%
Revenue from other non-agricultural land	0%	0,01%	0,04%	0,03%
Cần Thơ				
Total revenue	100%	100%	100%	100%
Revenue from residential land	93,25%	1,28%	92,20%	89,37%
Revenues from non-agricultural production and business land	6,75%	98,01%	7,72%	10,54%
Revenue from other non-agricultural land	0,%	0,71%	0,08%	0,10%
Đồng Nai				
Total revenue	100%	100%	100%	100%
Revenue from residential land	86,68%	94,46%	94,79%	93,86%

Revenues from non-agricultural production and business land	13,32%	5,52%	5,16%	6,08%
Revenue from other non-agricultural land	0%	0,02%	0,05%	0,07%

Source: Calculated according to data from the General Department of Taxation

This study calculates the impact on revenues for residential land in 15 localities under the adjust tax rates plan on residential land. The given options are: (i) 0.2%; (ii) 0.3%; and (iii) 0.5%. The average total tax revenue from residential land in 15 localities in the period from2015 to 2017 accounted for 70.9% of the total tax revenue from land coast-to-coast, subsequently the tax revenue from residential land nationwide will be based on 70.9% as above. The hypothesis of revenues from residential land in the 15 localities used to calculate the impact is the average revenue of the period from2015 to 2017. The average value of taxable residential land for the period from2015 to 2017 is calculated by distributing the average tax revenue from residential land in the period from2015 to 2017 by the present non-agricultural land use tax rate, which is functional to residential land, by 0.03%.

The calculation outcomes present that: If raising the non-agricultural land use tax rate for residential land from 0.03% to:

(i) 0.2%, the revenue from residential land in 15 localities increased to about VND 4,944.239 billion and the revenue from residential land of the whole country developed to about VND 6,984.549 billion.

(ii) 0.3%, the revenue from residential land in 15 localities increased to about VND 7,694.323 billion and the revenue from residential land of the whole country increased to about VND 10,869.49362 billion.

(iii) 0.5%, the revenue from residential land in 15 localities increased to about VND 13,392.934 billion and the revenue from residential land of the whole country increased to about VND 18,919.7166 billion.

Table 3: Impact of increasing tax rates on residential land on non-agricultural land use tax revenues in some localities

Local	*Plan 1: 0,2%*		*Plan 2: 0,3%*		*Plan 3: 0,5%*	
	The tax increase rate compared to the current regulations	The increase in revenue compared to the average revenue in the period of 2015-2017 (VND billion)	The tax increase rate compared to the current regulations	The increase in revenue compared to the average revenue in the period of 2015-2017 (VND billion)	The tax increase rate compared to the current regulations	The increase in revenue compared to the average revenue in the period of 2015-2017 (VND billion)
Đà Nẵng	0,17%	200,855	0,27%	319,006	0,47%	555,306
Hà Nội	0,17%	1937,655	0,27%	3077,453	0,47%	5357,047
Hải Dương	0,17%	139,579	0,27%	221,685	0,47%	385,897

TP. Hồ Chí Minh	0,17%	1045,851	0,27%	1661,57	0,47%	2891,471
Hải Phòng	0,17%	282,834	0,27%	449,208	0,47%	781,955
Hưng Yên	0,17%	102,447	0,27%	162,710	0,47%	283,237
Khánh Hòa	0,17%	69,523	0,27%	110,419	0,47%	192,211
Quảng Ninh	0,17%	119,991	0,27%	190,575	0,47%	331,741
Quảng Nam	0,17%	33,44	0,27%	53,111	0,47%	92,454
Quảng Ngãi	0,17%	19,36	0,27%	30,748	0,47%	53,525
Vĩnh Phúc	0,17%	72,51	0,27%	115,177	0,47%	200,493
Bà Rịa Vũng Tàu	0,17%	167,551	0,27%	266,11	0,47%	463,229
Bình Dương	0,17%	176,814	0,27%	280,822	0,47%	488,839
Cần Thơ	0,17%	150,857	0,27%	239,597	0,47%	417,077
Đồng Nai	0,17%	424,972	0,27%	516,132	0,47%	898,452
Tổng số thu của 15 tỉnh	0,17%	4944,239	0,27%	7694,323	0,47%	13392,934
Tính cho cả nước	0,17%	6984,549	0,27%	10869,49362	0,47%	18919,7166

Source: Authors' calculations

IMPLICATIONS

The analyzing results reveals the impacts of (1) the total property tax revenues measured by all taxes related to land and housing (non-agricultural land use tax, land use right transfer tax, agricultural land use tax, land rental fees, land use levy, state-owned houses purchase) and (2) the impacts of total property tax revenues measured on non-agricultural land use tax revenues to income give different results. The reason is that the calculation methods of property taxes in (1) and (2) is different. The analysis results (1) show that increasing the proportion of property tax revenues in total revenues has the effect of reducing the national income level (-0.22), especially, the income of urban areas mainly decreases. At the same time, it growths people's income and expenditures in rural areas, but rural incomes surge much more clearly, so rural residents still have income surplus after their spending. The analysis (2) demonstrates that the increase of local non-agricultural land use tax revenue has a small positive impact on local income (0.03) and this impact is mainly on objects that are in the middle of income according to the quintile. Together, both (1) and (2) argue that property taxes reduce the disparities in income and expenditure of rural areas. Accordingly, it can be discussed that it should only be considered to rise the tax rate on non-agricultural land use tax to increase the proportion of non-agricultural land use tax in total

revenue because it has more positive effects on the economy. And considering the reasonable adjustment plans to rise the tax rate on other sources of housing-land assets (agricultural land use tax, income from land rental, etc.), it can have a negative impact on income and residents' spending, especially in rural areas.

Most estimation models (locally) exist the autocorrelation phenomenon among data series, which is quite common when estimating with panel data series. Therefore, the panel estimation models in the study are mostly using the random effect panel data model (Radom effect model); some regional impact assessment models use fixed impact panel data.

Because the statistical figures are fairly short, the estimated coefficients of the model are common factors. And since there were not enough observation samples to calculate the estimated coefficients by space (for each locality), the research neglected the isolated influence of each factor on each locality. This is an open question for later studies, when the statistical data is more complete and the assessment on the effect of property taxes on each locality is studied in more detail, which helps the policy management (taxes, real estate market) in each locality are more suitable, realistic and more effective.

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