



RESEARCH ON FACTORS AFFECTING LAND PRICES IN THANH MIEN DISTRICT, HAI DUONG PROVINCE

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Abstract

The study was conducted based on the application of exploratory factor analysis (EFA) and multi-linear regression models to analyze factors affecting land prices in Thanh Mien district, Hai Duong province. The authors used a 5-level Likert scale to design a questionnaire to assess the level of influence of factors on land prices in Thanh Mien district. Surveying 150 households with land use rights transfer transactions and officials related to land valuation with the questionnaire. SPSS software is used to process data, and the results after testing the scale with Cronbach's Alpha coefficient and EFA exploratory factor analysis identified 20 factors belonging to 5 groups of factors affecting land prices in the district. The results of the linear regression model analysis show that 74.283 % of the fluctuations in residential land prices are explained by factors affecting land prices, of which the group of factors with the greatest influence is the group of location factors (27.6 %), followed by the group of economic factors (26.93 %), followed by the group of social factors (20.76 %), the group of other factors (14.88 %) and finally the group of factors with the least influence is the group of policy factors (9.81 %).

Keywords: Residential land prices; Influencing factors; Linear regression model; Thanh Mien district.

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1. Introduction

Land price is the connecting bridge in the relationship between land - market - state management. The land valuation must be consistent with the actual land use right transfer price on the market under normal conditions. When there is a difference compared to the actual land use right transfer price on the market,

it must be adjusted accordingly [1]. Good land price management will be an effective tool in land finance policy, ensuring a stable long-term source of revenue for the State budget, the healthy development of the real estate market, and overcoming weaknesses in land management and use, ensuring economical and effective land use.

However, land prices are affected by many different factors. The Land Law 2013, Decree No. 44/2014/ND-CP regulating land prices, and Circular No.36/2014/TT-BTNMT have detailed regulations on land valuation methods, construction and adjustment of land price tables, specific land valuation, and land price consultation. However, in reality, there is always a difference between land prices regulated by the State and land prices traded on the market because land prices in general and residential land prices in particular are affected by many factors.

Thanh Mien district, Hai Duong province has made great strides in economic, cultural, and social development in recent years. Many projects have been implemented and completed, such as the Co Island expansion project; investment projects to build residential areas, road expansion projects, etc., leading to increasingly vibrant land-related activities in the locality, and land prices in the district always tend to increase. Although land valuation has been carried out under state regulations, there are still limitations that affect land recovery and make it difficult to determine land use fees and land rents. Therefore, understanding the factors affecting land prices helps the government and investors make reasonable decisions, promoting economic and infrastructure development. At the same time, this study also helps land management agencies have an overview of the real estate market, thereby being able to develop appropriate policies for effective land management and use.

2. Research methods

2.1. Method of selecting research locations

Based on the land price list regulated by the People's Committee of Hai Duong province (2020) [10] and the actual conditions of Thanh Mien district, the authors divided the research location into 3 areas and selected routes that reflect the city's socio-economic development and the difference in land prices as follows:

- Area 1 includes 3 routes: the section from Neo bridge flower garden and the section from Neo Intersection to Nguyen Luong Bang street flower garden, Thanh Mien town, belonging to group A - Type I street; the section from the turn to Doan Tung commune People's Committee to the 3-way turn to Nguyen Luong Bang memorial house. This is an area of great importance in connecting different areas and has a large traffic volume as well as a highly regulated price.

- Area 2 includes 4 routes: Tue Tinh street, Thanh Mien town; Chu Van An street, Thanh Mien town; Residential area of Chuong, Lam Son commune, along Provincial Road 392; Land along National Highway 38B, Thanh Mien town. Area 2 is the area that plays a role in connecting residential areas, with main traffic routes, and has a regulated price at an average level.

- Area 3 includes 3 routes: The section through Thanh Giang, Tu Cuong, Ngu Hung, and Tien Phong communes - land along Provincial Road 392B; Dang Tu Te street, Thanh Mien town; The remaining streets within Thanh Mien Town. Area 3 is the area that plays an important role in

connecting residential areas and supporting internal trade and has a regulated price at a low level (Table 1).

2.2. Method of collecting secondary data

The authors collected data on socio-economic development and the transfer of land use rights from 2021 to 2023, at the Department of Natural Resources and Environment and the Registration Office for Land use Rights of Thanh Mien district.

2.3. Method of collecting primary data

The research team conducted a survey of 20 officials working in land management in Thanh Mien district, Hai Duong province on factors affecting land prices regulated by the state and land prices in the market in 3 years 2021, 2022, and 2023. The results identified 5 groups of factors representing 21 independent variables affecting land prices to be included in the research model (Table 2).

The authors collected primary data from a survey of 150 households and individuals who transferred land use rights at the study sites. The sample size was determined based on the sampling method of Hair, Anderson, Tatham & Black (1998) [3]. Accordingly, the minimum sample size is 5 times the total number of observed variables:

$$n = 5 \times m$$

in which: n: Number of samples to be investigated; m: Number of observed variables understood as a measurement question in the survey [3].

In this study, it is expected that there will be 21 influencing factors, so the

minimum sample size to be investigated is greater than or equal to $21 \times 5 = 105$. To ensure the requirements, the number of samples selected for investigation in this study is 150, the sampling method is random.

The authors use a 5-level Likert scale to assess the level of influence of the factors [7]: (1) No influence; (2) Little influence; (3) Normal; (4) Influence; (5) Very influential.

2.4. Exploratory factor analysis method

The collected data were entered into SPSS software for exploratory factor analysis. The data processing and analysis process includes 2 main steps:

Step 1: Verify the scale using Cronbach's Alpha index.

In the study, the measurement of factors is done using many observation questions. Therefore, when creating the questionnaire, the observed variables are sub-variables of a created factor. To assess the suitability of the sub-variables with the parent factor, the study conducted a scale verification using Cronbach's Alpha index and the total item correlation coefficient (Corrected Item - Total Correlation). The data ensures reliability when Cronbach's Alpha coefficient is in the range (0.6 - 0.95), and the total item correlation coefficient > 0.3 [3].

Step 2: Exploratory Factor Analysis (EFA)

The main goal of EFA is to describe the relationship between a set of observable variables k (smaller number) and unobservable variables. Factor analysis works on the principle of measurability

and reduction of variables with common variance, unobservable. Variables are only accepted when the appropriate coefficient KMO (Kaiser - Meyer - OIKIN) is in the range (0.5 - 1) and the loading weights > 0.35 [5] or the distance between 2 loading weights (Factor Loading) of the same variable in 2 different factors > 0.3 [3], if the loading weight > 0.3 then the sample size must be at least 350, if the sample size is about 100 then the loading weight should be > 0.5 and if the sample size is about 50 then the loading weight must be > 0.75 . For this study, the loading weight was chosen to be > 0.5 because the number of samples investigated was 150. In addition, the scale was only accepted when the total variance explained (Total Variance Explained) $> 50\%$; Bartlett's coefficient with a significance level of $\text{sig} < 0.05$ to ensure that the factors are correlated with each other; Eigenvalue coefficient has a value ≥ 1 to ensure that the factor groups are different.

2.5. Regression analysis

The authors use a multiple regression model in the form $Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \beta_n X_n + e$ to determine the level of influence on land prices of the factors. In which:

Y_i is the dependent variable representing the price of the land plot;

X_1, X_2, \dots, X_n are independent variables representing the factors affecting land prices;

β_0 is a constant, the value of Y when all values of X are 0;

$\beta_1, \beta_2, \dots, \beta_n$ are regression coefficients;

e is the standard error.

3. Research results

3.1. Land prices regulated in Thanh Mien district

a. Urban residential land

Location 1: Land located next to roads and streets (frontage);

Location 2: Land located next to alleys of roads and streets, with an alley cross-section $B_n \geq 3$ m and an alley depth calculated from the construction boundary close to the edge of the main road sidewalk to the beginning of the land plot < 200 m;

Location 3: Land located next to alleys (sidewalks) with an alley cross-section $2 \text{ m} \leq B_n < 3 \text{ m}$ and an alley depth calculated from the beginning of the alley to the beginning of the land plot < 100 m or located next to alleys with an alley cross-section $B_n \geq 3$ m and an alley depth calculated from the construction boundary close to the edge of the main road sidewalk to the beginning of the land plot ≥ 200 m;

Location 4: Land with remaining location, with less favorable conditions for production, business, and living.

b. Rural residential land

- Land on the outskirts of urban areas, along main traffic routes (national highways, provincial roads, district roads), traffic hubs, commercial and tourist areas and residential areas:

+ *Location 1:* Land adjacent to main traffic routes, commercial and tourist areas, and residential areas, with favorable conditions and the highest land price;

+ *Location 2:* Land adjacent to roads and alleys leading to main traffic

routes, with alley cross-section $B_n \geq 3$ m and alley depth calculated from the construction boundary to the beginning of the land plot $D < 200$ m;

+ *Location 3*: Land adjacent to main roads and alleys leading to main traffic routes, with alley cross-section $B_n \geq 3$ m and alley depth calculated from the construction boundary to the beginning of the land plot $200 \text{ m} \leq D < 400$ m; Adjacent to alleys with a cross-section of $2 \text{ m} \leq B_n < 3$ m and an alley depth calculated from the construction boundary of the main traffic road to the beginning of the plot of land $D < 200$ m;

+ *Location 4*: Land adjacent to main alleys leading to main traffic roads with a cross-section of $B_n \geq 3$ m and an alley depth calculated from the construction boundary to the beginning of the plot of land $400 \text{ m} \leq D < 600$ m; Adjacent to alleys with a cross-section of $2 \text{ m} \leq B_n < 3$ m and an alley depth calculated from the construction boundary of the main traffic road to the beginning of the plot of land $200 \text{ m} \leq D < 400$ m;

+ *Location 5*: Land adjacent to main alleys leading to main traffic roads with a cross-section of $B_n \geq 3$ m and an alley depth calculated from the construction boundary to the beginning of the plot of land $600 \text{ m} \leq D < 800$ m; Adjacent to alleys with an alley cross-section of $2 \text{ m} \leq B_n < 3$ m and an alley depth calculated from the main road construction boundary to the beginning of the plot of land of $400 \text{ m} \leq D < 600$ m;

+ *Location 6*: Land located adjacent to main alleys leading to main roads with an alley cross-section of $B_n \geq 3$ m

and an alley depth calculated from the construction boundary to the beginning of the plot of land of $800 \text{ m} \leq D < 1,000$ m; Adjacent to alleys with an alley cross-section of $2 \text{ m} \leq B_n < 3$ m and an alley depth calculated from the main road construction boundary to the beginning of the plot of land of $600 \text{ m} \leq D < 800$ m; Land at the next location of the plot of land has a depth greater than 100 m;

- Land in the remaining locations in rural areas

+ *Location 1*: Land located in the center of the commune, near schools, markets, and medical stations, adjacent to main traffic routes or traffic hubs of the commune, with favorable conditions and the highest land price;

+ *Location 2*: Land located adjacent to main traffic routes, inter-commune roads with favorable conditions and lower land prices than location 1;

+ *Location 3*: Land located adjacent to inter-village roads, with favorable conditions and lower land prices than location 2;

+ *Location 4*: Land located adjacent to alleys leading to main traffic routes, district roads, inter-commune roads, and land located along other roads of the commune, with favorable conditions and lower land prices than location 3;

+ *Location 5*: Land in the remaining locations, with the lowest land prices;

+ In case the land location has just been determined according to the suburban area, along the main traffic routes (national highways, provincial roads, district roads), traffic hubs, commercial and tourist areas, and residential areas;

and the location has been determined according to the remaining area in the countryside, the land price is calculated according to the method of determining the location with the higher land price.

Land prices on the research routes in Thanh Mien district have differences between routes and locations. Land prices at location 1 are always the highest, being the

center of the district, convenient for traffic, and suitable for family business purposes. Land prices gradually decrease and also have quite a difference between locations.

Market research results show that land prices on the market have large fluctuations and are many times higher than the land prices in the regulated price list (Table 1).

Table 1. Regulated land prices and market land prices in Thanh Mien district, Hai Duong province

Area	Route	Location	Regulated land prices (1000 VND/m ²)	Market land prices (1000 VND/m ²)			Difference (times)		
				2021	2022	2023	5/4	6/4	7/4
1	2	3	4	5	6	7	8	9	10
Area I	Nguyen Luong Bang Street, Thanh Mien Town (from the flower garden to Neo Bridge)	1	14000000	2850000	33000000	45500000	0.20	2.36	3.25
		2	7000000	19500000	24000000	35500000	2.79	3.43	5.07
		3	5000000	12000000	19200000	28000000	2.40	3.84	5.60
		4	3000000	10500000	12500000	15000000	3.50	4.17	5.00
	Nguyen Luong Bang Street, Thanh Mien Town (section from Neo intersection to flower garden)	1	14000000	28000000	32500000	46000000	2.00	2.32	3.29
		2	7000000	15500000	22500000	24500000	2.21	3.21	3.50
		3	5000000	9200000	14700000	15800000	1.84	2.94	3.16
		4	3000000	6800000	9500000	9200000	2.27	3.17	3.07
	Land along Provincial Road 392, Doan Tung Commune (from the turnoff to Doan Tung Commune People's Committee to the 3-way intersection to Nguyen Luong Bang Memorial House)	1	10000000	28500000	32800000	38000000	2.85	3.28	3.80
		2	5000000	18000000	20000000	24200000	3.60	4.00	4.84
		3	4000000	135000000	15800000	14200000	33.75	3.95	3.55
		4	3000000	7800000	8300000	7800000	2.60	2.77	2.60
Area II	Tue Tinh Street (from the flower garden to Phuong Hoang Ha)	1	8000000	12200000	15000000	20000000	1.53	1.88	2.50
		2	4000000	7500000	9700000	16600000	1.88	2.43	4.15
		3	2500000	5400000	7000000	9800000	2.16	2.80	3.92
		4	1600000	2700000	3500000	4000000	1.69	2.19	2.50
	Chu Van An Street (from Neo Intersection - to Dong Trang culvert)	1	8000000	11000000	13000000	16000000	1.38	1.63	2.00
		2	4000000	7500000	9200000	11800000	1.88	2.30	2.95
		3	2500000	5400000	7000000	9000000	2.16	2.80	3.60
		4	1600000	2200000	3000000	4000000	1.38	1.88	2.50
	Land along provincial road 392 (section belonging to the residential area of Chuong, Lam Son commune)	1	7000000	18800000	20000000	31700000	2.69	2.86	4.53
		2	3500000	10500000	14100000	22200000	3.00	4.03	6.34
		3	2800000	7800000	8800000	10700000	2.79	3.14	3.82
		4	2100000	4000000	5700000	8800000	1.90	2.71	4.19

Area	Route	Location	Regulated land prices (1000 VND/m ²)	Market land prices (1000 VND/m ²)			Difference (times)		
				2021	2022	2023	5/4	6/4	7/4
1	2	3	4	5	6	7	8	9	10
Area II	Hoang Xa Street (from Agricultural Bank to Tran Van Giap Street)	1	6000000	8000000	10000000	12000000	1.33	1.67	2.00
		2	3000000	5500000	7200000	8500000	1.83	2.40	2.83
		3	2000000	3400000	5300000	7300000	1.70	2.65	3.65
		4	1200000	2100000	3200000	4500000	1.75	2.67	3.75
Area III	Land along provincial road 392B (section through Thanh Giang, Tu Cuong, Ngu Hung, Tien Phong communes)	1	5000000	25000000	33500000	36000000	5.00	6.70	7.20
		2	2500000	15100000	28800000	29600000	6.04	11.52	11.84
		3	2000000	10200000	14500000	16500000	5.10	7.25	8.25
		4	1500000	7800000	9100000	10500000	5.20	6.07	7.00
	Dang Tu Te street, Thanh Mien town	1	5000000	7600000	8500000	10800000	1.52	1.70	2.16
		2	2500000	4100000	6600000	7700000	1.64	2.64	3.08
		3	1300000	2000000	3200000	4500000	1.54	2.46	3.46
		4	1000000	1200000	3500000	4500000	1.20	3.50	4.50
	The remaining streets within Thanh Mien town	1	2500000	4200000	7500000	8000000	1.68	3.00	3.20
		2	1500000	2000000	3000000	4000000	1.33	2.00	2.67
		3	800000	1300000	1500000	2000000	1.63	1.86	2.50
		4	600000	1100000	1200000	1500000	1.83	2.00	2.50

3.2. Factors affecting land prices in Thanh Mien district

Based on the investigation and interviews with 6 staff of the Department of Natural Resources and Environment, 6 staff of the Thanh Mien District Land Registration Office, and 8 land officials of communes in Thanh Mien district. The results show that land prices here are affected by many factors including 21 factors affecting land prices, divided into 5 groups of factors, specifically:

i) Location factors: Different locations will lead to differences in land prices, at the same time, land prices change according to road sections and areas [5];

ii) Economic factors: Land prices are affected by issues such as economic growth rate in the area; income and consumption of residential areas as well as bank interest rates [11];

iii) Social factors: Land prices are affected by social factors such as urbanization speed, population density, living environment, public awareness, social security, and land speculation [9];

iv) Group of policy factors: Factors affecting land prices include planning policies, land price policies, tax policies [9];

v) Group of other factors: Including shape, area, width, and depth of the land plot, these are factors affecting the value of the land plot [4].

After identifying 5 groups of factors affecting land prices, a survey was conducted on 150 households and individuals who received and transferred land use rights in 2021, 2022, and 2023 on selected routes according to the survey form. The specific results were:

Table 2. Results of household and individual surveys on factors affecting land prices in Thanh Mien district

Factors affecting land prices	Total number of questionnaires	Influence		No Influence	
		Number of questionnaires	Ratio (%)	Number of questionnaires	Ratio (%)
I. Location factors					
(1) Distance to administrative center	150	131	87.3	19	12.7
(2) Distance to school	150	132	88	18	12
(3) Distance to hospital	150	120	80	30	20
(4) Distance to market	150	126	84	24	16
II. Economic factors					
(5) Economic growth rate in the region	150	150	100	0	0
(6) Income and consumption of residents	150	150	100	0	0
(7) Bank interest rates	150	150	100	0	0
(8) Income generating capacity of the land plot	150	146	97.3	4	2.7
III. Social factors					
(9) Urbanization rate	150	150	100	0	0
(10) Population density	150	150	100	0	0
(11) Living environment	150	150	100	0	0
(12) Education level	150	150	100	0	0
(13) Social security	150	150	100	0	0
(14) Land speculation	150	150	100	0	0
IV. Legal factors					
(15) Legal status of the land plot	150	134	89.3	16	10.7
(16) Restrictions on land use rights	150	132	88	18	12
(17) Planning restrictions	150	131	87.3	19	12.7
V. Other factors					
(18) Plot shape	150	150	100	0	0
(19) Plot area	150	150	100	0	0
(20) Plot frontage width	150	150	100	0	0
(21) Plot depth	150	150	100	0	0

3.3. The level of influence of factors affecting land prices in Thanh Mien district

3.3.1. Reliability analysis of survey data

The authors analyzed the reliability of survey data using SPSS software, through Cronbach's Alpha coefficient and the Corrected Item - Total Correlation

(Table 2). The results of Cronbach's Alpha testing for 21 independent variables in the research model showed that the survey variable "The ability to generate income of the land plot" (KT4) had a Corrected Item - Total Correlation of 0.193, less than 0.3 (not reliable enough), so it had to be removed from the research model. Thus, 20 survey variables are eligible to continue with exploratory factor analysis.

Table 3. Results of reliability analysis - Cronbach's Alpha

Observation variable	Symbol	Corrected Item - Total Correlation	Cronbach's Alpha coefficient
Location factors (Cronbach's Alpha = 0.825)			
Distance to the administrative center	VT1	0.590	0.805
Distance to school	VT2	0.704	0.759
Distance to hospital	VT3	0.656	0.779
Distance to market	VT4	0.662	0.773
Economic factors (Cronbach's Alpha = 0.700)			
Economic growth rate in the area	KT1	0.425	0.677
Income and consumption of residents	KT2	0.683	0.511
Bank interest rates	KT3	0.733	0.482
Income generating capacity of the land	KT4	0.193	0.807
Social factors (Cronbach's Alpha = 0.939)			
Urbanization rate	XH1	0.855	0.922
Population density	XH2	0.780	0.932
Living environment	XH3	0.833	0.925
Public awareness	XH4	0.830	0.926
Social security	XH5	0.767	0.934
land speculation	XH6	0.837	0.925
Policy factors (Cronbach's Alpha = 0.885)			
Economic policy	CS1	0.766	0.846
Tax policy	CS2	0.794	0.821
Planning policy	CS3	0.770	0.843
Other factors (Cronbach's Alpha = 0.834)			
Land plot shape	KB1	0.528	0.850
Land plot area	KB2	0.840	0.706
Land plot frontage width	KB3	0.571	0.828
Land plot depth	KB4	0.736	0.756

3.3.2. Exploratory factor analysis

Exploratory factor analysis (EFA) is used to reduce a set of k survey variables into a set F (with $F < k$) of more meaningful factors. In this study, instead of studying 20 factors affecting land prices, the authors studied 5 groups of factors, each of which includes factors that are correlated with each other to save time and research costs.

The results of the test of the suitability of factor analysis showed that the KMO coefficient (Kaiser - Meyer - Olkin) = 0.792, satisfying the condition $0.5 < KMO < 1$ (Table 3). Thus, exploratory factor analysis is suitable for real data. In addition, the Bartlett's test has a value of Sig. = 0.000 < 0.05, showing that the real data is completely consistent with EFA analysis and the survey

variables are linearly correlated with the representative factor.

Table 4. Results of KMO and Bartlett's Test

Index		Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.792
Bartlett's Test of Sphericity	Approx. Chi-Square	2503.349767
	df	190
	Sig.	0.000

The evaluation results of the survey variables in the model with the required factors, because the total explained variance of the independent variable is $74.283 > 50\%$ (Table 4). The results show that 74.283 % of the change in the result factor is due to the factors (variables) given in the model, that is, the survey variables in this study explained 74.283 % of the variation in land prices in Thanh Mien district.

Table 5. Total explained variance and factor loading of the rotation matrix for independent variables

Factors	Eigenvalues			Total explained variance		
	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative (%)
1	6.570	32.851	32.851	6.570	32.851	32.851
2	3.372	16.859	49.711	3.372	16.859	49.711
3	2.439	12.196	61.907	2.439	12.196	61.907
4	1.325	6.627	68.534	1.325	6.627	68.534
5	1.150	5.749	74.283	1.150	5.749	74.283
6	0.837	4.185	78.468			
7	0.707	3.534	82.002			
8	0.677	3.387	85.389			
9	0.569	2.846	88.235			
10	0.473	2.365	90.599			
11	0.369	1.844	92.444			
12	0.354	1.771	94.214			
13	0.319	1.593	95.807			
14	0.251	1.255	97.062			
15	0.218	1.091	98.153			
16	0.111	.556	98.709			
17	0.099	.497	99.206			
18	0.085	.427	99.633			
19	0.053	.265	99.897			
20	0.021	.103	100.000			

Table 6. Factor loading results of the rotation matrix

Variables	Component				
	1	2	3	4	5
XH1	0.878				
XH6	0.862				
XH5	0.857				
XH3	0.857				
XH2	0.854				
XH4	0.852				
VT3		0.812			
VT4		0.795			
VT2		0.785			
VT1		0.711			
KB2			0.820		
KB3			0.779		
KB1			0.712		
KB4			0.712		
CS3				0.851	
CS2				0.809	
CS1				0.808	
KT2					0.923
KT3					0.899
KT1					0.647

The rotation matrix determining the factor loading shows that 5 groups of factors with 20 survey variables are arranged in a non-original order. The factor loading of all variables have values >0. According to Hair & CS (1998), a factor loading >0.3 is considered to be at the minimum level; a factor loading >0.4 is considered important; a factor loading >0.5 is of practical significance (Table 5). Thus, it can be affirmed that each element in each factor is correlated with the factor of which it is a component and has practical significance.

Thus, the exploratory factor analysis confirmed the following 5 groups of factors: Location factors, economic factors, social factors, policy factors, and individual factors were included in the regression analysis.

3.4. Regression analysis and determination of the level of influence of factors on land prices

3.4.1. Regression analysis

After conducting the steps of testing and factor analysis, eligible factors are included in the regression analysis to determine the linear regression equation between land prices and influencing factors as well as to determine the level of influence of those factors on land prices. The adjusted R2 value is 0.63, so 63 % of the variation in land prices is caused by the influence of

independent variables in the model. The Durbin-Watson value (d) is a test value used to detect the presence of correlation in regression analysis. The value of d is always between 0 and 4. If $1 < d < 3$ then the model does not correlate, if $0 < d < 1$ then the model has a positive correlation, if $3 < d < 4$ then the model has a negative correlation. Therefore, it can be assumed that there is no first-order linear correlation in the multiple linear regression data because the Durbin-Watson coefficient value of 1.925 is very close to the value of 2.

Table 7. Regression coefficients

Model	Unstandardized regression coefficient beta	Standardized regression coefficient beta	Sig.	Multicollinearity statistics	
				Acceptability	VIF
Constant	-2.616		0.000	0.683	1.463
VTtb	0.703	0.332	0.000	0.808	1.238
KTtb	0.406	0.324	0.000	0.628	1.592
CStb	0.256	0.250	0.000	0.863	1.158
XHtb	0.170	0.118	0.032	0.667	1.499
KBtb	0.280	0.179	0.004	0.683	1.463

From the regression coefficient results, the authors consider the unstandardized regression coefficients in the beta coefficient column. Thereby, the authors can provisionally estimate the sample regression model before testing, the model is represented as follows:

$$Y = -2,616 + 0,703VT + 0,406KT + 0,256CS + 0,170XH + 0,281KB + \epsilon$$

In Table 6, the significance level Sig. of the variables in the regression model, all have a value of 0.000, which is

smaller than the maximum value of 0.05. Therefore, all variables have an impact on land prices. The VIF values of all variables have an impact on land prices. The VIF values of all variables are greater than 1, indicating that there is a multicollinearity phenomenon in this analysis.

Analysis of variance ANOVA to test the reliability of the regression analysis (Table 8) shows that the transformed F value = 49.033, the significance level Sig = 0.000, the results of the regression analysis ensure reliability.

Table 8. Analysis of variance ANOVA

	Total variance	df	Mean-variance	F	Sig.
Regression	35.955	5	7.191	49.033	<.001b
Remainder	21.118	144	0.147		
Total	57.073	149			

3.4.2. Assess the level of influence of factors on residential land prices

Table 9. Level of influence of factors on land prices

Group of influencing factors	Standard beta	Ratio (%)	Order of influence
VT - Location	0.332	27.60	1
KT - Economy	0.324	26.93	2
XH - Social	0.250	20.78	3
CS - Policy	0.118	9.81	5
KB - Others	0.179	14.88	4
Total	1.203		

Thus, the results of the analysis of the influence of factors on land prices in Thanh Mien district show that the location factor has the highest influence at 27.6 %, followed by the economic factor at 26.93 %, followed by the social factor at 20.78 %, other factors at 14.88 % and finally the policy factor at 9.81 %.

The location factor and economic factors have the highest influence on land prices in the Thanh Mien district. This is consistent with the fact that when regulating land prices in the land price frame, as well as the regulated price list, the location factor is the basis for building land prices. If the land plot is more conveniently located near the center, schools, hospitals, etc., the price will always be higher than other plots. In addition, the group of economic factors (economic growth rate, income and consumption, bank interest rates) is also a factor that greatly affects land prices.

Thus, the results of the analysis of the influence of factors on land prices in Thanh Mien district show that the location factor has the highest influence at 27.6 %, followed by the economic factor at 26.93 %, followed by the social factor at 20.78 %, other factors at 14.88 % and finally the policy factor at 9.81 %.

From the above research results, it can be recommended that when valuing

residential land in Thanh Mien district, it is necessary to consider more carefully the location and economic factors to set land prices in accordance with market prices, while contributing to socio-economic development and improving the effectiveness of state management of land.

4. Conclusion

Land prices in the Thanh Mien district market in the period of 2021 - 2023 are always higher than the regulated price, the difference also fluctuates according to each location in each section of a route

Land prices in Thanh Mien district are affected by five groups of factors, including location factors, social factors, economic factors, policy factors, and other factors. The results of the linear regression analysis determined the linear regression equation as $Y = -2.616 + 0.703VT + 0.406KT + 0.256CS + 0.170XH + 0.281KB + \epsilon$

In which, the group of factors that have the greatest influence on the land price of Thanh Mien district is the group of location factors (27.6 %), followed by the group of economic factors (26.93 %), followed by the group of social factors (20.78 %), the group of other factors (14.88 %) and finally the group of policy factors (9.81 %).

5. Recommendation

During the implementation process, the authors identified the location factor group and the economic factor group as the two groups of factors that have the greatest impact on land prices in Thanh Mien district. Therefore, when determining land prices in Thanh Mien district, it is necessary to consider more carefully the location and economic factors so that the land price is consistent with the market price while contributing to socio-economic development and improving the effectiveness of land management.

REFERENCES

- [1]. Baria M., Iivari J., Maragahh H., (1995). *Why do individuals use computer technology: A Finnish case study*. Information and Management. 29: 227 - 238.
- [2]. Bland J., Altman D., (1997). *Statistics notes: Cronbach's alpha*. BMJ. 314: 275.
- [3]. Hair Jr. J.F., Anderson R.E., Tatham R.L., Black W.C., (1998). *Multivariate data analysis* (5th ed.). New York: Macmillan Publishing Company.
- [4]. Ho Thi Lam Tra, Nguyen Van Quan (2006). *Land valuation Textbook*. Agricultural Publishing House, Hanoi.
- [5]. Ho Thi Lam Tra, Nguyen Vu Kien (2006). *The influence of location factors on residential land prices in Bac Ninh city, Bac Ninh province*. Journal of Agricultural Science and Technology. 4: 47 - 5.
- [6]. Ho Thi Lam Tra, Nguyen Van Quan, Pham Anh Tuan, Trinh Thi Mai (2019). *Research on residential land prices and factors affecting residential land prices in Chi Linh city, Hai Duong province*.
- [7]. Likert & R.A., (1932). *A technique for the measurement of attitudes*. 140(55).
- [8]. National Assembly of the Socialist Republic of Vietnam (2013). *Land Law 2013*. Labor Publishing House.
- [9]. Pham Anh Tuan (2016). *Land valuation textbook*. Hanoi University of Natural Resources and Environment.
- [10]. Hai Duong Provincial People's Committee (2019). *Decision 55/2019/QĐ-UBND dated December 20, 2019 of Hai Duong Provincial People's Committee promulgating the Land price list for the period 2020 - 2024 in Hai Duong province*.
- [11]. Topcu Mehmet, Ayse Sema Kubat (2009). *The analysis of urban features that affect land values in residential areas*. Proceedings of the 7th International Space Syntax Symposium, Stockholm.