

A LOCATION EFFECT ON THE CAPITAL GAINS OF CONDOMINIUM INVESTMENT

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ARTICLE INFO	ABSTRACT
Keywords: capital gains, condominium, location, real estate appreciation, real estate investment	This research focuses on the effect of locational factors on condominium capital gains investment in Thailand. It employed secondary data selected through judgmental sampling. Capital gains data spanning 5 to 15 years were collected quarterly from 1,381 condominium projects in Thailand. ANOVA and Pearson correlation were conducted to study the relationship between locations, capital gains, and price per square meter. The main findings can be summarized in three aspects: capital gains rates, locations, and timing, indicating that investing in a condominium based solely on capital gains without considering rental fees may not be a favorable strategy. Furthermore, regarding locations and timing, no significant returns were contributed. Although each location does not significantly contribute to different capital gains, the research highlights that residential and commercial activities are the most critical factors for generating higher-than-average capital gains. As a result, residential areas, the Bangkok Central Business District (CBD), Bangkok suburbs, commercial districts, and high-density residential areas are the top five potential locations for investment. Moreover, the relationship between the capital gains and the prices per square meter exhibits three directions: positive, negative, and no relationship, depending on locations.
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1. Introduction

For decades, investing in real estate has been perceived as an interesting approach to tackling inflation and creating wealth due to its unique potential for earning returns from real estate capital gains and rental fees (Chambers et al., 2021; Mattarocci & Siligardos, 2015). Previously, investing in real estate in Thailand offered substantial returns, with rental yields ranging from around 5%–7% (Global Property Guide, 2024) and capital gains between 5%–20% per annum, compared to the meager bank interest rates of 0.25%–1.50% per annum. This made real estate investment the primary avenue for generating passive income compared to other approaches, such as franchise royalty fees or licensing fees from songs, novels, or books.

However, changing urban structures, such as the growing number of expatriates, urbanization, changing lifestyles, smaller households, increased single-person households, and the rapid development of facilities, infrastructure, transportation, and many more have fundamentally impacted the real estate investment landscape (Jones, 2021; McDonald & McMillen, 2010; Khmara & Kronenberg, 2023). These changes, particularly in the condominium sector, have driven significant growth over the last decade (Figure 1). Condominiums are now perceived as both consumption and investment goods (Kiel, 1994). However, after the COVID-19 pandemic, it has been observed that the domain of real estate investment has changed, characterized by an imbalance between more supply and less or stagnant demand for condominiums (FazWaz, 2023). This shift has

significantly impacted the reduction in rental and dividend yields, declining from the previous range of 6–9% to a current range of 5–7% per annum (Global Property Guide, 2024) while also introducing a heightened risk of lower occupancy rates. This situation has also affected the mismatch between expected and actual yields for real estate investors, with many experiencing returns lower than their initial expectations (Rattanaprichavej & Teeramungcalanon, 2020). As a result, individual investors tend to increasingly depend on and prioritize another aspect of real estate investment returns—capital gains

(Chambers et al., 2021; Damrongrak, 2017). These capital gains have shown a substantial rise in residential property prices spanning over a decade in various locations (Davis & Palumbo, 2008; DWG Malaysia, 2023; Global Property Guide, 2024; Glaeser et al., 2005). This phenomenon among individual investors parallels the expectations of institutional investors. However, the firms anticipate additional benefits beyond mere capital gains, such as higher collateral, heightened security, increased investment capital, and elevated firm value (Chen et al., 2015; Rong et al., 2016; Wang et al., 2018).

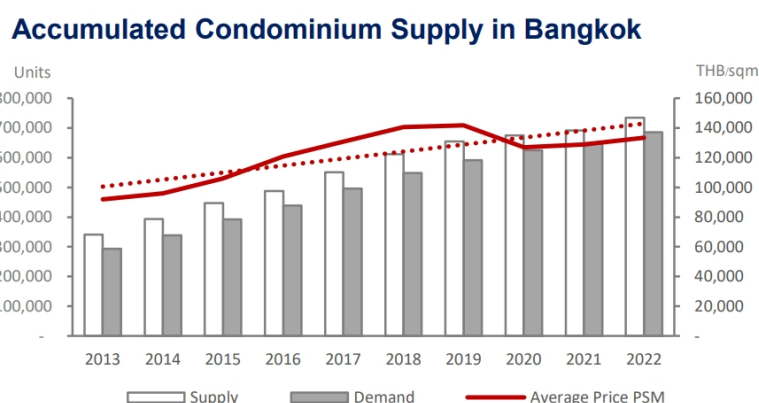


Fig. 1. Accumulated Condominium Supply in Bangkok from the year 2005 till 2022. Source: Nexus Real Estate Advisory (2023).

In contrast to the rental yield, capital gains are influenced by a diverse range of demands, including those from investors, speculators, and especially foreign investors in the case of condominiums. Both rental yields and capital gains are differently impacted by market dynamics (Mattarocci & Siligardos, 2015). In other words, capital gains are more susceptible to several factors, such as the economic situation, investment sentiment, and business cycles (Adair et al., 2006). Moreover, the implementation of Thailand's new property tax law in 2019, which placed a high fee on a large range of real estate types, especially residential projects and vacant land, has also influenced landlords to face the decision to sell or lease the land, resulting in an influx of additional supplies into the economic system, eventually negatively impacting real estate prices (Wheaton, 2005). Therefore, the capital gains associated with each real estate project seem to exhibit diverse and significant variability, depending on various factors, such as location, brand, pricing, and timing (Rong et al., 2016). Notably, locational factors that originated from several specific characteristics that distinguish real estate exhibit considerable variations across

different areas (Archer et al., 1996; Gyourko et al., 2013; Gyourko & Voith, 1992; Kang et al., 2021; Maloney & Rosenthal, 2022).

Unlike several other research studies that focus on examining the relationship between macroeconomic factors such as gross domestic product (GDP), unemployment rate, minimum wages, foreign direct investment (FDI), Consumer Price Index (CPI), inflation rate, exchange currency rate, public spending, regulations, and the growth of capital gains in housing or land plots (Mattarocci & Siligardos, 2014), this research focuses on the impact of location factors pertaining to condominium projects on real estate capital gains from a long-term perspective - a relatively underexplored area in research (Kang et al., 2021), as well as studying location in a multi-array of geographical, economical, and governance basis. Consequently, this research aims to address three fundamental research questions: 1) Over the past fifteen years, has it been worth it or not to invest in condominiums when it comes to expected capital gains? 2) Do different locations influence different capital gains levels, and which locations or cities yield the highest capital gains (superstar cities)? and 3) Do

different investment periods result in different capital gains, and what are their associated volatilities? As a result, the research objectives are to study 1) the capital gains trends of the condominium investment in the long run, 2) the relationship between the locations and capital gains and 3) the different capital gains in different investment periods of 5, 10, and 15 years. The core research assumption can be stipulated as different locations and timings of the condominium investments affecting capital gains.

The answers to these questions will lead to the conclusion of whether or not it remains attractive to invest in condominiums in Thailand for capital gains. Referring to other research in other countries, it was less attractive based on the 80-year (1901–1983) study of property prices in the United Kingdom (UK) conducted by Chambers, Spaenjers, and Steiner in 2021; however, this is definitely in contrast to the study of the house prices in the United States (US) from the years 1984–2004, which predicted continued real estate appreciation in the future (Davis & Palumbo, 2008; Glaeser et al., 2005). Given the significant differences in social structure, people's lifestyles, national policy, and economic development between Thailand and Western countries, which affect opportunities for investing for capital gains, it would be interesting to study real estate appreciation or capital gains in a Thailand case study. This study could serve as an informative example highlighting the similarities and differences in condominium investments for capital gains due to diverse contexts, especially since Thailand is a non-capital gains tax country. It could also be an interesting example for application in countries similar to it. i. The benefits of this research study are as follows: 1) It offers investors insights to assess and strategize their investment portfolios and the risks associated with condominium investments. 2) It supports investors in making informed decisions and predictions regarding investments in the condominium sector. 3) It yields broader economic and societal benefits, as capital gains are not confined to only individual investors, but they directly and indirectly impact the macro-economic system through various factors such as mutual funds, banking, savings, market consumption, social security, economic stability, property taxation, and international trade (An et al., 2021; Arsenault et al., 2013; Hughes & Seneca, 2004; Lutz, 2008). Last but not least, while the main goal of this research is to identify the most profitable locations for investment, it is essential to note that investing in real estate to suit

different contexts is crucial for sustainable development. Therefore, sustainable real estate investment and development play a vital role not only in generating profits but also in benefiting the environment and society (Rattanaprichavej, 2020).

2. Literature Reviews

As these research questions are mainly about the study of real estate capital gains in the context of condominiums in different locations in Thailand, it is essential to establish the foundational concepts of capital gains in various contexts for comparison with the real estate domain. This section will explain the concept of capital gains and delve into the notion of real estate appreciation. Furthermore, the significance of location or zoning effects on real estate values will be depicted in various contexts. This review aims to gain a diverse range of perspectives, such as previous studies, expectations, performance evaluations, contextual variations, results, significance, methodologies, influencing factors, etc.

2.1. Capital Gains

Concepts and details of capital gains are often discussed in the context of tax regimes, where the Internal Revenue Service (IRS) of the United States federal government (IRS, 2023) provides comprehensive insights that can be summarized in three key aspects. First, it is imperative to understand that a capital asset encompasses nearly everything individuals own and use for their personal or investment purposes, such as their home, personal-use items like household furnishings, and investments like stocks or bonds. Whenever individuals sell a capital asset, the difference between the asset's adjusted basis (the owner's cost) and the amount received from the sale constitutes (Oliver, 2001) either a capital gain or a capital loss. Consequently, four key points related to this research are: 1) real estate investments fall under the category of capital assets, 2) investing in real estate can result in either capital gains or losses, 3) various real estate types can yield different capital gains, and 4) In Thailand, there is no capital gains tax system for any assets.

Secondly, the duration of holding assets plays a significant role in determining whether a net capital gain or loss is classified as long- or short-term. Generally, if an asset is held for more than one year before being disposed of, the resultant capital gain or loss is classified as long-term. Conversely, if the holding period is one year or less, the gain or loss is considered short-term. For real estate investments,

both short- and long-term holding periods are applicable, presenting a critical aspect of this research, which seeks to investigate the differences in the capital gains or loss rate across various holding periods. Third, in financial contexts, “net capital gain” means the amount of the net long-term capital gain for the year is greater than the net short-term capital loss for the same period. This concept reveals the correlation between the duration of holding an asset and its potential gains or losses. It implies that the capital invested in real estate can appreciate or depreciate over a certain period of time.

Capital gains not only pertain to individual investments or returns but also have broader implications at the market level, influencing aspects such as market consumption, savings, economic growth, social insurance, and international trade (Medlen, 2007). Most research studies about capital gains can be navigated in three main aspects: 1) macroeconomic, which typically deals with capital gains tax in the stock market and real estate investment, focusing on economic and social perspectives, particularly income distribution and equality. It involves a dilemma between driving the economy or supporting low-income families by reducing capital gains tax (Adam et al., 2017; Burbidge, 2000; Fagereng et al., 2019; Roine & Waldenstrom, 2012; Sinai & Gyourko, 2004). Furthermore, capital gains tax is not only relevant in real estate but also in other types of businesses (de O. Cavalcanti & Erosa, 2007). 2) consumption and investment products, in the case of which it is important to consider capital gain taxes to help make housing more affordable and to prevent over-speculation in the real estate market. It also mentions a study showing that housing can be seen more as an investment asset rather than a consumption good due to high capital gains (Agarwal, et al, 2020; Cunningham & Engelhardt, 2008; Fagereng et al., 2019; Dusansky & Koç, 2007), and 3) financial ratios, which are about consideration of the real investment returns and capital gains tax with its worth compared to other income patterns as well as other financial involvements, such as dividend yields, price premium, inflation, interest rates, risks, trading, etc. (Adam et al., 2017; Ayers et al., 2003; Blouinet al., 2003; Pilotte, 2003; Sikes & Verrecchia, 2012). It's important to note that Thailand, like New Zealand, does not have a capital gains tax (Oliver, 2001). This sets it apart from other countries, particularly those in the Organization for Economic Co-operation and Development (OECD),

and makes real estate investment in Thailand unique and intriguing.

It can be concluded that the critical determinant for capital gains in any asset investment is the timing of the investment. Regardless of the duration for which investors hold their asset investments, achieving the expected returns is not guaranteed. Therefore, selecting the suitable investment period or duration and the quality of the real estate investment becomes vital to gain better returns. This holds particularly true for investments in unique assets such as real estate, characterized by immobility and longer time horizons for returns (Jacobus, 2021). It is noteworthy that, unlike other research focuses, this research aims to study capital gains in the context of condominium investment opportunities.

2.2. Real Estate Capital Gains

With real estate's unique characteristics, such as immobility, long-term requirements, scarcity, non-substitutability, etc. (Jacobus, 2021), the concept of capital gains in real estate investment involves various important considerations, such as real estate pricing, rental yield, real estate valuation, locational-based quality, and other related financial structures.

Capital gains in the context of real estate are typically referred to as capital appreciation or real estate price appreciation. They result from the initial intentions of property buyers, whether for investment purposes or residential use. Real estate capital gains differ from standard real estate prices in that they reflect a long-term perspective on the trend in real estate values (Chambers et al., 2021), whereas real estate prices represent specific snapshots in time. For instance, a high house price does not necessarily equate to a high house price appreciation rate, and the variables at play, including both tangible and intangible factors, such as developer brands, locational brands, scenario quality, etc., may have different impacts on house prices and appreciation rates (Kang et al., 2021). Therefore, real estate capital gains rates can indicate as well as predict the increment or decrement of property values over the long term, offering a more comprehensive perspective than simply assessing the real estate values at a single point in time. Consequently, it is imperative to understand real estate capital gains as they will affect long-term investment decisions. Expressly, when real estate's rental yields underperform, investors often turn to capital gains in the hope of achieving better

returns to substitute the rental yield in the long run (Chambers et al., 2021; Damrongrak, 2017).

Contemporary real estate investors across various sectors are concerned not only with the rate of capital gains nor operational revenues from their properties but also with other aspects such as collateral, firm values, investment capital, mortgages, and securities (Arsenault et al., 2013; Chen et al., 2015; Rong et al., 2016), as exemplified by the case study of Wang, Dai and Xu (2018) which demonstrates irrational hotel investments amidst oversupply, intense competition, and poor financial performance. In other words, capital gains serve as an indirect tool for strengthening other financial aspects of some firms.

In reality, the allure of real estate capital gains extends beyond real estate firms. Other businesses also earn extra revenues from the capital gains associated with their real estate holdings. These firms tend to focus on the growth of their property values and also on the chance of entering the real estate sector (Rong et al., 2016). Similarly, at the individual level, people also earn extra income through the increased value of their house prices. For many families, this constitutes a principal source of wealth (Flippen, 2004), enhancing their financial standing through higher credit capacity and collateral value and finally achieving targeted savings. Even though the actual income figure is still not conceived as real estate is unsold, the capital gains give them a greater financial capacity (Peng et al., 2019).

Investment in housing encompasses both functional and investment purposes (Kiel, 1994), significantly impacting a country's economy through various channels, including household finances, government policies, housing affordability, wealth distribution, urban economics, and national banks' mortgage and loan policies. In turn, these factors also affect house price appreciation (An et al., 2021). Therefore, it can be concluded that capital gains, or house price appreciation, are vital factors in the economic system, serving as both dependent and independent factors. Unlike other research studies that have delved into house price appreciation, particularly in terms of hedonic house price factors, including physical project settings, pricing segments, locations, and neighboring influences (An et al., 2021; Flippen, 2004; Kiel & McClain, 1995; Macpherson & Sirmans, 2001; McMillen, 2008), this research concentrates on the capital gains investment in condominiums in various locations.

2.3. Location and Real Estate Capital Gains

Given the immobility inherent in real estate, its value depends on its location (Jacobus, 2021). As a result, different components of each location constitute different environmental functions for real estate, which finally impact its values and appreciation (Davis & Palumbo, 2008; Kok et al., 2014). In other words, real estate value is also influenced by the urban economy (Jones, 2021; McDonald & McMillen, 2010; Khmara & Kronenberg, 2023). Actually, it is typically understood that the quality of these location components leads to higher real estate prices. However, such factors may not necessarily correlate with higher capital gains rates. While extensive research has explored the relationship between location and real estate value, relatively few studies have focused directly on real estate capital gains.

Different price-segmented real estate depicts a high-priced house typically exhibiting a lower capital gain compared to its lower-priced counterparts (Gyourko & Voith, 1992). Similarly, different locations within a city yield different real estate capital gains than those in outlying areas. This discrepancy is primarily attributed to supply constraints and market volatility (Davis & Palumbo, 2008; Glaeser & Gyourko, 2002; Glaeser et al., 2005; Maloney & Rosenthal, 2022). However, it is essential to note that the leading cause of limiting the supply of housing is not solely dictated by market demand but is often intertwined with the issuance and enforcement of zoning regulations (Glaeser & Gyourko, 2002; Glaeser et al., 2005; Glaeser & Gyourko, 2018). In other words, investing in different locations can yield disparate results, whether gains or losses, yielding unequal returns. This divergence characterizes cities with above-average capital gains as "Superstar Cities" or "Glamour Cities" (Archer et al., 1996; Glaeser et al., 2005; Gyourko et al., 2013; Gyourko & Voith, 1992; Kang et al., 2021; Maloney & Rosenthal, 2022; Davis & Palumbo, 2008). The origin causes of superstar cities can be attributed to superstar effects, which are mechanisms by which certain areas consistently experience high housing price growth relative to housing unit growth. Two key traits define a superstar's location. First, there must be some flexibility in its housing supply. Second, it must be preferred by a large enough portion of the population, resulting in excess demand. These facts indicate that variations in local house prices can be influenced by overall demand, not just changes in local factors like facilities or infrastructure. Notably, the research

conducted by Glaeser & Gyourko (2018), Glaeser and Gyourko (2002), Glaeser et al. (2005), and Gyourko et al. (2013) have adopted a key methodology, comparing the cost of house construction with house values to measure capital gains in various cities. These research results identified three distinct areas regarding house values: firstly, the areas where housing is priced far below the cost of new construction (no growth); second, the area where housing prices fall significantly below the cost of new construction (indicating robust growth); thirdly, areas where housing prices are much higher than the cost of new construction (indicating growth). By assessing the differences between cost and value over time, this approach captures capital gains and provides insights into a city's growth trends.

The study conducted by Glaeser et al. in 2005 revealed a consistent upward increase in housing prices over the past 30 years, accompanied by a substantial increase in price dispersion across American markets. The standard deviation of prices across metropolitan areas increased by 247%, with an average price appreciation of 72%. Similarly, the capital gains rates exhibited a wide range due to factors such as real estate type, location, and time. This variation resulted in differences of approximately 50–90% in house prices and 70–400% in land prices when comparing regions across 46 large metropolitan areas. These trends were due to the scarcity of supplies with increasing demands (Davis & Palumbo, 2008). Notably, the increasing capital gains rates identified in the study by Davis and Palumbo (2008) also mentioned that they are non-linear trends (Colwell & Munneke, 1997) and did not substantially rise, which reflected the volatility and risk of investment. These results hold important implications for investors who focus on capital gains, particularly those focused on percentage-based returns rather than absolute amounts.

While most housing research studied the differences in property values based on land use, geographical areas, and zoning regulations (Binoy et al., 2020; Binoy et al., 2022; Krajewska et al., 2021; Liu et al., 2007; Severen & Plantinga, 2018; Xie et al., 2021), this research will focus on the capital gains among segmented condominium areas. Condominiums reflect several interplays of value and location-based components (Colwell & Munneke, 1997; Kok et al., 2014) of both tangible and intangible factors affected by the concepts of urban economics (Jones, 2021; McDonald & McMillen, 2010); Khmara &

Kronenberg, 2023). These factors encompass various considerations, such as neighborhood characteristics, racial or ethnic demographics, pricing segments, environmental surroundings, access to facilities and infrastructure, convenient location, and many more.

3. Material and methods

This survey research was conducted using secondary data collected from the condominium projects, selected through a judgmental sampling approach, and sourced from Hipflat.com, a well-known global online real estate trading platform in Thailand. This study defines capital gains as the difference between the current asking sale or resale price and the previous year's asking sale or resale price. Data on capital gains of 5 to 15 years, with quarterly intervals, were collected from 1,381 condominium buildings located in various regions of Thailand, including Bangkok and its surrounding areas, as well as other provinces. In fact, the data period was specified to prevent irregular fluctuation. However, important circumstances that might impact the overall economy and condominium capital gains, particularly enormous political conflicts/instabilities, massive flood disasters, and the COVID-19 pandemic, should be remarked on. The data segmentation was mainly based on three different perspectives: 1) Geographical Regions: based on Central, Northern, Eastern, Western, Southern, and Northeastern parts of Thailand. 2) Economic Factors: Based on classifications by CB Richard Ellis, an international property services company in 2023, the segments included Bangkok core CBD (Central Business District), Bangkok outer CBD, Bangkok non-CBD, and other provinces, and 3) Governance factors: Segmentation was determined based on the city plan established by Bangkok authorities, consisting mainly of residential, industrial, commercial, agricultural, and preservative areas.

Various statistical measures, such as mean, minimum, maximum, and standard deviation (SD), were used to describe the capital gains of condominiums. To examine the differences in capital gains among various condominium investment locations and time periods, an Analysis of Variance (ANOVA) was applied. Employing this statistical technique with descriptive data can uncover the different capital gains of each location and time period. The Pearson correlation was also used to study the relationship between capital gains and the price per square meter of condominiums. This analysis aimed to uncover any potential correlation between

these two variables, shedding light on how price changes might impact capital gains.

4. Results

This research aims to explore the locational effect on condominium investment for capital gains. 1,381 condominium project samples were collected and analyzed to answer the three main research questions indicated in the introduction. The condominium location, the price per square meter, and the investment capital gains of the condominium are described as follows.

4.1. Average Price per Square Meter of Each Condominium Project's Location

Table 1 provides an overview of the condominium projects' location, categorized by their geographical location. Regarding regional categorization, it is evident that the condominiums in the Central and Southern regions command higher selling prices per square meter compared to the other areas. This phenomenon can be attributed to the presence of significant provinces and cities, such as Bangkok, the capital city, which serves as the center of business, economics, and tourism in Thailand. Additionally, provinces such as Samutprakarn, Nonthaburi, and Pathumthani, which are closely connected to and expanded from Bangkok, contribute to the relatively higher prices. The southern region, encompassing well-known provinces such as PrajuaBKirikan (Hua-Hin area), Phuket, Krabi, and others, attracts foreign tourism, potentially causing property price values to rise. Surprisingly, the average prices in the East were not as high as initially expected, as some provinces situated in the East were well-known in terms of both tourism and industry. However, statistical analysis using the F-test revealed that there were no significant differences in the average price per square meter of the condominiums across various regions.

As for the condominium project's location, which is categorized by economic basis, it becomes evident that the selling prices per square meter of the condominiums situated in the Central Business District (CBD) commanded the highest price. It was evident that the vital role played by Bangkok's CBD in facilitating all business and economic activities contributed to the higher property prices in this area. Conversely, other areas of Bangkok exhibited relatively lower prices, conforming to the distance from Bangkok, which seemed similar to the concept of the concentric zone theory. In more detail, the difference in condominium prices between Bangkok's CBD and

other areas of Bangkok was almost double. This observation aligns with previous research findings, as documented by Glaeser, Gyourko and Saks (2005), and Davis and Palumbo (2008). The variety of condominium prices in Bangkok can be attributed to the city's vast size and unequal development. Notably, cities characterized by a blend of tourism and industry had higher property prices, likely due to their multifaceted economic functions, which generated robust demand from both local and foreign investors. However, when subjected to statistical analysis using the F-test, there were no statistically significant differences in the average price per square meter of the condominiums across various economic zones.

In terms of the condominium project locations categorized by city planning, a high-density area had the highest price per square meter of the condominium, reflecting its high demands. Conversely, medium- and low-density residential locations had low prices. Condominiums located in commercial areas also exhibited a high price per square meter, reflecting high demands for work-life requirements. Unsurprisingly, the condominiums in agricultural areas had the lowest price per square meter concerning their lower value. Statistical analysis using the F-test revealed significant differences in the average price per square meter of condominiums in various city planning zones. Moreover, the minimum and maximum average prices within all categories presented a stark contrast, illustrating Thailand's diverse classification of condominiums.

From the above information, it can be concluded that the highest-priced locations, in terms of price per square meter, were situated in the Central region, particularly in the CBD and high-density residential areas. Therefore, compared to other locations, Bangkok's CBD, known for its significant activities such as business, economics, tourism, infrastructure, and transportation activities, including subway systems, airport rail links, highways, and various investment opportunities, attracted the highest property prices. This can be attributed to solid demand from both foreign and local investors.

4.2. Annual Condominium's Average Capital Gains Rate during the Year 2008–2022

According to Chambers, Spaenjers and Steiner (2021) and Damrongrak (2017), it is essential to analyze appreciation rates over the long term. Therefore, this study examines 15 years of appreciation rates. The minimum and maximum capital gains rates were

0.60% and 3.98%, respectively, with the total average being 2.18%. While these rates may not appear attractive at first glance, they were at least higher than the average inflation rates (1.66%), and when compared to the current bank interest rates at around

1%, they still yielded a higher rate of return, especially when considering the rental yield, which was generally around 5%–7% (Global Property Guide, 2024). Therefore, investing in a condominium may result in a total return of around 7%–9%.

Table 1

Condominium location and its price per square meter				
Categories of Condominium's Location	Numbers of Condominium Projects/ (Percentages)	Price per SQ.M. (Thai Baht: THB)/ (SD)		
		Minimum	Maximum	Average Price
Condominium Project's Location by Regions (F= 1.423 Sig.=0.216)				
Central (Bangkok and its Vicinities)	896 (64.9)	10,800	663,379	92,468.27 (59,005.42)
East	397 (28.7)	16,678	184,947	69,425.64 (28,629.21)
South	67 (4.8)	44,633	155,089	93,299.29 (26,965.15)
North	18 (1.3)	20,247	111,121	65,357.78 (23,723.49)
Total	1,381 (100.0)	Total Average		78,667.36
Condominium Project's Location by Economics Basis (F= 1.382 Sig.=0.238)				
Central Business District (CBD)	307 (22.3)	29,044	663,379	134,717.61 (73,431.51)
Bangkok Outer CBD	245 (17.8)	17,387	192,230	77,380.71 (35,050.97)
Bangkok non-CBD	229 (16.6)	10,800	153,325	63,688.38 (29,670.01)
Bangkok Suburb	89 (6.5)	22,419	106,647	59,694.18 (17,344.68)
Tourism Country City	465 (33.7)	16,678	242,160	73,471.15 (30,269.05)
Industrial Country City	2 (0.1)	48,713	67,221	57,967.00 (13,087.13)
Mixed Cities of Tourism and Industrial	42 (3.0)	26,423	184,947	81,413.81 (37,019.84)
Total	1,379 (100.0)	Total Average		78,333.26
Condominium Project's Location by City Planning* (F= 3.954 Sig.=0.002)				
High Density Residential	309 (22.4)	22,687	386,921	112,361.20 (60,762.66)
Medium Density Residential	138 (10.0)	14,084	153,325	67,156.30 (30,236.52)
Low Density Residential	44 (11.3)	13,935	93,994	46,358.66 (23,561.25)
Mixed Low and Medium-Density Residential	156 (7.0)	10,800	158,202	68,324.31 (31,850.17)
Mixed Medium and High-Density Residential	96 (7.0)	22,211	164,227	78,960.66 (30,318.72)
Overall Residential	172 (12.5)	20,247	242,160	74,359.35 (30,472.12)
Commercial	460 (33.3)	16,678	663,379	88,515.48 (57,985.83)
Industrial	3 (0.2)	30,148	59,866	46,242.33 (15,012.26)
Agricultural	3 (0.2)	22,419	68,357	42,868.00 (23,380.03)
Total	1,378 (100.0)	Total Average		72,784.79

* F-test significance level at 0.05 (ANOVA)

** Total numbers in each category may not equal 1,381 due to missing information.

Source: own study.

It is interesting to note that, during the years 2011–2018, the average capital gains rates were higher than in other years. This increase in rates might be due to the boom in condominium investment. In contrast, during the years 2018 to 2021, the average capital gains rates were relatively low. This could be due to the declining trends in condominium investment and the impact of the COVID-19 pandemic, which led to a constraint in supply and a shrink in demand. Similar circumstances occurred in the New England region of the United States (Wheaton, 2005). During the years 2021–2022, the average capital gains rate had been

gradually increasing along with the stages of economic recovery. It is uncertain whether the increase is caused by demand pull or cost push, possibly due to a roaring inflation rate and higher construction costs, similar to the research findings of Davis and Palumbo in 2008.

Apart from this information, the minimum and maximum capital gains rates give rise to two significant conclusions following An, Becker, and Cheng's study of housing prices in Kazakhstan (2021). Firstly, condominium prices were not always appreciated; conversely, they could depreciate.

Secondly, the minimum, maximum, and standard deviation revealed that each condominium exhibited a wide range of capital gains rates. Notably, after the year 2015, this reflected higher volatility in

condominium investment, which was also similar to the study by Davis and Palumbo (2008) about the significant fluctuations in home prices in the United States.

Table 2

Annual Average Capital Gains Rate of Condominiums and Inflation Rate during the Year 2008–2022					
Year	Number of Condominium Projects	Capital Gains Rate (Percentage)			Inflation Rate (Percentage)
		Minimum	Maximum	Annual Average/ SD	
2022-2023	1,381	-54.04	91.36	2.35 (13.40)	4.72
2021-2022	1,369	-83.68	95.11	2.74 (17.77)	1.24
2020-2021	1,303	-92.86	91.24	0.60 (16.03)	-0.84
2019-2020	1,269	-80.58	87.93	1.39 (17.70)	0.71
2018-2019	1,174	-83.57	94.54	1.46 (17.41)	1.07
2017-2018	1,078	-87.65	99.76	3.35 (16.25)	0.67
2016-2017	951	-73.58	98.55	1.56 (15.68)	0.19
2015-2016	856	-98.26	87.79	2.76 (15.55)	-0.90
2014-2015	787	-49.99	91.01	3.98 (13.05)	1.90
2013-2014	684	-46.78	96.77	3.53 (13.85)	2.19
2012-2013	593	-88.32	78.11	2.47 (13.00)	3.01
2011-2012	454	-62.25	99.47	2.00 (12.68)	3.81
2010-2011	385	-50.83	85.83	1.45 (12.10)	3.30
2009-2010	284	-39.57	57.36	1.49 (10.81)	-0.83
2008-2009	168	-26.65	77.28	1.52 (12.12)	5.19
Total Average				2.18	1.66

* Inflation rates data were derived from TTB Analytics, TMB Thanachart Bank (TTB), 2022

Source: own study.

4.3. Periodical Capital Gains from Condominium Investment by Locations

As described earlier, it is essential to note that the selling prices of condominiums do not necessarily equate to capital gains. Therefore, there is a difference to be made in this explanation. From Table 3, when considering the condominium project's location categorized by region, the 15-year capital gains rate in the Central and Eastern regions significantly outperformed other regions. This could be attributed to the growth of heavy industry, tourism, and the government's Eastern Economic Corridor (EEC) policy. In contrast, despite the higher prices per-square-meter of condominiums in the south, they could not yield much capital gains. Moreover, the capital gains rate in the Central region, encompassing the major cities, experienced a significant decline from 2018 to 2023. The situation worsened in the south, which incurred losses in terms of capital gains. As a result, this observation indicated: 1) the condominium prices and the capital gains rates were not always related; conversely, they sometimes appear to be inversely correlated, as observed in the 1992 study by Gyourko and Voith. In another view, the high prices of condominiums in the Central and Southern regions might affect the saturated capital gains rates, and 2) an excess of supply compared to demand, particularly

in the Central and Southern regions over the past five years, may have contributed to this phenomenon. According to the standard deviation of capital gains rates, they also highlighted the wide dispersal of each condominium's capital gains among each region, as reported by Glaeser et al. in 2005, and 3) specific areas, notably the Southern region, did not show clear signs of recovery after the last five years, likely due to the impact of the COVID-19 pandemic. However, the ANOVA test indicated that only the average 10-year capital gains rate differed among the regions.

For the condominium project's location-driven economic basis, the capital gains rates generally generated higher yields during the 10- and 15-year investments, which were contrary to the view of the regional category. Considering a long-term investment of 15 years, the residential areas, excluding the areas in Bangkok, have the potential to make the highest capital gains, followed by the Bangkok CBD. This was a sign of better development in other areas, as well as condominiums in the Bangkok CBD being able to command high prices per square meter and high capital gains rates. This could be due to the unique development combination of high-rise residential and commercial areas, creating a kind of mixed-use city. Nevertheless, other locations connected to Bangkok still experienced lower capital

gains rates compared to the Bangkok CBD. It can be explained that most infrastructure, facility developments, and demands were clustered in the Bangkok CBD. When comparing regional locations, it was confirmed that only Bangkok CBD produced a high capital gains rate. The Central region (including all areas in Bangkok and other provinces) produced a lower capital gains rate, which was similar to the studies conducted by Davis and Palumbo (2008); Glaeser and Gyourko (2002); Glaeser et al. (2005) and Maloney and Rosenthal (2022).

When we examine the highest capital gains rates, it is evident that they predominantly originate from condominium projects located in commercial areas. Particularly when compared to the year 2022, these rates were distinctively higher than those in other areas. Condominiums situated in tourism-rich cities have also shown signs of recovery in the tourism sector. However, there was an unexpected trend in condominiums located in industrial cities, as they experienced depreciation during the last five years. This may be due to the limitations of the relatively small sample sizes in this category. In general, some areas have yet to show clear signs of recovery after the last five years due to the COVID-19 pandemic, especially Bangkok Outer CBD, an Industrial Country City and Mixed Cities of Tourism and Industry. The standard deviation of capital gains rates also highlighted the wide dispersal of condominium capital gains rates among condominiums within each economic zone, aligning with the findings of Glaeser, Gyourko and Saks in 2005. The ANOVA test showed differences only in the average 5 and 10-year capital gains rates within the economic areas.

Regarding the Condominium Project's Locations categorized by City Planning, it was observed that the capital gains rates usually generated higher yields during the 10 and 15-year investments. It is evident that during the years 2022 to 2023, condominiums in

commercial areas across every province were able to generate the highest capital gains rate. Meanwhile, for 15-year investments, residential areas showed the highest appreciation. The residential locations at varying levels showed appreciation rates ranging from approximately 2.08% to 3.72%. Remarkably, the condominiums in industrial areas experienced depreciation across all periods. Surprisingly, agricultural areas generated higher capital gains rates than many residential locations, which could be attributed to the remaining potential for appreciation in their lower-priced land. The ANOVA test showed differences only in the average current and 10-year capital gains rates within each city planning area.

4. Discussion

Expanding on the above analysis, a test was conducted to examine the assumptions of a negative relationship between the average price per square meter and the 15-year capital gains rates using the Pearson correlation. Interestingly, statistical analysis showed a significant negative relationship between the average price per square meter and the 15-year capital gains rates in only the following categories: Bangkok Outer CBD, Mixed Low and Medium-Density Residential, and Mixed Medium and High-Density Residential. In other words, investing in condominiums in these locations had its unique considerations, as higher prices per square meter relate to lower capital gains rates, whereas lower prices per square meter relate to higher capital gains rates. Simultaneously, it showed a positive relationship between the average price per square meter and the 15-year capital gains rates in Low and Medium-Density Residential areas, implying that investing in condominiums in these areas with higher prices per square meter relates to higher capital gains rates, while lower prices per square meter relate to lower capital gains rates.

Table 3

Periodical Capital Gains of Condominium Investment by Locations					
Categories of CondominiumLocation	Average Capital Gains (Percentage/SD)				Average Price Per Square Meter (THB/SD)
	Current (2022-2023)	5 years (2018-2023)	10 years (2013-2023)	15 years (2008-2023)	
Condominium Projects' Locations by Region					
Central (Bangkok and its Vicinities)	2.13 (12.91)	1.80 (6.23)	2.72 (3.81)	2.71 (2.49)	92,468.27 (59,005.42)
East	3.33 (14.88)	2.20 (7.89)	1.97 (4.97)	2.17 (3.56)	69,425.64 (28,629.21)
South	-0.41 (11.47)	-0.17 (4.82)	n.a.	n.a.	93,299.29 (26,965.15)
North	2.70	1.67	n.a.	n.a.	65,357.78

Categories of Condominium Location	Average Capital Gains (Percentage/SD)				Average Price Per Square Meter (THB/SD)
	Current (2022-2023)	5 years (2018-2023)	10 years (2013-2023)	15 years (2008-2023)	
	(8.43)	(5.65)			(23,723.49)
Condominium Project's Location by Economics Basis***					
Bangkok Central Business District (CBD)	3.69 (15.00)	2.79 (6.90)	3.75 (4.15)	3.13 (2.46)	134,717.61 (73,431.51)
Bangkok Outer CBD	1.37 (11.72)	1.41 (5.55)	1.95 (3.57)	2.49 (2.68)	77,380.71** (35,050.97)
Bangkok non-CBD	1.85 (1.07)	1.43 (5.97)	1.88 (3.15)	1.51 (1.76)	63,688.38 (29,670.01)
Bangkok Suburb	1.67 (12.35)	0.90 (5.87)	3.05 (3.54)	2.90 (3.07)	59,694.18 (17,344.68)
Tourism Country City	2.47 (14.52)	1.60 (7.63)	1.94 (4.97)	2.23 (3.56)	73,471.15 (30,269.05)
Industrial City located in the Country	-6.68 (9.44)	-1.46 (0.00)	n.a.	n.a.	57,967.00 (13,087.13)
Mixed Cities of Tourism and Industrial	1.62 (12.31)	4.76 (6.95)	2.29 (4.95)	1.64 (4.36)	81,413.81 (37,019.84)
Condominium Project's Location by City Planning					
High Density Residential	2.38 (14.46)	2.48 (6.04)	3.04 (3.81)	2.78 (2.70)	112,361.20 (60,762.66)
Medium Density Residential	1.27 (9.28)	1.65 (5.98)	2.00 (3.01)	0.78 (1.80)	67,156.30 (30,236.52)
Low Density Residential	1.08 (5.52)	0.19 (4.00)	1.30 (2.30)	2.74 (1.19)	46,358.66* (23,561.25)
Mixed Low and Medium-Density Residential	1.24 (9.82)	1.29 (5.60)	2.08 (3.66)	2.22 (1.54)	68,324.31** (31,850.17)
Mixed Medium and High-Density Residential	1.48 (10.96)	0.34 (4.29)	1.40 (2.53)	2.08 (1.73)	78,960.66** (30,318.72)
Overall Residential (Unclassified level of Density, a location excludes Bangkok)	0.57 (12.61)	1.45 (6.49)	3.63 (4.71)	3.72 (4.07)	74,359.35 (30,472.12)
Commercial	4.02 (15.75)	2.28 (8.19)	2.46 (5.02)	2.73 (3.17)	88,515.48 (57,985.83)
Industrial	-2.24 (10.18)	-3.05 (0.00)	-2.72 (0.00)	n.a.	46,242.33 (15,012.26)
Agricultural	1.93 (3.35)	1.93 (3.38)	4.32 (3.32)	n.a.	42,868.00 (23,380.03)

* Positive relationship between the average price per square meter and the 15-year capital gains rates tested by Pearson correlation.

** Negative relationship between the average price per square meter and the 15-year capital gains rates tested by Pearson correlation.

*** Only the 5- and 10-year average capital gains rates of the condominium projects' locations categorized by economic basis showed different values, as tested by ANOVA.

Source: own study.

In conclusion, the capital gains rates in various locations at different times can be encapsulated into three main aspects. First, the post-period capital gains rates were generally higher than the current capital gains rates. Second, according to the findings by Davis and Palumbo (2008) and Kok et al. (2014), each location appreciates differently, either positively or negatively, with investing in condominiums in residential areas showing the highest capital gain rates. Third, the relationship between the price per square meter and the capital gains rate of the condominium is delineated in three patterns: no

relationship, positive relationship, and negative relationship, depending on each location.

5. Conclusions

This research focuses on the long-term effect of location factors on real estate capital gains in condominium projects. Its primary aim is to determine whether investing in condominium capital gains is an attractive option, with additional research objectives aiming to study 1) the capital gains trends of the condominium investment in the long run, 2) the relationship between the locations and capital gains and 3) the different capital gains in different investment periods of 5, 10, and 15 years. To achieve

this, the study analyzes the capital gains rates, locations, and timing of condominium investments, leading to the following conclusions:

1. Over the past fifteen years, capital gains from condominium investments have ranged from 1% to 4%. In specific years and locations, very few projects even experienced capital losses. Generally, earning higher return rates than the typical 1% bank deposit interest rates is likely to be acceptable for investors, especially when factoring in possible rental income and the trade-offs associated with management responsibilities. However, it is essential to note that when calculating only the real capital gains rates (inflation adjustment), which should account for related expenses such as property tax and inflation rates ranging from 1% to 3%, the real capital gains are only around 1%. These rates may not be sufficiently attractive to investors, primarily when they are concerned with various kinds of risks. In summary, investing in a condominium with the expectation of solely capital gains without factoring in rental income may not be a very appealing investment option. In contrast, as reported by the Treasury Department (Real Estate Information Center, 2022), capital gains of vacant lands in Thailand commonly earn capital gains rates at around 9% for the entire country, mainly due to the scarcity of available land.
2. The average capital gains rates in different locations are rather varied, coinciding with the concepts of urban economics (Jones, 2021; McDonald & McMillen, 2010) and the studies by Davis & Palumbo (2008) and Kok et al. (2014). If concerning the condominiums of the long-term investment, which generate real capital gains after deducting property tax, inflation rates, and factoring in risks, there are no locations that consistently yield real capital gains of over 1% in any given period. However, the capital gains for condominiums in the overall residential area are the highest, with an average of 3.72% over 15 years. In brief, overall residential, Bangkok CBD, Bangkok Suburb, commercial, and high-density residential areas are, respectively, the top five possible locations where condominiums can generate higher than average capital gains.

3. In general, the average capital gains rate for a typical period does not fluctuate significantly. However, the 5- and 10-year average capital gains rates for the location of the condominium project, categorized by economic basis, showed different values according to the F-test. Therefore, it can be concluded that no specific time during the last 15 years has shown a clear advantage for investment.

To summarize the above details, the significant findings of capital gains rates, locations, and timings indicated that, unlike vacant land, it might not be a good opportunity to invest in a condominium expecting solely capital gains without concern over rental yields. This situation reflects a similar trend observed in the property price study conducted in the United Kingdom (U.K.) by Chambers, Spaenjers and Steiner in 2021. In other words, building passive income dependent only on condominium capital gains may not be a viable strategy. Conversely, it leads to the suggestion to condominium investors regarding the necessity of focusing capital gains as a compliment, together with the return from rental fees to create attractive returns (Chambers, Spaenjers & Steiner, 2021; Mattarocci & Siligardos, 2015). Therefore, for investors, the underlying reasons for investing in capital gains and rental fees are far different due to the related expenses, taxes, responsibilities, locations, competition, economics, and market, so it is necessary to study them thoroughly before taking the decision to invest. Although each location results in relatively similar capital gains, it is highlighted from the research results that residential and commercial activities are the most critical factors for generating higher-than-average capital gains. Additionally, in regards to the concepts of Superstar and Glamorous cities producing higher than average capital gains by Glaeser et al., 2005; Gyourko et al., 2013; Gyourko & Voith, 1992, overall residential areas, high-density residential areas, commercial areas, Bangkok CBD, and Bangkok suburbs are the frontline attractive investment locations.

With the presented three types of relationships between the price per square meter and the capital gains rate of the condominium, investing in a high-priced condominium might not always yield higher capital gains than a low-priced one. Condominium investors thus have to realize their investment goals, whether prioritized over volumes or values of the return. The research results yield essential implications

for condominium investors, such as 1) the limited opportunities of gaining high capital gains in condominium projects have to be realized, and investors must choose or craft their own strategies, such as avoiding the investment, mixing with other incomes, or even to bear with its low rates but higher than Bank interest and inflation rates, and 2) overall residential areas, high-density residential areas, commercial areas, Bangkok CBD, and Bangkok suburbs are the best locations to invest in, especially aiming for today's highest capital gains.

The current lack of attractiveness in investing in condominiums aiming for only capital gains can be attributed to three main reasons. First, the changing social structure of Thai people has led to a decrease in population trends, resulting in lower demand for condominiums and impacting price appreciation. This aligns with the concept of supply and demand-led house prices proposed by Gyourko, Mayer, and Sinai in 2013. Second, the economic impact of the COVID-19 pandemic from 2019 to 2022 has decreased investment demand for condominiums. Finally, there was likely an over-investment in condominiums around ten years before the COVID-19 pandemic, leading to an oversupply in the market and putting pressure on the current price increases. This interesting information could be considered as an essential case study for application in other countries with similar contexts. Particularly, noting the facts about lower capital gains from condominium investments, the need for new investment strategies for condominiums and the potential for higher-than-average capital gains in specific locations are essential.

For future research suggestions, the ANOVA technique was employed to identify the differences in regard to the primary goal of this research, which was to seek the best area to invest in, accounting for three aspects, i.e. geographic, economic, and planning, for earning the highest capital gains. However, it might be able to gain an insightful explanation by using Multiple Regression Analysis. Moreover, although the characteristics of each category of the condominium's location originated from various factors, the extended studies on features such as the condominium's age, size, height, price, and brand are also interesting, and might expose the root cause of the difference in the capital gains rates across locations. The limitations of this study include the small sample sizes in some specific categories, such as the locations in the South and North, as well as in industrial and agricultural areas, due to fewer development projects. There may

also be a potential sample selection bias due to incomplete data provided by Hipflat.com, which was used in this research. It has been noted that some minor condominium data do not appear, which might be due to a system error and obsolete data from very old condominiums. Additionally, using asking condominium prices to represent the capital gains may affect the accuracy, as it is not the final actual price transaction, potentially resulting in the deviation of results.

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