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District-based Rental Value Coefficients for Shopping Mall Development in Istanbul

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ABSTRACT

This study investigates the district-based rental value coefficients for shopping malls in Istanbul, a city with significant commercial real estate activities. The research focuses on identifying regional and district variations in rental income values, crucial for urban retail investment success. Data were collected from 101 active shopping malls across 39 districts and analyzed using arithmetic mean and proportional rate methods. The findings indicate that districts such as Bakırköy, Beşiktaş, and Kadıköy have the highest rental values, while Esenyurt, Arnavutköy, Sultanbeyli, and Sancaktepe rank lowest. These insights provide valuable guidance for investors during the feasibility phase of shopping mall projects, highlighting the importance of location in achieving financial success. The study emphasizes the role of socio-economic conditions and accessibility in rental value determination, offering a detailed analysis that contributes to the socio-economic dimension of urban studies. The results guide retail investors in utilizing district-based coefficients for more accurate feasibility assessments, ultimately supporting sustainable commercial real estate development and urban improvement.

Highlights:	Contribution to the field statement:
- Higher socio-economic status of districts increases the rental value coefficients of shopping malls. - Improved accessibility and public transportation connectivity positively affect the rental income of shopping malls in Istanbul. - The diversity and visibility of tenant stores are positively correlated with the rental values of shopping malls. - Proximity to central business areas increases the commercial rental values of shopping malls in Istanbul.	This study contributes to the field of urban retail investment by providing valuable socio-economic insights and offering practical guidance to decision-makers during the feasibility stage of their investments.

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1. Introduction

Shopping malls, which are a type of commercial real estate, have evolved into new socialization hubs where urban communities share their commercial experiences, parallel to the development of metropolitan regions. Due to the decline in the quality of public infrastructure in traditional centers, urban functions have gradually shifted from conventional areas to new city centers (Derya Arslan & Ergener, 2023). This type of building affected the development of urban and territory forms (Manuel Pagés Madrigal, 2018). Moreover, these centers have impacted not just urban lifestyles but also influenced urban communities in terms of socioeconomic and cultural living conditions, as well as the security perceptions of households residing in nearby areas (Caymaz, 2019; Olla et al., 2023). This central urbanization has also changed the culture of retail. Consumers preferred to visit these centers more often. As a result, retail real estate investors are developing large-scale shopping center projects in urban city centers.

From a retail real estate investor's perspective, the development and management of these malls require careful consideration of market trends and consumer preferences. Besides, these investments have a significant effect on the evolving dynamics of urbanization, encompassing cultural, and socioeconomic conditions, and demographic shifts in the surrounding areas (Ho et al.,2016; Ke and Wang,2016; Ananthakumar and Sinha,2019). Moreover, these centers are risky ventures for investors due to their location feature, require large amounts of capital, and require a relatively long period on the return of their investment in an economic context. Since the primary objective of an entrepreneur is to achieve high returns from his/her investment in the long term, the commercial success of the shopping center is critically important. In this direction, the rental value of commercial units also plays a decisive role in the financial and socioeconomic success of these centers (Patat,2018; Özegeli,2016; Iskandar,2017; Astarini & Utomo, 2023; Nebati et al., 2023).

According to the literature, there are many studies conducted on the factors that affect the rental income of shopping malls. These are location, center's pulling power, the purchasing power of nearby household's income level, total leasing rate and period of commercial units, competitiveness in the retail market, sales ratios, shopping externalities , shopping mall management's service quality (Benjamin et al., 1990; Sirmans C.F. and K. Guidry,1993; Ingene and Ghosh, 1990; Okoruwa et al., 1994; Hardin III and Wolverton,2000; Tay et al., 1999; Gatzlaff et al., 1994; Sirmans et al., 1996; Ghosh,1986). Alongside these factors, tenant mix is also crucially important in rental values (Wu et al., 2023; Xu et al., 2022; Zhang et al., 2023; Leung et al., 2024). Retail investors need to develop a correct tenant mix to achieve commercial and financial success from their shopping mall investments. According to Gamal and Romadhon (2023) and Khairunnisa (2023), another significant impact on rental income is the visibility of stores. In their research, they portrayed a positive relationship between the visibility of retail and rental values. It is emphasized that as the visibility of the store increases, the rental value also maximizes. Among the visibility of stores, the diversity of products offered by brand stores also affects the rental value (Yuo & Tseng, 2021; Orr & Stewart, 2022). RozilahKasim et al. (2018), proposed that green building certification potentially leads to higher rental income for commercial real estate investors. However, studies conducted by Masebe et al. (2020), Che et al., (2023), and Liu et al., (2022) highlight the rising trend of e-commerce in the retail market following COVID-19. They argued that this trend decreased rental rates and lowered the leasable areas of retail space in shopping malls.

 In line with all these studies, it is noteworthy that rental income is a significant factor in shopping mall development for both urban life quality and commercial real estate investment success within a two-dimensional approach. At this point, if investors fail to accurately predict the future rental values of commercial units at the feasibility stage of the venture, the investment may lose its future profitability in the economic context. Moreover, misallocation of capital expenditure may lead to unwanted situations such as bankruptcy or foreclosure in the long term (Miles et al., 2000). In terms of urbanization, if the investment fails, socialization areas for households living in the immediate vicinity may decrease, employment may slow down, and security problems may arise. Since these

difficulties bring financial and social issues, an optimal solution to determine rental incomes is needed at the feasibility stage. In this respect, a skilled strategy should be developed for both sustainable commercial real estate development and urbanism.

Literature review shows that limited research has been conducted on the commercial rental values focused on the city or district level. To fill this gap, this study aims to empirically investigate the district-based coefficient values of commercial rent income in commercial real estate investment. The scope of methodology consists of two parts; data collection and data analysis. During the data collection phase, face-to-face interviews, shopping valuation reports, and rent ads were used to obtain rental values, the missing data of the rental income were completed by the values on the www.endeksa.com website.

To create the data set, firstly, all rental values from the website were ranked by using an interval scale and then classified based on regions and districts. After classification, the input data of shopping mall rental values has been added to the dataset regarding regions. When analyzing the data set, the arithmetic mean technique was used to calculate the average rental value of each region. To achieve the district-based coefficient value the proportional rate was used. The findings of this article contribute to the socio-economic dimension of urban studies by providing a detailed analysis of commercial rental values across various districts, which is crucial for understanding the economic situation of urban retail investments. Meanwhile, this research also guides investors to employ district-based rental coefficient values during the feasibility stage. So, the ventures make decisions based on tangible data.

This study is structured into five main sections, including the introduction. In the second section, the selected shopping malls for the dataset are described, and the methodology of the data analysis is detailed. The results derived from the analyses are interpreted in the third section. Implications and findings were discussed in the fourth section. The final section offers projections for future studies by summarizing the overall conclusions.

2. Materials and Methods

The research design consists of two main phases: data collection and data analysis as illustrated in Figure 1. While the first part shows the research studies conducted during the data collection phase, the second part demonstrates the analysis process of the dataset. At the end of these stages, region-based rental value coefficients were calculated in line with the research objective.
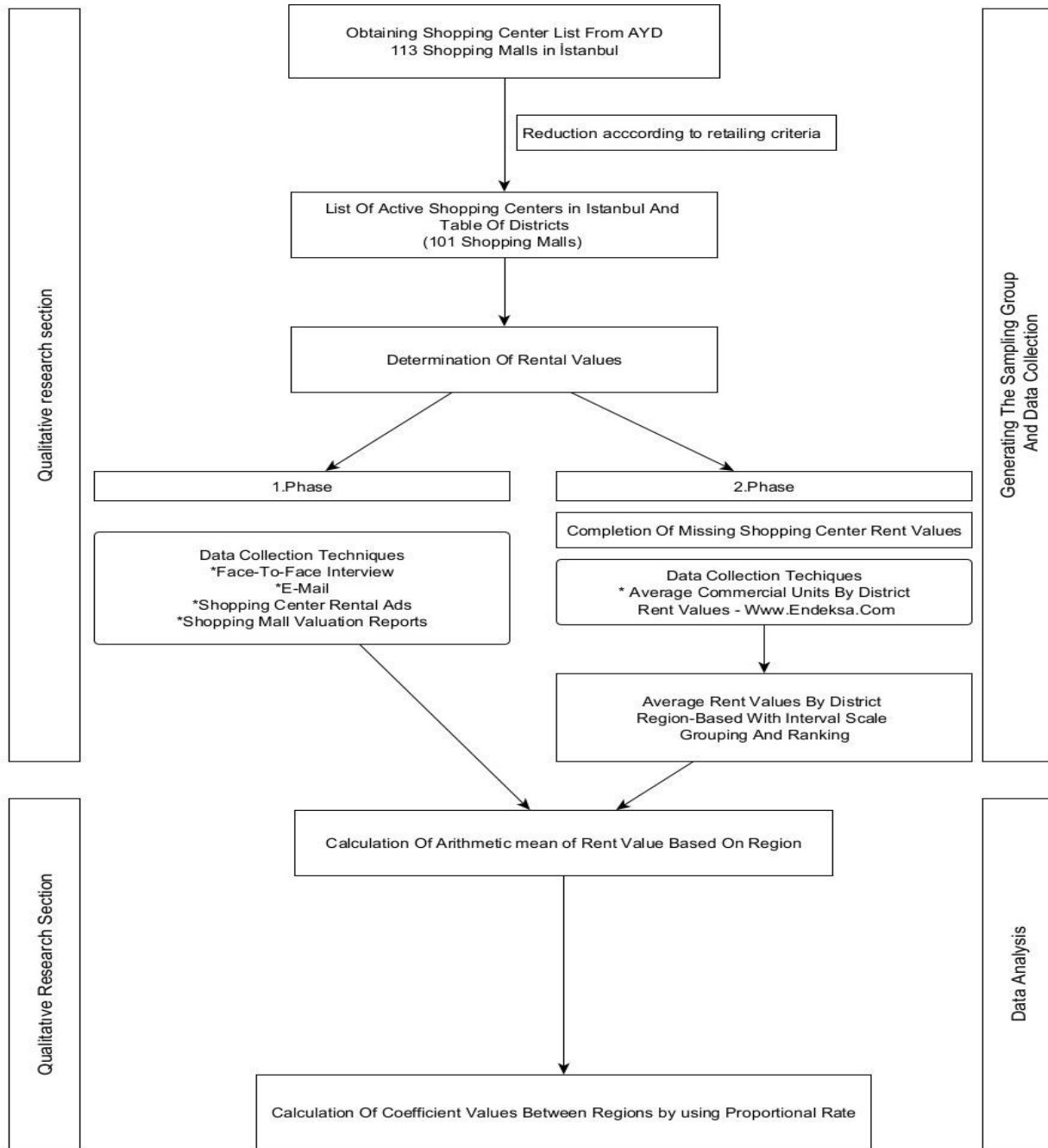
Figure 1. Research Framework.

2.1. Study Area

Istanbul province was selected for this study due to its prominence in Turkey's shopping mall industry. As of 2023, Turkey hosts a total of 446 shopping malls, with the majority located in Istanbul (30%) and Ankara (9%) (GYODER, 2023). Istanbul boasts the largest gross leasable area (GLA) for shopping malls in the country, totaling 5,213,721 square meters. This accounts for approximately 38% of Turkey's total GLA of 14,009,962 square meters, far exceeding Ankara's 1,655,941 square meters and the combined 7,140,310 square meters in other cities (GYODER, 2023).

However, since 2017, shopping centers across Turkey have faced economic challenges, leading to a decline in their functionality (Eva Real Estate, 2019). Istanbul, with its vast leasable area, was particularly affected, experiencing a 17% decrease in leasable space (Eva Real Estate, 2019). Furthermore, both in Istanbul and across Turkey, the growth rate of shopping mall investments has

decreased since 2017 (GYODER, 2023). This slowdown can be attributed to macroeconomic policies within the country and the global COVID-19 health crisis. These uncertainties have deterred both local and foreign investors from pursuing new shopping mall projects, especially in Istanbul.

As Turkey's most populous and dynamic metropolitan area, Istanbul comprises 39 districts, with 24 on the European side and 15 on the Asian side, and an official population of 15,655,924 in 2023 (TURKSTAT, 2024). This city is also at the center of economic growth and is envisioned as a global city, positioning itself among global cities (Sadri, 2017). Therefore, due to these reasons, Istanbul was selected as the case study area for this research.

2.2 Data Collection

This study tries to identify the commercial rental value pattern for different districts of Istanbul by putting forward coefficient values among districts. For this reason, 101 active shopping mall investments located across 39 districts in Istanbul were utilized for the analysis.

According to the Shopping Mall Investors Association (AYD), there are 131 shopping malls in Istanbul province by the year 2023. The study was initiated with this list where certain criteria were applied; inactive malls and the malls with certain retail characteristics (i.e. outlets) (a total of 30) were eliminated from the list. Several approaches were followed to obtain the commercial rental values. The first step was face-to-face interviews with the management team of malls where a handful of them accepted the invitation.

The second step was to review shopping mall valuation reports which are publicly available. The third attempt was to review rental advertisements for commercial units in shopping malls published by the Istanbul Chamber of Commerce and Industry website. As a result of these attempts, 40 shopping malls' actual monthly rental value data for 2023 were gathered. The Endeksa website (www.endeksa.com) was used to complete the rest of the 61 shopping malls' data. Endeksa is a platform that utilizes big data analysis and machine learning methods to provide real estate value, location data analysis, and predictions. The purpose of this platform is to enable individuals to confidently complete real estate transactions by offering transparent, independent, and up-to-date real estate values. This platform's reliability stems from being founded by certified experts in real estate valuation, regular monthly updates of data, and data access is facilitated through a subscription-based membership system. However, these rental values do not reflect the actual monthly rental income of the shopping mall investments operating in that region. They only indicate the rental values of small and medium-sized commercial areas operating for commercial purposes in the relevant district. Therefore, the values obtained from this website were only used to ascertain the general ranking of districts from highest to lowest, and for classification as regions.

Monthly commercial unit rental value ranges, obtained from www.endeksa.com website, based on districts of Istanbul are demonstrated in Table 1. This table shows the general ranking of commercial unit rental values based on regions.

Table 1: Commercial Unit Rental Value Ranges for Istanbul based on Districts in 2023.

Region Number	Commercial Unit Rental Value Range ($ / m2)	Districts in Istanbul
1	8,1 $ -9 $	Bakırköy, Kadıköy, Beşiktaş
2	7,1 $ -8 $	Şişli, Sarıyer,Fatih
3	6,1 $ -7 $	Güngören, Bayrampaşa, Zeytinburnu, Beyoğlu, Eyüpsultan, Üsküdar
4	5,1 $ -6 $	Ataşehir, Pendik, Tuzla, Maltepe, Ümraniye, Kartal, Başakşehir, Avcılar, Beylikdüzü, Kağıthane, Büyükçekmece, Bahçelievler, Bağcılar, Gaziosmanpaşa, Küçükçekmece
5	4 $ - 5 $	Esenyurt, Sancaktepe, Arnavutköy,Sultanbeyl

When constructing the whole dataset with a total of 101 shopping mall samples for Istanbul, the rental incomes of 40 shopping centers were placed regarding relevant regions by using Table 1 with their original values obtained from the first phase of data collection. For the remaining 61 shopping malls, rent values determined on a district basis were used in Table 1.

2.3 Data Analysis

The dataset including a total of 101 shopping mall monthly rental value is based on empirical data obtained from various sources in the retail market. To achieve the coefficient values for each zone, the arithmetic mean and proportional rate methods were used during the data analysis process. These methods are simple, easy, and trustworthy to apply and also have validity for empirical studies (McDonald & Morris, 1984).

Initially, the commercial rental values in the whole dataset were calculated for each region. In this way, the lowest commercial rental value region was identified. Subsequently, the coefficient value of this zone was set as 1, and other regions' coefficients were calculated by using the proportional rate method. Clusters were created and determined as "Region 1-2-3-4-5" with similar district coefficient values.

3. Results

As stated in the introduction section of our study, calculating the rental income of commercial units in shopping mall investments has a significant impact in the context of the investment's success. However, many factors determine rental income. Foremost among these factors is the geographical region. Given that there is currently no database of this nature available for investors, this study aims to reveal shopping malls' district-based commercial rental coefficient values in Istanbul. As a result, district-based rental coefficient values of 101 shopping malls operating in Istanbul by the year 2023, were demonstrated in Table 2.

Table 2: District-based Commercial Rental Coefficient Values of Shopping Malls in Istanbul.

| Region Number	Districts in Istanbul	Commercial Rental Values by Region	Coefficients Rate
Region 1	Bakırköy, Kadıköy, Beşiktaş	53,69 $ /sqm	3,56 x
Region 2	Şişli, Sarıyer, Fatih	47,63 $ /sqm	3,16 x
Region 3	Güngören, Bayrampaşa, Zeytinburnu, Beyoğlu, Eyüpsultan, Üsküdar	44,10 $ /sqm	2,92 x
Region 4	Ataşehir, Pendik, Tuzla, Maltepe, Ümraniye, Kartal, Başakşehir, Avcılar, Beylikdüzü, Kağıthane, Büyükçekmece, Bahçelievler, Bağcılar, Gaziosmanpaşa, Küçükçekmece	35,42 $ /sqm	2,35 x
Region 5	Esenyurt, Sancaktepe, Arnavutköy, Sultanbeyli	15,07 $ /sqm	1,00 x

As shown in Table 2, the coefficient value of the shopping malls located in Kadıköy, Beşiktaş, and Bakırköy districts representing Region No.1's coefficient is 3.56. When these districts' values are compared to other regions, it is observed this zone has the highest value concerning rental income.

In terms of Region No 2, which contains Şişli, Sarıyer, and Fatih districts, commercial rental income coefficient values are calculated as 3.16. There is a fractional difference between the first and second regions.

The shopping malls placed in Güngören, Bayrampaşa, Zeytinburnu, Beyoğlu, Eyüpsultan, and Üsküdar districts are within the scope of Region No.3. Their rental income coefficient values of these districts are 2.92. Besides, the coefficient value for Region No.4 consisting of Ataşehir, Pendik, Tuzla, Maltepe, Ümraniye, Kartal, Başakşehir, Avcılar, Beylikdüzü, Kağıthane, Büyükçekmece, Bahçelievler, Bağcılar, Gaziosmanpaşa, Küçükçekmece are calculated as 2.3. Lastly, the rental value coefficients of the shopping centers operating in Sancaktepe, Esenyurt, Arnavutköy, and Sultanbeyli have the lowest value of 1.00.

Based on these coefficients, it can be assumed that monthly rental incomes of shopping malls in Istanbul for 2023 on a square basis in terms of regions are approximately 53.69 $/sqm for Region 1, 47.63 $/sqm for Region 2, 44.10 $/sqm for Region 3, 35.42 $ /sqm, and finally 15.07 $ /sqm for Region 4. These values can be used for feasibility works for investments.

To guide commercial real estate investors on which districts in Istanbul have the highest commercial rental income potential, the findings of this research were visualized using the POWER BI application and displayed in Figure 2. In this map, the colors and the size of the circles represent the potential and strength of commercial rental income in different locations. This visualization helps investors understand which areas may offer greater rental income potential.
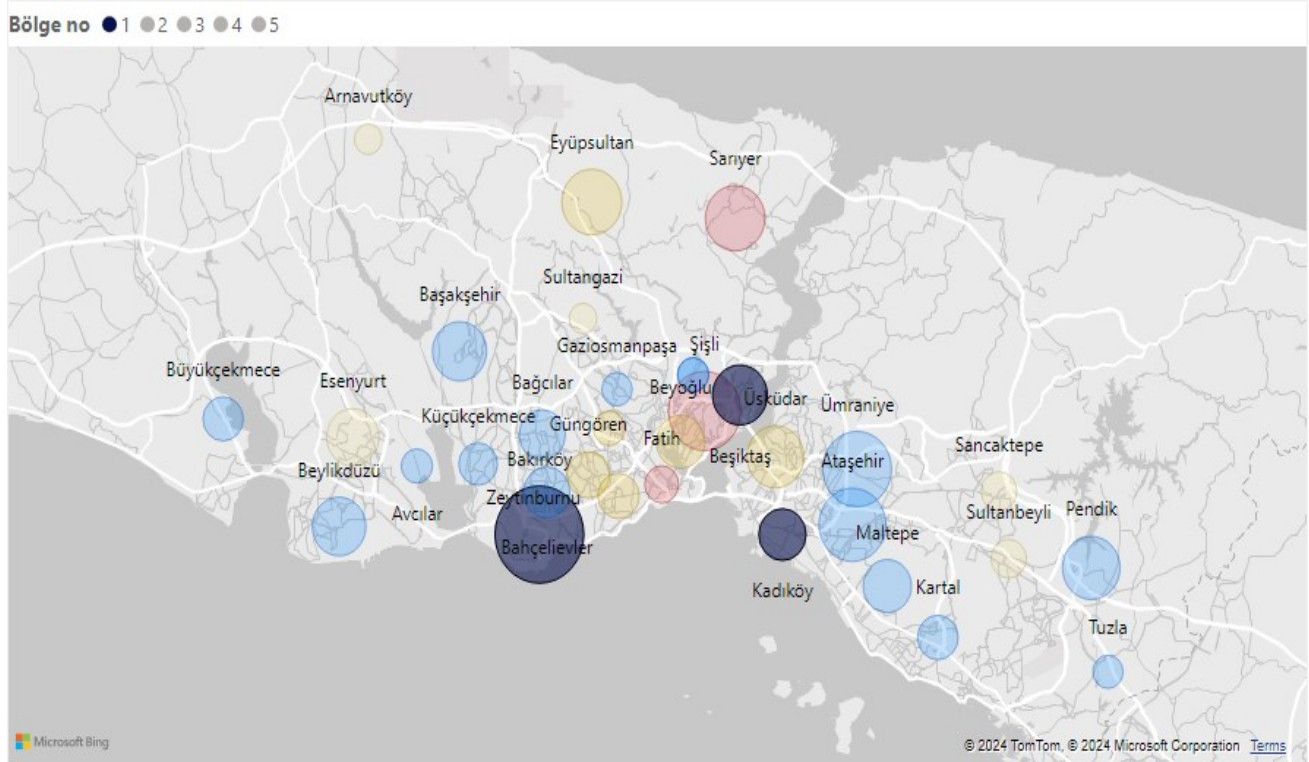
Figure 2. The commercial rental income level map for Istanbul province is based on districts.

4. Discussion

This article was conducted to present the commercial rental coefficient values for 101 actively operating shopping malls located in various districts of Istanbul by the year 2023. The results indicated that the shopping centers located in Sancaktepe, Esenyurt, Arnavutköy, and Sultanbeyli (Region 5) have the lowest rental income based on their coefficient value, while the malls established in Kadıköy, Beşiktaş, and Bakırköy districts (Region 1) have the highest coefficient value. In recent years, infrastructure improvements initiated by the municipality improved the public to Region 1. However, Region 5 (Sancaktepe, Esenyurt, Arnavutköy, and Sultanbeyli) has limited public accessibility. It implies that consumers prefer to visit these centers of attraction frequently because they can easily

reach these locations by various means of transportation. So, it shows that if more consumers drop in on these malls, both the frequency of visit rate and rental income would be increased. Therefore, the easy access feature of a shopping mall is a significant factor in terms of retail investment success. This implication and the results of the study also validate the outcome of previous studies about the positive effects of easy access to the rental values conducted by Bodkin and Lord (1997), Bloch et al. (1994), Nebati and Ekmekçi (2019) and Ferman and İlhan (2019). However, according to the study's findings, the Beşiktaş district requires a special evaluation. The shopping centers with the highest rental value in Istanbul are located in this district on the Zincirlikuyu-Levent-Maslak line, which is the Central Business Area (CBD) of Istanbul. In this direction, the result that the rental values of the shopping centers, especially those operating in the Beşiktaş district are the highest is consistent with the results of the model established by Demircioglu (2010).

In terms of socio-economic status, Şişli, Sarıyer, Kadıköy, Beşiktaş, and Bakırköy districts which have the highest rental value coefficients are among Turkey's most developed districts at the highest level (Sege,2022), while Arnavutköy, Esenyurt, Sancaktepe, Sultangazi, and Sultanbeyli districts are relatively at a lower level. These districts are mostly situated in the peripheries of the sub-centers, especially on the eastern side of the city. Household incomes in this region are somewhat lower than in the other regions. Therefore, this indicates that socio-economic conditions, particularly household income, play a crucial role in understanding the economic landscape of urban retail investment success. This finding was also in line with the other studies conducted by Sirmans C.F. & K. Guidry (1993), Hardin III & Wolverton (2000), Demircioglu (2010), White J.R. & Gray K.D. (1996) and Des Rosiers et al. (2005). Ho et al. (2016) argued that there is a positive relationship between the income level of the households residing in the shopping center vicinity and commercial rental values. Besides that, this result also supports the emphasis by Olla et al. (2023) on the impact of shopping malls on the urban lifestyle, culture of retail, and socio-economic conditions.

On the other hand, Şişli and Sarıyer districts are also within the area defined as the Central Business area of Istanbul, similar to Beşiktaş district. Located between the Bosporus bridges and ring road connections, these places provide advantages in terms of easy transportation. High-rise buildings built in this region have also increased the value of the region. Also, due to the high-income population living in these districts, the rental income of shopping centers operating in these locations within the city is relatively higher than the centers in other sub-regions which was emphasized by   Demircioglu (2010). In this case, it is an expected result that the rental values of shopping centers operating in the districts in Region 2 will be higher than in Region 3, Region 4, and Region 5.

This study is limited to observing shopping malls in Istanbul and does not reflect the rental income of anchor shops or small-sized shops. The results only depict the overall ranking by districts and the monthly average rental values concentrated on regions. Within the scope of this study, the findings of the rent income cannot be generalized to all other types of commercial real estate and for other countries.

5. Conclusion

Accurate determination of commercial rental values during the feasibility phase of shopping mall investments is important in terms of ensuring financial success and increasing the quality of urban life. In this direction, investors should formulate a proficient strategy for achieving sustainable commercial real estate development and urban improvement. This research aimed to determine the commercial rent coefficient values of shopping centers based on districts. In line with the purpose, a data set was prepared using data from a total of 101 retail shopping malls that were actively operating in Istanbul in 2023 as the study area. District-based ranking and region-based classification methods were used to create the data set and the arithmetic mean and proportional rate techniques were used to analyze. The results obtained according to rental price coefficient values discussed in this article are briefly summarized below:

- o The success of an investment in a shopping mall is often measured by high rental returns for investors. However, such ventures significantly impact the socio-economic status of

households living in the immediate vicinity. In this context, continued investment in shopping malls in urban centers could potentially increase employment rates and thereby household incomes, contributing positively to the local population.

o To implement a sustainable investment project, it is crucial to ensure easy access to the area where these investments are located. Therefore, investors and policymakers should collaborate closely. Policymakers can enhance public transportation systems by expanding coverage with new routes, increasing the capacity of existing routes for more efficient service, and improving user satisfaction by increasing the frequency of bus, tram, and metro services to reduce waiting times. Additionally, using environmentally friendly vehicles like electric buses can enhance the sustainability of the public transport system.

o Shopping mall management can also attract consumers by developing various marketing strategies such as promotions and discounts to draw them to these centers.

The findings of this article contribute to the socio-economic dimension of urban studies through a detailed analysis of commercial rental values across different districts. This analysis is crucial for understanding the economic landscape of retail investments in urban cities and also Istanbul province. Moreover, the research guides investors on utilizing district-based rental coefficient values during the feasibility stage.

In future studies, the sustainable commercial rental value prediction model can be revealed with more cases for Turkey to achieve financial and socioeconomic success in retail investments. Regarding the results, a survey can be conducted in the districts that have the lowest rental coefficient values to determine the expectations of households living in the immediate vicinity as consumers of shopping malls and to increase visit frequency to these centers.

Conflicts of Interest

The author(s) declare(s) no conflicts of interest.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

CRediT author statement:

Fatma Bengü Yoğurtçu: Conceptualization, Data Curation, Formal Analysis, Investigation, Methodology, Project Administration, Resources, Visualization, Writing - Original Draft; Almula Köksal: Funding Acquisition, Supervision, Validation, Writing - Review & Editing, Formal Analysis, Methodology, Investigation, Project Administration. All authors have reviewed and approved the final version of the manuscript.

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