Determining Performance of REIT (REIT): The Case of G-7 Economies

Muhammad Kashif Imran[1], Arifa Saeed[2], Safia Nosheen[3], Sumaira Rasheed[4]

Abstract

This study investigates the determinants of REITs (REITs) in order to investigate the performance of investment trusts in real estate in G-7 countries. For this purpose, a sample of 31 listed REITs from the United States, United Kingdom, Germany, Italy, Canada, France, and Japan was selected for a period from 2012 to 2021. The study employs Net Asset Value (NAV) as a proxy for REIT performance and considers various other factors as determinants, including net income, dividend yield, leverage, interest rates, inflation, foreign exchange rates, and size. The study applies a fixed effect with Driscoll and Kraay's standard error approach and results revealed a significant and positive influence of dividend yield, net income, foreign exchange rates, and size upon the net value of REITs. This concludes that these factors boost the performance of REITs. Conversely, this study discloses that both leverage, as well as interest rates, are significantly reducing the performance of REITs. The findings of this study provide valuable insights for investors and portfolio managers, aiding in the expansion of their understanding of the influential factors that impact the performance of REITs. By considering these factors, stakeholders can make more informed investment decisions in the REIT market.

Keywords: REITs; Driscoll - Kraay Standard Error Approach and G – 7 Economies

1. Introduction

A REIT (REIT) is a corporate entity that specializes in the ownership, operation, or financing of income-producing real estate properties. By pooling numerous investors' capital, REITs allow individuals to generate dividends from real estate investments without the necessity of personally buying, overseeing, or funding any properties directly. Oreagba (2010) defined a REIT as a publicly listed business that owns and manages real estate holdings and generates revenue similar to that of any other stock. According to Corgel et al. (1995), a REIT is an investment mechanism that facilitates the flow of money from investors into the country's real estate and property sectors. Jakpar, (2018) A REIT's (REIT) operational performance, which has a direct bearing on the expansion of returns on investment, may be used to assess the success of a REIT. REITs are mandated to pay out a sizable amount of their profits as dividends to their shareholders. A business must distribute at least 90% of its taxable profits to shareholders to be considered a REIT. As a result, REITs offer investors a consistent flow of income from their assets. Individuals may invest in the real estate market easily and affordably with the help of REITs without having to have extensive financial resources or knowledge of property management. REITs can be privately owned and run or publicly listed on significant stock markets. Nevertheless, their major goal is to continue offering real estate investors a lucrative investment vehicle.

The Global Financial Crisis (GFC) had a significant negative effect on the REIT business in 2007, and it led to a slow recovery that began in 2009 Wu, (2011) and Yuksel et al. (2017). Wong, (2005) the benefit of REITs is that they provide private investors access to high-profile, high-value assets that they may not otherwise have. By combining their financial resources, REIT investors can invest in a diverse portfolio of real estate assets with the potential for higher returns. In essence, REITs give private investors the chance to participate in real estate without having to shoulder the financial and management burdens associated with independently owning and managing properties. In 1960, as part of the Cigar Excise Tax Extension, REITs (REITs) were created in the US. REITs were established by Congress to provide small investors a chance to invest in real estate and make money without having to raise a lot of money or deal with the bother of owning and managing physical properties. At first, institutional investors were the only ones who could purchase REITs. However, modifications to the tax rules in 1986 made it possible for REITs to be publicly traded, opening the door for ordinary investors. As a result, REITs gained a lot more traction, and they are now a common choice for investors looking to gain exposure to the real estate industry. Wu, (2011) claims that the sector didn't begin to expand steadily until the Tax Reform Act of 1986, at which point it later went through an exceptional boom in initial public offerings (IPOs) in the 1990s. REITs (REITs) have a broad scope that encompasses various types of properties and industries. REITs can invest in different sectors of the real estate industry such as office, retail, hospitality, residential, healthcare, industrial, and logistics properties, among others. In addition to the general sectors, REITs can also specialize in specific areas of the real estate industry. Examples of specialized REITs include gaming properties such as casinos and stadiums, entertainment properties such as cinemas and theme parks, data centers, prisons, infrastructure, student and senior housing, and communication properties such as cellular tower sites.

Over the last three decades, both the number and equity market capitalization of REITs (REITs) has grown significantly globally. Compared to the 120 listed REITs in just two nations thirty years ago, there were 865 publicly-traded REITs as of December 2021, with a combined equity market valuation of almost $2.5 trillion. The fact that REITs are currently active in more than 40 nations and regions is evidence of the REIT market's rapid global development. This expansion demonstrates how REITs are becoming more and more popular as a diverse and accessible investment option designed for investors seeking exposure to the real estate industry. Over 200 publicly listed REITs with a total market value of over $1.5 trillion existed in the US as of 2021. With a market

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[1] Department of Banking and Finance, Dr. Hasan Murad School of Management (HSM), University of Management and Technology, Lahore, Pakistan, f2020096002@umt.edu.pk

[2] Assistant Professor; Department of Economics, Greenwich University, Karachi, Pakistan, arfasaeed@gmail.com

[3] Department of Banking and Finance, Dr. Hasan Murad School of Management (HSM), University of Management and Technology, Lahore, Pakistan, safia.nosheen@umt.edu.pk

[4] Corresponding Author, Lecturer, Department of Statistics, Virtual University of Pakistan, sumaira.rasheed@vu.edu.pk

value of over $250 billion, the Asia Pacific region has grown to be a substantial contributor to the worldwide REIT sector. Especially in nations like France, Germany, and the United Kingdom, REITs have seen remarkable expansion and development in Europe. With more than 100 publicly traded REITs and a market valuation of more than $350 billion, the European REIT industry has experienced a surge in the number of listed REITs and market capitalization. Globally, REITs have grown significantly, and the sector now offers investors a diverse and approachable alternative to engage in the real estate market. REITs are anticipated to play an even more significant part in the future of global investing as a result of the industry's continuing expansion. REITs (REITs) are an important investment option for many individuals and institutions around the world. In the G-7 countries, REITs have grown in popularity as a means of exposing investors to the real estate markets in G-7 nations. However, it is not widely known what factors affect REIT success in these nations. Hence, the objective of this study is to identify the key factors that impact the performance of REITs across the G-7 countries. We specifically want to look at how different macroeconomic and industry-specific factors affect REIT performance. To perform our research, we'll utilize a sizable dataset of REITs in G-7 nations spanning several years. The findings from this research will carry significant implications for investors, policymakers, and real estate professionals with an interest in comprehending the driving factors behind REIT performance in G-7 countries. We want to give insights that may be utilized to guide investment choices and enhance the general performance of real estate markets in these nations by identifying the major variables of REIT success.

Based on the above arguments, this study is structured to investigate the various factors which may impact the performance of REITs (REITs) in G-7 countries. The study presents interest rates, inflation, exchange rates, net income, dividend yield, stock return, leverage, and size as the determining factors of the performance of REITs. The present study contributes to the literature as this is the first study that presents the determining factors of the performance of REITs of G-7 countries. Additionally, this study considers both macroeconomic and industry-specific factors that may influence the Performance of REITs in G-7 countries during the period 2011 to 2021. This study will provide valuable insights into the factors that significantly influence REIT performance in G-7 countries, contributing to the understanding of real estate finance and investment. The findings can inform investment strategies, risk management, and policy decisions related to REITs in these countries.

The rest of the study reveals the discussion of the literature review in the second section. Data sources and methodology will be explained in the third section. The next section to section 3 will uncover the discussion of results and their explanation. The last and foremost section will provide conclusion and policy implications.

2. Literature Review

The review of past scholarly articles provides vital insights to help direct my study. This section aggregates and summarizes current works on the issue, culminating in the development of a conceptual framework. In recent decades, REITs (REITs), a common financial instrument, have attracted a lot of attention. A firm known as a REIT owns or funds income-producing real estate, including apartment complexes, office buildings, warehouses, medical facilities, and retail malls. The objective of this literature review is to examine the variables influencing REIT performance. Numerous studies have been conducted to identify the factors that impact the performance of REITs. It is well recognized that a variety of factors, including but not limited to interest rates, inflation, economic growth, dividend yield, net income, foreign exchange rate, and stock market performance, have an impact on REITs' success.

2.1. Foreign Exchange Rate & Performance of REITS

Nur Azwani Mohamad Azmin, (2016) A study published in the Journal of Applied Environmental and Biological Sciences titled "The Relationship of Macroeconomic Variables with REITs' Performance: The Case of Malaysian Companies" established that there is a significant relationship between exchange rates and the performance of Malaysian REITs. According to the author, these exchange rates show a link between their performance and that of REITs. This study highlights the significance of understanding the interplay between macroeconomic factors and the Malaysian REIT market by shedding light on the significant role exchange rates play in affecting the success of Malaysian REITs. Ngo, T., (2017) the study investigates how changes in foreign currency rates affect the profits of US REITs (REITs). It demonstrates that, regardless of how exchange rate changes are evaluated, the size of the REIT, or macroeconomic conditions, the strengthening of the U.S. dollar harms the returns of REITs. It's crucial to remember that the level of currency rate risk differs greatly amongst various REITs. Particularly vulnerable to the negative impacts of an increase in the value of the US dollar are REITs in the healthcare, industrial-office, residential, retail, and self-storage sectors. These results highlight the need for enhanced attention from REIT portfolio managers and investors by shedding light on a critical risk element that REITs confront. Muller and Verschoor, (2006) provide a helpful summary of the empirical results addressing the effects of exchange rate volatility on business value in their thorough research. Their study paints a contradictory picture, showing that the evidence is not always definitive. The researchers identify two main causes for this discrepancy. First, they draw attention to the fact that businesses' hedging practices might mask their identified exchange rate risks. This tendency is highlighted in several researches, including those by (Crabb 2002), (Aretz and Bartram, 2010), and (Doukas, Hall, and Lang, 2003). Companies may use hedging techniques to lessen the impact of exchange rate fluctuations, which makes it more difficult to identify and quantify their underlying exposure. Second, the researchers contend that companies engaged in simultaneous imports from and exports to several nations may have to counterbalance favorable and unfavorable exposures. A balancing impact results from this concurrent involvement in foreign commerce, lowering the firm's total vulnerability to exchange rate changes. By analyzing such situations, (Gao, 2000) and (Allayannis, 1995) have added to this knowledge. The complexity of company value sensitivity to exchange rate fluctuations is clarified by (Muller and Verschoor's, 2006) study, in conclusion. In order to understand the entire exposure of enterprises to currency rate swings, they emphasize the need of taking into account hedging efforts as well as concurrent importing and exporting operations. Further, (Chandra, Head, and Tappata, 2014) discovered that there is an 8% rise in the possibility of persons crossing the border if the value of the U.S. or

Canadian dollar increases by 10%. It's interesting to note that Canadian travelers appear to be more impacted by the strengthening of their own currency than American travelers. Above two analytical studies provide information on how exchange rate variations affect firms located close to borders, particularly those in the tourist and retail industries. Building on this study, I investigate the issue further by looking at how exchange rate fluctuations impact REITs (REITs). Instead of only in border regions, these REITs own and operate a wide range of properties, including hotels, resorts, flats, and workplaces.

2.2. Interest Rate & Performance of REITS (NAV)

Researchers, including (Allen, 2000), (Glascock, 2002), (He, 2003), and (Liow K. 2006), have widely studied by researchers the relationship between interest rates and the performance of REITs (REITs). As a result, it has been proposed as the original premise that macroeconomic factors, specifically the interest rate, have a negative impact on the return of the REIT performance. Khan and Siddiqui, (2019) In their research on the performance of REITs (REITs) in well-established markets like Singapore and Hong Kong, their analysis indicates a notable inverse relationship between interest rates and REIT performance, particularly in terms of Net Asset Value (NAV) performance. This suggests that REIT performance tends to significantly fall when interest rates rise. Although a number of academics (Lin, (2004); Bredin, O'Reilly, and Stevenson, (2008), Mueller and Pauley, (1995)) disagree that interest rates have an impact on REIT performance. Further, several significant studies have repeatedly shown evidence supporting the concept that interest rate fluctuations have an adverse effect on REIT performance. Jacob and Zisler (1994), Chan et al. (1990), Peiser and Smith (1985), and Chen and Tzang (1998) for example, have all provided arguments establishing a negative association between interest rates and REIT performance. According to Chomba, (1999), the ability of a person to purchase a home can be significantly impacted by changes in interest rates. Nguyen, (2015) asserts that a bond's value rises as interest rates fall. This happens because investors find the bond's dividend yield to be more alluring. Conversely, the cost of the bond decreases as interest rates rise. Similar to this, the greater yields produced by REITs (REITs) become more desirable when interest rates decrease, increasing their valuation. The rewards on REITs, however, become less alluring when interest rates rise, which lowers their valuation. Nguyen's arguments emphasize the influence of interest rate changes on various investment vehicles by emphasizing the inverse relationship between interest rates and the value of bonds and REITs. Delcoure, (2004) concurred that whereas long-term interest rates have a positive association with the return, short-term interest rates have a negative relationship. Nur Azwani Mohamad Azmin, (2016) Interest rate is negatively related to performance.

2.3. Net Income & Performance of REITS (NAV)

Khan & Siddiqui, (2019) the study looked at the factors that affect REIT performance in developing, emerging, and advanced Asian nations, including Pakistan, Malaysia, Thailand, Singapore, and Hong Kong. The study's conclusions show that in all three categories of markets (new, developing, and developed) net income has a significant positive relationship with REIT performance (NAV). Additionally, the study Hyen, (2017) also examined the determinants of REIT performance in Malaysia. It indicated that net income is one of the variables that affect the return of REITs. They find a positive significant relationship between net income and returns and it suggests that a REIT's larger net income is beneficial to investors' wealth. Research Zolkifli, (2018) discovered a notable inverse association between the net income of REIT (REIT) enterprises and NAV (Net Asset Value). These results imply that the NAV may be impacted by any changes in the net income of REIT companies, whether they are favorable or negative.

2.4. Dividend Yield & Performance of REITS (NAV)

Mohamad & Zolkifli, (2014) the researcher found a positive significant relationship between net asset value (NAV) and dividend yield. According to the research, REITs (REITs) NAV values tend to grow when dividend yields rise. This suggests that REITs with greater dividend yields may attract investors more so than those looking for REITs with higher NAV values. Additionally, Khan & Siddiqui, (2019), The dividend yield in well-established markets like Singapore and Hong Kong shows a strong and positive correlation with the performance of REITs (REITs), specifically their Net Asset Value (NAV), according to a 2019 study by Khan and Siddiqui. The authors looked at a number of variables affecting REIT performance in various economies, and their research revealed the importance of dividend yield as a factor impacting REIT performance in these developed countries. Further, in a study conducted by Hardin III and Hill's, (2008) research, the amount of excess dividends issued by a firm is closely tied to its capacity to earn FFO (Funds From Operations). The authors investigate the elements that influence REIT dividend distributions. Hyen, (2017) According to the research, dividend yield has a negative link with REIT performance. This conclusion is consistent with the findings of (Masum's, 2014) study. It implies that a greater dividend distribution may have an influence on the future growth of REIT shares but may result in less appealing returns.

2.5. Leverage & Performance of REITS (NAV)

Allen et al. (2000) concerning the influence of leverage on investment returns, made an interesting discovery. According to the research, leverage plays a significant role in magnifying both positive and negative returns, leading to substantial gains or losses in investments. Ling & Naranjo, (1997) & Chen & Jian, (2011) excessive leverage can raise the REIT's financial risk because it may find it difficult to pay its loans during recessions or times of rising interest rates. Due to increased financial risk from high levels of leverage, REIT performance can suffer. This can lead to increased borrowing expenses and worse returns. A REIT's debt-to-equity ratio is inversely connected to its performance. According to empirical evidence, the debt-to-equity ratio has a negative impact on REIT performance. Based on Barkham and Ward's, (1999), Debt may have an effect on the discount of Net Asset Value varies based on the method used to calculate the discount, it was stated. In order to overcome this, they proposed a novel method of discount calculation that took debt into consideration. This new element, known as the unleveled discount, is based on the idea that a business will issue new stock to repurchase existing debt without changing the asset side of the equation. This makes it possible to analyze the impact of other independent variables more effectively because accounting influences are not able to affect the discount. They found that leverage was still substantial at a 5 percent level after excluding the effect of debt from the computation of the net asset value. However, the relationship with the discount turned out to be negative. Additionally Anderson et al., (2001) looked at the REITs data set in research and discovered an intriguing finding. They separated the REITs into two groups based on

whether they were trading at a premium or a discount to Net Asset Value (NAV). Researchers discovered that premium REITs typically had lower debt levels. They provide a very rational justification for this remarkable link between leverage and discount. It appears that when it comes to debt financing, investors are often hesitant. Because more leverage can restrict the REITs' financial and strategic flexibility, this warning is warranted. Additionally, it increases their susceptibility to fluctuations in interest rates and market circumstances, which eventually increases the volatility of their earnings. These unfavorable elements might lead to sanctions for corporations with significant levels of debt in the public REIT market. As a result, it would seem that investors choose REITs with lower debt levels, which are often valued higher.

2.6. Size & Performance of REITS (NAV)

In research by Mohamad and Zolkifli, (2014), an analysis was carried out to find interesting relationships between the Net Asset Value (NAV) and the size of an organization. The findings showed that net asset value and business size had a notable positive association. This result lends credence to the hypothesis that changes in net income and the size of operations affect REITs' NAV. Larger REIT companies appear to outperform their smaller counterparts, displaying greater NAV, as they gain from economies of scale in a variety of areas including revenues, expenditures, and capital. These results support earlier studies by Lineman, (1997) and Ambrose and Linneman, (2001) and further demonstrate the benefits enjoyed by bigger REITs. For further support, in a study, Khan and Siddiqui, (2019) found that there is a significant and positive correlation between the size of REITs and their performance as measured by Net Asset Value (NAV) in well-developed markets like Singapore and Hong Kong. Research Yong, (2009) identified and came to the conclusion that the size factor had an adverse impact on returns. Interestingly, this component was only discovered to have an impact on returns prior to 1996, which was before the 1997 Asian financial crisis. The size of REITs, their income, and their profit have all been found to positively correlate with one another. In other words, a REIT's rental revenue and profit margin rise with its scale, resulting in a higher total yield. McIntosh, Liang, and Tompkins, (1991) set out on a ground-breaking research expedition that illuminated an intriguing occurrence in the world of REITs. Their results were highly surprising and showed a clear size impact. Unexpectedly, it found out that smaller businesses beat their larger rivals in this industry. Their research found evidence that smaller REITs not only provided better returns but did so without exposing investors to more risk. They succeeded in increasing yields while keeping risk at a level that was essentially constant. A notable negative association between a REIT's return and size was also found by McIntosh, Liang, and Tompkins. according to Chaudhry, (2004) and Hamelink, (2004) the study reveals that larger REITs exhibit higher geographic diversification but have less variation across property types, potentially leading to a negative correlation between size and return. Ziering, Liang and McIntosh, (1999) across a range of sizes, the size of real estate has a substantial impact on how risk and return dynamics are shaped. Interestingly, the largest real estate sector also has the highest average yield, making it the most volatile for investors. Lastly, according to Stansell and Coffin, (2000), size has a significant impact on REIT investment, with financial institutions often owning larger REITs. The fact that REIT interest expenses exhibit negative cost elasticity suggests that larger REITs have better access to institutional funding.

2.7. Stock Return & Performance of REITS (NAV)

In a study, Khan and Siddiqui, (2019) discovered a highly positive association between the Malaysian stock index and the Net Asset Value (NAV). The stock index and NAV in Thailand, however, had a negative association. While Hong Kong shows a negative association between the two, Singapore shows a considerably positive relationship between the stock index and NAV. These results demonstrate the various stock index dynamics and their relationships to NAV across regions. Further, Tan, (2009) study from 2009 focused on evaluating Malaysian REIT stock performance in relation to the Bursa Malaysia stock index. From June 2007 until June 2009, the study was conducted. The results showed a definite but relatively low correlation between the returns of Bursa indices and Malaysia REITs. Additionally, it was shown that Malaysian REITs have fewer systematic risks than the market as a whole. Tan's study revealed through the evaluation of Granger Causality that the stock market's fluctuations over the same time period had an impact on the performance of M-REITs.

Moreover, O'Neal, T. J., & Zheng, Y., (2014) authors of this study looked at the connection between REITs' net asset values (NAV) and stock performance from 1992 to 2012. They discovered no correlation between NAV and stock returns that were substantial, indicating that investors do not appear to price REITs using NAV. The researcher presents a number of theories that might account for this observation. First, they argue that rather than a REIT's stock return, investors could be more interested in the dividend yield. Second, REITs are frequently traded on exchanges, where supply and demand determine the price. This means that, depending on investor sentiment, the price of a REIT may be greater or lower than its NAV. A study by Ying, (2004) focused on employing a thorough panel technique to examine the long-term cointegration relationship and abrupt fluctuations between share prices and net asset values (NAV) of property businesses listed on the market. The results of the analysis repeatedly show a significant long-term and short-term link between stock prices and net asset values, both within and across various property markets. The NAV-based property stock valuation theory was also found to be a valid indicator of intrinsic value, making it a useful tool for assessing the performance of REITs. Chan, Hendershott, and Sanders, (1990) found that three main factors, changes in risk, variations in the term structure, and unanticipated inflation, have an influence on both REITs and the broader stock market. This finding is further supported by Cheong et al. (2006) who point out that REITs have a long-term cointegration link with both the stock market and long-run interest rates. Further, according to Corgel, (1991) the returns of REITs and the stock market have a wide range of short-term correlations but tend to be greater over longer holding periods. However, the returns of the REITs are more indicative of the variations in the rents and prices of the underlying properties in the trusts' portfolios.

2.8. Inflation & Performance of REITS (NAV)

There is constant discussion over how inflation affects the earnings of REITs, according to several industry analysts. According to several academics, inflation has no impact on REIT performance, including (Lu and So, 2001), (Kim, Leatham, and Bessler, 2007) and (Simpson, Ramchander, and Webb, 2007). On the other hand, certain researchers, including as (Chan et al., 1990), (Payne, 2003), (Chen, Hsien, and Jordan, 1997), continue to hold that there is a positive correlation between inflation and REIT

performance. This difference in viewpoint emphasizes how difficult it is to comprehend how inflation affects REIT returns. When inflation shocks occur in both time periods, returns on stock and REITs just react negatively but are insignificant. Fama and Schwert, (1977) investigated how inflation affects asset returns across a range of assets in research. Their research suggests that common equities typically underperform when used as a hedge against both anticipated and unplanned inflation. According to Lu and So, (2001), REITs and inflation have a well-known negative dynamic association. Despite the low significance of the reaction of REIT returns to an inflation shock, this dynamic connection has important ramifications for market expectations. Market investors expect the Federal Reserve Bank to raise interest rates when there is unanticipated inflation, which lessens their desire to rebalance their investment portfolios in favor of real estate and stocks. The dynamics of returns on each of these assets cannot be determined using this inflation component alone, though. Cohen, V. & Burinskas, A. (2020) the analysis discovered no significant relationship between inflation and REIT performance and Webb, (2007) also that the returns of REITs are unaffected by inflation. A study Adrangi, (2004) empirically demonstrates a definite inverse association between the returns of REITs and the rate of inflation. Another way, REITs are unable to properly guard against the impact of inflation on their returns during times of inflation. Therefore, it may be argued that the inflation rate has a negative impact on the REIT index's overall return. Ewing, (2005) empirical research found inflation reduces REITs' projected profits. Further, Khan & Siddiqui, (2019) It was shown that inflation and REIT Performance are highly positively correlated in established markets like Singapore and Hong Kong.

2.9. Diversification & Performance of REITS (NAV)

Yu, (2009) a thorough investigation of the dynamic REITs markets in Japan, Hong Kong, and Singapore, indicates the exceptional performance and diversification possibilities of Asian REITs. These markets shouldn't be disregarded while being in their early phases of growth. The study emphasizes the benefits of integrating Asian REITs in investment portfolios and emphasizes how their low correlation with other assets not only improves diversification but also has the ability to give investors with enticing dividend yield. Further study, Ratcliffe's, (2007) lends credence to the idea that specialized a REITs are more sensitive to market returns. According to the study's findings, diversity is essential for preventing peaks and valleys in the real estate market and for lowering overall systemic risks.

Other studies have looked at the benefits of global diversification, Ling and Naranjo, (2002) and Bond et al., (2003) According to these research, internationally diversified REITs may see greater returns when there are minimal country-to-country correlations. Newell, G., & Wen Peng, H., (2012) Japan's REITs, abbreviated as J-REITs, are the largest market of their kind in Asia. They are the fifth largest market in the world for REITs. From 2001 to 2011, this study intends to look into the attraction of J-REITs for potential investors by analyzing their relevance, risk-adjusted performance, and the benefits they provide in terms of portfolio diversification within the Japanese mixed-asset environment. Compared to other main asset classes, J-REITs had the best risk-adjusted returns and provided significant benefits in terms of portfolio diversification throughout the aforementioned period. Furthermore, their risk-adjusted returns increased much more in the post-global financial crisis era.

Conceptual Framework
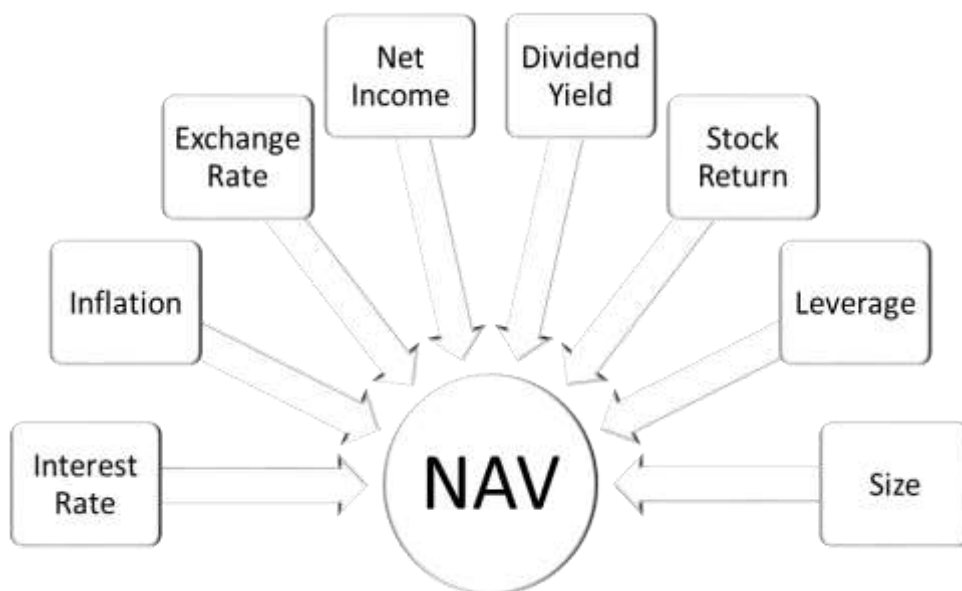
3. Methodology

In the evaluation of the performance of REITs, investors prefer to utilize the Net Asset Value (NAV)-based approach. NAV is commonly used in REIT studies and is computed by dividing the difference between total assets and liabilities by the number of outstanding shares. The perceived growth potential of a REIT is generally higher with a higher NAV premium. This study employs external independent variables including interest rate, inflation, exchange rate, and stock return, as well as independent internal variables such as net income, dividend yield, and stock return. Control variables, namely Leverage (Debt to Equity) and Size (Market Capitalization), are also incorporated.

This research focuses solely on listed REITs in the G-7 countries, namely the USA, Canada, UK, Japan, Germany, France, and Italy. A sample of 31 REIT companies was selected, all of which were listed for a period of eleven years, from 2012-2021. This study incorporates control and external factors, with a total of 310 observations. Table-1 shows all the details of the data for this study. The annual reports of the selected listed REITs and the Federal Reserve Bank by St. Louis (Federal Reserve Economic Data - FRED) and World Development Indicator (WDI) provided all the data for this study.

Table 1: Data Collection

Variable	Proxy	Symbol	Calculation	Data Source
Performance of REITs	Net Asset Value	NAV	NAV = (Assets – Liabilities) / Number of the outstanding share	Financial Statement of REIT
Dividend Yield	-	DY	Dividend Yield = Dividend / Market Price	Financial Statement of REIT & Exchange
Stock Return	-	SR	Average Stock Return = (Current year average stock price / Last year stock price – 1	Stock Exchange data portal
Interest Rate	-	INT	Average of 3 months interbank rate	FRED
Foreign Exchange Rate	-	FX	Average rate USD to Local Currency	FRED
Inflation	Consumer Price Index	CPI	Average inflation Rate	WDI
Leverage	Debt to Equity Ratio	DE	Leverage Ratio: Debt / Equity	Financial Statement of REIT
Size	Market Capitalization	SIZE	Price * Number of outstanding shares	Financial Statement of REIT & Exchange

Table 2 presents descriptive statistics for the study variables. There are 310 observations of the NAV variable, which stands for net asset value, with a mean of 3.74 and a standard deviation of 1.98. NAV ranges from -1.41 to 9.12 as its minimum and highest values. Similar data are provided for variables like net income (NI), dividend yield (DY), stock return (SR), interest rate (INT), foreign exchange rate (FX), inflation (CPI), leverage (DE), and business size (Size) in the table. These statistics give researchers insights into the distribution and properties of the data by providing the number of observations, mean, standard deviation, minimum, and maximum values for variable.

Table 2: Descriptive Statistics

Variable	Obser	Mean	Std. Dev.	Min	Max
lnNAV	310	3.74	1.98	-1.41	9.12
NI	310	21.59	61.81	-3.72	484.60
DY	310	5.38	4.86	0.00	50.13
SR	310	0.11	0.37	-0.48	5.35
lnINT	310	0.59	0.31	0.00	1.32
lnFX	310	0.06	2.62	-4.80	4.58
lnCPI	310	0.88	0.38	0.00	1.78
lnDE	310	0.03	0.68	-2.59	2.20
lnSize	310	4.40	1.94	1.18	8.68

4. Estimable Model

For empirical estimation of the relationship between the variables, we formulated the following function:

$$NAV = F (NI, DY, SR, INT, FX, CPI, DE\ SIZE)$$

This function measures the performance of REITs in terms of their Net Asset Value (NAV), which is a function of various variables such as net income (NI), dividend yield (DY), stock return (SR), interest rate (INT), foreign exchange rate (FX), inflation (CPI), and other control variables like leverage (DE) and Size (SIZE). The econometric specification of this function is outlined below:

$$\ln(NAV)i,t = \alpha + \beta\,(NI)i,t + \beta_2\,(DY)i,t + \beta_3\,(SR)i,t + \beta_4\ln(INT)i,t + \beta_5\ln(FX)i,t + \beta_6\ln(CPI)i,t + \beta_7\ln(DE)i,t + \beta_8\ln(Size)i,t + \epsilon i,t$$

Where,

NAV = Net Asset Value, INT = Interest Rate, CPI = Inflation, FX =Foreign Exchange Rate, NI = Net Income, SR = Stock Return, DY = Dividend Yield, DE = Leverage – Debt to Equity Ratio, Size = Firm Size, ϵ = Error Term, i & t = Country & Time respectively.

Panel Data Estimation involves a series of tests to estimate the panel dataset. The following subsections detail the sequential steps taken in the estimation process.

The first econometric consideration is to identify multicollinearity among the independent variables. In general, the presence of severe multicollinearity is indicated by a variance inflation factor (VIF) over 10, which often happens when R2 exceeds 0.90. Table 3's VIF values for the independent variables fall below the cutoff point (less than 2.02), indicating that multicollinearity in

our estimation is improbable. Ordinary least squares (OLS) may be an inadequate specification when there is country-specific variability, such as differences in social and cultural norms, and a fixed/random effects model should be employed in its place. In order to select the best estimation method for panel data analysis, two tests are essential.

A statistical test called the Breusch and Pagan Lagrangian Multiplier Test is used to examine if a random effects regression model is preferable to a straightforward OLS regression model. The H_0 of the test is that there is no variance across countries (σ^2) or no panel effect (significant difference across countries). A significant value of χ^2 indicates the presence of panel effects, either fixed or random. This post-estimation test is helpful in selecting an appropriate regression model for panel data analysis. Here, P value > F = 0.000 so, we rejected the null hypothesis & LM test proposed panel effect.

The decision between a fixed effects model and a random effects model is offered by this post-estimation test. Each model was calculated and put to the test. A p-value of less than 1%, 5%, or 10% suggests that the fixed effects model is the preferable option for panel data estimation, and this is the criterion used to determine which model to use. The null hypothesis is rejected in this study since the probability value of the χ^2 test is less than 0.05, which indicates that the test is significant. It implies that a fixed effects model would be better fitting for this research. The three tests presented in subsections 3.6.1, 3.6.2, and 3.6.3 are displayed in the table below:

Table 3: Tests for Panel Data Estimation Technique

Multicollinearity Test			Selecting an Appropriate Estimation Technique for Panel Data			
Variable	VIF	1/VIF	Breusch-Pagan Lagrange multiplier (LM)		Hausman Test: Choice between Fixed or Random Effects	
NI	2.013	0.497				
LnFX	1.971	0.507				
lnSize	1.94	0.516			Hypothesis:	
lnCPI	1.383	0.723	[Ho: σ^2 u = 0]		Ho: Variance in coefficients not systematic.	
DY	1.346	0.743	Null Hypothesis: No-panel effect.		HA: Variance in coefficients systematic.	
lnDE	1.216	0.822				
lnINT	1.174	0.852	$\bar{\chi}^2$ (01)	944.26	Value	Decision
SR	1.032	0.969			p- val> χ^2 = 0.000	Since p-val>χ^2>0.05 as well as 0.01 fixed effects is suitable
Mean VIF	1.509	-	P value > F	0.000		

The findings of the fixed effect regression analysis shown in Table 4 give important information about how the dependent variable and independent variables are related. The coefficient estimates, p-values, standard errors, and summary statistics for the regression are all provided by the regression analysis. The coefficient estimates illustrate how much the dependent variable changes for a one-unit increase in the corresponding independent variable while holding all other independent variables constant. Meanwhile, the standard errors indicate the degree of uncertainty in the coefficient estimates, with smaller standard errors indicating greater precision. The p-values are used to determine the statistical significance of each variable, where a p-value less than the chosen significance level (usually 0.05 or 0.01) indicates statistical significance.

Table 4: Regression Model Estimations

Dependent Variable is lnNAV				
Fixed Effects Estimation (Ordinary Least Square)				
Regressor	Coefficient	Standard Error	T Value	P Value
NI	0.003	0.001	5.110	0.000
DY	0.032	0.004	7.420	0.000
SR	0.002	0.034	0.050	0.964
lnINT	-0.260	0.065	-4.010	0.000
lnFX	0.380	0.157	2.420	0.016
lnCPI	0.060	0.038	1.560	0.120
lnDE	-0.435	0.036	-11.960	0.000
lnSize	0.287	0.042	6.860	0.000
Constant	2.329	0.194	12.030	0.000
Diagnostics				
R-Squared	0.644	F (8, 271)	61.268	P. Value (F-test) = 0.000

The results of this study's research demonstrate that net income (NI), dividend yield (DY), the foreign exchange rate (FX), and size (size) all have substantial positive effects on REIT performance, whereas interest rate (INT) and leverage (DE) have significant negative effects. Additionally, the performance of REITs is insignificantly impacted by stock return (SR) or inflation (CPI). The R-squared value shown in Table 4 also tells us how much of the variance in the dependent variable can be accounted for by the

independent variables. A 64.4% explanation of the variance in REIT performance can be found in the independent variables, according to the R-squared value of 0.644. Finally, the F-test and corresponding p-value (p=0.000) show that the regression is statistically significant overall.

In studies involving micro panels with a limited number of years, serial correlation is generally not expected. Serial correlation can result in standard errors of coefficients being underestimated and an inflated R2 value. To assess the presence of serial correlation, we conducted the Wooldridge test. Interestingly, our findings in Table-3.5 suggest that the null hypothesis can be rejected with p-values less than 0.05 and 0.01, demonstrating the residuals' presence of serial correlation. As a result, the OLS coefficients are subject to bias, consistency issues, and efficiency issues.

Heteroskedasticity can result in inaccurate standard error estimates for coefficients and their corresponding t-values, even if the OLS estimates are unbiased. To test for the presence of heteroskedasticity, we employed the modified Wald test for group-wise heteroskedasticity. The outcomes in Table-5 demonstrate that the null hypothesis can be rejected with a p-value less than 0.05, indicating the presence of heteroskedasticity in the residuals. As a consequence, the standard errors and t-values of the coefficient estimates may be incorrect. The two tests provided in the following table support this findings:

Table 5: Tests for Serial Correlation & Heteroskedasticity, in Fixed Effects Regression

Wooldridge Test for Serial Correlation		Modified Wald Test for Group Wise Heteroskedasticity	
Ho: No First Order Serial Correlation		$H0: \sigma^2i = \sigma^2i$ for all i	
F (1, 30)	51.559	χ^2 (31)	1773.14
p-Value > F	0.000	p-Value > χ^2	0.000

The Fixed-Effect model with Driscoll-Kraay standard errors is used in this research study to evaluate the relationship between a group of independent factors and the dependent variable, which is the net asset value (NAV). The dataset contains 31 cross-sectional units and 310 observations for the study. To correct for the issue of heteroscedasticity and serial correlation in the data, we have used the Driscoll and Kraay Standard Errors method, which involves estimating the model using OLS and constructing a weight matrix based on the residuals to adjust the standard errors of the OLS regression coefficients. This approach enhances the accuracy and reliability of the regression analysis. The results of the study in Table-3.6 indicate that all Net Income (NI), Dividend Yield (DY), Foreign Exchange return (FX), and Size (size) are a statistically positively significant relationship at 1% level with the performance of REITs. Where's Interest rate (INT) and Leverage (DE) is a statistically negatively significant relationship at 1% level with REIT's performance, while stock return (SR) and Inflation (CPI) demonstrate an insignificant relationship with the performance of REITs. The result of 0.644 for inside R-squared implies that the independent factors explain 64.4% of the variation in the dependent variable within each group. To address the difficulties of heteroskedasticity and serial correlation in the data, the Driscoll-Kraay standard errors are used. The total regression model is statistically significant, as indicated by the F-statistic of 3978.65 and the p-value of 0.0000.

Table 6: Regression Model Estimations

Dependent Variable is lnNAV				
Fixed Effects Estimation with Driscoll and Kraay Standard Error Approach				
Regressor	Coefficient	Standard Error	T Value	P Value
NI	0.003	0.000	7.430	0.000
DY	0.032	0.006	4.980	0.001
SR	0.002	0.017	0.090	0.931
lnINT	-0.260	0.062	-4.180	0.002
lnFX	0.380	0.110	3.440	0.007
lnCPI	0.060	0.036	1.630	0.137
lnDE	-0.435	0.038	-11.510	0.000
lnSize	0.287	0.025	11.490	0.000
Constant	2.329	0.168	13.890	0.000
Diagnostics				
R-Squared	0.644	F (8, 9)	3978.65	P. Value (F-test) = 0.000

5. Results & Discussion

The purpose of this study was to assess the performance of REITs using a Net Asset Value (NAV)-based approach. The research considered several independent factors such as interest rate, inflation, exchange rate, stock return, net income, dividend yield, and stock return. Leverage (debt to equity) and size (market capitalization) were taken into account. The data gathering procedure concentrated on listed REITs in the G-7 nations from 2012 to 2021. The conceptual framework and estimable model were constructed to experimentally assess the connection between the variables. Test for Multi-Collinearity, Breusch and Pagan Lagrangian Multiplier Test (LM) and Hausman test were tested. According to the findings, a fixed effects model was better suited for this investigation. However, testing for serial correlation and heteroskedasticity indicated problems with the model; to address

these problems, fixed effects estimating was performed using the Driscoll and Kraay standard errors technique, which accounted for heteroscedasticity and serial correlation.

The study findings on the performance determinants of REITs show various significant correlations between independent variables and REIT net asset value (NAV). According to this study, net income has a considerable positive link with REIT performance. This conclusion suggests that when a REIT's net income improves, so does its NAV. Higher net income implies that the REIT is better able to earn profits from its real estate holdings, which leads to an increase in its total value. The financial theory behind the positive association between net income and net asset value is that net income contributes to retained earnings, which in turn increases net assets and enhances a company's net asset value. Profit accumulation and the rise of the company's intrinsic worth over time drive this relationship. These findings rely on support from the studies by Khan and Siddiqui (2019) and Hyen (2017) both of which emphasise the relevance of net income in predicting the success of REITs. They discover an important positive correlation between net income and REIT performance, implying that higher net income benefits investors' wealth. These findings are applicable to developing, emergent, and mature Asian markets, including Pakistan, Malaysia, Thailand, Singapore, and Hong Kong.

This study also demonstrates a substantial positive association between dividend yield and REIT performance (NAV). This means that if a REIT's dividend yield rises, so does its NAV. The financial theory of valuation helps explain the positive association between dividend yield and net asset value (NAV) of REITs, where greater dividend yields suggest a higher perceived worth of future cash flows. Furthermore, income-seeking investors are drawn to REITs with greater dividend yields, which leads to increasing demand and higher NAV. These findings receive backing from Mohamad and Zolkifli (2014) and Khan and Siddiqui (2019), they find a positive and substantial association between REITs net asset value (NAV) and dividend yield implying that REITs with greater dividend yields may be more appealing to investors than those with higher NAV values. According to Khan and Siddiqui's research, this association is especially strong in well established markets like Singapore and Hong Kong. The dividend yield is important in affecting REIT performance in these developed nations, as seen by its positive link with NAV. This study finds a significant positive association between the foreign exchange rate and net asset value. This conclusion implies that the NAV of the REIT grows when the foreign exchange rate strengthens relative to the REIT's local currency. According to theory, when a corporation has overseas subsidiaries or does international business, the financial statements of those companies are often translated into the reporting currency for consolidation reasons. Exchange rate fluctuations can result in profits or losses on the translation of these overseas assets and liabilities, influencing the company's overall net asset value. These findings are authenticated by Nur Azwani Mohamad Azmin, (2016) finds a link between exchange rates and the performance of Malaysian REITs. The second research by Ngo, T. (2017) focuses on US REITs and shows that strengthening the US currency has a negative impact on REIT returns while weakening the US dollar has a positive effect. Both studies emphasize the need of paying attention to and considering currency rate risk. This study finds a significant positive association between the size of a REIT and its net asset value. When compared to smaller REITs, larger REITs often have greater net asset values. The principle of economies of scale may be used to explain the correlation between net asset value (NAV) and firm size that is positive. As businesses expand, they may take advantage of cost benefits, improved productivity, and enhanced profitability, all of which raise the net asset value of the company. These findings are upheld by Mohamad and Zolkifli (2014) indicating that larger REITs tend to have higher Net Asset Values (NAV) due to economies of scale in various areas. This finding is consistent with earlier studies by Lineman (1997) and Ambrose and Linneman (2001) suggesting that bigger REITs perform better than smaller ones. Khan and Siddiqui (2019) further support this idea, showing a significant positive correlation between REIT size and performance measured by NAV in well-developed markets like Singapore and Hong Kong.

Furthermore, this study suggests a negative significant relationship between interest rates and net asset value. Financial theories including the present value theory, capital asset pricing model (CAPM), cost of capital theory, and dividend discount model (DDM) can all be used to explain the inverse relationship between interest rates and net asset value (NAV) of a corporation. A higher cost of capital and a decrease in the present value of future cash flows result from higher interest rates since they increase the discount rate. In consequence, this lowers the company's NAV. Higher interest rates can also make borrowing more expensive, have a negative effect on corporations with high debt levels, and have an influence on how future dividends are valued, which would further reduce NAV. These findings are confirmed by many scholars who have thoroughly investigated the relationship between interest rates and the profitability of REITs, including Allen (2000), Glascock (2002), He (2003), and Liow (2006). The dominant theory contends that interest rates, in particular, have a negative influence on REIT returns. A substantial negative association between interest rates and REIT performance, notably in terms of Net Asset Value (NAV), was discovered by Khan and Siddiqui (2019) in their study on REIT performance in well-established markets like Singapore and Hong Kong. Numerous further important research, such as those by Chan et al. (1990), Peiser and Smith (1985), Chen and Tzang (1998), Jacob and Zisler (1994), and Chan et al. (1990), have repeatedly shown data supporting the notion that interest rate changes have a negative impact on REIT performance. The findings also reveal a negative significant relationship between leverage (i.e., debt levels) and net asset value. This implies that as the leverage of a REIT increases, its NAV tends to decrease. increased financial risk is the primary cause of the inverse connection between leverage and net asset value (NAV) of a corporation. Increased risk of default, greater interest payments, decreased financial flexibility, increased vulnerability to changes in interest rates and market circumstances, and unfavorable market perception are all effects of rising leverage that all work together to impair net asset value. These findings are corroborated by Allen et al. (2000) Leverage magnifies both positive and negative investment returns greatly, resulting in huge gains or losses. According to Chen & Jian (2011) and Ling & Naranjo (1997), high leverage raises a REIT's financial risk and makes it more difficult for it to repay loans during recessions or times of rising interest rates. High levels of leverage consequently have a detrimental impact on REIT performance, leading to increased borrowing costs and lower returns. According to empirical data, a REIT's performance and debt-to-equity ratio are inversely related.

This study found no statistically significant relationship between inflation with net asset value. This suggests that, within the context of the research, changes in inflation do not have a meaningful impact on the net asset value of REITs and inflation have a complicated and variable relationship that can vary based on a number of variables. Through the income strategy, inflation may have an effect on REITs' NAV since higher rental rates might boost their revenue and value. In addition, as real estate assets, particularly those held by REITs, can increase in value with rising prices, they are sometimes seen as a hedge against inflation. Inflation-affected interest rates and capitalization rates are likewise entwined with the impact of inflation on REITs' NAV. These findings rely on support from some researchers argue that inflation has no effect on REIT performance, citing studies by Lu and So (2001), Kim, Leatham, and Bessler (2007), and Simpson, Ramchander, and Webb (2007), Further, there was also no statistically significant association between stock return and net asset value in this investigation. This shows that, in the context of the study, changes in stock return no have a meaningful impact on the net asset value of REITs. Several reasons might explain the minimal relationship between stock returns and the net asset value of a REIT. Stock price variances from the underlying NAV can be caused by investor mindset and market psychology, resulting in an insignificant connection. Furthermore, due to variables such as investor points of view, market circumstances, and liquidity concerns, REIT stocks may trade at a discount or premium to their NAV, further weakening the relationship. Furthermore, the income-generating aspect of REITs, largely through rental payments, might attract investors who are more concerned with consistent income rather than NAV growth, reducing the significance between stock returns and NAV. In the context of REITs, these considerations emphasize the intricacies and dynamics that might impact the link between stock returns and NAV. These findings gain reinforcement from several studies have been conducted to investigate the relationship between stock indexes and Net Asset Value (NAV) in various locations. Khan and Siddiqui (2019) discovered a favorable relationship between the Malaysian stock index and NAV, whereas Thailand revealed a negative relationship. Hong Kong likewise showed a negative relationship. However, Singapore showed a significantly favorable relationship. O'Neal and Zheng (2014) investigated the relationship between REIT NAV and stock performance from 1992 to 2012 and found no significant association, suggesting that investors may not price REITs using NAV. Investors' concentration on dividend yield and the effect of supply and demand on REIT prices in exchange trading are two possible factors. Tan (2009) focused on Malaysian REIT stock performance relative to the Bursa Malaysia stock index and revealed a low correlation between the returns of Bursa indices and Malaysia REITs, suggesting fewer systematic risks for Malaysian REITs.

6. Conclusion and Policy Implications

This study aimed to evaluate the performance of REITs of G-7 economies using the Net Asset Value (NAV) based approach. The study applies a fixed effect with Driscoll and Kraay standard error approach and results revealed a significant and positive influence of dividend yield, net income, foreign exchange rates and size upon net asset value of REITs. This concludes that these factors boost performance of REITs. Conversely, this study discloses that both leverage as well as interest rates are significantly reducing the performance of REITs. These findings are consistent with previous research conducted in various markets, emphasizing the complex and context dependent nature of the relationships between these variables and REIT performance. The implications of this study provide valuable insights for investors, policymakers, and real estate market participants in G-7 countries. The results show how various factors significantly impact significant impact on the performance of REITs. Investors can make educated decisions about REIT investments by comprehending the impact of macroeconomic indicators, market conditions, and financial characteristics. These findings can be used by policymakers to create plans that support a supportive environment for REITs, potentially attracting more investments as well as encouraging economic growth. Real estate market participants can also use this information to optimize portfolio allocation and change their strategies in response to the identified determinants. Overall, the study improves our ability to predict REIT performance and offers useful implications for those who are involved in the real estate industry.

6.1. Limitations and Recommendations

This study sheds light on the performance of REITs, there is still room for improvement. Future studies might improve on this work by increasing the sample size and including more internal and external variables to develop a stronger link between the variables and reveal REIT performance from a global viewpoint. The present study is limited to the G-7 countries, but future researchers might expand their results to include other countries throughout the world. Furthermore, the frequency of observation (daily, weekly, or monthly) may have an effect on the results. Future studies might look into this issue using high-frequency data, such as monthly observations. Future research can improve our knowledge of REIT performance by addressing these constraints and informing real estate decision-makers.

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