OFFICE SECTOR INVESTMENT ANALYSIS
PROPERTY CYCLE IMPACT OR STRUCTURAL SHIFT?

DOUW G B BOSHOFF

Ass. Professor, Department of Construction Economics, University of Pretoria

ABSTRACT

This paper explores the South African Commercial Real Estate market, with a specific focus on office properties. Post-COVID devaluations are considered to have a detrimental effect on the viability of investment in the sector, with the question being raised if it is caused by flexible working policies and a structural change in demand, or if we are yet to see a recovery amidst a trough in the property cycle. The research investigates the long-term equilibrium level of variables contributing to the sector's space and capital market, with the view of predicting the short to medium term future of office space investment. Reference is made to the direct property market as well as implications for the listed sector in South Africa. Implications of the research can be applied in other markets and international comparisons are suggested for further research.

Keywords: CRE, financial stability, property trends, business cycle, income drivers, operating expenses,

1. THEORETICAL BACKGROUND

1.1. General

The CRE sector is globally considered as a very important contributor to economic activity. It provides the space needs to enable virtually all other economic activities to take place, including manufacturing, retail activities, business services, etc. The sector also contributes to directly and indirectly economic activity and job creation. These factors emphasize the importance of understanding the interconnections between the CRE sector, the economy and the financial sector to effectively monitor the critical aspects of the sector that may have implications for financial stability as highlighted by Olszewski (2013).

The ESRB (2019) found that to effectively evaluate the risks and vulnerabilities within the CRE sector, it is essential that the definition of CRE should clearly delineate its linkages with the financial system. The following definitions of CRE are set out in the ESRB recommendations reports of 2016 and 2019 respectively: *"any income-producing real estate, whether existing or under development, and excludes social housing, property owned by end-users and buy-to-let housing"* and "CRE refers to "*any income-producing real estate, whether existing or under development, including rental housing or real estate used by the owners of the property for conducting their business, purpose or activity, whether existing or under construction, that is not qualified as residential real estate property, and including social housing*". Geis and Luca (2021) define it as *"building that are held with the intention of creating a stream of income for their owners"*. The 2016 ESRB definition is used for the purposes of this research. The sector consists of retail, office, industrial and other subsectors.

Deghi, Natalucci and Qureshi (2022) found that the CRE sector has the potential to impact overall financial stability due to its size, close reflection of broader economic conditions, and heavy reliance on debt financing. They also assert that in many economies, banks have significant exposure to commercial real estate loans, while nonbank financial intermediaries also play a substantial role (Deghi, Natalucci and Qureshi, 2021). Thus, if the sector experiences a negative shock, it can lead to lower property prices, negatively affecting borrower credit quality and putting pressure on lenders' balance sheets. When significant price misalignments occur in the commercial real estate market—where prices deviate from economic fundamentals—the risk of price declines increases. Their analysis demonstrates that these misalignments amplify the downside risks to future

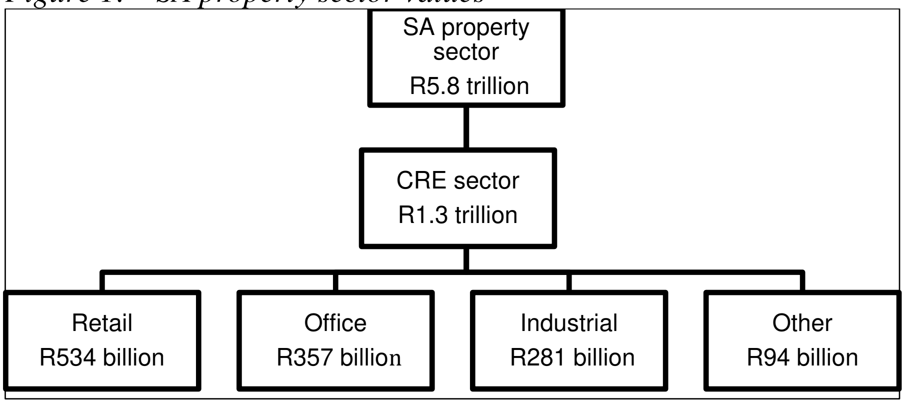
GDP growth. Similarly, The IMF (2021) indicated that the CRE sector is connected to the financial sector and the economy, therefore the performance of the sector can have ripple effects on both the financial sector and the broader economy.

According to Zhu (2003) the linkages between the real estate market collapses and financial crises has been well documented. Instance of financial crises linked to a decline in real estate prices include the US savings and loan crisis in the late 1980s, the financial crisis in Sweden and Japan in the early 1990s, as well as the extensive real estate market collapses and financial crises in Southeast Asia in 1998. In the UK, the Independent Banking Commission identified the failure of the banking system in 2007 as a major factor that contributed to stress in the banking sector.

The IMF financial stability report (2023) highlighted the increasing concerns about the state of the commercial real estate (CRE) market, which is facing challenges due to worsening economic conditions and higher funding costs. In the United States, small to mid-sized banks account for the majority of CRE lending, therefore any decline in asset quality would result in significant impacts on the banks' profits and willingness to lend. Non-bank financial institutions (NBFIs) also play a crucial role in the real estate investment trusts (REITs) sector and commercial mortgage-backed securities markets, amplifying the ramifications of CRE market stress on financial stability and economic growth.

Boshoff & Seymore (2013) reported that the real estate sector contributed 20.9% to the fixed capital stock of South Africa (SA), and 14.95% of the gross fixed capital formation in the economy during 2013. In terms of this capital formation, 71.2% of the sector, is attributable to non-residential buildings. Boshoff & Seymore (2016) further estimate that CRE contributed approximately 3.75% of all economic activity in SA during 2013, 5.35% of the total GDP, and supported approximately 1.5% of all employment in SA over that period. In a similar study, Oxford Economics Africa (2022), indicated R89.380 billion contribution to GDP by the 5 major Metropolitan Municipalities in the country, 182,000 jobs created and R17.668 billion in taxes facilitated. SAPOA (2023) estimates the total commercial office stock to consist of approximately 19,000,000m^2 of office space of different grading, while the Property Practitioners Regulating Authority (2023), estimates the property sector to have been worth R5.3 trillion in 2016 as per Figure 1. Of this total, CRE is estimated to account for R1.3 trillion (22.4%). According to Property Practitioners Regulating Authority (2023) the sector is also estimated to have contributed around R46 billion to the fiscus during that period.

Figure 1: SA property sector values



Source: Property Practitioners Regulating Authority (adapted)

Over the years, sophisticated investment vehicles have been developed with mixed characteristics of direct real estate investments and publicly traded real estate investment vehicles such as REITs. A REIT is a company that derives income from the ownership, trading, and development of income-producing real estate assets (SA REIT, 2024). Jenkinson (2007) highlighted that the introduction of REITs represented a positive development from a financial stability perspective, as it expanded commercial property investment opportunities to a broader community of investors and concurrently mitigated the concentration of exposures to individual investment while enhancing trading opportunities. REITs were introduced in South Africa in 2013 (Boshoff & Bredell, 2013) and in South Africa there are special tax considerations associated with a REIT and through shares listed on the JSE it offers investors exposure to real estate (SA REIT, 2024). They have cemented their importance in the South African CRE market by growing from a market capitalisation of below R50 billion in 2004 to a high of around R435 billion in 2017, before retracting to around R250 billion market capitalisation in the middle of 2022 (Pilusa, 2023). Although the diversification benefits of REITs have been reported and analysed for many years (i.e. Kuhle, 1987 and Jenkinson 2007), it is also reported that publicly traded REITs cannot be used as a proxy for direct real estate (Black, 2004), while others indicated that there are some useful similarities (Boshoff, 2013a).

Real estate is considered an investment class with a particular purpose as reported by Hudson-Wilson, Fabozzi & Gordon (2003), namely:

- To reduce the overall risk of the portfolio by combining asset classes that respond differently to expected and unexpected events.
- To achieve absolute returns well above the risk-free rate.
- To hedge against unexpected inflation or deflation.
- To constitute a part of a portfolio that is a reasonable reflection of the overall investment universe (an indexed, or market-neutral portfolio).
- To deliver strong and relatively stable cash flows to the portfolio.

Vtyurina and Sowerbutts (2023) highlighted that while historically CRE has been perceived as an attractive asset, it has represented significant risks to the financial system due to funding vulnerabilities and broader spillover effects on the real economy. Zhu (2003) finds that during past episodes, the rapid expansion and subsequent downturn in the CRE sector significantly contributed to challenges within the banking sector. Large declines in commercial property values led to widespread decreases in profitability and a deterioration in asset quality across the banking sector, resulting in financial distress for many institutions. Similarly, Olszewski (2013) shows that the close correlation between the CRE sector and financial sector highlights that challenges within the CRE sector can have adverse effects on banks.

Geis and Luca (2021) including Deghi et.al (2021) finds there are several channels in which developments in the CRE market can affect financial stability and the broader economy. These channels include:

- High exposures by banks and non-bank financial institutions may put pressure on balance sheet positions.
- Tighter funding conditions resulting from deteriorating CRE asset quality and losses incurred by investors could dampen economic activity.
- The bank solvency channel.
- The collateral channel.
- The CRE debt and equity investment by nonbank financial institutions.

1.2. Bank Solvency and Collateral Channel

The commercial real estate (CRE) sector in South Africa does not have a property price index; thus, capitalisation rates are often used as a proxy for monitor changes in CRE prices. The sector is sensitive to interest rate fluctuations and rising interest rates have led to an increase in capitalisation rates albeit with a time lag (

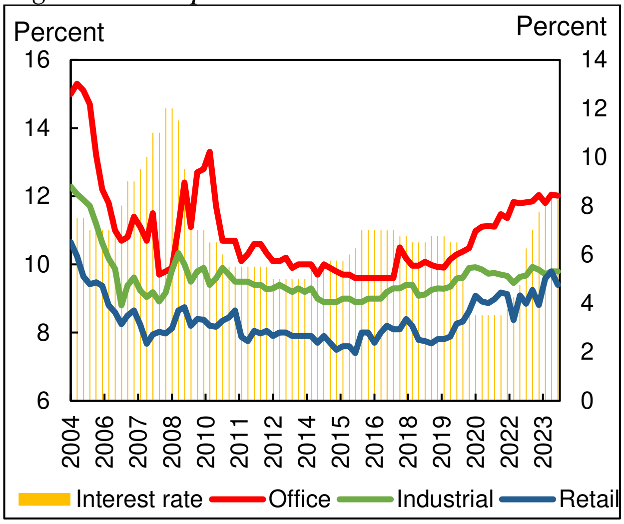
Figure *2*). This suggests CRE prices, especially for the office segment, are declining with both structural and cyclical factors contributing to this phenomenon.

Although there was a significant increase in bank lending to the sector from September 2022 to October 2022, remaining stable until August 2023, the downward trend in lending growth from the latter part of 2023 signals emerging challenges in securing financing for new projects and/or refinancing existing debt (Figure 3). This further exerts downward pressure on property valuations which could become a source of stress for the banking sector.

The effect of higher rates for longer is fast translating into higher credit risk. The non-performing loans have ticked up and remain above pre-pandemic levels (

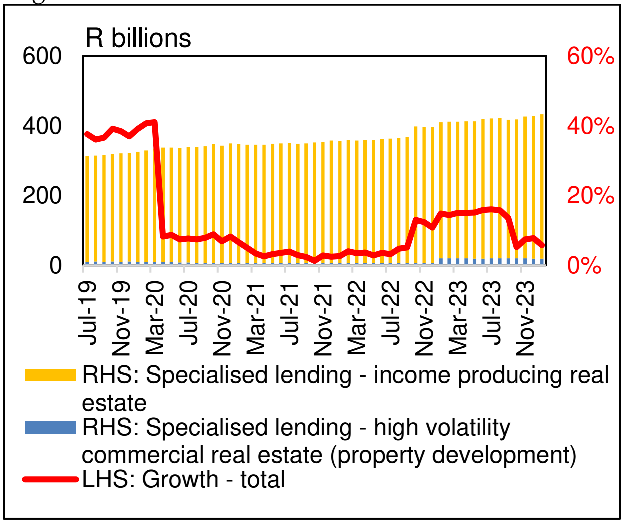
Figure ***4***). Considerable uncertainty around the outlook for the sector interacting with the higher-for-longer interest rates could lead to more pronounced credit risk, particularly for banks with large CRE exposures.

Figure 2: Capitalisation and interest rates



Source: Bloomberg and Rode & Associates

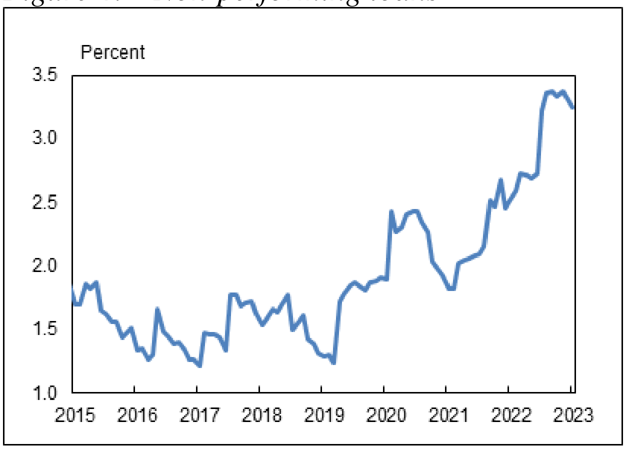
Figure 3: Total credit extended to CRE



Source: PA

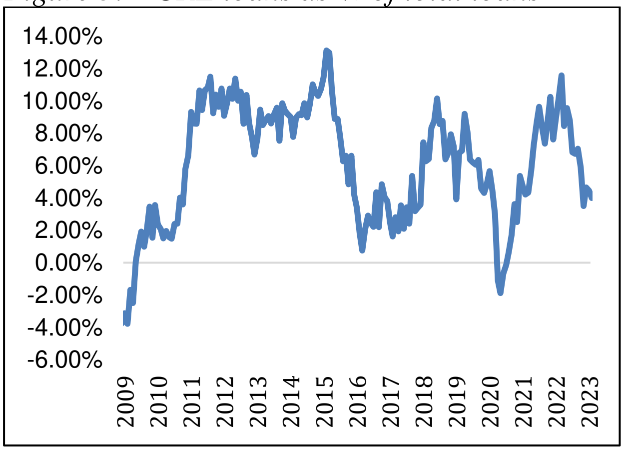
The year-on-year growth for CRE loan is on a downward trend indicating potential challenges in the sector. This decline may negatively impact banks and the broader economy.

Figure 4: Non-performing loans



Source: PA

Figure 5: CRE loans as % of total loans



Source: PA

1.3. NBFI Channel

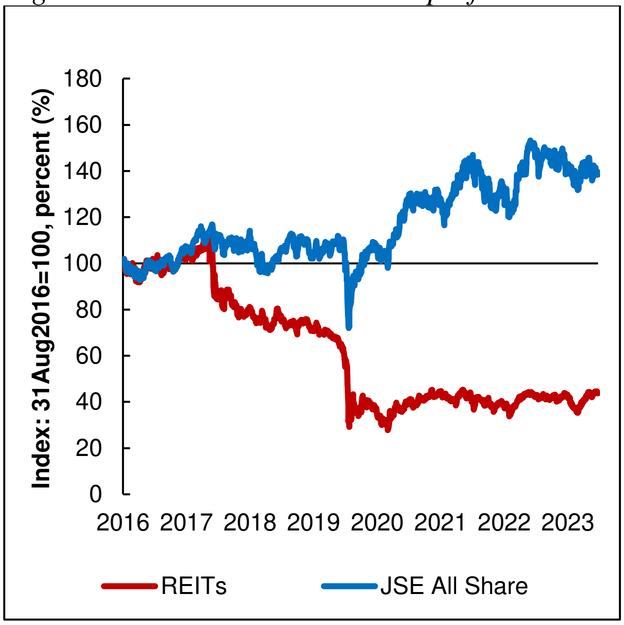
A rise in interest rates, combined with a decrease in demand for office space as working from home has become more prevalent, has lead to an increase in vacancy rates and a decrease in property values, causing concern in the CRE sector (ING, 2023).

According to the International Monetary Fund (IMF) a channel that could impact on financial stability is the commercial real estate debt and equity investments by NBFIs (such as insurers, retirement funds and investment funds). In the event of a decline in CRE prices, the value of assets held by investors would fall and they become reluctant or unable to provide new financing[1] Furthermore, such a decline could cause the fire sale of commercial real estate assets which, in turn, could lead to redemption pressure for investment funds. Factors that could influence CRE prices in a noteworthy way is the highly illiquid nature of CRE and the maturity mismatch of property investment funds (IMF, 2021).

The NBFI channel can amplify the bank solvency channel due to the high levels of interconnectedness in the financial system, specifically in South Africa. NBFIs are highly leveraged and some NBFIs rely on financing from banks (IMF, 2021).

REITs have become more prevalent in the CRE and should these companies need to sell property, suddenly or on a large scale, to meet redemption payments it could become a concern (ING, 2023).

Figure 6: REITs and JSE ALSI performance



Source: Bloomberg

CRE has been a topic of interest, particularly in relation to its implications on financial stability, with the channels of transmission shown in Figure 7. There are several research papers that have been written on the topic exploring the linkages between CRE and financial stability in various countries. These papers have provided valuable insights into the potential risks and vulnerabilities that CRE can pose to financial stability in different economic environments. On the other hand, while there are research papers on CRE in South Africa, there is lack of comprehensive studies that specifically explore the implications of CRE on financial stability for South Africa. This gap limits the understanding of potential risks and challenges that the South African financial system may face in relation to its CRE sector. This research paper addresses this gap and aims to help policymakers and market participants in developing effective measures to safeguard financial stability.

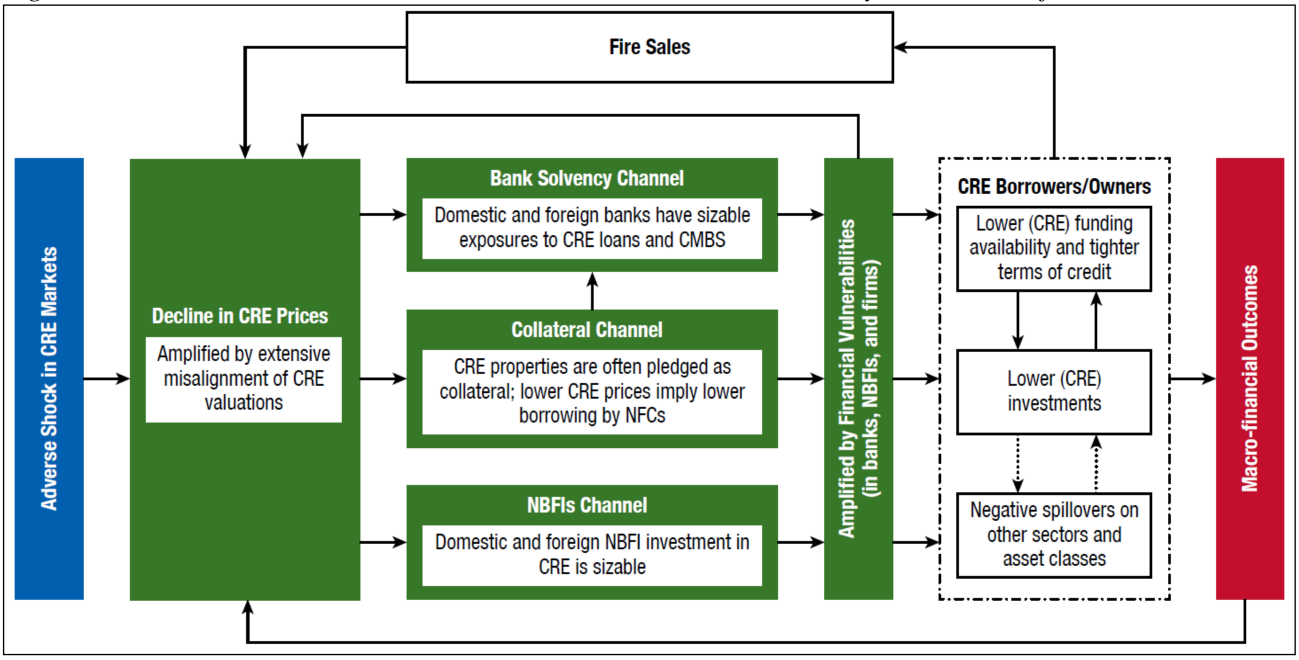
The unique characteristics of real estate create, on the one hand, many opportunities for real estate investors, and, on the other, many difficulties. The different factors influencing the behaviour of real estate should therefore be investigated carefully. DiPasquale and Wheaton (1992: 181) stated that analysing the market for real estate presents challenges because of the inter-relation of space- and asset markets.

The earliest recording of work that distinguishes between use decisions and investment decisions with respect to real estate was probably Weimer (1966), but Hendershott and Ling (1984) were the first to integrate space- and capital markets into real estate. Corcoran (1987) graphed the space market and capital market of real estate separately, but interdependently, explicitly distinguishing between the short- and long-run supply of space. DiPasquale and Wheaton (1992) and Fisher, Hudson-Wilson and Wurtzebach (1993) further refined this model, which is referred to as the diagrammatic model by Viezer (1999: 504), which in turn developed a model that similarly describes the space and asset markets in the property sector by way of econometric stochastic equations, referred to as the Real Estate Econometric Forecast Model (REEFM). The model by DiPasquale and Wheaton (1992) was officialized in a textbook on property economics as the FDW-model, the most

[1] For insurance companies it is not reluctance rather the fact that they are subject to regulatory solvency constraints.

detailed treatment found in a seminal textbook. The principles of space and capital markets were tested for its applicability in a South African context by Boshoff (2013b).

Figure 7: Commercial Real Estate Markets and Financial Stability: Channels of Transmission



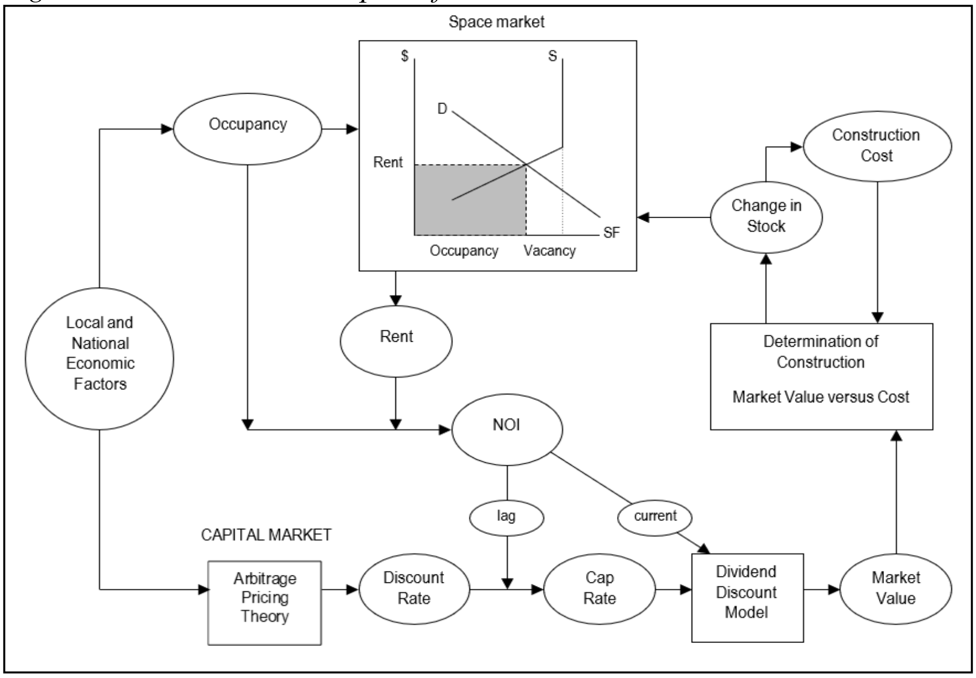
Source: International Monetary Fund, 2021:54

2. METHODOLOGY

Viezer (1998) developed an econometric model for the integration of real estate's space and capital markets – the Real Estate Econometric Forecast Model (REEFM). The conceptual framework of REEFM is illustrated in Figure 8, which provides an overview of the driving factors that would impact on the equilibrium price levels within real estate. The REEFM framework depicts local and national economic factors, and for developing countries international economic factors, to be influencing occupancy of space as well as the capital market, which can be measured through arbitrage pricing theory. Occupancy levels influence the equilibrium price of rent, which is in turn also dependent on the existing supply of stock. The equilibrium rent, together with occupancy levels influence the net operating income, which also assumes operating expenses to be deducted from gross income.

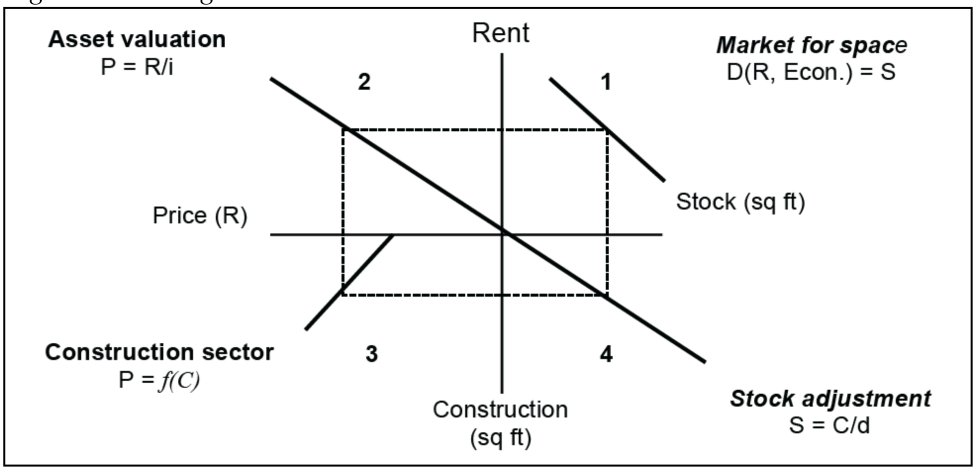
The net operating income is, through the capital market dynamics which determines discount rates and capitalisation rates, determining the market value of assets. Through a comparison of market value in relation to construction cost, new construction or development can take place. This would typically take place when market value is higher than construction cost, i.e. it is profitable to do new developments. With a higher demand in construction, the equilibrium price of construction might be adjusted, which in turn impacts the amount of new construction that will take place. With new developments, the amount of existing property stock or space is adjusted, which feeds back into the equilibrium price of space due to the higher supply and possible vacancies created.

Figure 8: REEFM's conceptual framework



Source: Viezer, 1998: 107

Figure 9: Diagrammatic FDW-model



Source: Archour-Fischer, 1999:38

The workings of space and capital markets can also be explained by the FDW-Model as provided in Figure 9. The FDW-Model consists of four quadrants, with the first being the market for space, assuming the equilibrium price of rent, which is influenced by economic factors. This is carried over to quadrant 2 where asset valuation is taking place at the applicable capitalisation rate, depicted by the slope of the valuation line and generally observed in the market through sales, or determined through other models such as arbitrage pricing theory or the capital asset pricing model. The value of assets is carried forward to quadrant 3, observed as the intersecting point with the x-axis. The construction function has its origin on the x-axis at the minimum price of construction that would initiate new developments, if the value of assets is in excess of this intersecting point, bearing in mind the flipped display of the quadrant, new construction will take place which would create new stock. This is carried over to quadrant 4, the stock adjustment, or supply side of space, which will then close the loop to feed back into quadrant 1 where the equilibrium price of rent is determined.

These models provide a good base to evaluate market performance, especially with consideration to the equilibrium price levels when data is analysed over time. When considering the mentioned models, it is necessary to take note of the leads and lags that exists in the market. Real Estate by definition is very illiquid, and is considered to be fixed in supply in the short run, and even in the long run, easier to adjust for increasing demand while very difficult to adjust for decreasing demand. Thus equilibrium prices would initially adjust upwards with higher demand, causing new construction and additional stock, limiting the further increase in price, but with reduced demand, the oversupply remains, causing a rapid adjustment in the equilibrium price, which is difficult to overcome. The price of rent and ultimate values are therefore quicker to adjust downwards than upwards, with corrections for improving markets being slower than for deteriorating markets. This is especially due to the time aspect of adjustments i.e. in the planning and construction period of new space. Planned and undergoing developments tend to be completed even with down turning or saturated markets, causing an exacerbated oversupply on completion.

The analysis in the following section will show the various datasets in order to evaluate the property market in South Africa in line with the recommended REEFM and FDW models. Rent is deflated by a GDP price index in order to have real rent that is comparable over time. After deducting expenses and vacancies, the Net Operating Income is capitalised to obtain the induced values, which should provide an indication of demand for new stock, and is compared to construction. Stock adjustment takes place by also comparing construction activity to total stock after depreciation or removals. The equilibrium price is then evaluated by comparing the real rent to GDP/m^2 of stock, which enables concluding remarks.

3. ANALYSIS

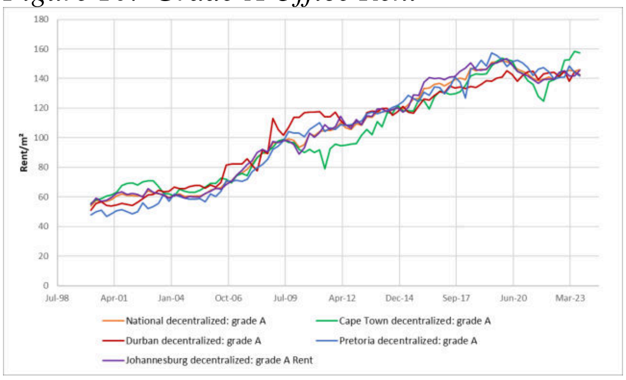
Viezer (1998) developed an econometric model for the integration of real estate's space and capital markets –

3.1. Determination of Rent

When analysing the market by way of either the REEFM or FDW models, the departure would be the price of rent.

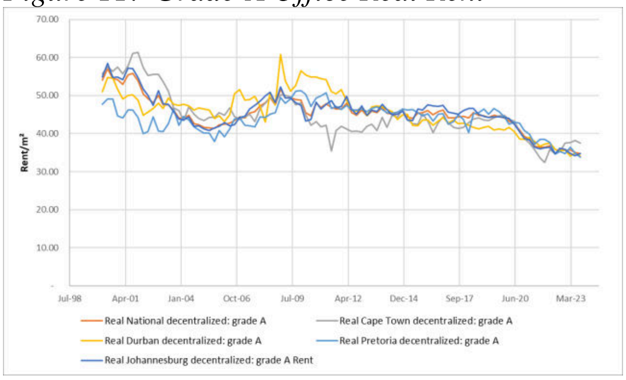
Figure ***10*** provides the change in rent over time for A-grade offices in the major economic centres in South Africa, while Figure 11 provides the real rent after deflated by a GDP price index. From Figure 11 it is evident that the real rent varies over time, and change also for different geographical regions. It would thus be necessary to also consider the local economic factors when analysing local rental levels, such as impact of specific local conditions (refer Boshoff, 2017).

Figure 10: Grade-A Office Rent



Source: Rode Time-series Pro

Figure 11: Grade-A Office Real Rent



Source: Author's Calculations

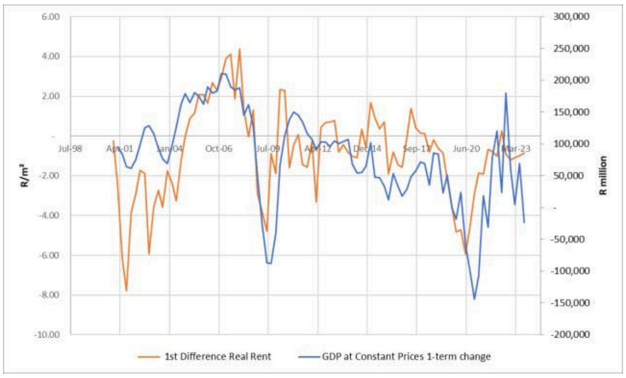
At the National level, the long-term average real rent is approximately R45/m^2 at constant 2000 prices. This has, however, reduced from a high in 2000 of R56/m^2, to R44/m^2 in June 2005, when a property surge was experienced up to the end of 2009, when priced peaked at R53/m^2. Since 2009, prices reduced to a level where it hovered around R45/m^2 until 2020, from where it had a rapid decline to R33/m^2 and the latest R32.50/m^2. It is thus evident that real rent is well below the long-term averages, with the reason for that and the expected future movement to be investigated. When comparing real rent to economic activity, the 1st difference real rent has a correlation of 0.45 to the 1st difference of real GDP at a 10 quarter lag, and 0.39 at a 4 quarter lag. The difference between the two is due to the rapid downturn adjustment, with slower upturn adjustment. Also, it lowers both correlations, which if the upturn and downturn were equally (in)efficient, the correlation would probably have been much higher. Visually the movement of the two datasets over time is displayed in

Figure ***12***, where the co-movement is evident, with real rent pulled forward by 4 quarters to eliminate the visual impact of the lag, and the period from 2nd quarter 2020 to 4th quarter 2021 removed from GDP as being considered as outliers due to the severe impact of COVID and skewing of the results. It is further evident from

Figure ***12***, that the post-COVID recovery in GDP was short lived, with the subsequent reduction in the 1st difference. This suggests that the reduction in real rental decline would probably not see an immediate positive, thus real rental growth to remain negative until a longer term improvement is seen in the GDP growth.

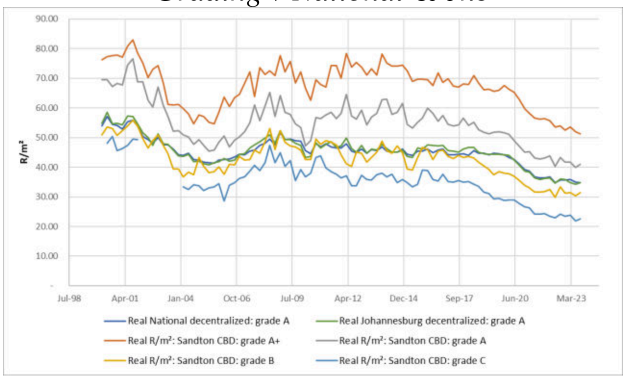
If, however, the rentals of different grading of office space isare considered, as provided by Figure 13, with the Sandton property taken as example, it can be seen that the different gradings are also performing with different levels of sensitivity to external factors. The national average for Grade A and the Johannesburg average Grade A office market moved in a very similar pattern as Sandton Grade B offices. Thus, any office user can choose to occupy a decentralised Grade A office, or a Grade B office in Sandton for the same price. Furthermore, the Sandton B grade offices and Johannesburg and National A grade offices had a very flat movement 2008 to 2018, while Sandton Prime grade offices had a general increasing price until 2012/13 and then a general decline to date. Sandton A grade offices were in-between, being less stable than B grade, but more than Prime. The general decline in real rentals, caused offices to be generally more affordable in real terms, with a Prime grade office in Sandton at just about the same cost than a B grade office 15 years ago, back in 2009, or substantially less than the long-term equilibrium price of A grade offices in Sandton, and just about the same price as the long term decentralised A grade office in less popular nodes. Furthermore, all gradings are at a lower real rental level than the lowest previous levels achieved in 2005. It is this substantially lower real rental levels which questions the sustainability of the current price levels, suggesting that a correction should be expected at some stage.

Figure 12: Grade-A Office Real Rent in Major Centres



Source: Author's calculations

Figure 13: Sandton Real Rent for Different Grading v National & Jhb



Source: Author's Calculations

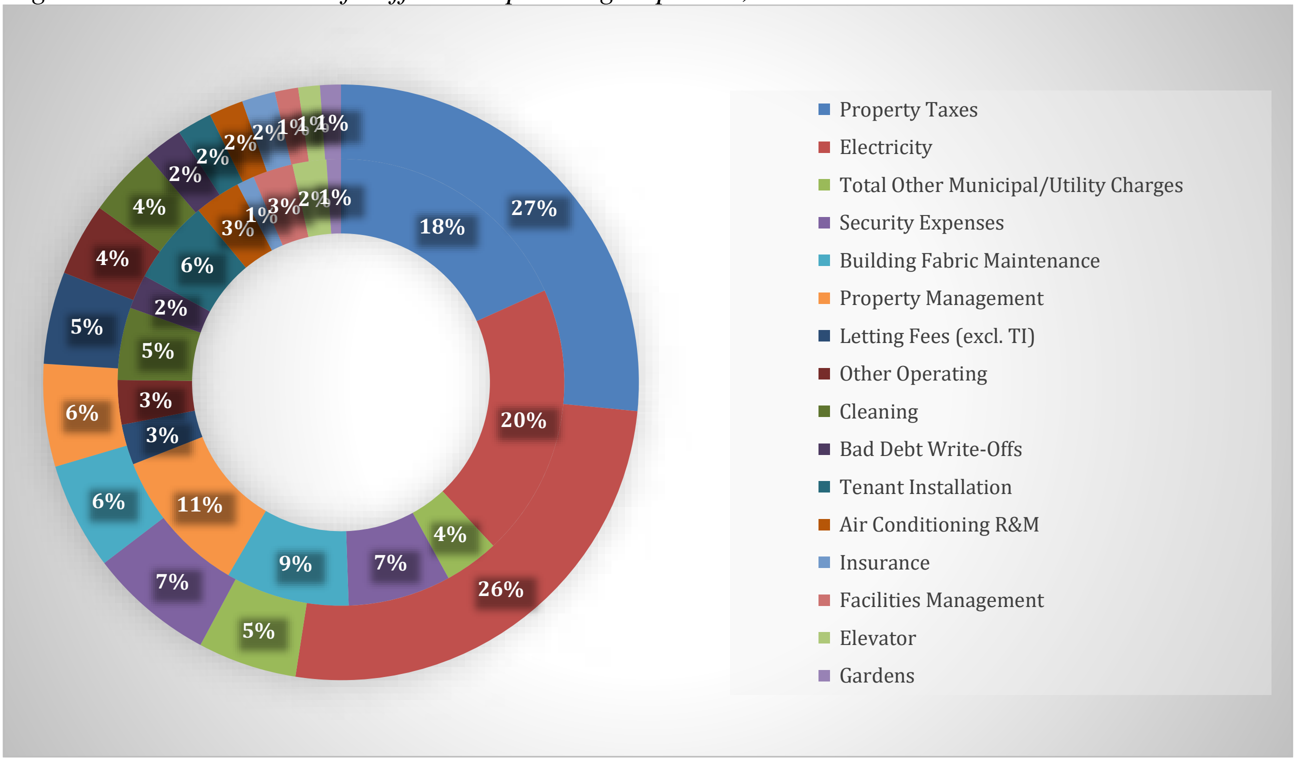
The rent as explained so far, is unfortunately not the full picture. The REEFM indicates that Rent together with Occupancy influences net operating income (NOI). For this purpose it is necessary to evaluate operating expenses as well as vacancies, which is deducted from gross rent to calculate NOI.

Figure 14 provides a comparison of the contribution of different operating expenses, with the 2000 contribution on the inside and the 2022 contribution on the outside.

Figure ***15*** provides the operating expenses deflated by CPI in order to evaluate the total impact on NOI. It is evident that the main cost is property tax, which took over as the main expense from electricity, which was highest in 2000, but now is the second highest cost. It is still, however, part of municipal expenses, which with other municipal charges totals 58% of all expenses, up from 42% in 2000. In real terms, all expenses excluding municipal utilities and charges averaged R10/m^2 at constant 2000 prices, although it had a gradual increase to R12/m^2 due to inflationary pressure as per the latest cost publication by MSCI. Municipal charges on the other hand, had a cost of below R8/m² prior to 2009, increasing after that to over R16/m², thus more than doubled over the period, also at constant 2000 prices.

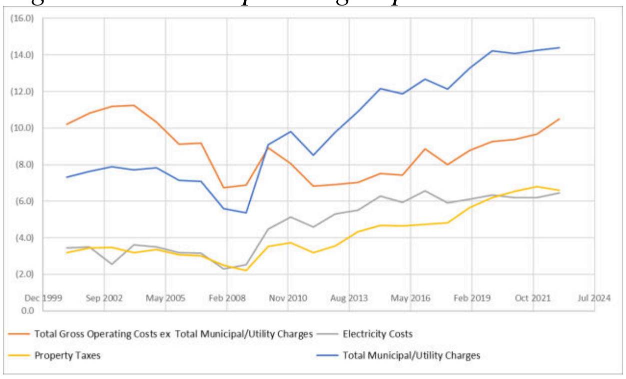
It should be noted though, that electricity expenditure is usually for the cost of the tenant, thus, although it has a negative impact on the cost of occupation, it is not deducted from gross income to determine NOI. The total impact can therefore be taken as R12/m² for expenses other than municipal charges, plus R8/m² for property rates, or a total of R20/m². The total indicated operating cost for valuation purposes is provided in Figure 16.

Figure 14: Contribution of Different Operating Expenses, 2000 v 2022



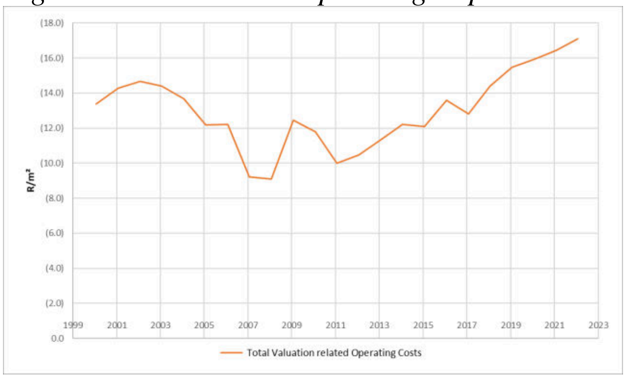
Source: MSCI

Figure 15: Real Operating Expenses



Source: Adapted from MSCI

Figure 16: Total Real Operating Expenses



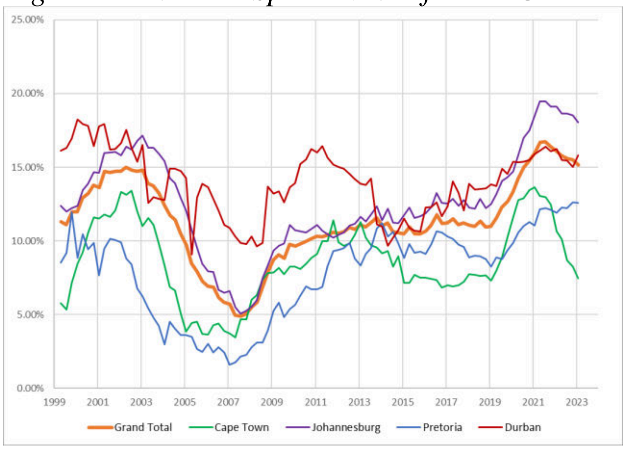
Source: Adapted from MSCI

The last aspect of the impact on NOI to consider is vacancies. The total vacancies over time for the main metropolitan areas are provided in

Figure *17*. One of the difficulties with assessing vacancies, is the impact on expenses. Although it is clear that vacancies cause a loss of income due to the absence of tenants paying rent, vacancies could have an impact on expenses, whereby some expenses reduce, such as property management fees or mechanical wear and tear costs due to lower usage of equipment, while some might even increase, such as security, whereby the lower activity at a premise might cause an increased risk of vandalism and requirement for security. Others, such as property rates are, however, unaffected. It is thus difficult to evaluate expenses from a market valuation perspective in terms of how it is being affected by vacancies, i.e. should income be adjusted and the full stated operating expenses cost be deducted, or should expenses be deducted from the full income and the net income be adjusted for vacancies. The former is a more pessimistic view and would result in a lower NOI, and the latter a higher NOI. In reality, the actual result would be somewhere in the middle. For purposes of this, the NOI is adjusted for vacancies, whereby it is assumed that expenses, as for income, is reduced in line with vacancy movements.

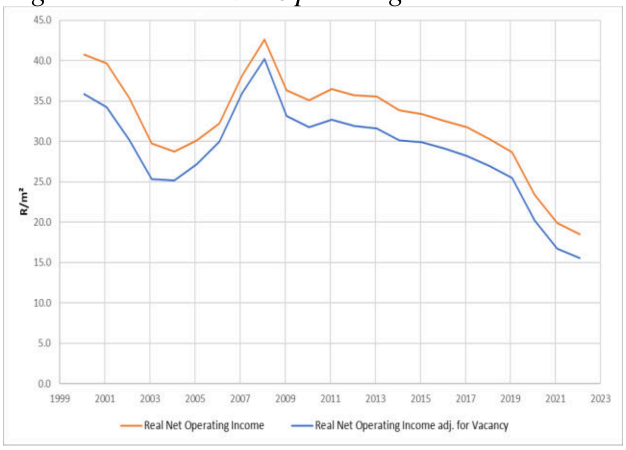
Taking the impact of operating expenses and vacant space into consideration, the Net Operating Income of all properties can be determined, assuming the total MSCI portfolio's expenses is a representative sample of all property. The result is a fairly dire situation as can be viewed from Figure 18. From this it can be seen that the property slump in the early 2000's caused Real NOI at constant 2000 prices to reduce from R40/m^2 to just above R30/m^2, from where the property boom in the latter half of the decade caused real NOI to increase again to over R40/m^2. Since then, real NOI is on a downward trend to end at below the previous bottom at R28/m^2 just before COVID, from where the downward trajectory accelerated to a current level of below R20/m^2, or R15.50/m^2 after adjusting for vacancies, almost half of the already record low level just before COVID.

Figure 17: Vacant Space as % of Total GLA



Source: SAPOA as recorded by MSCI

Figure 18: Real Net Operating Income



Source: Author's Calculations

3.2. Asset Valuation

In order to perform the asset valuation function as per the second quadrant of the FDW, it is necessary to capitalise the rent as determined in quadrant 1 at an appropriate capitalisation rate. The REEFM calls for a bit more complicated application whereby discount rates should be determined through arbitrage pricing theory, which would be used to specify the capitalisation rates used to calculate market value from the NOI. A general application for determining discount rates would also be the capital asset pricing model. The Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT) are two frameworks used in finance to understand the relationship between risk and expected return of investments. While both have the same goal, they differ in their approach:

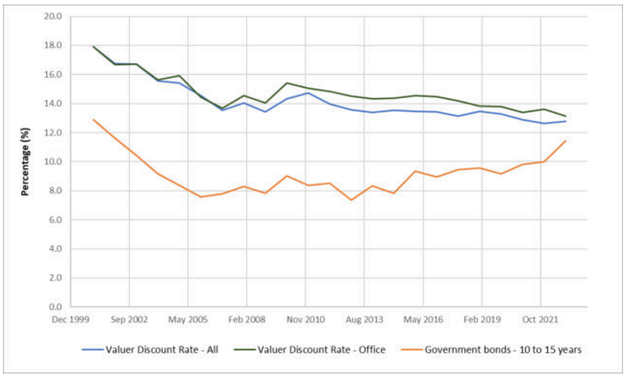
CAPM is a single-factor model, meaning it considers only market risk (the risk of the overall market) to explain the expected return of an asset. The Capital Asset Pricing Model (CAPM) originated in the early 1960s and was developed through various contributions (Sharpe, 1964; Treynor, 1961, 1962; Lintner, 1965, Prager & Lintner, 1965; Mossin, 1966), built upon earlier research in modern portfolio theory by Markowitz (1952), which laid the groundwork for understanding risk and return in investment portfolios. While CAPM has faced critiques and limitations, it remains a foundational concept in modern finance, especially for portfolio analysis and risk assessment. The CAPM assumes a perfectly efficient market where all investors have the same information and act rationally.

APT is a multi-factor model, acknowledging that multiple factors beyond just market risk can influence asset returns. These factors can be macroeconomic (e.g., inflation, economic growth) or company-specific (e.g., profitability, size). Unlike CAPM, APT doesn't specify the exact number or identity of these factors. Also, unlike CAPM, which has a clear origin story with specific seminal papers, APT doesn't have a single, definitive paper credited with its introduction. Instead, the development of APT occurred gradually through the work of several researchers over time. The work of Ross (1976) is often cited as the first formal presentation of APT. It introduced the key concept of arbitrage pricing theory and outlined the basic framework for this multi-factor model. Roll and Ross (1979) further developed APT by introducing the concept of factor risk premiums and providing a more rigorous theoretical foundation for the model. While not directly introducing APT, Black (1972) provided a crucial theoretical framework for the multi-factor approach by demonstrating that asset returns could be explained by multiple sources of risk. It's important to note that APT is an evolving theory, with numerous researchers who have contributed to its development and refinement. Additionally, compared to CAPM, APT lacks a single, universally accepted definition or set of equations. This flexibility offers a more complex and potentially more accurate representation of the market, but it also comes with challenges in implementation and interpretation. This, however, makes it particularly useful also for interpretation in a real estate context, as applied by Viezer, and suggested by Boshoff & Cloete (2012) to be measured in the listed property market for implementation in the direct property market.

The REEFM indicated that APT be used for the determination of Discount Rates, which in turn is used for the determination of Capitalisation Rates. The FDW-model also specifies that Capitalisation Rates be used for the valuation of space. It should be noted that the difference between Discount Rates and Capitalisation Rates are in the fact that Discount Rates are a Total Return over the life of an investment, opposed to Capitalisation Rates that are first year yields, i.e. a type of price earnings ratio, whereby a fixed term's income, such as the first year, is capitalised to a total investment value. The relationship between Discount Rates and Capitalisation Rates can generally be measured by expected growth of earnings, i.e. the income growth rate, which is added to the first year's yield to provide a total return (refer Gordon, 1959). With the Discount being a total return, it is compared to the risk free rate, typically government long term bond yields, which is also considered to be a total return, but on a different investment. In accordance with APT, the risk premiums for property, location, property type, etc. is added to the government bond yield to determine the Discount Rate. Capitalisation Rates can then be determined by deducting the expected long term growth rate from the Discount Rate, or alternatively, Capitalisation Rates are observed in the market through sales activity, dividing the first year's income into the sales price, which would also provide an opportunity to get a view of the market's expected growth if this Capitalisation Rate is deducted from the Discount Rate.

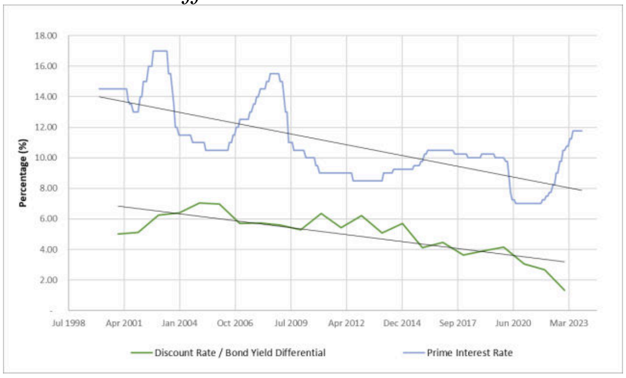
Error! Not a valid bookmark self-reference. provides a comparison to long term Government Bond Yields and Discount Rates for All Property and Offices specifically. It is evident that there appears to be a close correlation initially, but then Bond Yields started to increase, while Discount Rates continued to reduce. In fact, a regression of Discount Rates to Bond Yields reveal an r^2 of over 0.8 up to 2014, from where it reduced to a mere 0.23 in 2022. To attempt an explanation of this, the Discount Rate and Bond Yield differential (risk premium) is compared to the Prime Interest Rate over time. The argument is that as interest rates change, due to the long term structure of property investment, the security value and the leverage opportunity, the cost of capital would change the perceived risk premium. As per Figure 20, although there is not a clear direct correlation between the Discount Rate / Bond Yield differential and Prime Interest, both is clear to have a long term downward trajectory, although the clear opposite movement in some short term periods are concerning and questioning this relationship.

Figure 19: Discount Rate v Government Bond Yield



Source: SARB, MSCI

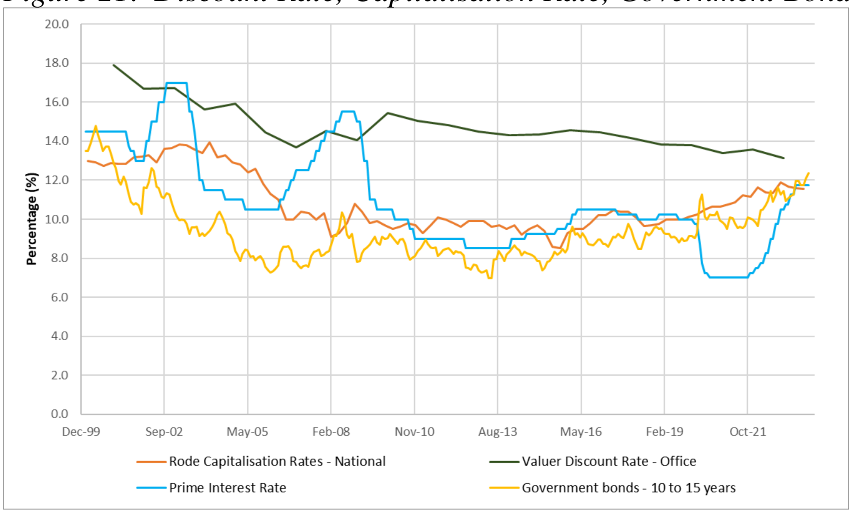
Figure 20: Discount Rate / Bond Yield Differential v Prime Interest



Source: SARB, Author's Calculations

As an alternative explanation, Figure 21 provides the Capitalisation Rates also overlayed with Discount Rates, Bond Yields and the Prime Interest Rate. From this, Capitalisation Rates are moving much closer with Bond Yields than Discount Rates. Valuers are, therefore, taking into consideration the movement in Bond Yields and Prime Interest rates, which both influences the cost of capital of property investors through cost of equity and cost of debt, and adjust property values accordingly. This would be expected through the observation of sales in the market, with comparable sales being the primary method of valuation preferred by courts (refer cases Minister of Water Affairs v Mostert 1966 4 SA 690 (A) 723F; Estate Marks v Pretoria City Council 1969 3 SA 227 (A) 253H-254B). The reduced differentially between Discount Rates and Capitalisation Rates suggests that valuers perceive the expected growth to be declining, or otherwise stated, investors would be willing to accept a lower future return than what was traditionally acceptable when transacting with property. This explanation might find support in the theory of recency bias (refer Tversky & Kahneman, 1973), whereby valuers are anchoring to the recent low, and negative growth of property income, and adjust their growth expectations downward. With this, the lower growth expectations are built into cashflow forecasts, and also added to perceived Capitalisation Rates to calculate Discount Rates, rather than the other way round, i.e. taking the total return expectations, which is based on long term Bond Yields plus risk premium, and considering the difference to Capitalisation Rates as the market's perception of growth expectations. Either way, there appears to be a disconnect between Capitalisation Rates and Discount Rates and the way it is implemented in valuation practice. For purposes of this, Capitalisation Rates would be used, as being considered more likely to be accurate, and more readily observable in the market than Discount Rates, which are based on more assumptions and uncertainty.

Figure 21: Discount Rate, Capitalisation Rate, Government Bond Yield & Prime Interest



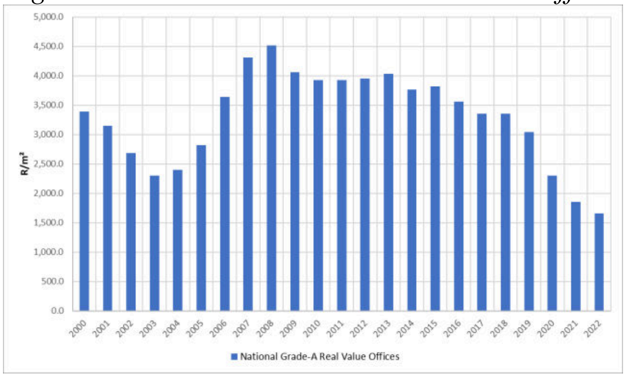
Source: SARB, Rode, MSCI

3.3. Construction Cost V Value & Stock Adjustment

Figure *22* provides the values as estimated to be the national average for grade-A office space. These values, according to Viezer, would dictate construction activity by comparing the values to construction cost. Figure 23 provides the real construction cost over time of buildings completed, by dividing the value of buildings completed in Rand terms by the square meters of buildings completed for any given period and then deflating this by CPI. In

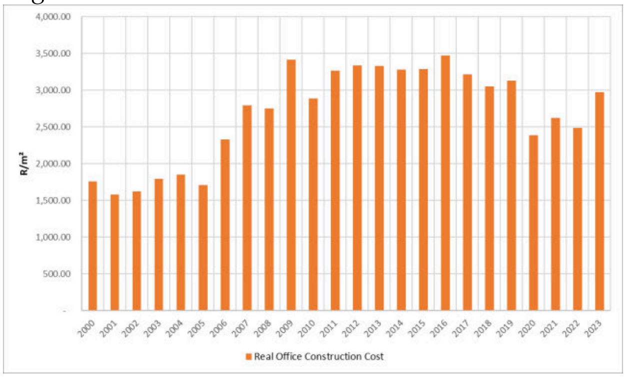
Figure *24*, the values are compared to construction cost.

Figure 22: National Grade-A Real Value Offices



Source: Author's Calculations

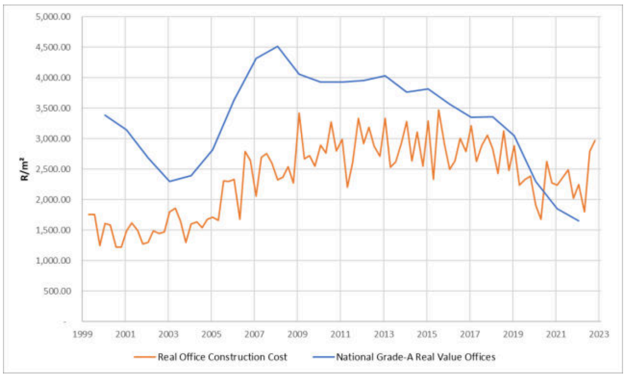
Figure 23: National Grade-A Real Constr. Cost



Source: Author's Calculations

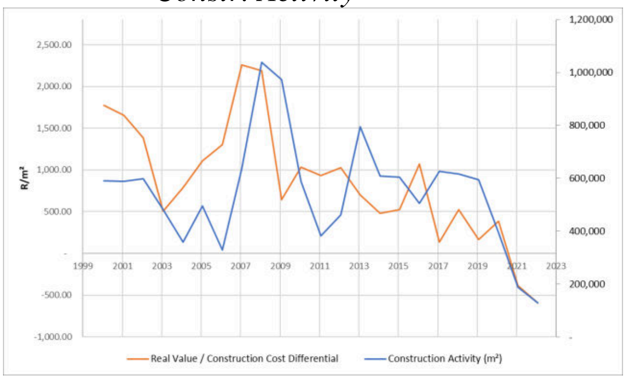
Figure 25 provides the differential in real values to real construction cost in Rand per square meter and comparing this to the actual square meters of buildings completed. It is evident that there is a similar general movement, thus in the longer-term values would dictate construction activity. At a one-year lag, the correlation (r) between the two variables is 0.576, indicating that 33% of the movement in construction activity can be explained by the movement in values of offices, at a one-year lag, based on the r². This would confirm Viezer's observations. It is, however, also evident that real construction cost increased over time, suggesting that construction became more expensive, either due to the type of construction, or that construction cost in reality inflated well above CPI. Most of this substantial increased happened, however, during the early 2000's, when values also surged, suggesting that more luxurious construction took place, due to the boom experienced in the market, with a gradual reduction again when the market started to decline. It is thus evident that construction cost would also be influenced by values, which would also impact on the actual volume of construction activity taking place, As also observed by Viezer.

Figure 24: Grade-A Real Value of Offices v Constr. Cost



Source: Author's Calculations

Figure 25: Office Value / Constr. Cost Diff. v Constr. Activity

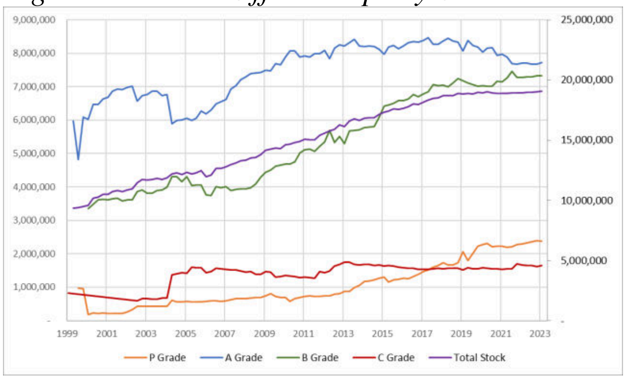


Source: Author's Calculations

With new stock added to the market, the supply/demand equilibrium price is adjusted. New stock would add vacant space to the market, which needs to be filled by existing users of space and can thus be measured by considering the relationship between vacancies and real rent. In order to evaluate this, it is first necessary to give consideration to the total property stock, which is provided by

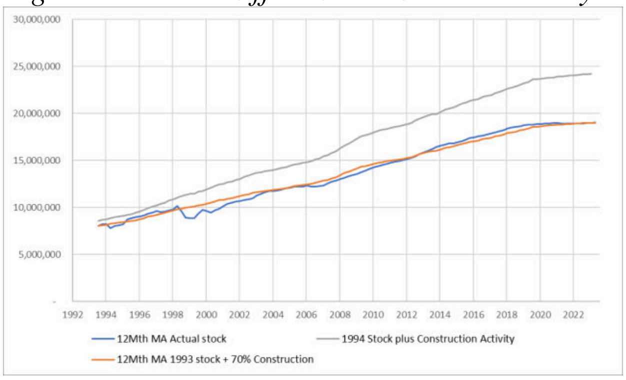
Figure *26*, showing the different grades of office stock, as well as the total stock. It is evident that the individual grades of office stock are increasing and decreasing over time, sometimes with large jumps, but also seen as in different directions for different gradings. The total stock has a fairly even increase over time, though. This would be due to the reclassification of gradings over time. A further observation is that the total property stock had a fairly even increase over the years, but then showing a flattening curve since 2019, which coincides with the drop in property values, and the reduction in construction activity. Of interest though, is the fact that it appears as if no new stock is recorded, but construction activity is still taking place. Figure 27 investigates this by comparing the 1994 total property stock and adding the total office buildings completed to this, i.e. assuming that all new construction is adding to the total property stock. It is evident that this increases the deemed stock to be much higher than actual stock. If, however, 70% of construction activity is added, a graph that very closely follows actual stock is observed. This suggests that 30% of construction activity is for the purpose of replacing depreciating stock, and thus, with the current level of construction activity that is much lower that the long-term depreciating stock, a reduction in property stock can be expected.

Figure 26: Total Office Property Stock



Source: MSCI

Figure 27: Total Office Stock Constr. Activity



Source: Stats SA, Author's Calculations

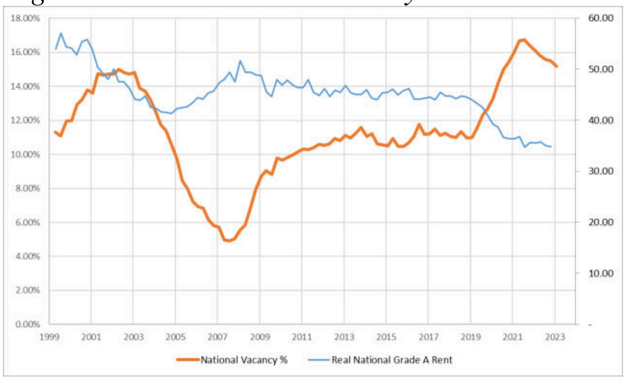
4. SUMMARY

The REEFM and FDW models provided the necessary background to understand the behaviour of real estate over time. The question to be raised is, where are we in terms of market equilibrium at the moment, and what are the factors that are standing out as risk contributors?

Figure *28* provides an indication of real rent plotted against vacancies. It is evident from this that the market is more volatile pertaining to vacancies than real rent, but it also suggests that the latest reduction in vacancies are not seen in the adjustment of real rent yet. Figure 29 provides the long-term performance of Gross Domestic Product divided by total property stock, to give an indication of the GDP/m² produced (the two severe downturn quarters in June and September 2020 were averaged out to avoid the distortion caused by the short term), (also refer Boshoff, 2010 for analysis on the residential market). The argument is that the higher the GDP/m², the higher the real rent, i.e. due to a shortage of space and a need for an expansion in the property stock for purposes of production in the economy. Assuming that the market was in equilibrium in 2000, the comparison of real rent to GDP/m² can be seen over time, where a similar directional movement is evident, but with a lag, but also some periods of disequilibrium. Real Rent is observed to lag approximately 13 quarters behind GDP/m², with an r^2 of 0.7023, Figure 30 displays the rent against GDP/m² with a lag of 7 months (i.e. rent moved forward by 7 months), but also shows a spread of GDP of approximately R20,000//m² within which real rent moved over time. It is evident that there are time periods of moving outside the spread, which is typically followed by a correction. This suggests that a correction was in place at the start of the graph in the late 1990's, which might have been due to the volatile interest rate, and other economic disturbances at the time. Real rent started to see a significant decline with GDP/m² at the start of 2000, which was probably caused by the dampening effect of the historical peak in interest rates in 1998 of 25.5%. Interest rates dropped very fast afterwards to 14.5%, followed by an economic and then property upturn, until the Global Financial Crices in 2008, whereafter the economy was on a slowing path in terms of GDP/m^2 for most of the remaining period until COVID, which indicates that additional property stock was added faster than economic growth. Property real rent moved mostly sideways after 2008, rather than following the downward GDP/m² trend, which might be what caused a significant downward trend during and after COVID, when the market acknowledged disequilibrium. This oversupply is also evident in

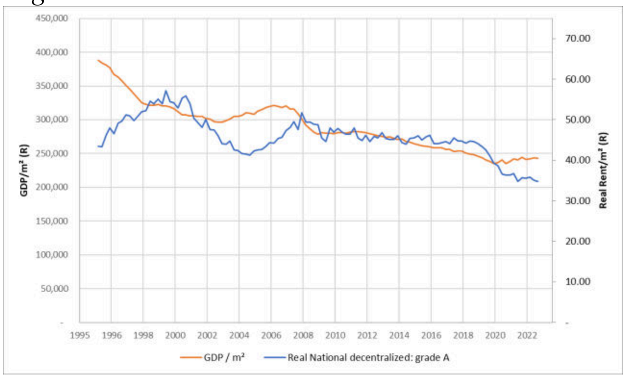
Figure ***24*** and Figure 25, showing the value to construction cost variance compared to construction activity. Real values started to reduce, but construction activity continued at a level in excess of apparent need. With the 2020 downturn in the property market, it appears as if real rent just corrected itself for a long-term reduction in economic activity. The way forward would be in the unfeasible new developments causing the construction activity to reduce to record lows. This would cause a take-up of vacant space as depreciation of existing stock continues, and some stock is converted to alternative use. Any economic growth would supplement this, causing an increase in the GDP/m² level.

Figure 28: Real Rent v Vacancy



Source: Author's Calculations

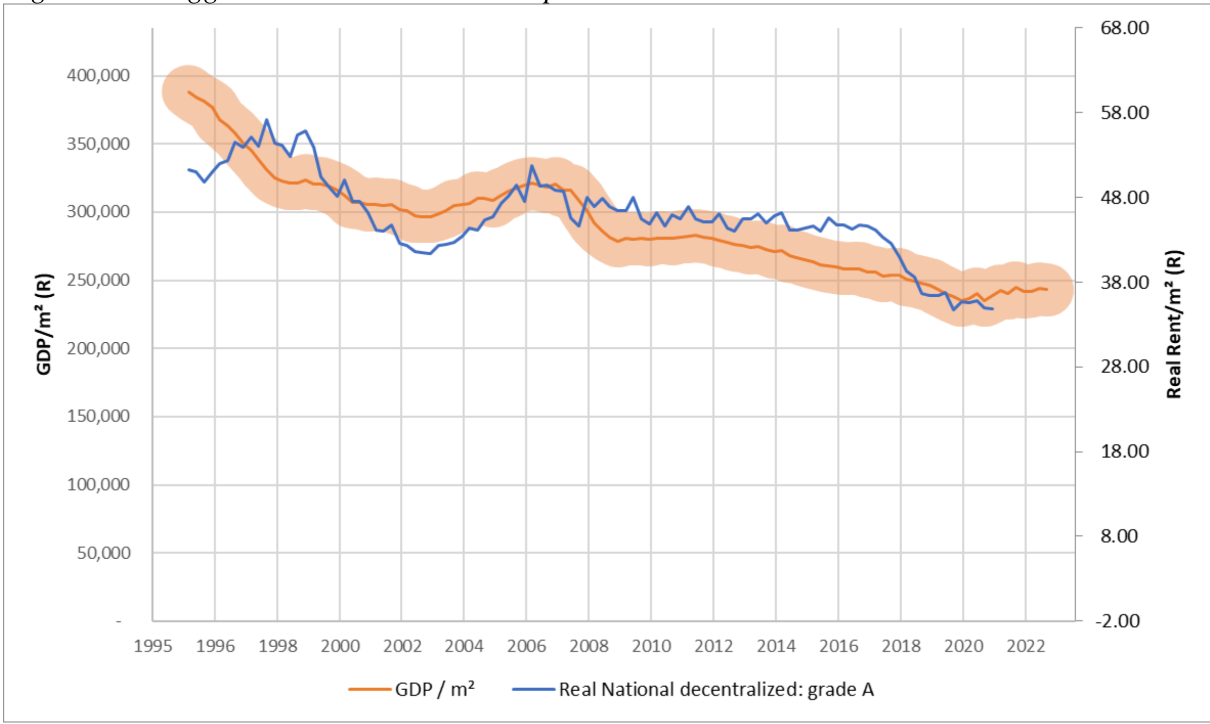
Figure 29: Real Rent v GDP/m²



Source: Author's Calculations

Given the lag in GDP/m² to predict real rent, it is estimated over the next three years that the equilibrium price of approximately R38/m² to R39/m² to be achievable from the current R35/m², thus at least maintaining the real rent level, with a gradual R3-R4/m² correction. A caution to this is that construction activity might slow down this correction, with building plans passed suggesting that up to 140,000m² of additional stock might be added to the market, after adjusting for depreciation. This would indicate an equilibrium price by December 2027 of R38.80/m² real, or R193.87/m² nominal, assuming an inflation adjustment going forward of 4.5% per year, or nominal rental growth of 6.92% per year until then. Real rent is then expected to further increase to R40.72/m² by December 2031, indicating nominal rent at R243/m², or an annual growth of 5.77% from 2027 to 2031.

Figure 30: Lagged Real Rent v GDP/m² Spread



Source: Author's Calculations

Although the stabilising real rent, or potential growth in nominal rent, given the various relationships discussed earlier, sounds promising, a significant negative impact to this is operating expenses. As evident from

Figure ***15***, operating expenses, even in real terms, are increasing at an alarming rate. Property Rates, as the largest contributor to expenses, are also the fastest increasing, with a real growth of 8.11% per year since 2008, translating into a 14.3% increase per year in nominal terms. Given the meagre income growth experienced since then, and expected in the future, this situation is unsustainable and a significant cause for concern. The net income remaining to fund cost of capital from investors and debt, is shrinking, and also causing a significant impact on valuations, causing the security of these assets to come under pressure. If operating expense growth would continue at the current rate, predictions are that even with the stabilising income, real values would reduce by a further 30% over the next 8 years due to expense growth. In nominal terms, that translates into a movement of R7,622/m² in December 2023 to R7,600/m² in December 2031.

Given the above, construction activity is expected to remain under pressure, with no hope of a recovery, other than some minor depreciation replacements, defensive capital to be spent and conversions to different uses. Financially it is expected that no projects would in the short to medium term be viable due to the value to construction cost differential that is negative, and appears to grow into more negative levels. This is a significant concern for job-creation, with the construction sector being a big source of unskilled and semi-skilled labour, which would have a lot of impact on affordability of personal debt, as well as personal savings, from where capital formation can be funded in the economy, not to mention indirect and induced impacts of this.

Given the growth expectations in gross income, and the forecasts that interest rates should stabilise, it is expected that capitalisation rates should equally remain stable. The negative real growth in net income might, however, put pressure on capitalisation rates, causing an increase, due to a lack of growth in income return, causing income yields to move closer to total return expectations. This would further exacerbate slow or negative valuation growth, and further pressurise security in the debt market.

The results suggest that there is no significant evidence of a structural shift in the demand for office space, but rather an over-supply that developed over a number of years pre-COVID, with COVID only the shock that forced the market back to equilibrium. The concern is the lack of economic growth, resulting in reduced demand for space, and consequential negative impact on rent, amidst rising operating expenses and cost of capital. The outcome is a property market that appears to lack the fundamental investment case, with little hope for a recovery in the near term future. It is, however, evident that the underperformance of property investment can be attributed to an economic cycle, and the solution is within ordinary economic principles. It is important that an economic stimulating environment should be promoted through fiscal and monetary policies. Within that, due to little to no construction activity, combined with depreciation and conversion of excess stock, the oversupply of space should disappear over time, forcing the equilibrium price back to a longer term average.

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