THE IMPACT OF COMMERCIAL URBAN FORMS ON THE PERFORMANCE OF COMMERCIAL REAL ESTATE MARKETS: A CASE STUDY OF NAIROBI CITY

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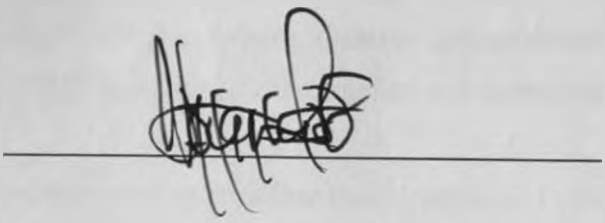
DECLARATION

I, Wilberforce Ojiambo Oundo, do hereby declare that this thesis is my original work and has not been presented for a degree in any other University



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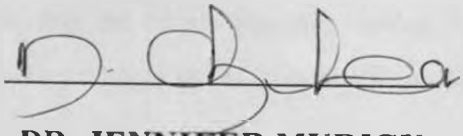

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DEDICATION

The study is dedicated to all practicing professionals who gather courage and spare time to pursue both academic and professional excellence to the highest level!

ABSTRACT

The purpose of this study was to establish the current commercial urban form of the City of Nairobi, the factors that had contributed to the changes in the commercial urban form for the period 1997 to 2007 and the impact of the changes in the commercial urban form on the performance of the commercial real estate market. The review of the existing literature found that the performance of commercial real estate was strongly influenced by the changes in the commercial urban form.

The study adopted 'dispersion ratio', commuting time and cost, 'density ratio' and professional/expert opinion as the key indicators of commercial urban form. The study further used location, relocation, investment and disinvestment decisions to identify and rank the important causes of the changing commercial urban form. The performance of commercial real estate markets and sub-markets was measured by analyzing the perceptions of investors and occupants and financial measures of performance (total rate of return and risk). A comparison of the means of the measures of commercial urban form and the performance of the commercial real estate markets was used to test the study hypothesis. A regression analysis was used to measure the impact of changes in commercial urban form on the performance of commercial real estate market.

The 'dispersion ratio' and 'density ratio' of the Nairobi City commercial land use was found to be 2.03 and 14.8059 respectively. The mean commuting time was 52.25 minutes and the mean cost of travel was Kshs. 53.55. These findings indicated that the commercial centres were clustered in one section of the city and hence the commercial urban form was polycentric but compact (i.e., many centres but not geographically dispersed). The professional/expert rated the commercial urban form as polycentric with one dominant centre and several sub-centres. The overall rating of the commercial urban form of Nairobi City was 2.62 on a scale of 1 to 5. The commercial urban form was rated as polycentric (multiple centers) but least geographically dispersed compared to other cities of the world such as Bangkok.

The main commercial centres are Inner City, CBD, Westlands and Upper Hill, with the linear developments along Mombasa Road emerging as the fifth commercial sub-centre. These centers are differentiated by levels and quality of infrastructural developments and urban services, rental rates, type of developments (buildings), occupancy characteristics and density and land values. The centre that recorded the highest growth rate during the period selected for this study (1997-2007) was Upper Hill at 14.43%. The zero growth rate of Inner City and the negative growth rate of Westlands (-5.16%) and CBD (-9.30%) is an indication that the commercial urban form of Nairobi City had changed over the period selected for the study.

The most important factors influencing location and relocation decisions and hence the commercial urban form of Nairobi City were identified and ranked as follows:

1. Physical state of Inner City;
2. Increase in population;
3. Increase in property prices;
4. Individual location decisions;
5. High economic growth rate; and
6. Increase in rent.

The poor physical state of the Inner City stood out as the most important factor that had caused the current commercial urban form. The poor spatial condition of the Inner City was caused by poor urban land management, failed urban management, underinvestment in infrastructure and rigid planning regulations. The study recommended that understanding, directing and managing the above factors would result in an orderly and efficient city that offers the most competitive performance of the commercial real estate investment.

The analysis of decision-making in commercial real estate revealed that investors evaluated the physical condition of the centre and the likely future changes before making investment and disinvestment decisions. The most important factors considered in selecting the location (sub-market) were returns, size of the commercial centre,

planning regulations and nature of property ownership (land tenure). The study found that investors would retain an investment in a centre as long as the centre offered a chance to increase rent to match inflation and pass over the entire running costs to tenants and where the rate of return was higher than the market average rate of return. The findings confirmed that investment decisions in commercial real estate investment were undertaken on the basis of commercial sub-centres.

The analysis of the financial measures of real estate investment revealed a pattern of distorted and falling performance for the period 1997-2007. This was the period of rapid changes in the commercial urban form and the study concluded that spatial changes and commercial real estate performance was inversely related. The analysis of the total rate of return found that Upper Hill (13.95%) was the peak of the commercial real estate market in Nairobi City while Inner City (3.27%) was at the bottom of the hierarchy. Upper Hill had reported the highest variations in the total rate of return and hence the highest risk exposure. On the overall, the performance of the commercial real estate market had fallen from a mean total rate of return of 10.52% in 1997 to 6.69% in 2007.

The inverse relationship between changes in commercial urban form and the performance of the commercial real estate market confirmed that the emergence of multiple commercial centres (change in commercial urban form) resulted in distorted performance of commercial real estate market. The negative regression constant further suggested that the relationship between changes in commercial urban form and the performance commercial real estate markets was an inverse relationship. The hypothesis of the study (that the emergence of multiple commercial sub-centres in Nairobi City resulted in distorted performance of the commercial real estate market) was, consequently, supported by the data collected for this study.

The surrogate measures of commercial urban form that contributed the most to the performance of the commercial real estate markets were 'occupancy density ratio', 'net growth rate' and 'net future inflows'. These findings suggested that occupancy density, the growth rate of specific sub-centre and the entire city and the expectations of future

inflows by occupants and investors are the main factors affecting the performance of the commercial real estate markets. It is, therefore, possible that an urban centre can record positive performance of the commercial real estate market if it proactively manages occupancy densities and the extent and pace of growth of the various sub-centre.

The study recommends urban regeneration programs and review of urban management policies and systems in order to achieve an efficient city with high performing commercial real estate markets. This is expected to ensure that all commercial sub-centres, the original and the new emerging centres, are appealing to investors and renters, being differentiated only by nature of business and age of occupants. This will ensure that the performance of the commercial real estate is positive and not inverted (distorted). The study posits that this can only be achieved by comprehensive, focused and continuous research on the phenomenon of changes of the commercial urban form and the performance of the commercial real estate markets.

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Chapter One

INTRODUCTION AND PROBLEM STATEMENT

1.1 Introduction

The structure of urban centers in the various parts of the world has changed tremendously in the past 100 years. The changes have been in terms of size, spatial organization, the quality and distribution of public services and infrastructure and employment base (Habitat, 1996). These changes occurred in the developed world much earlier and are now being replicated in the developing world. Unfortunately, the phenomenon is not well understood in the developing world and this lack of knowledge is the cause of inefficiencies in this cities.

The changes in urban centres have ultimately produced a polycentric urban commercial form consisting of the inner city (the original city centre) and the CBD, as the largest centers, and the other centers as competing and complementary centers (Habitat, 1996; Fu et al., 1999; Jones, 2000; Plaut et al., 2003, Geho, 2003 and Goga, 2005). The spatial conditions of these centres will, inevitably, change with time as a natural consequence of change or induced by external forces. These changes are continuous processes that tilt the scales in favour of and against the centres, resulting in an urban form that is ever transforming. However, the most common phenomenon, both in the developing and developed world, has been the rapid decay and abandonment of the inner city and rapid development and expansion of new sub centres (Richardson et al., 2000 and Kwanshie, 2003).

The disproportionate development has resulted in distorted and inefficient city. The difference in the rate and scale of development is a direct consequence of changes in the spatial qualities and quality of services in the various commercial centres (Sullivan, 1990). The magnitude and speed of these spatial changes will depend on the perception the market participants hold about the commercial centre.

The general population (investors and users of commercial developments) responds to these changes by moving out of some centres to others and, in some cases, return to the same centres they had earlier left. The return to former commercial centres is a

manifestation of dissatisfaction with the quality of life and investment in the new centres and a sign of continuously changing commercial urban forms (Habitat, 1996; White, 1999 and Borja, 2001). Those who move in, out and then return eventually realize that the expected benefits of agglomeration, change in cost structure, quality of work place and other incentive were not achieved.

In response to this distorted development pattern and inefficiently changing urban forms, many city authorities have directly intervened by way of renewal and regeneration of the inner cities and other dilapidated centres (Gibson et al., 1982; McNamara, 1993; Lloyd et al., 1993 and Sullivan, 1990). Urban regeneration has been pursued on recognition that the inner city and other commercial centres with poor spatial qualities are integral parts of the city and its real estate market. The neglect of centres with poor spatial quality directly affects the performance of the real estate sub-markets and the entire citywide market. Urban regeneration is, therefore, a form of prudent urban management that encourages sustainable growth of cities and their real estate markets (Stren, 1993).

Grissom et al., (1994), Roulac (2003), Slade (2000) and Kolbe (2003) conclude that the performance of the real estate market is localized and intrinsically linked to the spatial (location) characteristics of any given region and the surrounding regions. There is evidence to suggest that commercial real estate market in one sub-centre will perform differently from another sub-centre (Born et al., 1994). An analysis of the performance of the commercial real estate market cannot, therefore, be divorced from the spatial characteristics of the commercial centre. The analysis of the commercial real estate market should be at the smallest level, which are the sub-markets.

The physical state of a commercial centre is a reflection of the perceptions investors and occupants have about the past, present and future performance and quality of its commercial real estate market. Roulac (1995 & 2003) and Gat (1998) point out that the typical office user will select real estate in a place that enhances the quality of life to the employees and the clients/customers. Likewise, investors will select a location that maximizes current returns and assures capital appreciation. The factors that encourage users and investors to locate in a place are the opposite factors that discourage occupation

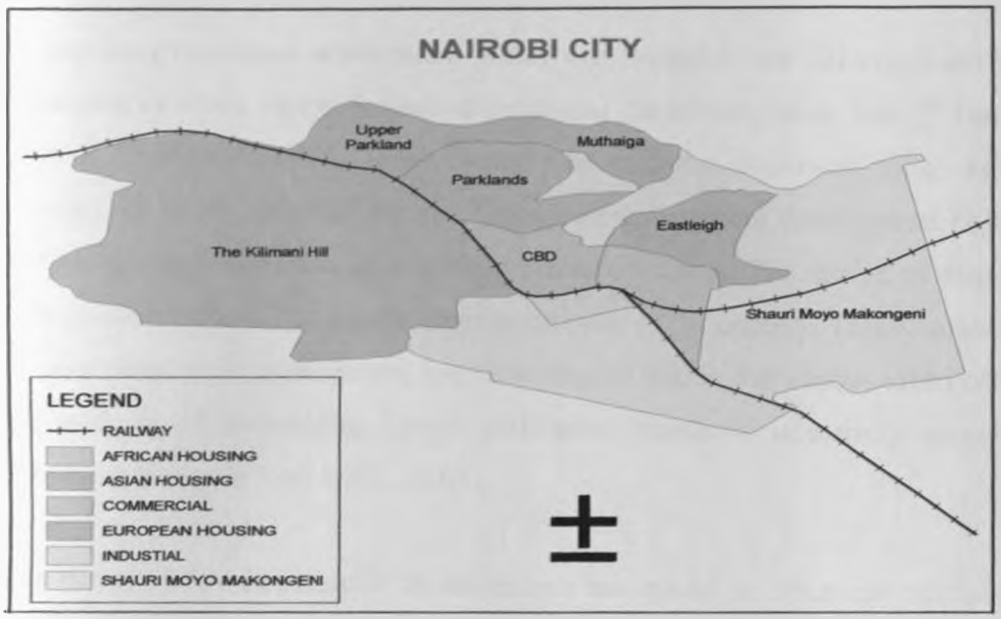
and investment in alternative location. These collective decisions and perceptions of the suppliers and users about the location determine the performance of the commercial real estate market and sub-markets.

1.2 Problem Statement

Most of the recent commercial developments in the City of Nairobi have been undertaken in the sub-centres instead of the inner city and the CBD. The inner city has been overlooked, left to deteriorate and is no longer attractive to investors and occupiers (White, et al., 1948; CCN, 1985 & 2004; Kingoria, 1980; Njau, 1975; Laurenti et al., 1972, Hassanali, 1976, Murigu, 2005 and KIPPRA, 2005). The new sub-centres were expected to have superior spatial quality, offer better working and living environment and record higher performing commercial real estate markets. They were expected to attract investors and occupants at the expense of the existing sub-centres. The emerging sub-centres have, unfortunately, replicated the services, quality and problems of the inner city and hence defeating the main purpose of commercial centres suburbanization. The emergence of multiple commercial urban forms has, therefore, not served the primary function of providing better spatial characteristics and commercial real estate markets. As a result, these changes in the commercial urban form have not resulted in a better functioning city and commercial real estate market.

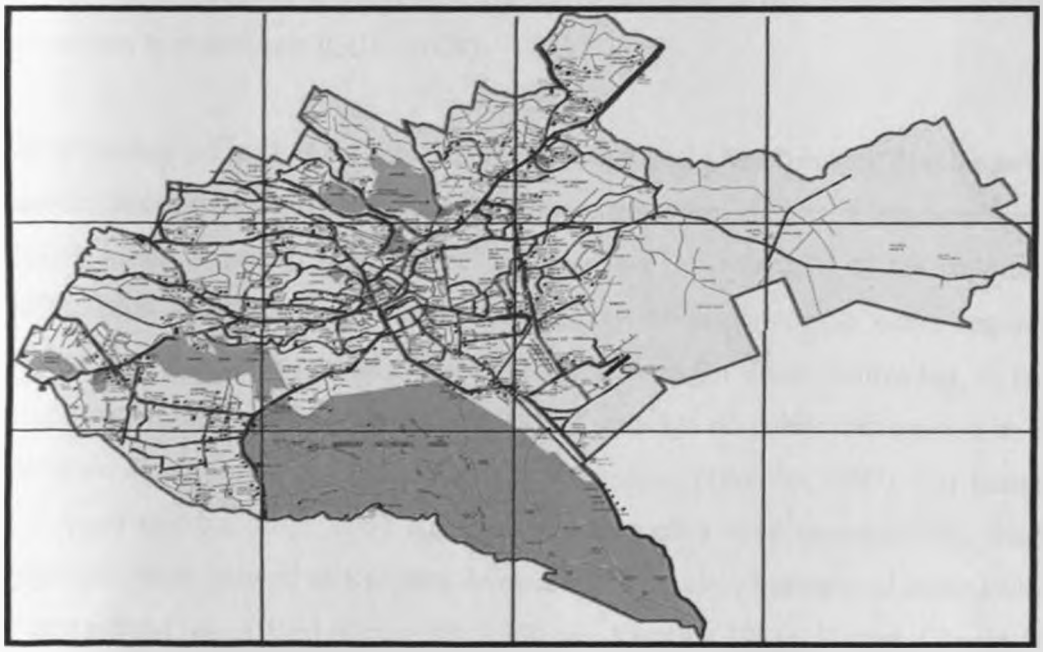
Nairobi, like many other cities in the developing world, has experienced unprecedented growth since its formal settlement in 1899. Census reports and other records indicate that the city's population has grown from 11,512 people in 1906 to 270,000 people at independence in 1963 and then to 2.14 million by 1999 (GOK, 1973 and GOK, 2008). It is estimated that Nairobi had a population of 3 million people by end of the year 2006 and was growing at 7% annually (CCN, 2006). Spatially, the city has grown from an area of 23 square kilometres in 1900 to the current 684 square kilometers. The city has, therefore, expanded almost 30 times in a period of about 100 years as shown in Maps 1.1 and 1.2.

Map 1.1 Nairobi as at 1948



Source: Redrawn from White, 1948

Map 1.2 Nairobi as at 2007



Source: Survey of Kenya, 2007

The rapid growth of Nairobi city has produced a commercial urban form comprising of several commercial centres with varying spatial quality and commercial real estate market structures and performance. This multiple commercial urban form has been encouraged by

an explicit government urbanization policy that favoured, and has continued to favour, dispersion of urban centres instead of expanding the existing ones. The 2nd Development Plan of 1970-1974 (GOK, 1969) formally adopted the dispersion policy as the main strategy for urbanization in Kenya. Subsequent government development policies have integrated this approach in addressing urbanization issues. The motive of dispersion has been to achieve balanced development in all parts of the country. This nationwide policy of dispersing urban development has been applied within the various urban centres with the tendency of encouraging newer settlements instead of intensively developing and improving the initial ones (NCC, 2004).

The dispersion of commercial developments has aimed at achieving equitable spatial distribution of resources and incomes among the various urban centres and within cities in order to avoid congestion in the original core (Laurenti et al., 1972 and GOK, 1974). The result has been the emergence of smaller urban centres all over the country and several commercial sub-centres in Nairobi while letting the main urban centres and commercial sub-centres to deteriorate (GOK, 2008).

The dispersion policy has not achieved the intended goal of distributing developments and incomes throughout the regions and within the major urban centres. It has been found that Nairobi is the dominant urban centre and accounts for over 55% of the national GDP (NCC, 2006 and 1985). In addition, the policy of dispersing to many regions and discouraging the dominance of a single sub-centre in major urban centres has, in fact, led to sub-optimal utilization of urban spaces and wastage of public resources due to low economic development and technological advancement (Obudho, 1997). For example, it was found that buildings along River Road (inner city) were comparatively shorter in height than those located on Kenyatta Avenue (CBD), a clear indicator of under-utilization of commercial urban land (Kingoriah. 1980 and Kiamba, 1986). Picture 1.1 and Picture 1.2 shows the differentiated development pattern (building heights) between the CBD and the original core (Inner City).

Photo 1.1: Picture of the CBD of Nairobi City (notice the high skyline)

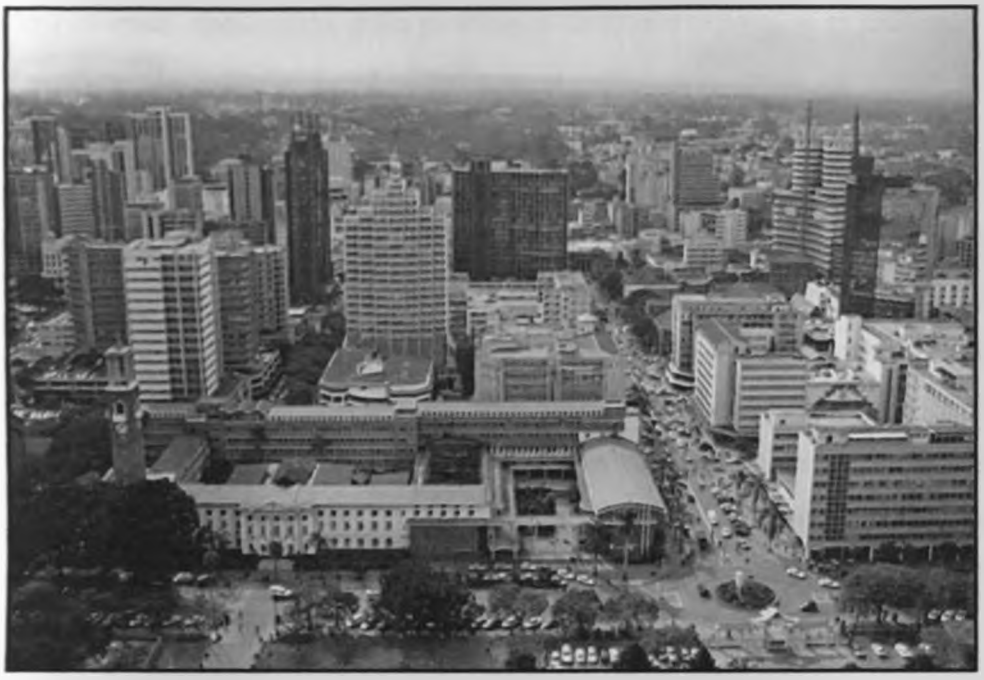


Photo 1.2: Picture showing the low-rise developments to the east of the CBD (the area considered the Inner City)

Prof. Anyang' Nyongo, the then Minister for Planning and National Development, observed that there was irrational use of urban spaces and that the streets of the CBD and inner city of Nairobi were more disorderly than they were a few years back (KIPPRA,

2005). Mr. David Nalo, the Permanent Secretary in the Ministry of Planning and National Development, sums up the main problem of this rapid expansion as follows:
"----there is mismatch of development approvals and provision of supportive infrastructure----" (KIPPRA, 2005).

Naturally, there has been rapid movement of places of employment since 1990s from the inner city to the Upper Hill and Westlands, two of the nearest sub-centres. The relocation from the inner city to the sub-centres was an attempt to escape from the poor physical state of the inner city characterized by old and poorly maintained buildings. This disproportionate expansion of Nairobi shifted the peak of the commercial real estate performance from the inner city and the CBD to the sub-centres. The inner city of Nairobi was, therefore, unable to effectively compete with the emerging sub-centres. This has caused distortion in the demand and supply of commercial real estate and consequently resulted in differentiated performance of commercial real estate investment and market.

The consequences of the imbalanced urban growth have been noticed by the general public. Lay commentators in the mainstream newspapers and magazines have observed the growth pattern of the commercial sector and complained of the resultant problems of the CBD and Inner City as follows:
"--- many buildings in the area served by Haile Selassie Avenue and lower Moi Avenue as well as the area east of Uhuru Highway and Kenyatta Avenue lack modern facilities and have little or no parking spaces, making them unattractive to tenants---" (The East African, September 13-19, 2004 page 23).

Experts in the real estate industry have also noticed the changes in the urban form and their impact on the commercial real estate market. Reports by Knight Frank (1998 and 2003) and Regent Management Limited (2003 and 2007) concluded that congestion, poor building quality, infrastructure overloads, poor perception by office renters and falling security and safety levels are pushing occupiers into more suburban locations. The inner city is now characterized by inadequate water supply, sewerage, refuse collection, street lighting, transportation and other services and high incidents of insecurity (Chana et al., 1996 and CCN, 2006).

Heavy traffic congestion has been one of the standout reasons for the exodus from the inner city. Hake (1977) reports that the CBD of Nairobi City had already started experiencing traffic jams by 1928. The problem has become progressively bad with time. The Nairobi Development Plan of 1984-1988 (CCN, 1985) acknowledges that the inner city does not have adequate parking. The lack of adequate parking has resulted in heavy traffic jams and increased parking fees. Photo 1.3, 1.4 and 1.5 show traffic congestion on the streets of the CBD and the sub-centres. In addition, the Nairobi City Council increased parking fees from Kshs. 50.00 to Kshs. 70.00 and then Kshs. 140.00 per motor vehicle per day between the years 2000 and 2008, an increase of 180%.The inner city has now become unattractive for high-worthy investments in real estate thus distorting the citywide commercial real estate market.

Photo 1.3: Early Evening Traffic Jam on Koinange Street (CBD)

Source: Taken by the Researcher

Photo 1.4: Mid-morning Traffic Jam on Ring Road, Parklands (Westlands)

Source: Taken by the Researcher

Photo 1.5: Late-Afternoon Traffic Jam on Haile Selassie Avenue (Upper Hill)

Source: Taken by the Researcher

The inner city has naturally attracted the informal and small-scale enterprises due to the perceived flexibility in occupancy terms. The influx of these groups has inevitably exacerbated the rate of deterioration due to low levels of employment, income and building maintenance standards. The invasion of inner city streets of Nairobi by hawkers has, in a major way, discouraged formal businesses on the most affected streets (Daily Nation, 27th October 2006). The migrating businesses have carried away with them the bargaining power and influence to force Nairobi City Council to provide resources required to rehabilitate the Nairobi downtown. The Inner City and the CBD have, therefore, continued to deteriorate and consequently distort the performance of commercial real estate market as an investment avenue.

Most of the investments in infrastructure and other urban services have, consequently, taken place in areas outside of the inner city and the CBD (Obudho et al., 1992). This imbalance has thus acted as a disincentive for investment and re-investment in the inner city, encouraged relocation of employment to the newer commercial centers and resulted in loss of confidence by the financial sector that provide funding for real estate developments. For example, Knight Frank (1998) found that 55% of the new commercial developments in Nairobi were concentrated in the sub-centres. Murigu (2005) further found that 55% of the office spaces measuring 611,000 square meters supplied between 1990 and 1997 were found in the sub-centres. Most of the new occupancies in Nairobi have, therefore, occurred in the sub-centres instead of the inner cores.

The relocation to the new sub centers has, however, not improved the quality of the work place, working environment and employee satisfaction. This movement has only helped to hasten the decay of the vacated sub-centres, distort the real estate market and generate inefficiency in the management of Nairobi city. Several reports appearing in the media indicate that traffic congestion, crime, high rents and unreliable and/or inadequate urban infrastructure are a problem in the sub centers as much as they are in the inner city (Daily Nation, 26th March 2007). Many workers in Upper Hill as well as in Westlands now complain of lack of shopping facilities and public transport, heavy traffic jams and high food prices. Some of the comments include:

"*-----the attractive suburbs to which firms were fleeing to in the 1990s are quickly getting congested and the services are strained--- there is inadequate water supply, sewer system remain unchanged--, narrow roads serving in the zone---*"(The Standard, 29th March 2007).

As a result of these distortions, the overall performance of the real estate market in Nairobi has been declining (Makena, 2004 and Makathimo et al., 2004). Syagga (1998) and GOK (2007) report that commercial real estate investment recorded an average rate of return of 8.907% for the period 1987 and 1996, which was lower than the returns of 19.5% achieved by investing in government bonds. Knight Frank (1998) also concluded that commercial properties rental growth has under-performed both the rate of inflation and Nairobi Stock Exchange performance index throughout the 1990 decade. Regent Management Limited (2007) found that the average rental rate in Nairobi had increased by 5.63% between 1990 and 2006 compared to an average increase in the inflation rate of 8.43% for the same period. The commercial real estate was, therefore, no longer a superior investment vehicle.

The uneven spatial development of the commercial sectors of Nairobi has also resulted in differentiated performance of the commercial real estate market in the various commercial centres. Most local experts report that the current commercial urban form has resulted in rent inversion where rents in the Inner City are lower than those of the sub centers. Murigu (2005) found that the inner city was the worst performing sub-market compared to the CBD and the suburban commercial centers. Knight Frank (1998) found that development levels and prices were at their highest in areas outside of the CBD and Inner City and this was creating supply imbalance. According to Regent Management Limited (2007), the inversion of the rent gradient started in the year 2000 in response to the infrastructure problems and the invasion of the CBD by lesser quality tenants. The survey found that the average asking rents in Upper Hill was Kshs. 43.50 per square foot per month compared to Kshs. 36.00 per square foot per month in the CBD as at the end of the year 2006. This has distorted the market and increased market inefficiency.

The difference in performance of the real estate market between the various sub-markets is

rapidly being wiped out. By the end of the year 2006 it was found that rents and occupancy levels in the CBD, the Inner City (downtown) and Upper Hill were almost the same at 86.97%, 80.52% and 89.62% respectively (Regent Management Limited, 2007). At the same time, the average rental rate was between Kshs. 35.80 and Kshs. 39.65 per square foot per month in all the commercial centres of Nairobi. This occurred at a period the sub-centres had exhibited the same spatial conditions, problems and challenges.

Most of the office renters and investors, therefore, no longer find any advantage in locating and investing, for example, in the Westlands compared to the CBD. The perception of parity between the centres will result in high price (rent) elastic market, wastage in allocation of commercial spaces and result in sub-optimal return on investment. This will result in an inefficient city. This phenomenon will remain a major challenge to urban managers due to lack of information and tools to measure commercial urban changes and real estate market performance.

1.3 Study Objectives

The purpose of the study is to analyze the changes in the commercial urban form and their impact on the performance of the commercial real estate market in the various commercial centres. The specific objectives are:

(a) Establish the commercial urban form of Nairobi City;

(b) Identify and rank factors that encourage the location, relocation and return of office users and investors in and out of the selected commercial centres of Nairobi;

(c) Evaluate the impact of these location and relocation decisions and the resultant commercial urban form on the performance of the commercial real estate market in the various commercial centres;

(d) Make recommendations that will result in efficient and sustainable growth of the commercial urban form of cities in Kenya and elsewhere in Africa and achieve highest performance of the commercial real estate market.

1.4 Study Hypothesis

The hypothesis of this study is:

The emergence of multiple commercial sub-centres in Nairobi City has resulted in distorted performance of the commercial real estate market.

For purpose of this study, distorted performance of commercial real estate markets occurs if:

(a) there are differences in the means of the various performance measures between the selected commercial centres; and

(b) the performance of the newer sub-markets (Westlands and Upper Hill) is higher than the sub-markets in the original core (Inner City and CBD).

1.5 Justification for the Study

The rapid changes in the commercial urban form in Nairobi have taken place without adequate knowledge of the causes of the changes, the direction, pace of the changes and the consequences on the performance of the real estate market and to the overall economic growth. The local authorities and the market itself have not seized the opportunities presented by these changes and neither have they taken contingent and corrective measures to minimize the negative impacts.

The poor response has been attributed to lack of comprehensive urban development management policy and studies on the interaction of urban form and real estate market (Gallagher et al., 1999 and KIPPRA, 2005). McMillen et al., (2003) and Ratcliffe (2005) report that the developed world embraced research in order to manage urban changes orderly and avoid frequent market shifts. In response to office oversupply in the 1990s, the US and UK markets and professionals increased the volume of research works and publications (Wheaton et al., 1999 and McDonald, 2002). This has enabled these markets to minimize 'bursts' and 'beeps' and achieve regular and predictable market and physical cycles. South African cities have followed the trend established in the developed world to solve urban problems. Situma (KIPPRA, 2005) reports that the government of South Africa has funded studies aimed at achieving sustainable urban transformation.

However, the rest of the third world has not undertaken careful and comprehensive studies on why, when or where office sub-centers form. The managers of urban centers do not know the causes and characteristic of the inner city decay and the forces sustaining developments in the other centers. The managers do not understand the long term impact of the urban form on commercial real estate market, the overall social cost of the expansion of the city, among others.

There have been very few researches and studies in Kenya in respect of this subject and those few have been narrowly structured to inform policy formulation. These studies include Digo (1990), Kingoriah (1984), Hassanali (1976), Chege (1973) and The Nairobi Urban Study Group (1973). The lack of, or the very few studies, has resulted in lack of adequate knowledge for decision making in urban development.

Kingoriah (1984), in a study of land use patterns in Nairobi, found that there were limitations of the urban structure generated from government intervention. The study concluded that the extent and the consequences of these limitations were not fully understood. The study recommended further research to understand the operation of economic forms affecting different aspects of life in each area, and in the entire city.

Digo (1990) and Hassanali (1976) concentrated their respective studies on a few streets and blocks within the CBD of Nairobi. Chege (1973) prepared a detailed profile of the nature and form of development and economic activities of the central area of Nakuru town. These studies were narrow in design and, therefore, offered very few lessons that could be used to initiate either public-led or market initiated urban rehabilitation and commercial real estate market corrections.

The Nairobi Urban Study Group Report of 1973 included various surveys about the central area, its problems and basic objectives for its revitalization. The findings of the study resulted in the formulation of the Nairobi Metropolitan Growth Strategy that proposed to integrate the two parts of Nairobi CBD. As was the case with other past reports, the study ignored the economic impact of the urban form. This scenario cannot be allowed to go on for long if the city has to achieve sustainable growth.

There is a very big gap in knowledge concerning the linkage between economic performance and the spatial urban form. This gap is responsible for the poor spatial character of Nairobi city and the lack of positive intervention strategies. Mr. Zachary Ogongo, the PS in the Ministry of Local Government, proposed that the solution to the spatial and economic problems of Nairobi lay with formulation of a strategy to integrate spatial activities and the real estate developments (KIPPRA, 2005).

The study, therefore, attempted to present a comprehensive analysis of the interaction between commercial urban form and real estate markets in the third world using Nairobi city as a case study. This will allow the urban authorities to formulate urban development management strategies that will result in a balanced urban development pattern and satisfactorily performing real estate markets. It is expected that this contribution to knowledge will enable cities achieve sustainable growth.

1.6 Area and Scope of the Study

The scope of the study is limited to commercial urban form and real estate markets in Nairobi City. Nairobi was selected because of its strategic location in Kenya and the entire Eastern and Central African region. The Ministry of Local Government (2005) pointed out that Nairobi is the most competitive commercial capital in the East and Central African region. According to the population census of 1999, the population of Nairobi constituted one fifth of the country's total population of approximately 36 millions. In addition, it accounted for over 50% of the country's Gross Domestic Product (GDP), and nearly 60% of manufacturing output. The city was, therefore, the most important centre in the country.

Nairobi was also selected for the study as it exhibited special problems of size and complexity which were caused by rapid spatial changes. These changes must be addressed in order to place Nairobi at the same level of regional cities in the West, Americas, Asia and North Africa. The outcome of this study can then be replicated to other cities in the region.

The commercial sector of any urban centre comprises of the central business district (CBD), the inner city and the sub-centres (Jones, 2000 and Frey, 2004). The city of

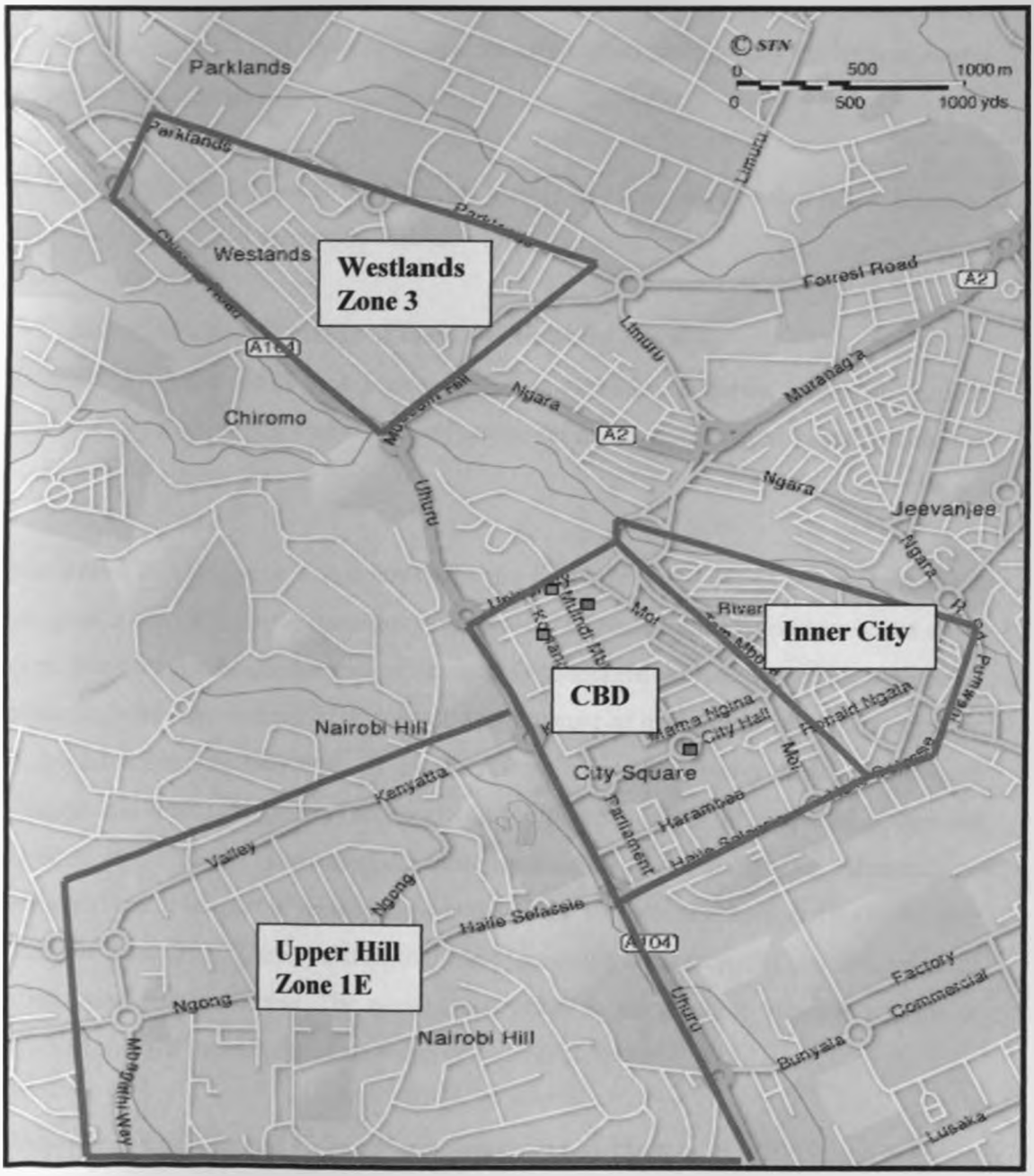
Nairobi exhibits the same urban commercial form comprising of the CBD, inner core and the sub-centres. The 1948 Nairobi Master Plan delineated the commercial sector of the city as the area covered by Station Road (Haile Selassie Avenue), Government Road (Moi Avenue), Delamere Avenue (Kenyatta Avenue) and Victoria Street (Tom Mboya Street). According to the current planning guideline of the City Council of Nairobi, the commercial centres of Nairobi include Zone 1A (area bound by Uhuru Highway, University Way, Haile Selassie Avenue and Nairobi River), Zone 1E (Upper Hill Area) and part of Zone 3 (Westlands). In addition, the Department of City Planning allows commercial developments in selected sites in Zone 2 (Eastleigh, Pumwani and Ziwani) and part of Zone 3 (Parklands). In the recent past, commercial centres have been developed next to residential estates. Examples of commercial centres located within residential estate include Nairobi West, Yaya Centre, South B, South C, Buru Buru, Langata, Village Market, Parklands, Ngara among others.

The main commercial zones of the city of Nairobi were identified as Zone 1A, Zone 1E and part of Zone 3. Based on the current development and occupation patterns, Zone 1A encompasses the CBD and the inner city while Zone 1E (Upper Hill Area) and Zone 3 (the Westlands section) are the sub-centres. The predominant development allowed in the Parklands section of Zone 3 was residential and hence could not qualify as a commercial sub-centre. The other residential estates-based commercial centres were found to be small and only catered for the immediate needs of the neighbourhood. The scope of the study was, therefore, limited to Zones 1A, 1E and 3 (Westlands) as depicted in Map 1.3. These centers represented the various commercial real estate sub markets.

The study selected commercial real estate due to the heavy investment required and the high consequences of a bad investment decision. As a result of heavy capital investment, commercial real estate has tended to attract large scale and group investors. These categories of investors undertake formal pre-investment analysis and decision-making. McDonald (2002) argues that investment in commercial real estate is sometimes done without due consideration of likely performance. As a result, there is strong need for better methods for analyzing and forecasting office markets. Gatzlaff et al., (1995) argue that examining the performance of commercial real estate market is important to the

improvement of general economic welfare. The analysis of the performance of the commercial real estate market, at citywide and the individual sub-centres, is equally important to avoid financial loss and misallocation of resources.

Map 1.3: The Commercial Sub-Centres of Nairobi City Selected for the Study



Source: Survey of Kenya and own construct, 2008

The US and European countries have realized the need of detailed analysis of the office

market. As a result, these markets have commercial research services that investigate, analyse and forecast the performance of commercial real estate markets. Examples include CB Richard Ellis, Torto Wheaton Research and Building Owners and Managers Association (BOMA) (McDonald, 2002). The Kenyan market does not have similar research organizations and, therefore, Nairobi city and its commercial real estate market has changed without guidance.

The study, therefore, looked at the citywide market and the various sub-markets based on some predetermined measurement criteria.

1.7 Definition and Context of Key Terms and Concepts

The study has used terms and concepts that might have different means in various circumstances. For purposes of this study, these terms are defined and contextualized as follows:

Commercial Urban Form: this refers to the physical layout and design of the commercial land use of a city. The key determinants are density, street layout, transportation and urban design. The analysis of commercial urban form is concerned with review of the patterns of movement, land use, ownership or control, the structure of built landscape and occupation and infrastructure development. It is, therefore, a comprehensive look at the built landscape and internal logistics (economic and infrastructural) (Gilliland et al., 2006 and McMillen et al., 2004). The emerging built landscape and the supporting infrastructure system will result in a set of relationships between the various commercial sub-centres and residential land use. These relationships are generally characterized on the level of centralization and clustering. The commercial urban forms are now viewed in terms of polycentric versus monocentric and dispersed versus compact.

Monocentric Commercial Urban Form: according to Plaut et al., (2003) and Sullivan (1990) this urban form comprise of one single commercial centre with the inner core as the focal point. All developments and activities are sited and transacted in relation to the inner city. Under this arrangement, land and real estate pricing and densities are negative function of distance from the inner core.

Polycentric Commercial Urban Form: this is the opposite of the monocentric commercial urban form. Polycentric commercial urban form, also referred to as multicentric, comprise of several commercial centres (Sullivan, 1990). The standout characteristic of polycentric urban form is the existence of several land and real estate prices and density 'peaks', one at the city centre and one for each sub-centre. Indeed, each commercial sub-centre has its own mini-CBD in which all activities and decisions gravitate.

Compact Commercial Urban Form: arises where commercial sub-centres are clustered together in order to maximize on agglomeration economics (White, 1999). The commercial sub-centres will tend to cluster at one central place that is easily accessible from all sides of the city and residential neighbourhoods.

Dispersed Commercial Urban Form: this refers to an arrangement where commercial sub-centres are located in separate sections of the city and far away from the inner city/CBD, more times than not tending towards the residential neighbourhoods. A dispersed commercial urban form is a form of urban sprawl of the commercial sector and is chiefly characterized by longer traveling distances and time (Lupalo, 2002).

Real Estate Markets: a real estate market is defined as an interaction of individuals who exchange real property rights and attributes (economic and physical) for other assets such as money (AI, 2001). A real estate market operates to set prices and allocate real estate to the various competing interests through a regulated environment. Real estate markets are profiled in terms of type of property, the (residential, commercial, industrial and many more), the type of transaction (such as rental or sale) and the geographic area in which the transactions has taken place. It is, therefore, possible to identify several real estate markets and sub-markets in any given area, legal jurisdiction and time.

1.8 Organization of the Study

The study is organized into eight chapters.

Chapter One is the introductory part of the study. The key issues presented are the

introduction to the study, the problem statement, the study objectives, study hypothesis, the justification of the study and the area and scope of the study.

Chapters Two and Three review literature on commercial urban form and the analysis and measurement of the performance of the real estate market with emphasis on commercial real estate. Chapter Two has detailed analysis on the various commercial urban forms, the measurement tools of commercial urban forms, factors/causes of the various commercial urban forms, changes in the commercial urban form, the inner city decay and revitalization and the dichotomy between the various commercial centres. Chapter Three presents commercial real estate market analysis and performance measurement tools. These two chapters form the theoretical framework underpinning the entire study.

Chapter Four is the research methodology. The areas covered are the research design, the population, sample and sampling techniques, data collection, variables and their conceptualization and finally the tools of data analysis and presentation.

Chapter Five presents the case study. The chapter discusses the urbanization trends in Kenya, the historical development of Nairobi, the town planning phases and policies, urban management challenges of Nairobi City and a review of the commercial real estate market performance.

Chapter Six and Seven present the findings of the study. Chapter Six presents the commercial urban form of Nairobi, the measures/indicators of commercial urban form, changes in the commercial urban form and the main factors causing the changing commercial urban form. Chapter Seven presents the findings on the performance of the commercial real estate market, in terms of the total rate of return and risk.

Chapter Eight reviews the study findings, tests the hypothesis of the study and presents the summary of findings, conclusions and recommendations. The chapter has, in addition, areas of further study.

Chapter Two

COMMERCIAL URBAN FORMS

2.1 Introduction

The numbers and the importance of urban centers have increased worldwide. The level of urbanization is now high in most continents, ranging from 40% in Africa to 90% in North America (Bocquier, 2004). In Kenya, it is estimated that 34% of the total population, as at the 1999 census, lived in urban areas (GOK, 2007). The growth of urban centres, especially in Africa, is now inevitable and efforts must be made to manage the positive and negative aspects of urbanization.

An urban area comprises of socio-economic activities that require concentration of people, buildings, economic and socio-political activities (functions) and infrastructure in a relatively small space. The factors and systems that allocate space to people, buildings, activities and infrastructure are important issues of consideration if the urban centre is to fulfill its dual role as a centre of production and consumption (Wurtzebach et al., 1994). The resultant allocation will be a reflection of the need to specialize and the aggregate diversity of the whole urban centre. The character, size and expectations of the components of the urban area will naturally change over time, thus necessitating continuous change in the size and shape of the various land uses. The continuous allocation and reallocation of the limited urban space to the competing land uses result in rapid changes in the urban form.

The rapid changes in the urban form have been characterized by two growth patterns, namely: the decrease and contraction or progressive decay and blight of the central cities (inner cities) and the rapid growth of the commercial satellite centers and suburban residential neighborhoods (Richardson et al., 2000). Wurtzebach et al., (1994) argue that the pattern of growth can either enhance or diminish the urban centre's economies of scale and agglomeration economics. The causes and factors responsible for these changes have been many, resulting in a continuously changing commercial urban form. These spatial changes have directly and indirectly impacted on the performance of the commercial real estate markets.

2.2 Urban Land Uses and their Location

An urban area is a collection of various economic, social, political and cultural activities. These activities may include commercial, residential, industrial, public use and, occasionally agricultural. Any given site in any urban centre is capable of being put to various uses, the determining factor being the competition among the users (Found, 1971). The amount of land occupied by each land use will vary from one urban center to another. These land uses will be located at various zones of the urban area such as the commercial zone, the transportation zone, the residential zones, industrial zones and the commuter zones (Kingoriah, 1980). The commercial land use will naturally be located in the CBD with industrial, residential and commuter zones following in succession. However, natural changes in population and the economic base of the urban centre and implicit government action will result in continuous changes through the process of gentrification and succession. Consequently, the land use patterns and urban forms will continuously vary from one urban centre to another and from time to time.

The location of the various land uses in any urban area will occur spontaneously or will have been deliberately planned. The natural processes by which each individual economic activity locates at a particular site is explained by the location theory. Isaard (1975) argues that the location theory is premised on the production function. The production function is concerned with the possible combination of products and rate of production and the site (location) that yields the maximum excess of revenue over costs. An urban activity will, therefore, locate at a site where it maximizes profits by minimizing expenses and maximizing revenue. The site will be allocated to that activity that operates on a higher production function, relative to other competing uses for that site. These are continuous processes, which result in an unending allocation and reallocation between various uses and users of sites in the urban centres.

It is possible that the location of an activity in a particular site and time might be influenced by several factors. The concept of the highest and best use, the rent bid concept and the concept of accessibility and complimentarity collectively constitute the location theory.

(a) The Concept of Highest and Best Use- The concept is based on the fact that for any given site, there are many alternative uses. The particular use devoted to a site will depend on the returns. The returns can be in monetary terms, or intangible values or a combination of both, either accruing to the individual or to the society. Urban developments that yield the highest returns are said to be 'high' uses and the one with the largest economic rent is the 'highest' or 'best' use.

AI (1999) defines highest and best use as the reasonably probable and legal use of a property (whether vacant or improved), which is physically possible, appropriately supported financially, feasible and results in the highest value. The allocation of real estate on the basis of highest and best use suggests that the purpose or combination of purposes has the highest comparative advantage and least comparative disadvantage relative to other uses. Dasso et al., (1989) are of the view that the highest and best use will always be achieved unless prevented by institutional limitations or lack of owner insight and initiative.

The location of activities based on the concept of highest and best use is subject to constant shifts. Barlowe (1978) sees these shifts to be caused by changes in land resource quality, technology, demand picture, zoning ordinances and other public policies and bidding and counter-bidding between various operators.

(b) The Rent Concept- The rent theory is based on the premise that a firm will locate on that site where its rent-paying ability is above that of other potential users of the site (Lean, 1969 and Dasso et al., 1989). The rent-paying ability of any firm at any given location will be a residual after deduction of all costs and adequate profit.

David Ricardo (1911) and Jonathan Heinrich Von Thunen (1968) are the two pioneer scholars associated with the rent theory. William Alonso (1960) applied the ideas of early theorists to the urban situation. While Ricardo postulated that rent-paying capacity was due to differences in land quality, Von Thunen based the analysis on the distance from the central market.

The distance from the market centre and the consequent high cost of transportation diminishes the residual profits set aside for paying of rent. This, in turn, means that land lying in close proximity to a market centre, with lower transportation costs, will command the highest rent in the entire centre. This suggests that rent reduces with increasing distance from the center of the city. Urban land and housing will, therefore, be priced as a downward function of distance from the CBD in a land rent gradient (Plaut et al., 2003).

The common pattern of urban development will have high earning commercial land use at the centre, and followed by residential and industrial in a succession. Since the location decision is purely economical, each site goes to the highest bidder. The land uses with least paying ability will locate at points where they can afford, normally a remote distance from the central point. The established pattern will continually change as the city grows in size and population. This pattern of urban land use may be altered as a consequence of government and community action, resulting in a distorted pattern.

(c) The Concept of Accessibility and Complimentarity- Accessibility and the need for complimentarity between uses have been factors in making location decision for employment and residence. Accessibility is measured by evaluating the net economic costs of moving persons and goods from one place to another (Lean et al., 1966). Complimentarity applies to the clustering of economic activities at one position.

The tendency of economic activities to concentrate along a particular line of the transport system brings about differentiation of sites, the greatest advantage going to the city center. It is only the uses to which accessibility is critical that will be willing to pay for the high prices and hence locate in such positions. Such a position will have low transport costs and hence attract many competing uses. It is only those activities, which can effectively maximize profits that will locate at those points. The converse will be true for the sites in the rural-urban fringes.

Gat (1998) observes that the concept of accessibility will produce a location pattern that starts with commercial (office) at the centre with transportation, manufacturing and residential following in that order. Sullivan (1990) argues that the allocation of land at the

centre to commercial use is efficient because it has the most to gain from proximity to the city centre. This is true on the grounds that office use relies heavily on face-to-face contacts and foot traffic.

The advantage of complementarity brings about clustering of like uses as well as unlike uses. The latter case occurs when firms use the by-products of another firm as factor inputs or where there is need to offer specialized services. Complementarity is easily achieved by increase in accessibility. The growth of position of greatest accessibility and complementarity vertically and laterally eventually divides into clusters of complementary activities. This gives rise to specialized neighbourhoods and sub-centres, both residential and commercial.

The location theory is, therefore, a useful concept in explaining the current and the changing urban forms. The continuous changes in the size of the urban centres, as a result of population, demographic structure and economic base, can be explained by the interplay of concepts of location theory. However, government and community actions might cause some distortion in this orderly allocation of urban spaces based on the concepts of rent theory, highest and best use and accessibility and complimentarity.

2.3 Commercial Urban Forms

Sullivan (1990) observes that the commercial section of an urban area can exhibit two contrasting forms of concentric (compacted) versus dispersed (suburbanized) and polycentric (many centres) versus monocentric (one centre). There is an emerging trend where the commercial sectors of some cities are exhibiting a hybrid of the two urban formations. The prevailing commercial urban form of a city is an indicator of its age, the rate of population change and economic growth rate and the impact of its transportation system and its shape as dictated by natural physical features (Wurtzebach et al., 1994).

2.3.1 The Changing Commercial Urban Form

Historically, an urban area would start as a simple settlement located at a point in the plain that had the most comparative advantage of centrality and the focal node of transportation. As the city grows in population and size, it develops pockets of settlements that are, to a

large extent, either dependent or independent of the centre. The new centers will also have their own central business area with surrounding land uses, rent gradient and real estate market structures. This growth would complete the conversion from a concentric urban form to a polycentric urban form.

(a) Concentric/Monocentric Commercial Urban Form-The concentric urban form comprise of a single central business district (the centre) surrounded by rings of factory land, and residences of different classes (Mills, 2004 and Balchin et al., 1985). Sullivan (1990) notes that urban activities in a concentric urban form are arranged according to their transport cost and rent-bid function. Land use is a continuum that starts with the inner centre with dense concentration of buildings and people and high prices of real estate and reduces to the outer rings (Roulac, 2003 and Plaut et al., 2003). Distance from the centre is associated with diminishing demand for real estate. Changes in the land use within the commercial sector and the entire urban centre are in the form of successive invasion and are caused by population migration, economic growth and income expansion. Wurtzebach et al., (1994) note that land use change can also occur when buildings no longer have attributes desired in the market because of changes in technology. The absence of an alternative centre leads to internal land use change.

The central business district is the point of highest density and rents and the centre where transportation routes converge. Plaut et al., (2003) observe that the central business district will be the main centre for employment and commercial activities and the nucleus of agglomeration. Roulac (2003) further stresses the importance of the CBD in the concentric urban form and observes that all real estate investment decisions are made in the contest of the CBD.

Richardson et al., (2000), Jones (2000), Lupala (2002) and Plaut et al., (2003) suggest that all urban centres in the developed and developing world exhibited the monecentric urban form at their early stages of growth. Examples of cities that exhibited the monocentric urban form at their early stages of development were Chicago in the USA and Sao Paulo in Brazil (Balchin et al., 1985 and Santos, 1996).

(b) Polycentric/Dispersed Commercial Urban Form- The modern urban centers are now exhibiting an increasing trend towards dispersion of urban activities from the city centre to other commercial and residential sub-centres (Richardson et al., 2000 and Plaut et al., 2003). The current urban centres now exhibit a polycentric urban form, with several commercial centres surrounded with residential, manufacturing and other urban land uses. Sullivan (1990), Gat (1998) and Plaut et al., (2003) observe that the key difference with the concentric urban form is the existence of several peaks of density, real estate prices and quality of developments and infrastructure, one at the inner city and CBD and the other at the centre of the various sub-centres.

The urban form consisting of the central city and other sub centers was first observed in the Western World. Thompson (1965) noted the emerging trend of enterprise locating outside the inner core in American cities. Hansen (1975), Wieand (1987), Malizia (2003), Euchner et al., (2003), Frey (2004) and Mills (2004) found similar trends in Western Europe. Jones (2000) observed a similar urban form in Asia as shown by the dispersed commercial urban form of Tokyo in Map 2.1.

A typical urban centre in the USA, Europe and Asia now comprises of the inner city in various states of decay and regeneration and increasing instances of vibrant sub-centres. The most common trends are cases of multiple commercial centers with the inner city losing employment and population, relatively and at times absolutely, to the suburbs and sub-centres. The CBD still retains its position as the transport node and the sub-centers will concentrate towards residential suburbs to which they provide goods and services. The distance of the sub-center to the CBD depends on its size and it is observed that a bigger sub-center will be located further away from the CBD.

Sullivan (1986) considers that a typical city in the developed world will consist of the CBD with several ring sub centers, all linked together by a complex land market. These findings are consistent with those of Fu et al., (1999) who report that urban centers exhibit a polycentric commercial form consisting of the CBD, as the largest center, and the sub-centers as competing and complementary centers. Plaut et al., (2003) have observed similar trends in Haifa with the rapid death of the inner city and continuous dispersion of

economic activities and settlements. The process can be considered as that of 'de-urbanizing' and "suburbanizing" with the result that the town centers have disintegrated (Tanghe, et al., 1984).

Map 2.1: Current Urban Form of a City in the Developed World- Tokyo City

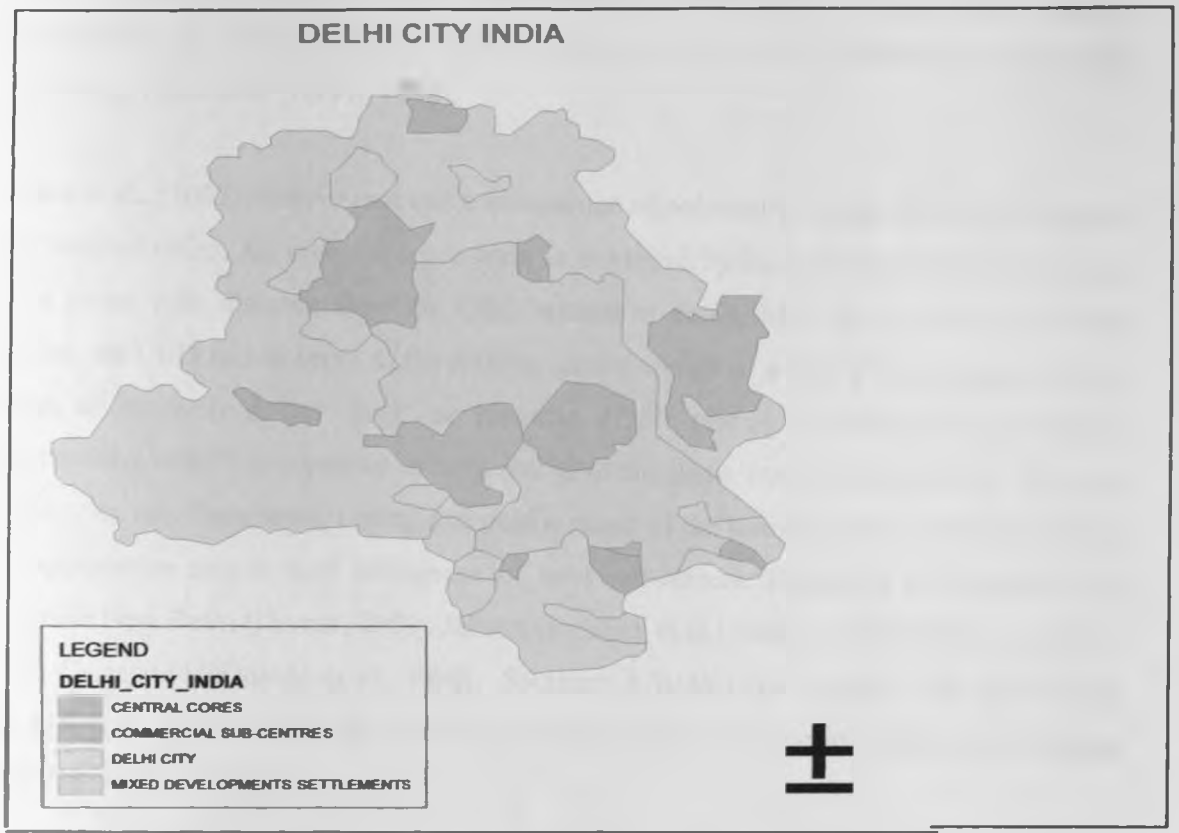
Source: Jones (2000)

Jones (2000), Richardson et al., (2000), Kumar (2000), Becker et al., (1999), Habitat (1996) and Richardson (1993) found roughly a similar urban form in the developing world. The cities in the developing world now exhibit a polycentric form with emergence of several sub-centres. Examples include South African cities of Johannesburg, Cape Town, Pretoria and Durban (Newell et al., 2002 and Goga, 2005). A similar pattern of multiple commercial urban structure has also been noticed in Dar es Salaam with a noticeable shift of commercial developments towards the Kariakoo Business District (Geho, 2003). Map 2.2 is a typical urban form for a city in the developing world.

Urban centers in the developing world now consist of sub-centers competing with the central city with varying densities and spatial qualities. The change from the concentric

(monocentric) to polycentric urban form has brought challenges to these cities. Sullivan (1990), Jelinek (1992), Habitat (1996), Lupala (2002) and Plaut et al., (2003), list these challenges to include rapid deterioration of the original centre, rent and density inversion, long and high commuting distances costs and high cost of providing urban services and infrastructure.

Map 2.2: Current Urban Form of a Developing World City- Delhi (India)



Source: Kumar (2000)

The horizontal expansion of the cities has resulted in long commuting distances, time and cost for workers in the commercial centres. Jelinek (1992) and Jones (2000) cite the examples of Mexico City and areas around London as some of the urban centres with long commuting hours. For example, inhabitants of Mexico City have to travel for three hours to their places of work compared to a maximum of 45 minutes in efficient cities. Lupala (2002) adds that the transport costs in Dar es Salaam increased to take almost 50% of the minimum wages of a government employee. As a result of long commuting distances,

petroleum consumption in USA cities is four more times than the European cities and six times higher than in Asian cities (Mordon, 1992). This has a direct impact on pollution levels and hence the quality of residences and place of work.

Habitat (1996) and Lupala (2002) report that rapid horizontal expansion increases the cost of providing infrastructure and reduces the efficacy of urban services. The low-density developments that are a defining characteristic of polycentric urban form increases dependence on motor vehicles and raise the cost of public infrastructure (American Planning Association [APA], 1998).

Plaut et al., (2003) observe that one consequence of polycentric urban form is the creation of inverted cities. An inverted urban form is exhibited by the increase of real estate rents and prices with distance from the CBD instead of diminishing. In the case of inverted cities, the CBD would serve as the local or global trough of a land pricing gradient rather than as its nucleus, the 'peak' or pinnacle of the pricing function having relocated somewhere else. The inversion of land rent gradient stems from neighbourhood effects of inner city neighbourhood, ageing and deterioration of the housing stock, advancements in transportation system and emergence of new sub-centers. Examples of inverted cities include New Delhi (Kumar, 2000), Jakarta (Rustiadi et al., 2002), Haifa (Plaut et al., 2003) and Chicago (McDonald et al., 1990). Southern African cities are also inverted with the rich living closer to the CBD and the poor having to endure long commuting distances (Becker et al., 1999).

The above discussion has established that modern urban centers will have multiple commercial centres comprising of the CBD, inner city and sub-centers. Garreau (1991) is of the view that everything in the CBD can be, and increasingly is being transferred to suburbs or 'edge-cities'. The CBD, the inner city and the sub-centers complement each other and at times compete with each other. The future urban form, both in the developed and developing world, is polycentric. The trend cannot be reversed and urban managers must now understand the phenomenon in order to achieve a sustainable urban form.

2.3.2 Measures of Commercial Urban Form

In the past, the number of commercial centres and the population distribution has been the indicator of urban form. However, in the recent past, there have been attempts to develop and refine other tools of measuring urban form. Galster et al., (2001) measured urban form using eight dimensions, namely density, continuity, concentration, clustering, centrality, nuclearity, mixed use, and proximity. These variables were used to test and rank the urban form in thirteen USA cities for the period of 1900 and 2000. The results of this analysis are presented in Table 2.1. Based on the indicators, Atlanta, Detroit, Miami and Denver were polycentric cities while New York, Philadelphia, Boston and Chicago were less dispersed.

Table 2.1: Galster Indicators of Urban Form

	Density	Concentration	Clustering	Centrality	Nuclearity	Proximity
Atlanta	806.25	0.28	0.38	177.86	44.17	0.2569
Boston	1000.63	0.47	0.44	191.83	88.80	0.2754
Chicago	1647.09	0.40	0.49	160.30	82.42	0.3392
Dallas	901.57	0.41	0.47	149.40	24.03	0.3311
Denver	1462.90	0.31	0.41	178.22	67.40	0.1656
Detroit	1265.60	0.34	0.39	141.51	69.94	0.2610
Houston	989.45	0.40	0.54	183.16	13.44	0.2539
Los Angeles	1861.84	0.37	0.36	166.97	57.92	0.3800
Miami	1883.26	0.32	0.41	125.91	43.79	0.1793
New York	1946.48	0.51	0.51	202.24	96.56	0.4048
Philadelphia	1483.97	0.41	0.52	192.14	89.98	0.2551
San Francisco	1639.00	0.43	0.37	194.76	70.18	0.2611
Mean	1407.42	0.39	0.44	167.46	62.84	0.2800
Standard Dev	389	0.06	0.06	25.36	25.71	0.0700

Source: Galster et al., (2001)

Allen (2001) developed a measure of urban form called the INDEX, which included over 30 indicators computed at a variety of geographical scales. The INDEX produces forecasts of vehicle miles traveled, ambient air emissions, and jobs/housing balance. Song et al., (2004) refined the INDEX and the Galster indicators to produce a time series measure of the urban form that was relevant for policy decision-making. Richardson et al., (2000), on

the other hand, used densities to measure urban form in the developing world.

The Galster Indicators of urban form can be compressed into two key measures of density and accessibility. The indicators of density, concentration and clustering can be grouped as 'density' measure of urban form. The centrality, nuclearity and proximity can be categorized under the measure of 'accessibility'. It is now possible to conclude that the key measures of urban form are density and accessibility. These are compound concepts that entail the following:

(a) **Density**: This measure of urban form is looked at in terms of population and development spread. Richardson et al., (2000) and Song et al., (2004) suggest that decentralization and sprawl results in reduced densities. Lower density is an indication of a dispersed urban form (polycentric) and a higher density indicates the opposite.

(b) **Accessibility**: According to the American Planning Association (1998), dispersed urban form result in too much separation between uses and long traveling distances. Song et al., (2004) propose that accessibility should be viewed in terms of the median distance from the centre of every single residential unit to the centre of the nearest commercial centre. It is, therefore, expected that a shorter median distance will indicate a polycentric urban form and vice versa. Bertaud et al., (1998) extended this measure of accessibility to develop the 'dispersion ratio'. The 'dispersion ratio' is the average distance per person to the CBD as a ratio of the average distance to the centre of a circle. It is expected that the higher the ratio, the more dispersed the city.

Song et al., (2004) used the density and accessibility to measure the urban form of two neighbourhoods in the Washington County in the USA between 1960 and 2000. It was found that the densities increased from 4 dwelling units per acre in 1960 to an average of 10 in 2000. The median distances from residential units to the nearest commercial centre increased from 1000 feet in 1940 to 2100 feet in 1990 before falling to an average of 1800 feet by the year 2000. The findings suggest that the urban form dispersed over the period

under review. This measure can be replicated to a bigger scale.

Richardson et al., (2000) used the ratio of central city to suburban densities to measure the level of compaction and dispersion of urban activities in a sample of urban centres both in the developed and developing world. It is postulated that the higher the ratio, the more the urban form tends towards compaction (concentric). It was found that the mean ratio of central city density to the rest of the city was 38.50 in the developing countries and 11.86 in developed world. This suggests that cities in the developed world were more dispersed than those of the developing world.

Bertaud et al., (1998) subjected 35 world cities (including 14 in the developing world) to the test of 'dispersion ratio'. The city with the lowest dispersion ratio was Bangkok (0.99) while the highest was Bombay (3.08), suggesting that the former was more compact than the latter. However, most of the cities in the sample had a 'dispersion ratio' ranging from 0.90-1.10, suggesting that the urban forms are tending towards polycentric all over the world.

It would, therefore, seem that the density and accessibility (distance from the original core of the city) are the main tools of measuring urban form. Based on these tools, it can be concluded that cities in the developed world are more dispersed than those of the developing world. However, as Richardson et al., (2000) and Bertaud et al., (1998) discovered, cities in the developing world are also increasingly dispersing commercial and residential activities away from the original core.

2.4 Factors Encouraging Changes in the Commercial Urban Forms

Modern urban centers are now exhibiting an increasing trend towards dispersion of activities and businesses from the city centre to other commercial and residential sub-centres. The factors that encourage dispersion of economic activities and population are many and vary depending on historical development, the main functions of the city and government policy. These causes include the rate of spatial, demographic and economic growth of the city, physical/town planning decisions, excessive suburbanization of residences, the size of the hinterland and the geographical features, the state/condition of

the CBD and inner city, changes in transportation system, technological advances, changes in occupancy and rental rates of commercial properties, the nature of property and land ownership rights, among others (McMillen et al., 2003; Barlowe, 1978; Wieand, 1987 and Chan et al., 1989).

The reason, or a combination of reasons, will determine individual firm location and investment decisions and differentiation of development and economic activities between the sub-center and the inner city. The continuous process of location and relocation of economic enterprises between the inner city and the sub-centres ensures a dynamic urban form and commercial real estate market. This process results in an urban form consisting of a decaying CBD, decayed inner city and growing sub-centres.

(a) **Population-** Bourne (1975) sees population size, density and occupation character as the main determinant of the number and size of the sub-centers and the relative importance of the inner city. McMillen et al., (2003) found that the number of sub-centers rises with population and commuting costs and that an ordinary city will develop its first sub-center when its population reaches 2.68 million permanent inhabitants. Barlowe (1978), Wieand (1987) and Chan et al., (1989) found that the total population of and the spatial size of the urban area determine the distance of the sub-center from the CBD. It is postulated that a bigger sub-center will be located further away from the CBD. It is, therefore, possible to conclude that rapid population growth encourages dispersion of commercial and residential developments.

(b) **Loss of Agglomeration-** The loss of agglomeration economies in the central city results in negative externalities and this precipitates the move away to other centers. As the city increases in size, the CBD becomes congested, overwhelms the gains from agglomeration economies and makes it more efficient for some or all firms to suburbanize (Wurtzebach et al., 1994; White, 1999 and Mills, 2004). The loss of agglomeration economies in the inner city is essentially a manifestation of failed delivery of urban services (World Bank, 1995). The lack of urban services affects growth of enterprises located in inner cities and forces them to seek

alternative locations in sub-centers. It seems, as Gibson et al., (1982) observed, that suburbanization and the rate of inner city decay are positively related. As the inner city gets more congested and becomes unattractive, businesses and individuals tend to move to the less-congested newer centers.

(c) **Transportation and Communication Technology**- The suburbanization of office employment has also been caused, in part, by advances in transportation systems and communication technology. Barlowe (1978) and Euchner et al., (2003) found that the widespread use of automobiles has reduced the relative importance of the central point as the transportation node for the entire city. The motorways, the underground railway line and other forms of transportation networks have allowed businesses to reach their markets and customers without necessarily locating within them. These advances, in addition, have decreased the cost of transportation and of transmitting data, voices and pictures. However, Jones (2000) acknowledges that this applies to a certain spatial extent beyond which it becomes expensive and inefficient to provide infrastructure and basic urban services. This, therefore, limits the number of sub-centres and their distances from the central business districts.

(d) **Planning Regulations**- The existence of inner cities and sub-centres with varying densities and spatial qualities are a sign of various forms of city growth or of planning intentions (Lupala, 2002 and Thompson, 1965). Barlowe (1978), Home (1982), Richardson (1993), Valenzuela (1994), and Jones (2000) found that the current polycentric commercial urban form in most cities of the world is a result of deliberate planning action to decongest the central city. This peripheral expansion is encouraged by the availability of cheap buildable land in the sub centers and the poor land management in the inner cities (Lupala, 2003). Gariy (1989), Jones (2000), Rustiadi et al., (2002) and Kumar (2000) found that planned decentralization has guided the commercial urban growth patterns of New York, Los Angeles, Dhaka, Nairobi and South Korean and Indian cities.

In contrast, some cities such as Rome (Italy) and Los Angeles (USA) have pursued the policy of compaction of the city (Jones, 2000). The justifications for

concentration of economic development and activities in the inner core and the CBD has been to reduce land consumption, achieve greater social interaction, reduce fuel consumption and enhance environmental protection. Bourne (1975) points out that the policy of concentration (agglomeration) was borne out of the need to achieve an optimal size of the commercial centre that could achieve cost efficiency. The authorities in these cities have encouraged redevelopment and intensive development of the inner cores by increasing density and expanding infrastructure and urban services.

Cities in Western Europe and Asia have pursued a combination of the two growth patterns with good success. Jones (2000) and Kumar (2000) cite London, New Delhi and Paris as examples of cities that have both decentralized to the periphery and redeveloped the inner city. Cherry (1988) reports that London is now a more evenly distributed city with approximately half of real estate values concentrated in the commercial sub-centres compared to only 29% in 1931. Richard et al., (2000) observes that Bangkok is suburbanizing and, at the same time, densely developing its inner core at the same speed in order to achieve evenly distributed developments and infrastructure.

Jones (2000) and Gat (1998) note that positive public action to develop both the inner city and the periphery ensures that both the centres are attractive to various real estate investors and users. This has ensured that population and businesses are evenly distributed between the various commercial centres. This phenomenon is supported by gentrification and segregation of users on the basis of rent-paying ability. In turn, this has reduced market distortion and allowed these cities to have vibrant real estate markets.

(e) **Land Tenure and Property Laws**- Becker et al., (1999) and Payne (1997) report that the type of and the level of refinement of property rights is a contributor to the urban built form. Malpezzi (1990) and Jones (2000) give the examples of Cairo, Jakarta and New Delhi as cities that land tenure, property ownership rights and land taxation laws have influenced the prevailing urban

form. It has been found that investors will only invest in sites with secure tenure even if it means sprawling to the outer fringes. In addition, Becker et al., (1999) argue that investors will invest in neighbourhoods with insecure land tenure with hope of realizing higher capital gains upon regularizing the land tenure system. The occupants and users of these real estate investments, on the other hand, will choose to locate in places where their occupancy rights override owners' rights. This explains cases of scattered and abandoned neighbourhoods in the inner cores and new development in the peripheries.

(f) **Occupancy Characteristics**- The type of occupants, categorized in terms of landlords and tenants, also determines the resultant urban form. McFarland (1966) found that tenants-dominated areas decay faster than owner-dominated areas and encourage dispersion. Hall (1984), Santos (1996) and Jones (2000) give examples of the London Borough of Tower Hamlets, Jakarta, Cairo, Sao Paulo and many other cities in the developing world that exhibit differences between tenant-dominated areas and owner-occupied areas. Tenants tend to invest less in the maintenance and upgrade of rented accommodation compared to owners and this leads to rapid deterioration of the real estate developments and the infrastructure. The middle-income and the affluent in these cities will tend to locate away from such dilapidated neighbourhoods and hence encourage suburbanization.

Gibson et al., (1982) also report that government control through rent restrictions leads to transfer of investments to locations exempted from such regulations and rapid decay of areas under the controlled zone. The development patterns will naturally follow land rights patterns and the highest concentration of development will be found in areas of secure tenure and those exempted from rent controls.

(g) **Real Estate Investment Decisions**- The investment decisions of the real estate market participants also determine the commercial urban form. Gibson et al., (1982), Hanley (1993), Zaman et al., (2000) and Jones (2000) report that high

land values in the central city inevitably push those on a lower consumption level to the periphery where land is cheap. Gilbert (1996) and Goga (2005) further identify land speculation as a major cause of investing in the sub-centers with the hope that land values will increase. This was observed in Sao Paulo and other metropolis in Southern America, Asia and South Africa. The tendency of capital to flow towards suburban and new developments as opposed to redevelopment projects leads to irrational investment decisions (Malizia, 2003).

(h) **Economic Growth-** Jones (2000) and Chan et al., (1989) are of the opinion that general economic improvement has a direct bearing on the commercial urban form. It is naturally expected that as the economy expands, new businesses will be established. These new businesses will require spaces that might not be available in the CBD and inner city. This will lead to establishment of other commercial centers. A number of the new businesses and existing ones that can do without the benefits of concentrated commercial centre will relocate to the sub centre.

(i) **Location Decision-** The collective location decisions of the firm and an individual will, in the long run, determine the extent of suburbanization of both centers of employment and residence. Both firms and individuals will weigh the costs and benefits of any location and will locate in centers that maximize benefits and minimize costs. Employees, on the other hand, choose to work in places that offer them the opportunity to have rewarding place experiences (Roulac, 2003). Firms will, therefore, tend to locate in areas with superior working environment to attract the best manpower at the lowest possible cost. This will likely be in the sub-centres in the event the inner city is dilapidated. Such firms will tend to locate in the sub-centres where workers can accept lower wages because they commute less, rents are low and goods transportation costs are low.

The causes of the current urban form and the consequent location and relocation decision

are, therefore, many. The location and relocation decisions will continuously change the character of the various commercial centres. Each centre will, in addition, continue to change in response to changes in the other centre, impacting on the urban form, the real estate market and the quality of life of urban dwellers in different ways.

2.5 Cycle of Commercial Neighbourhood Changes

McKenzie et al., (1976) point out that the changes to individual properties and entire neighbourhoods involve decay, conversion, urban renewal and then abandonment. Each cycle starts with neighbourhood properties being well maintained, modernized and occupied by stable users. The cycle then turns to a gradual decay of the neighbourhood. This leads to a period when the neighbourhood is deteriorated and prices of properties have fallen, a high turn-over of low-income persons, density is high and maintenance is low, illegal uses are common and abandoned properties are noted. The cycle then enters a recovery period, attracting new occupants who are different in income levels and density of occupancy from current occupants. These new occupants rehabilitate and remodel the structures. However, over the years, the enthusiasm dies and the process of decay starts all over again. This cycle of decay and rebirth can be repeated indefinitely unless it is interrupted by a major change in land use and deliberate rehabilitation program.

Al (1999) and Wurtzebach et al., (1994) classify neighbourhood changes into four continuous cycles namely:

(a) Growth- new buildings are constructed on vacant, newly cleared land or when properties are converted from a different use;

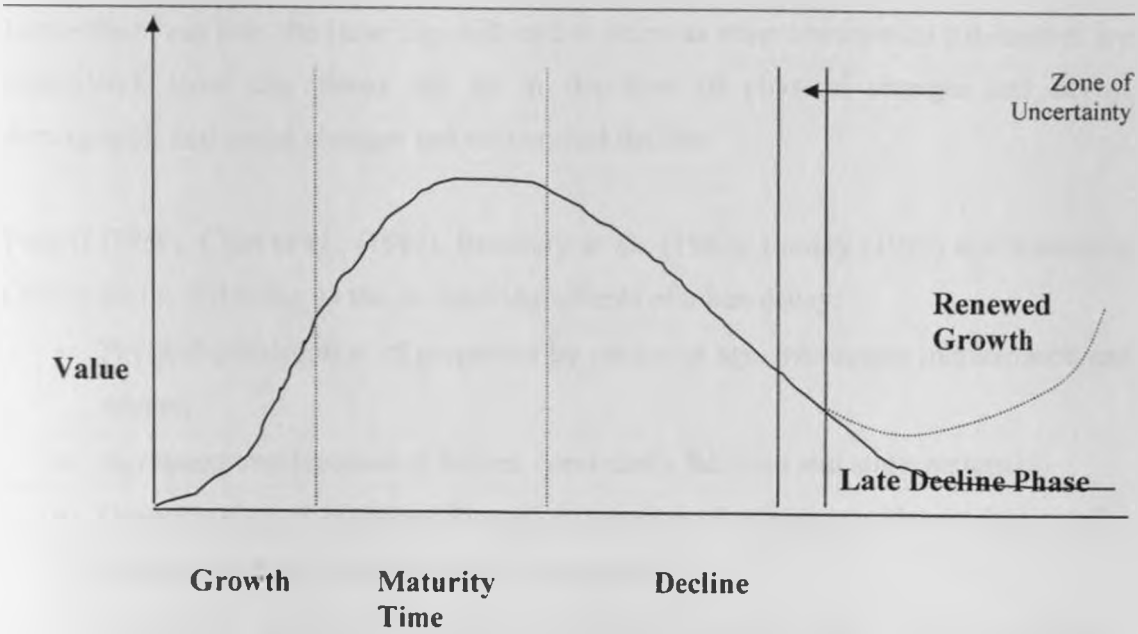
(b) Stability- end of growth era when it is no longer profitable to build or when other neighbourhoods become better value;

(c) Decline- when it can no longer compete with comparable neighbourhoods and maintenance costs become too high and vacancies increase;

(d) Revitalization- decline ends when the dominant land use changes or a period of renewal begins.

This process can be depicted graphically as shown in Figure 2.1.

Figure 2.1: Neighbourhood Growth Cycle



Source: Wurtzebach et al., (1994:78)

A neighbourhood that is changing exhibits certain characteristics that can indicate the direction of the change. Al (1999), Sirmans et al., (1993) and McKenzie et al., (1976) list these signals to include:

- A poor mix of land uses and conversion to another use;
- Considerable variations in construction, maintenance standards and ownership status with increase in age;
- Indistinct neighbourhood boundaries;
- High turnover;
- Low rental income;
- Increase in density of use and subletting.

The changes in the spatial pattern and character in one centre has a direct impact on the other centres in the city. A centre that is under the decline stage will encourage departure of investors and occupants to the centre under the growth stage. This suggests that urban managers must institute measures to reverse urban decay to achieve a balanced commercial urban form and real estate market.

2.6 The Inner Cities Decay and Revitalization

In the life of any city, the inner city will tend to decay as other commercial sub-centres are established. Inner city decay can be in the form of physical changes and decay, demographic and social changes and economical decline.

Perloff (1955), Chan et al., (1989), Bradbury et al., (1982), Hanley (1993) and Kwanshie (2000) list the following as the physical ingredients of urban decay:

- Physical deterioration of properties by reason of age, inadequate maintenance and misuse;
- Increasing obsolescence of homes, community facilities and street patterns;
- Overcrowding of buildings through conversion of existing residences into smaller housing units and commercial/business spaces;
- Breakdown in the enforcement of building and zoning laws and the lowering of standards in the provision of public facilities and services; and
- The decay process tends to accelerate and to be self-reinforcing.

Inner city decay is characterized by rapid changes in population size, density and character. Jones (2000), Chan et al., (1989) and Hughes (1979) report that inner cities are either acutely depopulated or are characterized by high population densities and mixed uses. In most cities in the North and many in the South, there has been a declining proportion of the population living in the central city (Habitat, 1996). In places where population has remained stable, like in Africa, the majority of the inhabitants of the inner city have been hawkers and small-scale operators.

Gibson et al., (1982), Sullivan (1986), Gilbert (1996) and Kwanshie (2000) report that poverty, unemployment, poor housing, inadequate schools, high crime rate, adverse social conditions, traffic congestion and deteriorating environmental conditions are the standout characteristics of the inner cities. Chan et al., (1989), World Bank (1995) and Wurtzebach et al., (1994) further observed that the traditional inner cities are likely to suffer from the lack of community facilities, disintegrated infrastructure and poor environmental conditions. A decayed inner city is, therefore, a manifestation of failed urban management. The only solution for this decay is urban renewal (Malizia, 2003 and Hanley, 1993).

Roberts et al., (2000) define urban renewal as a comprehensive and integrated vision and action which leads to the resolution of urban problems and which seeks to bring about lasting improvement in economic, physical, social and environmental conditions of an area that has been subject to change. Crouch (1990) and Tanghe et al., (1984) likewise define urban renewal as the physical change, or change in the use or intensity of use of land, buildings and infrastructure. Gibson et al., (1982) and Olayiwola et al., (2006), on the other hand, are of the opinion that urban renewal refers to the redevelopment, rehabilitation and adaptation of the older parts of towns and cities to new requirements. Urban renewal should, therefore, be seen as a formal effort to reverse the downward confluence of forces of decay and replace them with positive forces, which will afford a stable and continuous process of neighbourhood revitalization (Perloff, 1955 and McFarland, 1966).

Urban renewal is undertaken for environmental, social and economic reasons. Falk (1993) argues that urban renewal and revitalization should ensure social justice, natural balance and minimization of waste. Perloff et al., (1975) and Euchner et al., (2003) add that renewal can also be undertaken for the following reasons:

- For moral reasons;
- Business consideration- as the centre of the market and employment for the hinterland;
- Increasing national income by achieving economic efficiency;
- To reduce the cost of providing public infrastructures and urban services;
- To reduce waste and beautify urban landscape;
- To achieve spatial balance between the inner city and other centers;
- To achieve public social goals such as poverty eradication.

Perloff et al., (1975) suggest that inner city renewal programs should target upgrade of urban services, arrest of physical decay and creation of employment. Consequently, Gibson et al., (1982) emphasize that urban renewal should look beyond physical rehabilitation and concentrate more on the economic causes of inner city decay. Sustainable inner city renewal and revitalization must, therefore, tackle the fourfold problems of economic decline, physical decay, inadequate urban services and

infrastructure and social problems. Britain pioneered this paradigm shifts with the publication of the White Paper. The policy paper set out long-term urban renewal policy as follows:

- Strengthening the economies of inner areas;
- Improving the fabrics of inner areas;
- Alleviating social problems;
- Securing a new balance between the inner areas and the rest of the city by reducing decentralization (Gibson et al., 1982 and Homes, 1982).

The tools of physical planning, zoning regulations, and development control and re-planning the inner city have been used as an urban renewal strategy. Vitkovic et al., (1998) discourage the use of these approaches on the grounds that planning has fallen out of fashion. Zaman et al., (2000) report that these planning approaches have failed as urban renewal tools in Dhaka's inner city. Jones (2000), therefore, proposes that the planning approach to core-area development should be more sensitive to the existing urban fabrics, which can accommodate a whole range of economic activities. In this regard, public policy and programs for inner city must be formulated and implemented bearing in mind its importance to the larger metropolis.

The nature of ownership and the quantum of rights have also been used as a public tool in urban renewal and rehabilitation (Ortiz et al., 2001 and McFarland, 1966). Improving tenure systems and property rights is an important tool that can be used to revitalize decayed and vacant sites in inner cities (Payne, 1997). This will allow landholders to access capital and will also assure predictability of returns.

The state can also use economic and financial tools for inner city renewal and rehabilitation. Malizia (2003) proposes the use of 'top-up grants', tax relief, subsidies in the form of cheap land and financial support to tenants as some of the tools in this category. An example of the financial tools is the rehabilitation tax credit of the United States (Shilling et al., 2006). However, the use of these tools is becoming extremely rare due to changes in government economic and development policies.

Inner city renewal brings many benefits and advantages to the inner city and the citywide spatial and economic performance. Any upgrading and revitalization efforts will almost certainly lead to increased land and property values (Jones, 2000). Ding et al., (2000) found that proximity to rehabilitated housing significantly increased sale price by about 4% within the radius of 150 feet. Thompson (1965) and Euchner et al., (2003) cite other advantages of revitalization to include increased private investment and property tax revenue, rejuvenates downtown business districts and its economic growth and may reduce public costs. Tuminaro et al., (1997) found that investment made by the city in rehabilitation of decayed neighbourhoods resulted in 75% increase of real estate property tax base. These are benefits accruing to the local authorities but result in losses and disadvantages to the individual property owner and inhabitant. These disadvantages include high rents, gentrification, reduction of densities in the inner city and accelerated urban sprawl (Blair, 1970; Euchner et al., 2003 and Hughes, 1979). However, in the long run, urban renewal has many benefits to the public and the individual property owner/residents.

2.7 The CBD, Inner City and Sub-Centre Dichotomy

The relationship between the CBD, inner city and the sub centres can be looked at in terms of attributes of use, land values and real estate prices, density and type of development (Roulac, 2003 and Richardson et al., 2000). The relationship is a continuum that starts with an inner city having the highest concentration of buildings, businesses and people. This reduces with distance from the inner city. Gat (1998) holds the view that effect of distance should not be measured directly but as an exponentially decaying function of the distance from the CBD to the mid points of each sub centre. The actual distance will be irrelevant if urban services are adequately provided and the operations of the real estate and land markets are efficient.

The inner city will offer spaces suitable for small firms, much of it in flexible units, and some of it in areas due for redevelopment. The rentals in these areas reflect the fact that properties are old and environmentally ugly. The inner city will also offer these firms opportunity to access skilled labour without the expense of training. It is, therefore, common to find small-scale firms, hawkers and vendors in the inner city. These firms will

use the inner city for incubation and will migrate immediately thereafter (Cameroon et al., 1980). The city center and inner center will also be inhabited by the office sector that benefits from of face-to-face contact (Gat, 1998 and Clapp, 1993). It is for this reason that the main occupiers are the office and service sectors and businesses in the rapidly expanding sectors of the economy.

The sub-centres, on the other hand, will be mostly inhabited by activities that do not require high degree of agglomeration but require a compact area for the successes of their businesses. It is only activities that need infrequent contact with the CBD that will have an incentive to split off and locate in sub-centres in order to minimize costs and maximize profits (Mills, 1999). White (1976) and Howarth et al., (1998) assume that firms that suburbanize have an incentive to spread themselves out in all directions around the CBD. These incentives could include lower wages as a result of reduced commuting time and cost of workers and greater space availability.

The suburban centers will also contain activities for which electronic communication is a good substitute for face-to-face contact. The increasing use of the internet, high volume telephone/fax services, picture photos and video conferencing has been the perfect substitute for face-to-face contacts and, therefore, reduces the accessibility advantage of being at the CBD.

Frey (2004) and Howarth et al., (1998) disagree with the above categorization. The distinction between the inner city and the sub centers is not clear as the development and the populations within each of the two categories have become increasingly heterogeneous. It is hence possible to find similar sets of activities taking place both in the CBD and in the sub-centres. Under this arrangement, the sub-centres do not merely duplicate the inner city but actually compete with them. This explains why magnificent CBDs are still found in the USA, Singapore, Malaysia, Hong-Kong, Mainland China and South Africa (Mills, 2004 and KIPPRA, 2005).

The distinction between the inner city and the subcentre can also be analysed in terms of real estate pricing. Urban real estate is priced as a downward function of distance from the

centre (Plaut et al., 2003 and Jones, 2000). Despite this classical view, the modern cities are exhibiting cases where land values, rents and density gradients are increasing with distance from the city, thus creating an inverted urban form and distorted commercial real estate market.

2.8 Summary

The above discussion has presented the processes that shape the location of individual economic and social activities in an urban centre, the formation and growth of the various centres, the causes and characteristics of changes in the various neighbourhoods and the various intervention tools. It has been found that these processes are continuous and unending, leading to the formation of multiple centred commercial urban forms.

Urban lands are allocated to activities that result in 'highest and best' use of the site and can generate sufficient residual profits to pay for the highest rent. The urban activities will select and locate at sites that enhance accessibility and hence reduce transport costs. The need to locate close to raw materials and markets for the finished goods ensures that activities that compliment each other will generally cluster in one location. The advantages of agglomeration will result in specialized centres or centres with a predominant office sector.

The processes of location of individual activities result in a simple concentric urban centres at the initial stage of city growth. However, as the urban centre expands, the initial centre becomes unable to accommodate all the activities. Some of the urban activities will break off and found other centres. The dispersion of economic activities has now produced a polycentric urban form, both in cities of the developed and less developed countries. It is, therefore, common to find modern cities comprising of the CBD, inner city and several commercial sub-centres. The measures used to ascertain the urban forms are density ratios and accessibility measures.

The speed and extent of the dispersion of commercial developments, places of employment and population has been encouraged by several factors. Key among them are population changes, changes in economic growth, physical decay, changes in

transportation and communication technology, individual location and investment decision, suburbanization of residential neighbourhoods, planning and zoning regulations and land tenure systems. The interaction of these factors results in a continuously changing urban commercial form. It is expected that this process will continue until an external factor or some form of market correction mechanism intervenes.

The most common observation in the cities of the developing world is growing/expanding sub-centres and decaying inner cities. The reaction to a decaying inner city is to undertake urban renewal and rehabilitation programs, both at the citywide or macro level and individual building or block. A properly designed and executed urban renewal program generates economic efficiency, balance between the inner city and other centres and reduces market imperfections. The ultimate goal of urban renewal is to revitalize the economies of the decayed areas and enhance the performance of the commercial real estate market.

Chapter Three

COMMERCIAL REAL ESTATE MARKET PERFORMANCE ANALYSIS

3.1 Introduction

In any given physical region and legal jurisdiction, there will be several real estate markets. These markets can be categorized in terms of geographical locations (neighbourhood, city and regions) and type of real estate (residential, commercial, among others) (Wurtzebach et al., 1994). The interaction of the various stakeholders (investors, regulators, brokers, occupants, developers, purchasers, financiers and the public) with varying expectations constitute the real estate market and its dynamics.

Roulac (1995) argues that real estate investment is a complex process, the complexity being compounded by the periodical changes in real estate performance cycles. The interaction and the performance of the citywide markets and submarkets require regular study and analysis to appreciate their impact on the overall economic growth and urban development. As a result of heterogeneity of the markets and the properties themselves, commercial real estate markets require detailed information that can only be found at localized level (Kolbe, 2003). The primary unit of analysis is, therefore, the neighbourhood and the individual properties. In commercial real estate market, these sub-markets are the inner city, the CBD and the sub-centres. This analysis must put in mind the real property cycle as this influences the performance of the property and the entire market, in the short and long run.

3.2 Commercial Real Estate Markets Analysis

The analysis of the real estate market is necessary to anticipate future demand trends, to determine the highest and best use and the likely performance of the proposed individual proposed investment (AI, 2001). Market analysis, therefore, provides the necessary data and information required for any decision concerning investment in that market and the sub-market. The key tasks of market analysis include:

- Discussing megatrends affecting user preferences and product design;
- Estimating the long-term attractiveness of the location and site;
- Forecasting balance and imbalance between future demand and supply;
- Segmenting demand and differentiating supply; and
- Conducting sensitivity analysis of key variables in the project's cash flow projections (Howarth et al., 1998).

The analysis of the performance of the real estate market can be undertaken in terms of the level of imperfection/inefficiency, demand and supply dynamism, the sub-markets and property/market cycles.

3.2.1 Market Imperfection/Inefficiency

The concept of a perfect market emanated from classical economists who anticipated a market that was self-regulating with stable prices and a balance in supply and demand. Gartzlaff et al., (1995) describe efficiency as the allocation of resources such that no reallocation can occur that increases the utility of some without decreasing the utility of others. An efficient market implies that all market prices fully and instantaneously reflect all relevant information. There are no costs for acquiring the information, and if any, the cost is affordable to most of the players in the market. The absence of these fundamentals in the market consequently results in an inefficient market.

Gau (1985), Dasso et al., (1989), Jones et al., (1994), Gartzlaff et al., (1995) and Ling (2005) report that urban real estate markets are considered inefficient as a result of a set of market imperfections. These imperfections have their roots in the investment characteristics of real estate. These characteristics are viewed in terms of heterogeneity, liquidity, centrality of markets, government regulations, transaction costs, indivisibility of the real estate and information flow. Al (1991) further notes that market imperfections might also be related to significant influence of externalities on real estate values.

Dasso et al., (1989) and Al (2001) attribute real estate markets imperfection to the fact that full information is usually not readily available to all participants. Consequently, participants in a typical property market would have differing expectations of returns and

risks for real estate and differing values for a given parcel of real estate. In an inefficient market, participants with greater knowledge or skills can exploit other participants and thereby rapidly increase their wealth. In addition, information is generally captured and disseminated rather slowly in real estate markets. This may limit information capitalization into real estate values and thus enhance inefficiency.

In the developing world, urban real estate market imperfections are caused by 'market failures' (Becker et al., 1999). Ortiz et al., (2001) assert that 'market failures' in the developing world prevent free private markets from achieving an efficient allocation of natural resources. Market failures include the existence of public goods, natural monopoly, large transaction costs and externalities. In addition, real estate markets are characterized by the absence of well-defined property rights and, weak and small-scale capital markets. Payne (1997) lists other factors that distort urban real estate markets in the developing world as follows:

- Rapid and sustained urban growth that ensures a permanently high demand for land;
- Lack of alternatively high yielding investments that ensures continued investment in real property thus fuelling further land price inflation;
- Preference of real property as a means of transferring funds generated in the informal sector, or 'black' economy into formal sector with minimum risk;
- Constraints on the supply of public finance and services for land market operations; and
- Powerful vested interest and pressure groups that constrain policy options.

Becker et al., (1999) and Musgrave et al., (1984) identify government intervention polices and programs as another potential cause of market imperfections. These programs, at times, increase the magnitude of the problems. Rent controls, for example, can reduce the efficiency of the rental market and distort investment decisions. Malpezzi (1990) found that in Cairo, rental rates were distorted as a result of rent controls and the intervention was an inefficient transfer mechanism.

The level of market imperfection determines the actual or perceived performance of the

real estate market. The level of imperfection is exacerbated by the physical condition of the various sub-markets (centres). It is, therefore, expected that the various commercial centres will experience varying levels of real estate market imperfections and performance.

3.2.2 Commercial Real Estate Sub-Markets

The various commercial neighbourhoods can be considered as sub-markets. Roulac (2003) argues that the presence of people, capital and business in each sub-centre reflects the competitive nature of the place and determines the performance of the individual property and the entire sub-market. These sub-markets will exhibit different characteristics and performance levels. The segmentation of the markets is necessary in an attempt to evaluate the performance of the whole market.

The performance of the office market is differentiated between the CBD and the non-CBD areas (Newell et al., 2002). These findings suggest that the analysis of real estate market should be at the smallest unit. The inner city markets exhibit characteristics that make them different from other markets. Roulac (2003), however, points out that the inner city is the anchor of any urban centre. The performance of its real estate market, therefore, shapes the performance of the entire market. The strengths and weaknesses of the inner city have direct impacts on the performance of the entire market. Every property in the citywide market is affected by the performance of each property in each commercial centre and the entire collection of properties.

Malizia (2003) reports that property markets in the inner city locations are thin markets (few transactions) and hence decisions are subjective. Inner city areas are perceived as being 'margins' of acceptability for land users and are only brought into use, usually through development, when there is excess demand for land that cannot be met by supply in the emerging commercial centres. When supply of land begins to outstrip demand in the entire city, it is these relatively less attractive sites that will fall fastest from favour. This scenario results in substantial volatility of land values, which for an investor, represents a substantial uncertainty about what returns might be achieved from such buildings. The

expectations for investment returns will, therefore, vary from one centre to another, both in the short and long-run.

McNamara (1993) perceives inner city areas to be generally risky to invest in property compared to new commercial centres. The fact that inner city lands are the last to react to upturns and the first to fall, the risks of inner city development are more acute. Inner cities are also prone to high tenant, market and planning risks (McNamara, 1993 and AI, 2001). Newly completed inner city properties are likely to attract weaker tenancy covenants and hence the high instances of tenant risks. The possibility that authorities will change planning and zoning regulations in order to renew the city, is a source of uncertainty on the highest and best use of sites in the inner city. These rapid shifts in demand and supply experienced in the inner cities expose the property to high occurrence of market risks. Malizia (2003) reports that risks associated with the redevelopment period, the construction period and the lease up period are very high in inner cities. These risks must, therefore, be compensated with higher returns.

As a result of high risks, lenders and other sources of debt capital underwrite urban redevelopment projects more conservatively than suburban projects. The financiers also commit less debt capital to inner city projects in order to lower financial risk and financial exposure. As a result, returns from inner city investments are, in the long run, low. The negative perception of inner city investment consequently leads to a market distortion in favour of the newer subcentres. The distinction will last or might get more pronounced depending on the spatial and physical condition of the various centres.

Adair et al., (2003) found that the opaque market, inadequate information on returns and risks, barrier to availability of finance and uncertainty regarding the liquidity of assets contributes to this inefficiency. Consequently, real estate markets in the inner city are highly imperfect and volatile. It is possible that the difference in performance between the various sub-centres can be narrowed and eventually eliminated by inner city renewal.

3.2.3 Demand and Supply Dynamics and Pricing in Commercial Real Estate Market

In a typical market, the forces of supply and demand will allocate space among the competing uses and set the rent levels and other occupancy costs. These forces also determine the returns from an investment in real estate. Pallakowski et al., (1992) and Rosen (1984) suggest that the commercial real estate market analysis can be modeled around key variables of current and future office demand, flow of new construction (supply), vacancy rates and rental rates.

(a) Demand in Commercial Real Estate Market- Howarth et al., (1998) list three main demand indicators for current commercial real estate to include total employment, office-using employment and absorption (annual changes in occupancy). According to Rosen (1984) and Rabianski et al., (2007), demand for office space (measured as occupied space) is a function of total employment and real rents. Al (2001), on the other hand, considers the reputation of the businesses housed in the building as a more important factor of demand for office space than the location.

The forecasting of future demand trends is an important aspect in commercial real estate market analysis. Detoy et al., (1972) and Al (2001) postulate that future demand for office space is a function of several factors:

- Existing tenants expanding their space requirements;
- New tenants moving into the centre, relocating firms;
- New tenants emerging from start-up business venture in the area;
- Existing tenants upgrading their space requirements;
- Existing tenants in buildings forced to relocate because their present office space is being removed from the inventory;
- Average square foot area of office space required by an office worker;
- Vacancy rate for the specific class of office building;
- Land use patterns and direction of city growth and development; and
- Factors that affect the appeal of the office building (quality of construction, management and tenancy) and the availability of support facilities (shops, restaurants and recreational centers).

The estimation of the current and future office space demand is, therefore, important to all the players in the sector. The most important decision for the real estate investor is when, how and where to invest in order to maximize returns. This is achieved at full occupancy and highest rental rates. To the current and prospective tenant, an accurate estimation of space demand trends will influence current location decisions and future expansion plans. The concern of the entire market is to ensure that the demand and supply of spaces at a given moment in time and price (rent) is in balance.

(b) Supply in Commercial Real Estate Market- Gardner (1993) identifies factors determining supply in real estate market to include the long-term nature of real estate investment, the long time lags required to deliver real estate product to the market, demand uncertainty, adjustment costs and the unbridled optimism of developers. Rosen (1984) indicates that supply of office space in a market is a function of lagged vacancy rate, expected rent, construction cost, interest rate and tax rate. Howarth et al., (1998) suggest that the main indicators of supply are business and building cycles, credit availability and the regulatory environment. Gallagher et al., (1999) conclude that long-run supply cycles are caused by a more elastic supply relative to demand, long construction lags, a high rate of physical or economic obsolescence and a high rate of growth in space demand.

The most important determinants of office space supply are, therefore, demand for office space, rate of office decay/obsolescence, prevailing construction costs and availability of finance. Supply of available space in the office market is, in addition, a function of five corollary factors:

- Existing tenants going out of business reducing their space requirements;
- Existing tenants reducing space requirements;
- Existing tenants moving out of the centre, relocating firms;
- New office space being added;
- Vacant spaces from the previous period (office overhang) (Detoy et al., 1972).

The supply of office space will vary from one commercial centre to another. Rabianski et al., (2007) identified filtering, intra-market relocation, and changes in tenure preference as

relevant factors that affect sub-market absorption. Potential competitive supply can also "filter-up" from existing office buildings of lower quality if tight market conditions justify the cost of significant office rehabilitation. Prospering tenants in the suburbs may want to move up to high profile downtown space, especially when rents are depressed. Vacancies are thus transmitted from central to suburban locations. Similarly, relatively low rents in the suburbs may outweigh the attractions of a central location for certain tenants (Howarth et al., 1998).

(c) Rents in Commercial Real Estate Market- In general, the price of a product will depend on supply and demand. In simple terms, as the supply increases beyond demand, the price of the good will reduce until such a time that the demand and supply are in balance. However, this simple model does not apply in commercial real estate. Tay et al., (1999) argue that price (rent) in commercial real estate markets is not, in the short run, a direct function of supply and demand. The fixed nature of supply, the lag between supply and demand, differences in spatial quality, obsolescence and the high chances of overbuilding ensures that equilibrium rent is never achieved.

Sirmans et al., (1993), Gatzlaff et al., (1994) and Mueller (1999) suggest that the main factors determining the rental levels for any given property and markets are many. These include the share of the letting market commanded by the property and the owner, age of the property, the market value of the property, size of the tenant, load factor (number of tenants in the building) and the terms of the lease. It is expected that a property that commands a high share of the market (in terms of location and class) will have the leeway to charge higher rental rates. Tay et al., (1999) and Harvey (1987) argue that the effect of tenant size might result in higher and lower rents depending on the market perception of an anchor tenant. An anchor tenant, whose demand for space cannot be satisfied elsewhere, might be charged premium rent. Conversely, it is also possible that a big tenant might get preferential rental rates on account of reduced transaction and management costs and reduced chances of default.

Slade (2000) asserts that rents are inversely related to age. Older properties are susceptible to deterioration and physical decay of the property itself and the entire neighbourhood. Gat

(1998) found that age is inversely related to rent charged because older buildings and neighbourhoods suffer physical neglect, inappropriate tenant mix, and older facilities. An old dilapidated building will be less desirable and will naturally charge lower rents in order to maintain economically viable occupancy levels. This suggests that there will be marked differences in the rental rates among the various commercial centres, with emerging commercial centres commanding high rental rates compared to the dilapidated inner cities.

Mueller (1999) argues that rents are fixed in relation to the current market value of the property. The prevailing rental rates will, therefore, be fixed as a ratio of the value of the property considering a given payback period. At times, rent may move in tandem with value and at times, might move in different direction. It is, therefore, expected that in a perfect market, rents will reflect the current and future expectations of changes in market values. As a result of the differentiated physical conditions and perceptions about the quality of the various commercial centres, land values and rental incomes will show remarked differences citywide.

The importance of the load factor as a determinant of rental rates can be both negative and positive. Slade (2000) found out that different markets attach different importance to the load factor. Some markets will treat it as a negative impact while other will treat it as a positive attribute. However, the determining factor will be the level of amenities. A property with inadequate amenities and located in a commercial centre with inadequate infrastructure and urban services will have an inverse relationship between rent and the load factor (large number of tenants).

Ordinarily, the rental rates will vary depending on the length of the lease. Benjamin et al., (1992) found no significant relationship between the term of the lease and rental rate. However, Fisher et al., (1990) and Mills (1992) found that the rental rates charged for new tenants was different from those charged to tenants renewing leases. Tay et al., (1999) report that this is common in Hong Kong as it reflects the tenant's savings in costs associated with search for new premises and the cost of relocation. This suggests that older commercial neighbourhoods with a substantial proportion of long-term sitting tenants will

report lower rental rates compared to new centres with new tenants inflows.

The rental rates and their key determinants are, by their nature, prone to cycles. Mueller (1999) and Slade (2000) note that the growth rates for asking rents and the importance of each determinant are a function of the market's position in the physical real estate cycle. In addition, the rental rates and the rental growth rate will also reflect the spatial pattern and growth rate of the centre. In sum, rental rates will show remarkable differences in the entire citywide market.

(d) The Interaction of Supply, Demand and Rent- Supply, demand and rent interact closely to shape the performance of the real estate market more than any other factor. Any imbalance in supply and demand in specific sections of the city or the entire city distorts the performance of the markets (Mueller, 1999). Voith et al., (1988) found that the supply of office space tends to be quite price (rent) elastic, while demand may be relatively inelastic. Rosen (1984) found that the elasticity of demand in respect to rent in San Francisco (1961 to 1983) market was –0.18 while supply was inelastic. Hekman (1985), in a study of fourteen US cities over the period of 1979-1983, found that the elasticity of supply with respect to rent fell between 1.65 and 2.86. The interaction of the factors of supply and demand and determinants of the rental rates shape the performance and direction of the commercial real estate market, both at the sub-centre level and the entire market.

3.2.4 Real Estate Market Cycles

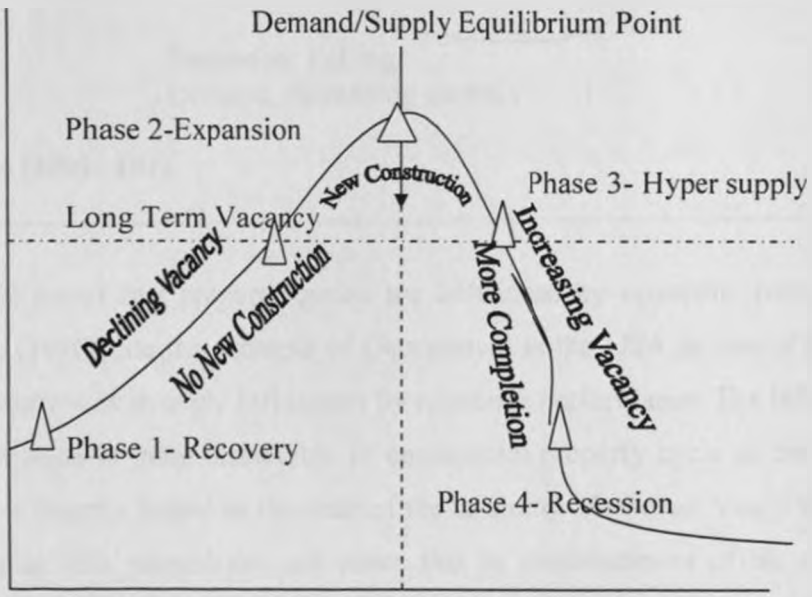
A real estate market, like any other market, is concerned with decision making to enhance profits and value. The timing of the decision is the key to the success of the decision. The success of a decision to acquire, renovate or dispose a real property asset depends on the real estate market cycles. Pyhrr, et al., (1990) conclude that the timing of acquisition and disposition in the cycle can be very important to the overall return received from real estate investments. Consequently, it is advised that real estate investors must consider real estate cycles before making investment decisions (McDonald, 2002).

McKenzie et al., (1976) and McDonald (2002) list phases of a typical property cycle as

prosperity, recession, depression and recovery. The four phases can be condensed into up-cycle phases (recovery and prosperity/expansion) and down –cycle phases (hyper-supply/depression and recession) (Muller, 1999). Figure 3.1 and 3.2 show the two most common property cycles.

The prosperity (expansion) phase is characterized by rising occupancy levels above the long-run equilibrium level and high construction levels. Market equilibrium is that point in time when aggregate demand and supply forces are in balance. This occurs at the peak of the real estate cycle when occupancy rates are in the range of 90% to 96% (Born et al., 1994). At this point, market rent rates achieve levels that permit new construction to begin and existing property rent rates to increase rapidly towards equilibrium property rents.

Figure 3.1 Physical Market Cycle

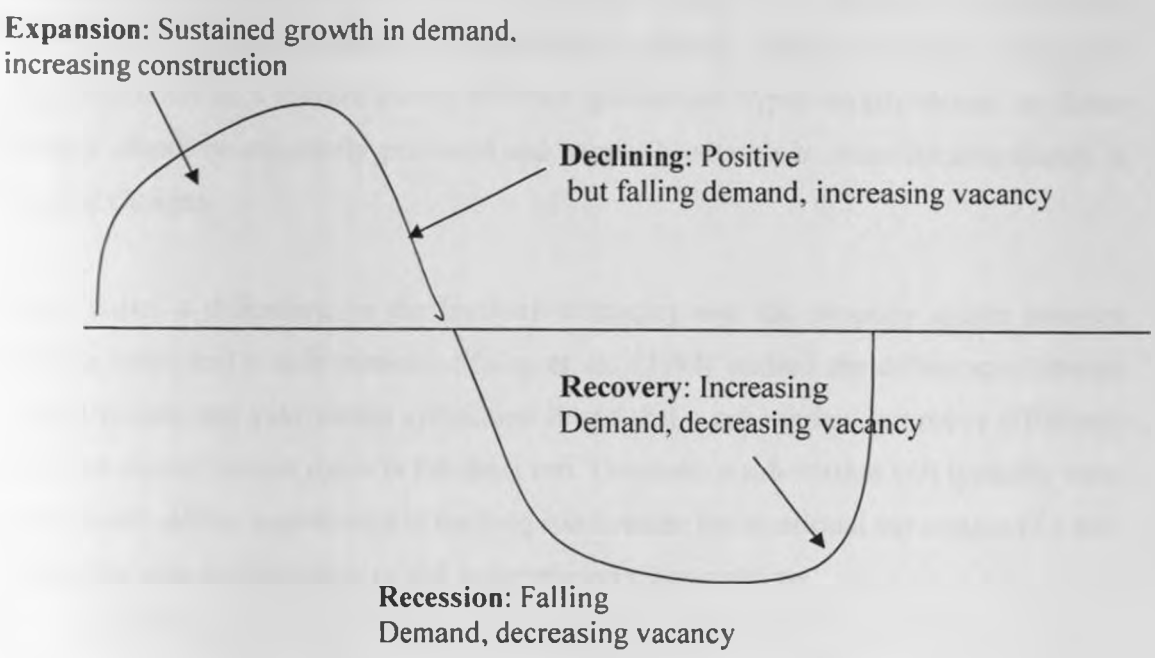


Source: Muller (1999: 134)

In the recession phase, there will be more completion and occupancy levels that will be below long-run equilibrium. Jongejan (1992) argues that in the recession phase, because of the 'pipeline effect', new buildings will still be completed, strongly competing and offering low rents to tenants. In the depression phase, rental values will decrease in real terms, making investors reluctant to invest. During the recovery from recession, the

occupancy rate rises with no new construction.

Figure 3.2 Demand and Vacancy Cycle



Source: **AI (2001: 101)**

Tse et al., (1999) assert that property cycles are influenced by economic performance. McKenzie et al., (1976) cite the example of Georgetown in the USA as one of the cities whose property cycle was strongly influenced by economic performance. The influence of economic performance is more discernible in commercial property cycle as the demand for office space is directly linked to the state of the economy. However, Vos (1993) does not wholly support this preposition and notes that in circumstances of no economic growth, there still can be high gross take up in one market coming from relocation from one sub-market.

Dasso et al., (1989), Gibson et al., (1982). AI (2001) and Witten (1987), on the other hand, argue that real estate construction and sales activity seems more closely related to the cost and availability of financing than any other regular cycles. This view is expected because real estate production requires huge capital outlay that can only be financed by borrowed capital.

It is, therefore, in the interest of the investor to make the investment decision at the right time to maximize returns. Pritchett (1984) argues that the most advantageous buying opportunities generally exist during late declining, bottom and early rising portions of the real estate market cycle. Muller (1999) argues that the peak of the market is reached when supply growth finally catches up with demand growth. This points may also occur numerous times as a market moves between growth and hyper supply phases, as future demand cannot be accurately predicted and supply is not able to react instantaneously to demand changes.

There exists a difference in the level of efficiency and the property cycles between markets (city) and within markets. Muller et al., (1994) studied the differences between overall market and sub-market cycles and found that a sub-market can move differently from the overall market cycle in the short run. However, a sub-market will typically trend with overall market movements in the long run because the locational advantages of a sub-market become appropriately priced in the market place overtime.

3.3 Commercial Real Estate Performance Measurement Tools

Investment in real estate is undertaken after a comparison with other investment opportunities and comparison between locations. This comparison requires standardized measurement tools to determine relative performance. Over the years, rental and occupancy rates have been used as the key measures of commercial real estate market performance (Muller, 1999). Other measures of commercial real estate market performance have included competitive real estate risk, hedge against inflation, property indices and financial rate of return (Sagalyn, 1990; Kapplin et al., 1995 and Newell et al., 1988).

Tandy et al., (1999) and Brown (2000) argue that these measures offer tools for asset allocation and risk monitoring, changes in real estate inventory and grouping of markets in terms of real estate performance. Howarth et al., (1998) observe that these tools offer the best approach to measurement of real estate markets performance. These performance measurement tools are now being used in the markets of developing world such as South Africa (Newell et al., 2003).

(a) **Rental Rates**- New construction decisions naturally depend on the expected financial returns. Mueller (1999), McDonald (2002) and Kolbe (2003) suggest that rental rates can be used as a basis for evaluating the performance of real estate. Born et al., (1994) add that the actual rents and equilibrium rental rates have been used as key factors in assessing the volatility or stability of the market. Gallagher et al., (1999) argue that the prevailing rental rates are a reflection of investment and occupancy decisions made by the key players in the real estate market. The prevailing and expected future rental rates are, therefore, key measures of the performance of real estate market and decision criteria.

It is expected that the prevailing rental rate in a neighbourhood is a function of its physical appeal and its position in the real estate performance cycle. Slade (2000) argues that the key determinants of rental rates such as average floor area, storey height, building age, load factor and number of buildings in the neighbourhood, are also key measures of the spatial quality of the market and sub-market. The rental rate is, therefore, a measure of the health of the market and can be used to track changes in the neighbourhood and the commercial urban form.

Carter et al., (2000) used rental rates to assess the impact of spatial quality (location characteristics) on the performance of the real estate sub-markets. The findings indicate that rental rates showed significant variations between two markets of different spatial quality of San Francisco (best quality) and Memphis (lowest quality).

(b) **Occupancy Levels**- Mueller (1999) reports that occupancy rates are a major tool of measuring the performance of any given commercial real estate and the entire market. The prevailing occupancy rates are a pointer to the interaction and balance between supply and demand, which are a reflection of the physical quality of the real estate market. The occupancy levels are, therefore, important measure of the performance of individual properties and the various sub-markets.

Born et al., (1994), Springer (1996) and Anglin et al., (2003) used the forecasts of the absorption and overall market occupancy rates to measure the performance of commercial real estate markets. They concluded that neighbourhoods in the USA with vacancies levels

of over 10% resulted in loss of market prices by 2.00% to 3.4% and increased the sale period by 14% compared to fully occupied properties. Rosen (1984) argues that this phenomenon arises out of the need to undertake adequate scrutiny to identify causes of vacancies and the fear of longer payback period. It can be concluded that neighbourhoods with high average vacancies will record lower real estate performance.

Gallagher et al., (1999) used new office stock and vacancy levels to measure growth of commercial centres (measured in terms of growth of office employment) in the various urban centres in the USA. Under this matrix, Los Angeles and New York had the fastest growing commercial centres for the period 1977-1997, while San Francisco and Cleveland were the least expanding. Rosen (1984), in addition, analysed the vacancy levels in San Francisco for the period 1961 to 1983 and predicted that the most profitable investment period was when office employment was on the upward trend. These findings suggest that real estate performance, as measured by vacancy levels, is differentiated between the various commercial centres.

Wurtzebach et al., (1991) and Tandy et al., (1999) report that major real property brokerage firms in the USA have used vacancy rates since the 1980s as a major barometer of real estate market performance. Examples include the Coldwell Bankers vacancy surveys, the CB Richard Ellis/Torto Wheaton surveys, the Cushman & Wakefield Site Solutions, REIS Reports and the F.W. Dodge/REAPS vacancy indicates. These surveys are mostly used by both investors and occupants to make investment and occupation decisions, among the various commercial centres.

(c) **Inflation Hedge**- Wurtzebach et al., (1991) and Rubens (1989) propose that the ability of the properties to act as a hedge against inflation is a good measure of the performance of the market and the sub-market. The key consideration is the co-movements of inflation rates and real estate returns from period to period. Commercial real estate investment should, therefore, produce income and returns that reduce or offset the loss in purchasing power resulting from inflation.

The uncertainty about future changes in inflation rate is now a major concern for investors

and managers when negotiating terms of commercial leases (Wurtzebach et al., 1991). The assessment of the ability of the individual property and the entire market to act as an effective inflation hedge, therefore, became a key investment consideration after the USA stock market collapse of 1987. Hartzell et al., (1988) report that real estate investment decision-makers in the USA now view inflation hedging as a key consideration in commercial real estate investment decision. Real estate markets in the UK, France, Germany and Switzerland have adopted the USA approach and now use inflation hedging ability as a measure of real estate performance (Maurer et al., 2002). This is a position that is gaining grounds in Africa, both in the south and the east (Geho, 2003).

The ability of a property to act as a hedge against inflation will be determined by its location and the time in the property/real estate market cycle and the general business cycle. It is possible that there will be differences in ability of individual properties, sub-centres (sub-markets) and entire markets and the time to act as a hedge against inflation. This difference will result in differentiated real estate market performance between the various sub-markets. Rubens et al., (1989) and Wurtzebach et al., (1991) found that real estate markets in the USA were a good hedge against inflation during the period 1960 to 1986. However, the 1980s recorded a lot more volatilities in inflation changes that could not easily be managed through lease structures and hence real estate was not a good hedge against inflation (Hartzell et al., 1988).

Wurtzebach et al., (1991), however, found that the measure of a market's ability to be a good hedge of inflation is not very accurate. The reliability of this measure is compromised because of the inability to measure future inflation trends.

(d) **Rate of Return**- Chiang et al., (1999) and Hargitay et al., (1993) consider the total rate of return as a key measure of the performance of the commercial real estate market. Torto Wheaton Research (2000) advocates the use of rate of return to measure real estate markets performance on the grounds that it is a quantitative measure that is easily understood and appreciated by many ordinary and sophisticated investors, in any part of the world. Wurtzebach et al., (1991) strongly recommends the adoption of the more reliable quantitative analyses of market performance (rate of return and risk) for all

markets in the world. The need for a reliable measure is more important in the emerging markets where uncertainty as a result of unpredictable future performance is prevalent. The rate of return reflects the impacts that key investment considerations such as the market balance between supply and demand, the overall price levels in the market and property-specific characteristics, have on the performance of the real estate market.

Hartzell et al., (1988) found that the use of rate of return and other financial measures of return are becoming a key consideration before an investment decision. This has become a trend especially for the pooled investment schemes such as insurance companies and pension funds, as a result of government prudent investment and disclosure rules in response to the collapse of the USA stock markets in 1987. Louargand (1992) report that 58% of the pension funds in the USA that had real estate investment used the rate of return to make investment decisions and evaluate the performance of individual property and the entire portfolio. Geho (2003) argue that economies in the East African regions must embrace quantitative approaches to real estate markets performance assessment if they are truly expected to join the unstoppable train of globalization.

The total return was used to compare the performance of the commercial real estate market between Shangahai, Guangzhou and Shenzhen (Tse et al., 1999). It was found that the rate of return was different in the three towns, an indication that the same is a good measure of real estate investment performance. This information was used by the Government of China to undertake major corrections on urban development and land management policies. Sing et al., (2000) used the rate of return to compare and rank various investment media in Singapore and concluded that real estate was a superior investment vehicle compared to stocks and bonds. These findings were used by many investment funds in asset allocation.

Similarly, Torto Wheaton Research (2000) used the rate of return to rank the performance of real estate markets in West Palm Beach and Chicago to advice a regulator on formulation of an investment policy for pension funds. Tandy et al., (1999) used the calculated rate of return to rank the real estate market performance of sixty major markets in the USA in the year 1997. It was found that the highest performing market was Boston

while the lowest ranked was Honolulu.

Brown (2000) adopted the rate of return to assess the performance of the UK real estate market for the period after the stock market crash of 1987 up to 1998. It was found that commercial real estate performance declined up until 1989/1990 but gradually recovered thereafter. Nabarro et al., (2004) calculated the total rate of return of the UK commercial real estate and used the same to advice lending institution on loan portfolio risk management.

Maurer et al., (2002) report that investors in the UK, Germany, Switzerland and France regularly use the rate of return to measure the performance of real estate markets. The results for the period 1980-2000 were used to compare the performance of the real estate mutual funds of these European countries with the real estate investment trusts (REITs) of the USA markets. Newell et al., (1996) used the average total rate of return for the period 1985-1993 to rank real estate performance among several countries in the world. The best performing real estate market was Australia (5.32%) while the least performing was USA (1.47%).

Newell et al., (2003) used real estate rate of return to profile and compare the performance of real estate markets in the apartheid era (1980- 1989) and post-apartheid era (1994-1999) of South Africa real estate market. Relative to performance in the apartheid era, the commercial real estate market showed lesser performance over the post-apartheid era (-1.2% p.a. versus -6.5 p.a.).

The rate of return has now become the most acceptable performance measurement tool in real estate in the whole world. Jones Lang Wootton (1988), Rodney et al., (1989), Sivitanides (1998), Maurer et al., (2002) and Nabarro et al., (2004) indicate that returns from commercial real estate ranges from 7.75% to 13.9% in Europe, Asia and USA markets. IPD (2001) report that the mean total return for commercial real estate in South Africa market fell between 7.7% and 11% during the period of 1970s to early 2000s.

McCue et al., (1994) point out that the rate of return is generally influenced by the

macroeconomic performance of the market, the nominal interest rates and property-specific factors. As a result, the rate of return will be different in the various commercial centres of any given city. The appeal and the perception of the centre by the investors and occupiers will have direct relationship with the market (sub-market) rate of return.

Fletcher (1995) and Nabarro (2004) argue that the rate of return do not reflect the illiquidity of real estate relative to other asset classes. The few transactions that are recorded in real estate markets and the heterogeneity of real estate cast doubts about the reliability of rate of return based on sales data. In addition, the rate of return based on sales data masks the inherent disadvantages of real estate investment compared to other asset classes. Sagalyn (1990) further reports that the real estate rate of return is not a good measure of real estate performance during recessions and in periods of low growth in real GNP. The low performance during these periods is attributed to capital depreciation and lower rental growth rates compared to inflation rate. In order to mitigate these shortcomings, Fletcher (1995) proposes the use of valuation certificates as the basis for calculating the rate of return. This allows the incorporation of many more properties and captures the current views being held about the real estate market.

Despite of the above shortcomings, Wurtzebach et al., (1991), Nabarro et al., (2004) and Hargitay et al., (1993) argue that the rate of return, either based on sales data or valuation certificates, is the only reliable tool of real estate performance measurement. Miles et al., (1991) present evidence to indicate that the variance between appraisal values and actual sales prices in the USA markets was only 1.6% for a period of 20 years. The rate of return, therefore, stills remains the best tool of measuring the performance of real estate.

(e) **Risk**- The deviation of actual returns from the projected returns (risk) is a key measure of the performance of the commercial real estate market. Torto Wheaton Research (2000) and Maurer & Sebastian (2002) argue that real estate investment decisions in the 21st century require solid assessments of return and risk, an understanding of the sources of risk and formulation of a strategy to manage the risk. The assessment of risk has become more important because of the increased internationalization of real estate investment activities (Newell et al., 1996).

Polleys et al., (1999) categorise real estate investment risks into two types: market risk and property-specific risk. AI (2001) found that market risk arises as a result of the likelihood that rental income will be affected by changes in the overall market and spatial condition of the neighbourhood. Sagalyn (1990) and Torto Wheaton Research (2000) observe that property-specific risks are caused by leases structure, existing rent levels, capital expenditure, the physical condition of the individual property and the spatial condition of the neighbourhood. These are key considerations for investment in commercial real estate and will vary from property to property and from one commercial centre to another. It is expected that an investor will invest in a market or sub-market that has the right risk/return profile and, hence, risk will be a key decision-making criteria. The prevalence of risk is, therefore, a reliable and realistic measure of the state of the markets and the sub-markets.

Polleys et al., (1999) and Wheaton et al., (1999) argue that the prevalence of risk varies between property types and commercial sub-centres. The risk prevalence of an individual property or an entire market or sub-market is an interpretation of the past and a reflection of the future performance in the eyes of the investors. This perception of risk influences investment and lending decisions and, therefore, accounts for the differences between the various commercial sub-centres.

Liao et al., (1998) argue that failure to fully comprehend risks of real estate investment caused the major financial crises in Thailand and Brazil (1997), the USA saving and loan crisis of 1980s, the crisis of the Japanese housing financial institutions in 1996 and the French bank crisis of 1996. It is for this reason that major real estate performance forecasters in the USA, such as Torto Wheaton Research, FW Dodge, Property Portfolio Research, Rosen Consulting and IPD in South Africa use risk and rate of return as the key tools to evaluate the performance of real estate markets (Wheaton et al., 1999).

Wheaton et al., (1999) and Liow (2004) used risk prevalence to measure and compare the performance of the commercial real estate markets in Los Angeles and Washington DC. It was observed that the commercial real estate market in Washington DC was twice as risky as the Los Angeles one, a reflection of the volatility associated with returns from the investments. It was also found that the commercial real estate market in West Palm Beach

(standard deviation of 0.63) was twice as risky as Chicago (Torto Wheaton Research, 2000). In addition, Jackson (2001) found out that risk exposure was a key consideration of lenders of real estate investment. It was found that high risks in the USA markets invariably resulted in high lending interest rates, which in turn affects the performance of the real estate market.

Newell et al., (1996) calculated the historical risk of various markets in the world and concluded that New Zealand (20.76%) was more riskier than Australia (13.76%), UK (5.20%), Canada (8.59%) and USA (5.20%). Sing et al., (2000) used volatility of returns (risk) to compare real estate and stocks in Singapore and concluded that investment in stocks was more risky compared to real estate. Brown (2000) used the volatility in returns (risk) for the period 1987-1998 to assess the performance of real estate market in the UK. It was found that commercial real estate rate of returns recorded high volatility during the period under consideration as a result of the stock market crash in 1987.

The use of risk is now becoming an important tool in the measurement of real estate market performance in the third world. Newell et al., (2003) used investment risk profiles to compare the performance of real estate markets in South Africa in the period of 1980-1989 (apartheid era) and 1994- 1999 (post-apartheid era). It was found that the real estate market had a higher risk exposure during the apartheid era compared to the post apartheid era, reflecting increased economic stability and international investment acceptance of South Africa in the post-apartheid era.

Brown (2000) indicates that risk can become a biased measure of the performance of real estate during periods of unexpected shocks to an economic system. Newell et al., (1996) contents that inflation causes problems in the use of risk measure in the emerging markets. It is, therefore, expected that risk, as a measure of real estate performance, will be used in conjunction with other tools of measurement, such as the rate of return. Chandra (2008) reports that risk and return go hand in hand and any performance measurement must incorporate both.

(f) **Property Indices**- In the recent past, there has been an increasing trend of market

analysts using indices as a performance measurement benchmarks (Fletcher, 1995 and Newell et al., 1988). The indices provide a higher level of accuracy and usefulness to the investors than the other traditional measures of performance. An index provides useful information for evaluating property management and investment profitability between sub-markets and over a period of time. Indices accord the real estate markets the transparency which equity and bond indices do to other asset classes. Nabarro et al., (2004) report that market indices enhance confidence and credibility in the market and encourage more investors to join the market.

Examples of property index currently in use in the world include:

- NCREIF/FRC (National Council of Real Estate Investment Fiduciaries and Frank Russell Company) of USA;
- S & P National Real Estate Index;
- IPD (Investment Property Databank) Index of United Kingdom;
- The Swedish Property Index (SFI/IPD);
- Russell Canadian Property Index;
- Richard Ellis Property Index for South Africa;
- SAPIX/IPD Property Index for South Africa.

3.4 Summary

The commercial real estate market is an important market in any urban centre. It accommodates all business and its output contributes, in most urban centres, over 80% of the entire city's output.

Commercial real estate market analysis is important to maximize investment returns, achieve spatial balance and avoid financial distress. The aim of market study and analysis is to ensure that investment in commercial real estate, individually and collectively, generates the highest returns throughout the holding period. The performance of the commercial real estate market is a function of supply, demand and rent. This interaction varies between the cycles and spatial markets and sub-markets. The spatial character of the sub-market will affect the performance of its commercial market compared to the other. The level of market perfection will influence the interaction of supply, demand and rent

and performance of the city-wide market and sub-markets.

The basic measurement tools of commercial office markets include rent, occupancy levels, inflation hedging ability, rate of return, risk and property indices. These variables can be measured on time series and this allows comparison from one period to the other and better markets and sub-markets. It is, however, recommended that performance analysis must combine several tools of performance measurement. Chandra (2008), citing empirical evidence from the Ibbotson Associates performance review of the US markets, strongly recommends the combined use of rate of return and risk to evaluate performance of real estate investment.

3.5 The Study Conceptual Framework

The performance of the commercial real estate market and the sub-markets in any urban area is directly determined by the changes in the commercial urban form. The changes in the commercial urban form can either result in improving or falling and unbalanced performance of the commercial real estate market, with the case of no changes at all being uncommon.

The changes in the commercial urban form take the pattern of progressive decentralization of commercial activities and infrastructure that is required to support these economic activities. The commercial urban form of any given city will start with a monocentric commercial urban form consisting of one single commercial centre, either located at the most central point of the urban centre or any other convenient point that maximizes accessibility. With time, other commercial centres emerge to either compete or compliment the original core, hence producing a polycentric commercial urban form. The transformation from monocentric to polycentric commercial urban form is now inevitable in all cities of the world and urban managers should seek ways and means of ensuring that the changes result in an efficient city with a high performing real estate market.

The changes in the commercial urban form should result in an efficient, growing and balanced city as measured by the efficiency of infrastructure provision, economic performance and commercial real estate performance. To achieve the highest level of

efficiency and the performance of the commercial real estate market, changes in the commercial urban form should occur under the following circumstances:

(a) A new sub-centre should only form when the city's population has exceeded 2,680,000 permanent residents, majority of whom are employed in the service (offices) sector. However, the population threshold can be expected to be higher or lower, depending on the rate of urbanization (UN-Habitat (2008) reports that the global average urban growth rate has been 1.5% per annum) and level of technological advancement of the city;

(b) The new sub-centre (s) should be located in relation to residential neighbourhoods to result in a traveling time to places of work that averages 45 minutes per trip. The emergence of new sub-centres largely depends on the level of infrastructure provisions and especially the transportation infrastructure;

(c) The emergence of polycentric commercial urban form should occur during a period of sustained 'modernization' of the economy (from agricultural-based to mass industrial production and services industry), expansion of the economy and consistently high gross domestic product (GDP) growth rate that result in higher per capita income and reducing poverty levels at any given time interval of assessment; and

(d) The level of infrastructure development and the development of other services necessary to support urban commercial activities should be uniform in all commercial sub-centres. The benefits of changing commercial urban form are maximized when the inner core (original commercial sub-centre) is continuously revitalized through investment in infrastructure and social engineering to ensure that it maintains its agglomeration economics. The process of revitalization and regeneration ensures that the changes in the commercial urban form are balanced.

The changes in the commercial urban are tracked by measuring the changes in some key variables. The key measures of commercial urban form are dispersion ratio, average commuting time, density ratio, occupancy characteristics and perceptions of the stakeholders. Some of these measures are qualitative in nature and are subject of opinions and differing perceptions. Table 3.1 is a summary of performance benchmarks of some

measures of polycentric commercial urban form that allows for an efficient functioning of the city and its commercial real estate.

Table 3.1: Performance Benchmarks of Key Measures of Commercial Urban Forms

Measure of Commercial Urban Form	Performance Benchmark
Dispersion Ratio	0.9-1.10
Occupancy Density Ratio	11.86-12.5
Travel Time	45 minutes
Population	3,000,000 permanent residents
Economy Modernization	Agriculture to contribute less than 10% of the GDP
Occupancy Characteristics	Differentiated on the ability to pay rent, level of space utilization and specialization of services being offered

The attainment of the above performance benchmarks will result in a balanced performing commercial real estate market characterized by two important situations:

a. An average total rate of return over a period of ten years that falls within the ranges of 7.7% and 13.9% per annum;
b. Each sub-centre will have a commercial real estate performance 'peak' with performance (demand, supply and total rate of return) reducing with distance from that centre until it meets the edges of another centre with the original core having the highest 'peak'.

The above is the ideal situation that should obtain for an urban centre that is transforming from monocentric to polycentric commercial urban form.

Chapter Four

RESEARCH METHODOLOGY

4.1 Research Design

The design of the research is both exploratory and causal-comparative using a case study. Lupala (2002) and Evan et al., (2006) adopted a case study approach for a similar study in Dar es Salaam and Khayelitsha CBD (South Africa) respectively. A causal-comparative design was employed for this study as it was expected that the urban form will affect the performance of the commercial urban real estate market. This design was also adopted on the expectation that commercial developments and real estate markets were not homogeneous. Consequently, the spatial character and commercial real estate market in the various commercial centres exhibited different patterns and performance. The comparison between the sub-centres was deemed necessary in order to ascertain the impact of urban form on real estate market performance. It was expected that differentiated performance of the commercial real estate sub-markets will be an indication that the urban form determined the performance of the commercial real estate market.

The nature of the research problem and the objectives determine the research design. The research problems and the objectives of this study indicated that the best approach in carrying out this study was both exploratory and causal-comparative. White (1975) defines exploratory research as one where there is an objective, but is nevertheless open-ended and in which the findings might form a basis of future successful research. The factors that cause location and relocation decisions in Kenya are not known and, therefore, an exploratory study design is the most appropriate approach.

Mugenda et al., (1999) define a causal-comparative research design type as one that seeks to determine reasons or causes for the current status of the phenomenon under study. The study sought to find out if location and relocation decisions (an indication of changes in commercial urban form) affected the performance of the commercial real estate market. The study further compares changes in the commercial urban form and performance of the commercial real estate sub-markets. The study finally establishes the degree and direction of the relationship between commercial urban form (measured using surrogates) and the aggregated performance of the commercial real estate market (measured in terms of total

rate of return).

A study of this nature required the use of a case study. Mugenda et al., (1999) argue that a case under study is viewed as an example of a class of events or a group of individuals. This procedure becomes more relevant in a study where there is lack of understanding of the nature, character and implication of the phenomenon. At the time of conceptualization of this study, there was general lack of knowledge on the process of changes in the urban form in Kenya and the impact on the performance of the real estate market. There was, therefore, a justification to undertake this comprehensive empirical investigation. Yin (1994) and Lupala (2002) contends that such a study should employ a multiple case design. Four commercial neighbourhoods were, therefore, selected based on a typical commercial form of a rapidly changing urban centre. These were the CBD, the Inner City, the Upper Hill and the Westlands commercial sub-centres.

The outcome from the study is expected to be descriptive and quantitative models to establish the relationship between the changes in the commercial urban form and the performance of the commercial real estate sub-market. The study is, therefore, a comparative study that compares and contrasts the commercial real estate market performance between the various commercial sub-centres over the period of the study. The sum of the various sub-centres is collectively used to determine the position of Nairobi City in the family of major urban centres in the world. In a globalizing world, the performance of the real estate market in Nairobi must measure up against other world cities. This comparison is a key determinant for attracting capital investment in real estate in Nairobi city.

4.2 Population, Sample and Sampling Techniques

There are many commercial centres and sub-centres in Nairobi, either as independent centres or connected to a residential area. Most of the bigger residential areas have an attached commercial centre offering a wide range of commercial and business services. The target population of the study is, however, the four main commercial centres of Nairobi. These centres are delineated based on the Nairobi Master Plan of 1948 (White et al., 1948), the Nairobi Metropolitan Growth Strategy of 1973 and the 2005 City Council of

Nairobi planning and zoning guidelines. The commercial centres identified are the CBD, the Inner City, Westlands and Upper Hill as presented in Map 1.3.

The primary units of analysis are the owners and users of commercial buildings in the four commercial sub-centres. The secondary units of analysis are the professionals, academicians and other stakeholders involved in advising investors and renters (occupants), the planning and management of city developments. The owners and users are expected to have different characteristics and perceptions/opinions/analysis about the commercial urban form and its impact on the performance of the commercial real estate markets. This diversity is captured in the selected sample. The users and owners owned and used commercial buildings that exhibit the following characteristics:

(i) Predominant users are offices, shops, eateries, stores and places of entertainment;

(ii) Buildings owned and used for investment purposes.

Buildings with the above characteristics are investment buildings that are sensitive to real estate market movements. The users and owners of such buildings make investment and occupancy decisions based on changes in the real estate market parameters. Murigu (2005) found that investment and other market fundamentals (e.g. expected income, payback period, costs of finance, demand and rate of return) were the key factors of consideration in investment decisions in commercial real estate in Kenya. The owners and users of these buildings, therefore, provided adequate data for the study.

The professionals and academicians are the secondary units of analysis in this study. Perloff et al., (1975) observed that professionals and academicians involved in urban planning, management, advisory and the entire building industry have strong opinions about the subject matter. These opinions find their way into investment decisions, official policy on city planning, development and management. The key professionals selected for this study are physical planners, architects, valuers, estate agents and property managers. These professionals were found to have relevant professional training in the area of the study and generally initiated and actualized decisions on location, relocation and return of office investors and renters. These professionals/experts generated background

information for policy decisions and, therefore, their views strongly influenced the growth and development of urban areas. Their collective actions shaped the changes in the urban form and the performance of the real estate market.

The sample for the study was selected by stratified random sampling in three stages. The first stage selected the sample for employers/tenants and employees/workers. The second stage selected the sample for building owners. The basis of stratification was the commercial centres as delineated by the Nairobi City Council planning guidelines in force as at 31st December 2007. In each commercial centre, the streets were the basis of stratification. The third stage was the selection of professionals/experts/academicians involved in town/physical planning, real estate design and real estate investment advisory and management. The basis of stratification was the professional and registration boards.

The study found that there were 326 buildings in Nairobi City that met the criteria of the study, namely being predominantly used for commercial use (shops, offices, eateries among others) and being owned for investment purposes (non-public buildings). Table 4.1 presents the distribution of buildings that met the study criteria in each of the commercial centres. It was observed that the CBD and the Inner City had most of these buildings. Westlands and Upper Hill commercial sub-centres were found to have an equal number of commercial buildings that met the criteria for selection into the sample.

Table 4.1: Commercial Buildings in the Commercial Sub-Centres of Nairobi

	Commercial Centre	No. of Buildings	Targeted Sample		
			Owners	Employers	Employees
1	Inner City	125	13	45	45
2	CBD	109	11	39	49
3	Upper Hill	46	10	35	40
4	Westlands	46	10	35	35
	Total	**326**	**54**	**164**	**169**

Source: Field Survey, 2009

The size of the sample in each commercial centre and on each street for the tenants/employers and employees/workers respondents was 50% of all the commercial buildings, subject to a minimum of 35 buildings. In each of the sampled commercial buildings, data was collected from at least 5% of the occupants (employers/tenants) and 5% of the workers/employees, subject to a minimum of 1 respondent from each of the sampled buildings in each of the two categories of respondents. This resulted in a minimum sample of 35 respondents for each category of the targeted population in each commercial centre. This ensured that the selected sample for the primary units of analysis (buildings, building owners, occupants/tenants and workers/employers) met the minimum cases of 30 required for study conclusions (Alreck et al., 1985). The proportion and size of the sample was adopted on the basis that real property owners and users showed considerable variations in decision-making. The sample size was also selected in order to achieve the practical minimum of 30 cases that was required to avoid bias in the sample estimates and to allow for statistical inference (Alreck et al., 1985 and Gay, 1981).

The sample for building owners was similarly selected by stratified sampling with the commercial centres and the streets being the basis of stratification. The target was 10% of the commercial buildings that met the criteria set above (326 as presented in Table 2.1on page 32), subject to a minimum of 35 buildings. The sampled buildings were further selected based on the categories of owners and year of investment. The category of owners (investors) reflected the fact that each category of investor placed different emphasis on various investment decision-making parameters. The differences in decision parameters and decision-making process were required to comprehensively capture and analyze commercial real estate performance, in terms of perception and economic returns. Murigu (2005) found that investors in commercial real estate had recently embraced formal investment analysis and decision-making. This indicated that investment decisions in real estate in the past did not reflect market fundamentals and were not accurate measures of the performance of the commercial real estate sub-markets and market. Conversely, the study assumed that most of the investment decisions in the 20th century were rational and were good barometers of the perception about a commercial real estate market and the performance of the individual property. The year of investment was considered an important factor in investment decision-making in Kenya and accorded higher proportion

in the distribution of the sample between the various commercial sub-centres.

Based on the existing literature on the pattern of changes of commercial urban forms, the inner city will be the oldest commercial centre and sub-centres the newest. Consequently, the study assumed the Inner City of Nairobi city was the oldest, followed by the CBD, Westlands and Upper Hill. The study, consequently, selected 20% of commercial buildings in each of the newer commercial sub-centres of Upper Hill and Westlands and 10% in the CBD and Inner City.

It was estimated that commercial buildings in Nairobi City accommodated 10 to 100 tenants (Regent Management Limited, 2005 and 2007). The number of tenants per building was higher in older buildings and those located in the Inner City. The study adopted 50 as the average number of tenants/employers expected to be found in a commercial building. The population of tenants/employers in the commercial buildings that met the criteria of inclusion in the study was, therefore, estimated at 16,300. Based on the rules set for selecting the sample size, the study targeted 164 employers/tenants, 169 employees/workers and 54 owners as summarized in Table 4.1. The sample was considered adequate to provide data to identify factors that influenced location and relocation decisions, the inflow and outflow balance in the various commercial centres and the performance of the commercial real estate sub-markets.

The study identified architects, physical/town planners and valuers/estate agents as the key professionals that influence and contribute towards location and relocation, investment and divestment decisions in Nairobi City. The professionals and academicians were selected from the membership registers at the respective professional bodies and statutory registration boards. These include the Architectural Association of Kenya, The Architects Registration Board, The Physical Planners Registration Board, The Institution of Surveyors of Kenya, The Valuers Registration Board and The Estate Agents Registration Board. Table 4.2 presents the summary of accredited and registered professionals among the architects, physical/ town planners and valuers/estate agents.

The professionals/experts had similar training from the University of Nairobi and other

local universities and had been exposed to similar conditions of practice and experience. The study considered this category of the sample to be fairly homogeneous with little variations in their responses. In such a case, Gay (1983), Mugenda et al., (1999) and Kane (1990) suggests that a bigger sample is not necessary and a small sample will not result in a big sampling error. A sample of either 10% of the population or at least 30 cases will be adequate.

Table 4.2: Summary of Approved/Registered Professionals

Professional Category	No. of Registered Professionals	Professional Association/Registration Board
Architects	343	The Architectural Association of Kenya and The Architects Registration Board
Physical Planners	47	The Architectural Association of Kenya and The Physical Planners Registration Board
Valuers/Estate Agents	259	Institution of Surveyors of Kenya, The Valuers Registration Board and The Estate Agents Registration Board
Total	**861**	

Source: www.aak.or.ke, Daily Nation (7th May 2009) and The Kenya Gazette Vol. CXI-No. 21 (13th March 2009)

The targeted sample from the professional/experts category was, therefore, 52 respondents, distributed between the private sector and the public sector. The aim was to capture responses from the policy makers and enforcers (the public sector) and the advisers, implementers and managers (the private sector). The study proposed to sample five physical planners from the public sector (Nairobi City Council and the Ministry of Lands) and two from the private sector. The study proposed to select ten (10) architects, one from National Housing Corporation (NHC), two from the Nairobi City Council and the rest from the private sector. Finally, the study proposed to select thirty valuers/estate agents/property managers who were registered estate agents/valuers, randomly selected from the main real estate consultancy firms, namely Tysons Ltd, GIMCO Ltd, Knight Frank, Regent Management, NW Realite, Landmark Realtor, Kinyua Koech Ltd, Lloyd Masika and Crystal Valuers and the rest from the Nairobi City Council and the Ministry of Lands (Nairobi). The sample for professionals/experts was heavily tilted in favour of

valuers/estate agents on the ground that they made most of the preliminary and final investment, disinvestment, location and relocation decisions on behalf of the investors and occupiers.

4.3 Variables and their Conceptualization

Based on the study hypothesis, the key variables were 'location and relocation decision factors' and 'performance of commercial real estate market'. The variable 'location and relocation decision factors' was considered as a measure of the changes in the urban form. The definition of each variable invariably involved several concepts and hence the use of surrogates was common.

Variable 1: Location and Relocation Decision Factors- Roulac (2003) points out that people now have greater latitudes to choose where to live, work, shop and invest. These location decisions reflect the perception and views people hold about a place. These location and relocation decisions are a reflection of changes in the commercial urban form. While most of location decisions are highly personal, there are some common themes that characterize these decisions. Consequently, there are many factors that encourage investment and occupation in commercial real estate properties. The same factors also encourage migration to and from one centre to another and disinvestment from centres.

The location, relocation, investment and disinvestment decisions affect the spatial condition of the sub-centres and direction of change. These continuous changes in the spatial quality result in continuous changes in the urban form. These location and relocation, investment and disinvestment decisions directly and indirectly determine the performance of the various real estate sub-markets and the overall real estate market. This perception is based on the fact that real estate markets performance is intrinsically linked with the urban form.

The various participants (investors, renters and workers) in the commercial real estate submarkets will make decisions based on their assessment on the impact of the several factors. The study, based on the reviewed literature, identified these factors as follows:

(a) Overcrowding in the neighbourhood,

(b) Distance from place of residence,

(c) Commuting cost and time,

(d) Size of commercial neighbourhood,

(e) Loss of agglomeration/lack of business,

(f) Lack of urban services,

(g) Decay of the general neighbourhood and buildings,

(h) High occupational costs/running costs,

(i) Need to locate in less congested area,

(j) Need to locate close to customers/clients,

(k) Need to locate close to source of raw materials/inputs,

(l) Ownership of cars,

(m) Better transportation system,

(n) Ability to use modern communication tools to conduct business,

(o) Planning regulations,

(p) Availability of land to build on the periphery,

(q) Poor management of the urban land/centres,

(r) Renewed neighbourhoods,

(s) Nature of property ownership (freehold versus leasehold),

(t) Ability to enjoy controlled tenancy,

(u) Less Government interference i.e., no Landlord and Tenants Act,

(v) Tenants versus landlord,

(w) Land values and rents,

(x) Land speculation,

(y) Economic growth,

(z) Business expansion,

(aa) City Council land rates,

(bb) Average wage per employee,

(cc) Satisfaction with the working environment,

(dd) Compatibility with neighbouring tenants/occupants,

The above factors indicate the strengths and weaknesses of the various sub-centres as place to work and invest. These factors can, therefore, be used to compare and rank the

various sub-centres, for investment and occupation purposes. They can also be used to identify the key factors that are considered by investors and occupants in selecting the place to invest and locate business. In essence, these factors are the factors that determine supply and demand of office spaces in the market.

The respondents were asked to select the likely reason(s) among the above that influenced their decision to locate at the current location. The respondents were also asked to indicate whether any of the above reason(s) was responsible for movement from one location to the other or whether any of the above factors will likely influence their location decision in the near future. The respondents were asked to rank the importance of each factor in their location decision on a Likert scale of 1 to 5 (Not Important to Very Important). The professionals/experts were likewise requested to indicate and rank the reasons that might be contributing to the movements of occupiers and investors in commercial real estate from one centre to another. The professionals/experts were also asked to express their views about the commercial urban form and the performance of the commercial real estate market.

The above responses were used to determine the movement in and out of a given commercial centre in past ten (10) years (from 1997 to 2007). This period was selected on the grounds that most commercial leases are for a period exceeding five (5) years and three (3) months, in order to avoid the applications of the Landlord and Tenant (Shops, Hotels and Catering Establishments) Act Cap 301 of the Laws of Kenya (Chomba, 1990). It was expected that the occupants (tenants) will have made location and relocation decisions at the end of the lease period. It was expected that occupants who made location and relocation decision and consequently occupied spaces in 1997 would have made another set of location and relocation decisions by 2001 and then in 2006 after the expiry of the leases. The respondents who had leases commencing after 2001 were requested to indicate where they came from. This was required in order to establish the centres that were losing favour (deteriorating) and those that were becoming popular.

Likewise, investors sampled for this study and who purchased/invested in the property after 1997 were requested to indicate whether they initially owned a property in another

centre. If the answer was in affirmative, they were then asked whether they divested from the former centre or the investment was an additional property. The respondents were also requested to indicate the aim of the investment in terms of portfolio diversification, lack of alternative investments in the sub-centre or unwillingness to invest further in the sub-centre.

It was expected that a growing and vibrant sub-centre will have more persons joining (both for occupation and investment) than those leaving. In the alternative, the centre should replace the vacating occupants and investors with equal or better quality persons/entities (in terms of size of space occupied and amount invested). A positive score was assigned value 1 while a negative score was assigned value 0. A positive score suggested that the sub-centre was growing while a negative score suggested that the sub-centre was deteriorating and was no longer attractive to investors and occupants.

Variable 2: Performance Measurement of Commercial Real Estate Market- In any given geographical area or jurisdiction, there will be several real estate sub-markets differentiated by development type, sellers and buyers, tenants and landlords, prices and costs and regulatory framework. Jones et al., (1994) are of the view that an urban area will have highly differentiated real estate sub-markets among the various commercial centres. The performance of these various sub-markets is closely tied to its physical state. The physical state is indicated by the inflows and outflows of occupants and investors. Consequently, the centres will exhibit differences in the performance of the commercial real estate market (Muller et al., 1994).

The real estate industry has developed tools to measure the performance of the individual real estate investment and the entire market. These measurement tools are used to make investment decisions in various locations, types of properties and compare with other investment vehicles.

Mueller (1999), McDonald (2002), Kolbe (2003) and Nabarro et al., (2004) list the main measurement tools to include rental rates, occupancy levels, property index, rate of return, inflation hedge, economic life, access to information, financing options and risk profile.

The importance of each tool will vary depending on the location and time in the property circle. The Kenyan market has not established a property index and the same cannot be used to measure the performance of the commercial real estate market in Nairobi. Murigu (2005) did not find risk profile as one of the key factors considered in the real estate market in Kenya.

The most common measure of the performance of the commercial real estate market is the financial rate of return (Hargitay et al., 1993). The rate of return is the ultimate measure of the performance of the individual property investment, the various sub-centres and the entire market. The current and projected rate of return (on rental yield and capital appreciation) is, therefore, used to compare investment locations and types. Wurtzebach et al., (1991) are of the opinion that the rate of return will combine all the attributes of the market- spatial, perception of the market and the financial aspect of the market. Jones Lang Wootton (1988), Rodney et al., (1989) and Sivitanides (1998) indicate that returns from commercial real estate ranges from 7.75% to 13.9% in developed world. In Kenya, the total rate of return for commercial properties has been found to range from 8.25% to 12.52% for the years 1987 to 2007 (Syagga, 1998 and Regent Management Ltd, 2007).

The researcher calculated the average rate of return (rental yield and capital appreciation) for each sub-market for each year between 1997 and 2007. The rental yield was the quotient of the net annual income and the capital value of the property. The determination of the rental yield required the establishment of the capital value or the capital outlay (purchase price or total cost of development) and the rental income for each year and commercial centre. Capital appreciation was a product of changes in the total cost of development (land, actual construction cost, the cost of finance and professional fees), annual rate of inflation and capital deductions required to maintain the buildings in habitable conditions and comply with relevant law and regulations.

The basis of capital value was the sum of the value of land, the average cost of construction per square foot, professional fees and cost of finance.

The value of land was the average of values returned by the City Council of Nairobi (for supplementary valuation rolls for new rate payers) and private valuation firms (Tysons Ltd, Lloyd Masika Ltd, GIMCO Ltd, NW Realite, Kinyua Koech Ltd and Regent Management Ltd) for each sub-market and year under review.

The cost of construction for each year for Nairobi was the average obtained from records at Ministry of Public Works (the Joint Building Council) and rate of construction from reputable quantity surveying firms. In addition, the study added the professional fees to the 'real cost of construction'. The professional fees were in relation to fees paid to the design and supervision team of architects, quantity surveyors, engineers, project managers and environmental impact assessors. These professionals are required for any construction project to get approval from Nairobi City Council and National Environment Management Authority (NEMA) and their fees were considered as key components of the project cost.

The study expected that the costs of commercial property development, being huge, will be financed by either equity, debt (borrowed funds) or a combination of the two. The study adopted the view that both modes of financing have a cost, the opportunity cost (for equity) and interest (for debt). The cost of finance was, therefore, included as part of the project cost.

The annual rental income was the product of the average rental rate and the average occupied area of each of the sampled building for each year in each commercial sub-market. The rental rate for the sampled properties in each commercial sub-market for each year under review was the average of the current asking rent and prevailing rental rate for old tenants. This averaging became necessary because it was assumed that asking rental rate and the prevailing rental rates were different as a result of rent escalations imbedded in most commercial leases.

The rate of return of each of the sampled property has been used to aggregate the performance of the commercial real estate sub-markets for each year between 1997 and 2007. The average rate of return of each sub-market has been used to rank the four identified commercial sub-markets in Nairobi City. The differences in scores suggested

that the performance of the commercial real estate market is differentiated between the sub-centres. The findings were used to test the hypothesis that the changes in the commercial urban form had impacted on the performance of the commercial real estate market in the various sub-markets and the entire Nairobi commercial real estate market.

The study calculated the risk in respect of each commercial sub-centre and used the results to rank the performance of the sub-markets. The study adopted the variations in the rate of return over the period selected for the study (1997-2007) as the measure of risk. The differences in the results suggested that the performance of the commercial real estate market is differentiated between the sub-centres. The findings were likewise used to test the hypothesis that the changes in the commercial urban form had impacted on the performance of the commercial real estate market in the various sub-markets and the entire Nairobi commercial real estate market.

4.4 Data Collection

There are several sources and methods of data collection. Kane (1990) categorises sources of information into interviews, questionnaires, participant observation and written sources.

The study captured data in two phases. The first phase was the review and analysis of literature and written documents on the historical development of Nairobi, survey plans, aerial photo maps and approved building plans of the sampled buildings. Master Plans and other physical/town plans, census reports, Nairobi Land Registry among others were used for the purpose of data collection. The aim was to pick out data that could not be easily obtained by use of questionnaires.

Questionnaires were the main tools of data collection in the second phase. Questionnaires were used to capture perception and views from commercial property owners, users and professionals/experts. The questionnaires were self administered to reduce delays, ensure that the respondents answered the questions correctly and properly and to achieve a high percentage of response. The study adopted closed-ended questionnaires. This ensured objectivity and uniformity in the responses. In addition, matrix questions were adopted in order to achieve clarity of some critical responses.

The questionnaires were pre-tested to a small sample to test understanding of the instructions and to test clarity and relevance of the questions. The comments received from these pretest respondents were incorporated in the final version of the questionnaires that were used for data collection.

For research of this nature that had a time series element, the period to be covered in the data collection is 10 years (Brown, 2000). This period coincide with the period used by valuers in the Commonwealth to value investment properties. Most property cycles, both market and physical, prevail for ten to fifteen years (McKenzie et al., 1976 and McDonald, 2002). Most of the respondents in a study of major real estate investment decision-makers in the USA considered 10 years as an ideal period to evaluate the performance of real estate market (Hartzell et al., 1988).

For the purpose of this study, the data was collected for the period between 1997 and 2007. This period was considered a watershed in the history of Kenya as it was the beginning of the era of economic and political changes. These changes were also reflected in real estate markets and public intervention in the development and management of urban centres. This resulted in an open economy with reduced government participation in the investment arena and open political competition. The period 1997-2007 also recorded fluctuating economic performance, starting with stagnations in the late 1990s and early 2000s and economic boom during the 2003-2007 (Ikiara, 2002 and GOK, 2007). The period was, therefore, considered an ideal period to analyse changes in the commercial urban form and performance of real estate market.

4.5 Data Analysis

The design of the study is exploratory and causal-comparative. The study explores and ranks factors that have encouraged movement of investors and users from one centre to another. These factors are responsible for rapid growth of some commercial centres and rapid deterioration of other centres. They are, therefore, the measure of the changes in the commercial urban form. The study further measures the performance of commercial real estate sub-markets and the entire citywide market. The analysis is used to compare the impact of the location, relocation and return decisions (changes in the commercial urban

form) on the performance of the commercial real estate market between the various sub-centres (sub-markets). The comparison is deemed necessary in order to establish whether the current commercial urban form determines the performance of the commercial real estate markets and sub-markets. It is further necessary to establish the direction and relationship between the measures of changes in commercial urban form and performance of the commercial real estate market in Nairobi City.

Alreck et al., (1985) and Mugenda et al., (1999) propose that data for this kind of research is analysed in three stages. The first stage is to compute descriptive statistics for each variable and sub group. The second stage is to carry out tests to explore if there are differences between the groups (subcentres/sub-markets). The final stage is to establish relationship between the variables of the study.

The data for the various variables were analysed to compute descriptive statistics. The data was analysed using Statistical Package for Social Scientists (SPSS) version 11.5 and Microsoft Excel 2003-2007 version. The descriptive statistics include the median, mode, mean, standard deviation, kurtosis and skewness. The aim is to show the most common observation, the deviation from it, and the form of the distribution of the variable and histograms. The qualitative data is presented in narrative form and frequency tables.

The most common tool in the second phase of data analysis has been the correlation technique. Correlation technique has been used to analyze the degree and direction of relationship between the various variables. Based on the scale proposed by Kane (1990), a correlation coefficient of absolute value of 0.7 and above at 95% confidence level is considered strong while a coefficient of less than 0.3 is not thought to show much relationship between the variables of interest. In respect of this study, correlation techniques are used to determine the strength and direction of the relationship (either positive or negative) between location and relocation decisions and net movement of investors and occupants (changes in the commercial urban form) and performance of the commercial real estate market in each sub-market.

Mugenda et al., (1999) propose the use of comparison of means as the main tool in the

second stage of the analysis. The study used the One Sample t-test and Paired Sample t-test to test the hypothesis.

The analysis of comparison of means by One Sample t-test was used to rank the importance of the various location and relocation factors that were ranked on a scale of 1 to 5 on basis of least important to most important. The test of the means required the setting of the decision point at which to reject or fail to reject the null hypothesis in a one-tail test of the hypothesis. The median score has, therefore, been set as the decision criteria. The results of these tests have been further subjected to a test of significance using the critical 't'. Mugenda et al., (1999) argue that the test of hypothesis by use of test of significance is necessary to eliminate Type I and Type II errors. Type I error occurs when it is concluded that a cause is significant when it is not. Type II error is the opposite and is committed when it is concluded that a cause/factor is not significant when it is actually significant. It was considered more appropriate to avoid committing Type II errors because excluding an important cause/factor might lead to wrong decision on the commercial urban form and the performance of commercial real estate market. In order to avoid committing Type II error, the study set the confidence level at 99%.

The Paired Sample t-test has been used to compare the means of the selected variables for the various commercial sub-centres and sub-markets. The test produces the t-statistics and the decision rule is based on the comparison of the calculated t-statistics and the tabulated t-value. If the calculated t-value is found to be greater than the critical or tabulated t-value, it was then concluded that there existed differences between the various commercial centres. The differences were found to be in respect of the commercial urban form and the performance of commercial real estate sub-market. This suggested that the commercial urban form determined the performance of the commercial real estate market. This, in turn, has been used to test the hypothesis that the changes in the commercial urban form has impacted on the performance of the commercial real estate market and draw conclusions of the study.

The third phase of data analysis has used correlation technique and regression analysis. Correlation technique has been used to analyze the degree and direction of relationship

between the various variables. Based on the scale proposed by Kane (1990), a correlation coefficient of absolute value of 0.7 and above at 95% confidence level is considered strong while a coefficient of less than 0.3 is not thought to show much relationship between the variables of interest. In respect of this study, correlation techniques are used to determine the strength and direction of the relationship (either positive or negative) between location and relocation decisions and net movement of investors and occupants (changes in the commercial urban form) and performance of the commercial real estate market in each sub-market.

The intention in the third phase of data analysis has been to find out whether the various independent variables predict the outcome of dependent variable. In addition, data at this stage is analysed to determine the contribution of each independent variable towards the outcome of the dependent variable. In these situations, regression analysis is the most acceptable data analysis technique (Mugenda et al., 1999). The design of the study and the hypothesis involved several surrogate measures of the independent variable (commercial urban form) and hence multiple regression analysis has been adopted. The relationship between the dependent variable (Y) and the independent variables (X's) has been formulated as follows:-

$$Y = \beta o + \beta_1 X_1 + \beta 2X2 + \text{----------} \beta nXn + \varepsilon$$

Where: ***Y- is the dependent variable***

X_1-n- are the independent variables
βo - is the constant
β_1-n- are the regression coefficients or change induced in Y by each X
ε- is the error

The independent variables were entered into the regression model using the backward elimination method of multiple regression analysis. The method allowed all the variables to be included in the model before the elimination process started. The least significant variables were eliminated one after the other and only the significant variables were left in the final step of the regression process. The elimination of a variable was based on its contribution to the magnitude of the mean square error (MSE) of the regression estimate. If the presence of a variable in the equation increased the MSE, the variable was removed

from the equation. This process continued until the minimum possible MSE was obtained. The independent variables found to the most important contributors towards the outcome of the dependent variable were subjected to a step-wise regression procedure to determine their contribution. However, Crockett (1988) suggests that beta coefficient can be used to compare the importance of each independent variable in relation to the dependent variable.

The regression analysis also yielded R^2, the coefficient of determination. This statistic refers to the amount of variation explained by the independent variable or variables. The possible values of R^2 range from 1 to 0. When R^2 is equal to 1, it indicates that all the independent variables included in the final model completely account for the variations in the dependent variable. The opposite will hold in the event where R^2 equals 0. Ferry et al., (1991) recommend that the value of R^2 should be at least 0.90 for a prediction model to be most reliable.

Regression analysis assumes that:

(a) Each independent variable is linearly related to the dependent variable;
(b) The observations are independent of each other, which implies that the sample was drawn at random;
(c) Homogeneity of variances exists, i.e., at each level of X, the variance of the Y value is constant;
(d) Y values are normally distributed around the mean at each level of X in the population; and
(e) There are no outlier observations in the data (Mugenda et al., 1999 and Carrol, 1988).

The regression analysis is only valid and reliable if it does not violate the above assumptions. One of the main violations of the above conditions is the strong relation between independent variables (multicollinearity). Where multicollinearity is present, the coefficients exhibit large changes when a variable is added or deleted from the model, or when a data point is altered or dropped. Multicollinearity will, therefore, be detected by examining the regression coefficients and the correlations of independent variables in the

multiple regression equation. In the study, the variables that were strongly related to the others were removed from the equation and the regression analysis conducted without them. The independent variable that was removed from the equation was the one that had the highest coefficient of correlation to the dependent variable. This variable was, in essence a combination of the other variables and its continued inclusion in the regression analysis was not necessary.

Chapter Five

NAIROBI CITY COMMERCIAL URBAN FORM

5.1 Introduction

Urban centres in Africa have changed tremendously since the 1960s. These changes have resulted in opportunities and problems. Sullivan (1990), Jones (2000) and Kumar (2000) identified problems of urban growth in Africa to include urban sprawl, inadequate urban services and infrastructure, high cost of providing services, disproportionate development and growth patterns, ineffective management practices, poor housing conditions and the growing income disparities. As the urban centres continue to expand and increase, urban problems are bound to get worse. Governments and civic authorities will be expected to institute direct and indirect intervention measures. The key measure should be effective urban management founded on good governance, accountability and transparency.

5.2 Urbanization Trends in Kenya

Kenya has recorded a high rate of urbanization since the colonial days. As at 1948, there were only 17 towns/urban centres, accommodating 5.1% of the total population (GOK, 1974). The 1999 census found that there were 277 urban centres, with the urban population accounting for 34% of the total population (GOK, 2008). Table 5.1 is a summary of urbanization trends in Kenya between 1948 and 1999. The rate of urbanization in Kenya has, therefore, been dramatic, having increased by 1500 times in a span of 63 years. It is estimated that approximately 40% of Kenyans now live in urban areas (GOK, 2008).

Table 5.1 Urbanization Trends in Kenya, 1948-1999

	1948	1962	1969	1979	1989	1999
No. of Centres	17	34	47	90	215	277
% of Urban Population	5.1	9.8	9.9	15.1	18.0	34.0
% of Urban Population residing in Nairobi	43.2	39.8	47.1	35.9	34.1	43.6

Source: GOK (2008)

Urbanization in Kenya has been characterized by movement of people from rural to larger urban centres. For example, rural-urban migration resulted in a 7% growth of Nairobi city for the period of 10 years (1989 and 1999) (GOK, 2003). The outstanding feature of this growth has been overcrowding and social unrest and distorted spatial distribution (Kacheche, 1984 and Obudho et al., 2002). Unfortunately, there have been no effective mitigating factors to alleviate the negative impacts of urbanization. The authorities perceived and have continued to perceive urban problems as purely a housing problem that can be solved by housing intervention tools (Bloomberg et al., 1965 and GOK, 2004). Stren (1975) argues that these tools were directed towards solving the housing problems and were not designed to address the whole issue of urban problems. The consequence has been deteriorated central areas of the city, commercial and residential urban sprawl and failed real estate markets.

This unfortunate situation has arisen because the country has lacked a comprehensive urban development policy. The overriding policy has been to encourage the growth of other urban centres without instituting measures to ensure sustainable development of the existing ones. Mbogua (1984) argues that this approach is simplistic and is likely to compound urban problems. Indeed, this has already happened and majority of residents consider the quality of urban centres unsatisfactory.

At independence and in the 1970s, the government pursued decentralization policy as the main urbanization policy. This policy was formally pronounced in the 2nd Development Plan (1970-1974) with the stated aim of slowing down the growth of the primate cities. Key programs under the decentralization theme have been the Service Centre Strategy, the Growth Centre Strategy and the District Focus for Rural Development Strategy (Olima, 1993). These programs identified and encouraged the development of alternative centres, each serving one or several functions.

The thrust of decentralization policy was to devise mechanisms that would contain rapid growth of individual cities and balance urban systems. Similarly, the de-concentration of primate cities and the re-direction of urban investment in less developed areas were expected to redress the distribution imbalance in urban centers systems (Gerreau, 1991).

This theme was carried over in the subsequent years and it now seems that decentralization and regional balance is the policy that directs urbanization in Kenya. The main thinking behind these policies has been political and social expedience to enable all regions of the country to share in national resources.

Kacheche (1984) argues that this approach resembles the 'growth centre mode'. This approach identifies and designates hierarchical schedule of centres for location of essential services, amenities and infrastructure. The approach was founded on a misconception that the growth of the big cities could be checked by public policy of encouraging development of alternative centres. It was envisaged that a smaller city will be easier to manage and will afford the necessary urban and infrastructure services.

The decentralization approach has, however, not achieved the intended objectives of distributing urban population and activities to other centres. The failure of the decentralization policy can be attributed to inadequate public investment in alternative urban centres (Obudho et al., 2002). The major centres of Nairobi and Mombasa still remain the major urban centres, accounting for about 70% of the urban population (GOK, 2008). However, Nairobi has accommodated the largest share of the country's urban population, urban developments and growth. As at the 1999 National Population Census, Nairobi City accounted for 43.6% of the total urban population. This was an improvement compared to the decline recorded between 1969 and 1989 as shown in Table 5.1. Nairobi thus continued its dominance in the hierarchy of urban centres in Kenya and, therefore, shaped and directed urbanization trends in the country. The policy of decentralization and sub-urbanization has, therefore, not worked and it is now necessary to focus attention on how to improve the efficiency of the big cities.

5.3 The Historical Development of Nairobi Commercial Urban Land Use

Nairobi is situated at latitudes 1°19' and 1°29' south of the Equator and 36°39' and longitudes 37°07' east of the Prime Meridian. The city lies astride the Nairobi River at an altitude of between 1600m and 1850m above see level. Like other cities in Africa, Nairobi has grown rapidly in the past 100 years to become a centre of commerce, administration and social activities.

Nairobi was initially established as a colonial trading centre and a military base by 1885 (Habitat, 1997 and McVicar, 1968).The British Protectorate established two trading centres at Fort Smith (currently Dagoretti) and at the present junction of Limuru Road and Ngara Road. The city, therefore, started as a centre of commerce.

Nairobi was, however, formally started as a railway town when the Uganda Railway reached at the current site in 1899. McVicar (1968) and Obudho et al., (1992) point out that the site was selected because it was almost midway between Mombasa and Kisumu, it had reliable water supply, it had ample level land for railway tracks and cool temperature. The Chief Engineer of Kenya Uganda Railway (KUR) annexed the whole plain south of Nairobi River swamp to the Ngong River. The Protectorate transferred the headquarters from Machakos to Nairobi immediately thereafter. Thus, by the turn of the century, Nairobi was now fully established as a centre of commerce and administration.

By 1900, Nairobi had already become a large and flourishing place with the developments consisting of KUR buildings and separate areas for Europeans and Indians. It extended within a radius of 1.5 miles of the sub-commissioner's office with a pie-shaped spatial pattern spanning from the Nairobi River, the railway line along the base of Nairobi Hill and the railroad station and workshops. The African commercial areas were restricted to the eastern side of River Road and the present day Kirinyaga Road (Huxley, 1964). The Asians, on the other hand, were restricted along River Road. By 1906, Nairobi had formed a definite spatial pattern that comprised of the following:

(a) European Business and Administration Centre- this was the core of the township and was covered by Station Road, Government Road and Victoria Street.

(b) The Indian Bazaar- this was the most intensively developed part of the township and occupied three streets to west of Government Road.

(c) The Railway Centre- this region comprised of the station, marshalling yard and the adjoining junior staff quarters.

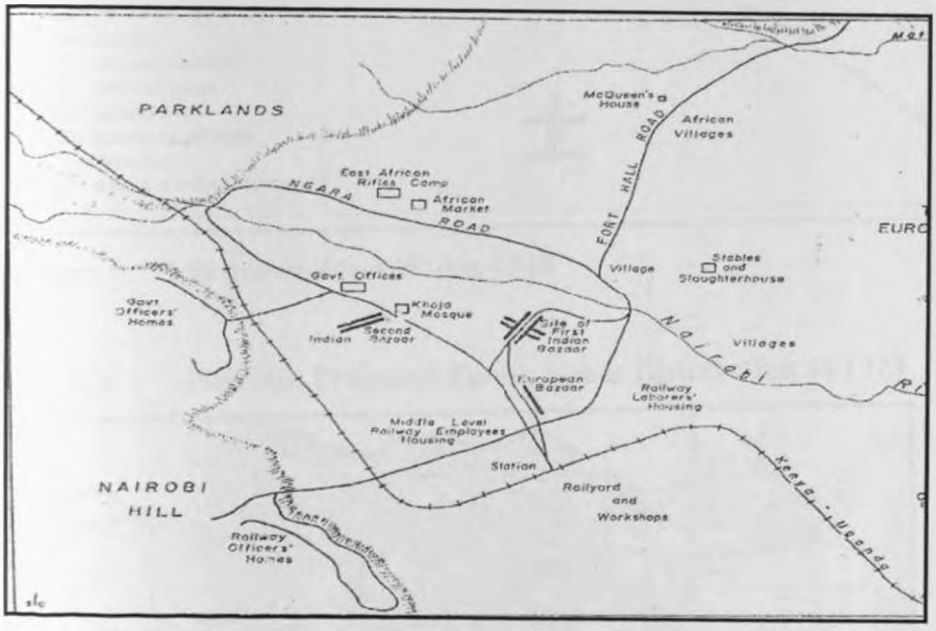
(d) The Ngara Area- this was the region to the east of the Nairobi River and comprised of Asian quarters and the African Market.

(e) The European Suburbs- these were located to the west and north of the European Business centre. Some of the key estates included Westlands, Upper Parklands,

Upper Hill and Kilimani.

By 1903, the segregation of land use on the basis of colour, race and income had been established. Map 5.1 shows the distribution of population and activity over Nairobi by 1903.

Map 5.1: Nairobi in 1903

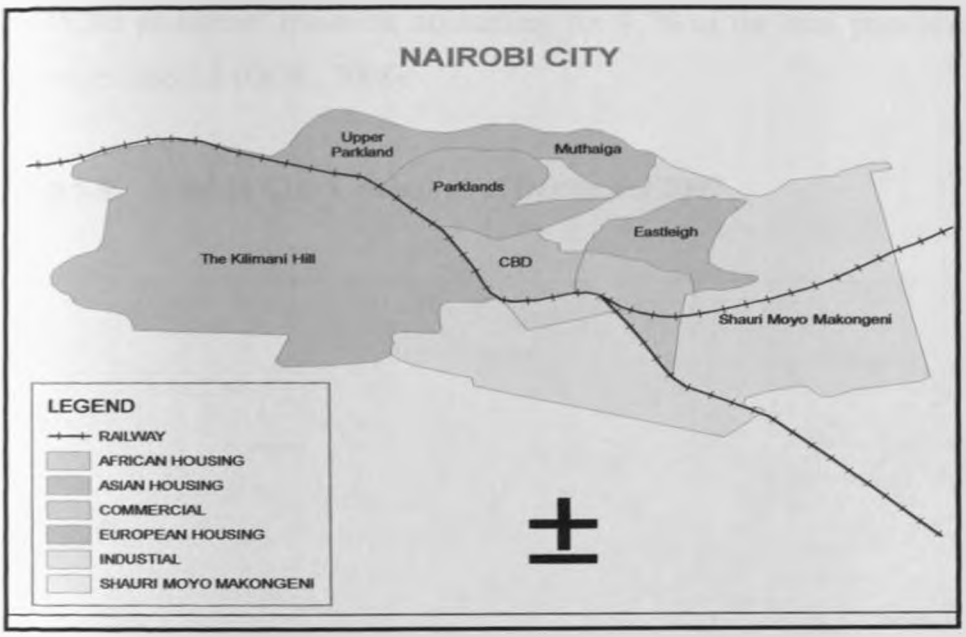


Source: White, 1948

By 1907, Nairobi was accepted as the official capital of Kenya. In 1919, it became a municipal council. By 1920, the municipal boundaries had been clearly defined and the township now comprised an area of 9.5 square kilometers. The boundaries were extended in 1948 to 83 square kilometers as shown in Map 5.2. Thereafter, Nairobi gained city status in 1950 to complete its first phase of development.

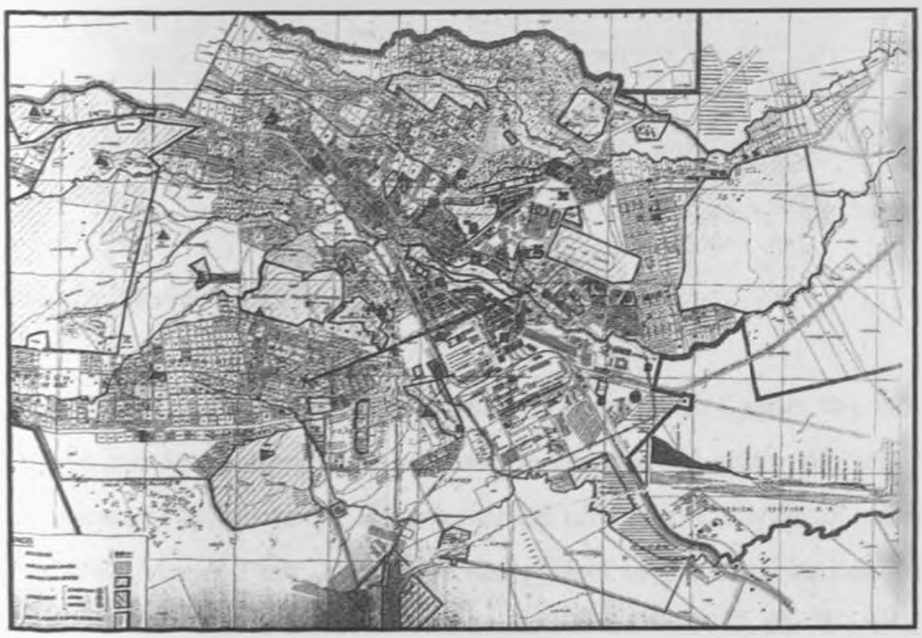
In June 1963, vide Legal Notice No. 517 of 1963, the city expanded from 90.6 square kilometres to 689 square kilometers. This extension was part of the implementation of the recommendations contained in the 1948 Master Plan as shown in Map 5.3.

Map 5.2: Nairobi City as at 1948



Source: Redrawn from White, 1948

Map 5.3: Nairobi: Proposed Future Space Distribution to 1973

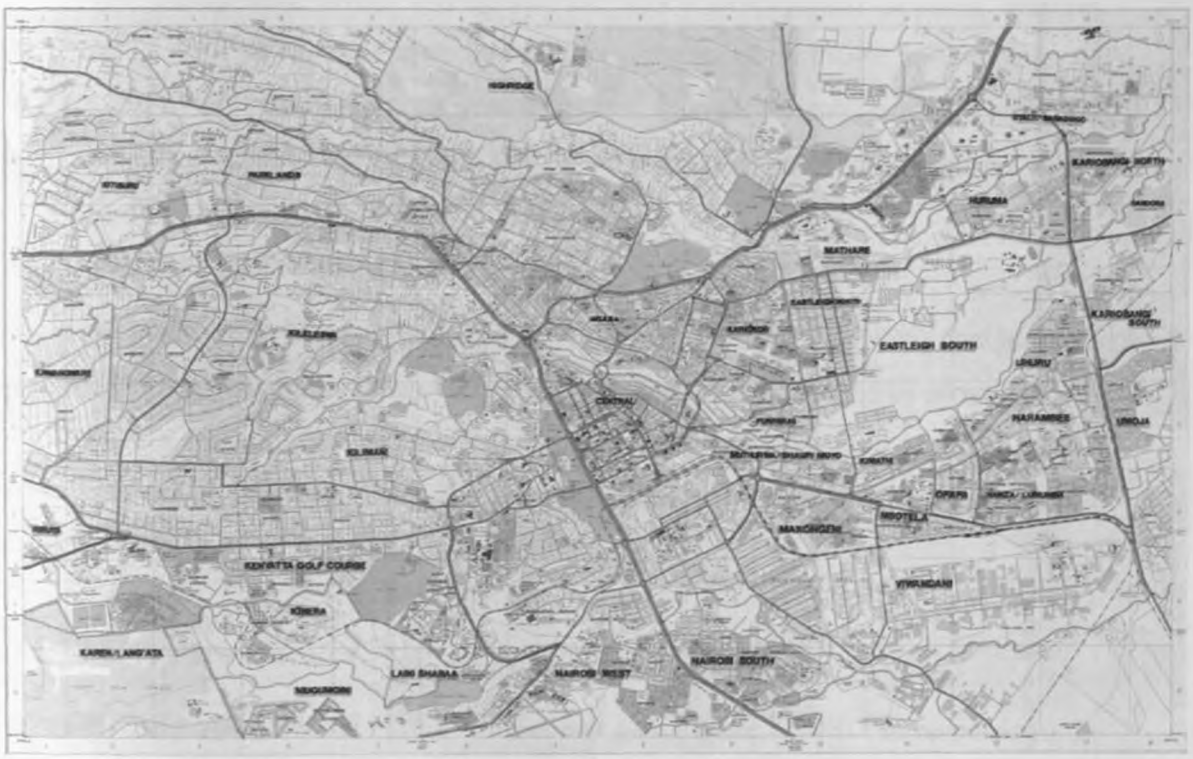


Source: White, 1948

The extended city annexed the European farms (Karen and Langata), the Kikuyu Native Land of Dagoretti, Kibera, Nairobi National Park, Embakasi Airport and the sisal estates to the north and east (Dandora, Kahawa, Njiru, Kasarani, Ruaraka and Garden Estates).

Nairobi is now a large metropolis extending to 696 square kilometers with a population of 3,146,303 permanent residents, accounting for 8.2% of the total population of Kenya as shown in Map 5.4 (GOK, 2008).

Map 5.4: Nairobi City Council as at December 2007



Source: Survey of Kenya, 2007

Over time, the European Business and Administration Centre, the Indian Bazaar and the station and marshalling yard became the commercial sector of Nairobi as the township grew into a city. However, the commercial urban form of Nairobi remained as planned by the 1948 Master Plan until 1979 when parts of the recommendations of The Nairobi Metropolitan Growth Strategy were implemented. In 1978, the Works and Town Planning Committee formally created Westlands as an addition commercial centre (Kiamba, 1984). The European suburb of Upper Hill has also become a commercial centre following the rezoning of the area by Nairobi City Council in 1993 to allow for development of commercial buildings.

The size and character of these commercial centres has continued to change over the years. Nairobi commercial sector now exhibits a polycentric urban form comprising of the CBD, Inner City and several sub-centres. According to Kingoriah (1980) and Abiero-Gariy (1989), the structure of the commercial urban land use in Nairobi is mainly the product of Government policy and action throughout the city's history and physical features. Rasmussen (1987) points out that, in addition, the administrative and commercial functions of the city have shaped its growth pattern as well. Nairobi is now a renowned commercial and administrative centre in Kenya and the entire East African region.

5.4 The Planning Phases of Nairobi

Kingoriah (1980), Kiamba (1986), Abiero-Gariy (1989) and Habitat (1996) conclude that the growth of Nairobi city commercial land use has been largely shaped by strict planning practices and a continuous process of rationalization and intensification of land use. The plans have been in the form of rigid master plans, the various government policies and changes in the zoning and planning regulations.

5.4.1 The Protectorate Era

During the early years, Nairobi grew without any plan (White, 1948). In response to the plague and other calamities that affected the early settlement, it became necessary to formally plan Nairobi. The 1926 physical plan prepared by Mr. F. Wallon Jameson defined the various zones of the city (Kingoriah, 1980). The plan was based on the need for aesthetic function, spatial relationships and urban structure that was devoid of illegal development and speculative tendencies. Abudho et al., (1992) conclude that the planning policy during the protectorate era was dominated by the need to racially discriminate land use.

The first formal plan for Nairobi was the 1948 Master Plan. The 1948 Master Plan split the Central Business District into Zone 1 and Zone 2 and set maximum building heights for each zone. Zone 1 was the European Zone which extended from the west and east of City Square and the maximum allowed building height was 30 metres. Zone 2 was the area around River Road and the Bazaar area with a maximum height of 15 metres. Kingoriah (1980) argues that the size of the plot and the land tenure system dictated the limited

building height in Zone 2. The Plan prohibited residential developments in Zone 1 but allowed residences in the upper storey in Zone 2. The Master Plan further created the 'Kenyan Centre' which extended from the High Court to the Hill, with no height limitations.

The Master Plan aimed at decentralizing industry and services and fixing the area within which the expansion was to take place. The 1948 Plan was incorporated into the Government budgeting and expenditure framework. As a result, it influenced Government investment decisions in infrastructure and other urban services. It, therefore, shaped the growth pattern of Nairobi city.

However, it has been argued that the 1948 Master Plan was a containment plan that was designed to prevent Africans from the prime parts of the city (Ministry of Local Government, 2005). The rapid rural-urban migration and changes in the political landscape after independence effectively rendered the plan irrelevant.

5.4.2 The 1973 Nairobi Metropolitan Growth Strategy

The 1948 Master Plan was expected to manage development in Nairobi up to 1973. However, by 1967, the City was already experiencing problems beyond the projections of the Master Plan (Njau, 1975). It, therefore, became necessary to formulate a new strategy to guide the development of Nairobi.

The Nairobi Urban Study Group (NUSG) of 1971 conducted a survey and developed the Nairobi Metropolitan Growth Strategy to support city development to the year 2000 (GOK, 1973). It was a strategy outlining mechanisms and spatial framework for the city's infrastructure development, social welfare services, facility development, urban land supply for development, and growth distribution. Among the key recommendations of the Nairobi Metropolitan Growth Strategy were:

(a) Restrict the growth of the present central business district;
(b) Divert employment opportunities from the present central business district to elsewhere to avoid congestion and reduce infrastructure cost; and
(c) Establish alternative commercial centres with diversified land use close to

residential neighbourhoods with a catchments population of over 250,000 persons.

The recommendations of NUSG were in line with Government policy of spatial distribution of urban activities and development, albeit to the scale of Nairobi city. The strong emphasis on the central area and the entire commercial sector indicates that the NUGS considered commercial land use the key driver of urban development in Nairobi. In respect to commercial sub sector, the NUSG noted that:

(a) there was underutilization of land in the central area and did not fully develop the economic potential of the sites;
(b) there was potential for increase in the density and new development and enhance efficiency of use of existing development; and
(c) the land tenure system in the central area that was largely leasehold system was viewed as imposing limitations on further development.

The NUGS therefore:

(d) advocated for consistent approach to lease renewal and called for lease renewal to be tied with planning proposal for the area;
(e) recommended for new commercial centres in Westlands, Adams Arcade and Eastleigh; and
(f) recommended for overt action to segregate economic activities between the various commercial centres.

The standout outcome of the Nairobi Metropolitan Growth Strategy was the accelerated development of Westlands and Upper Hill commercial sub-centres and neighbourhood-based shopping centres and the intensification of developments in the CBD (Kiamba, 1984 and Abiero-Gariy, 1989). The current polycentric commercial urban form is, therefore, a product of the Nairobi Metropolitan Growth Strategy.

The plan did not, however, solve the development problems of Nairobi. The plan, in fact, generated three contrasting problems, especially for the development of the commercial sector of Nairobi city. Kiamba (1984) argues that the partial and spasmodic

implementation of the plan was to blame for its failure to direct urban development in Nairobi City. Secondly, The Nairobi Metropolitan Growth Strategy encouraged haphazard and unauthorized development in most parts of the city at an alarming rate (Ministry of Local Government, 2003). Finally, the plan entrenched racial and sectoral segregation of land use and social differentiation of labour on account of income levels. As a consequence of this policy of decentralization, the inner city (Zone 1A- the lower side) has been left to deteriorate and the central business district has a serious problem of inadequate infrastructure (KIPPRA, 2005). The Nairobi Metropolitan Growth Strategy, therefore, failed miserably to direct the development of Nairobi city.

5.4.3 The No-Plan Phase (after the Nairobi Metropolitan Growth Strategy 1973)

The development of Nairobi during this period has been guided by the various five years development plans. Each plan has identified the main problems of the time and proposed intervention strategies. There were piecemeal approaches to re-plan and re-organize the land use plans in Nairobi in line with the recommendations of the Nairobi Metropolitan Growth Strategy.

The 1970- 1974 National Development Plan called for even distribution of development and population among the urban centres in the country. The plan proposed to encourage development of other towns and slow down the growth of Nairobi and Mombasa. The 1974-1978 Development Plan emphasized physical planning as a tool to manage urban development. The specific objectives of the Plan, among others, were:

(1) to achieve the maximum development of the rural areas so as to slow the rate of migration to urban centres;

(2) to establish a more even geographical spread of urban physical infrastructure in order to promote more balanced economic growth throughout the nation;

(3) to encourage the expansion of several large towns in addition to Mombasa and Nairobi, thereby providing alternatives and reducing the negative effects of excessive concentration; and

(4) the expansion of other urban centres to act as alternatives to Nairobi and Mombasa.

The 1970-1974 and 1974-1978 Development Plans were formulated on the strategy of decentralizing urbanization. Kobia (1985) considers this strategy, based on 'central place theory', to be unworkable in Kenya. The strategy was unlikely to work due to inequalities of the socioeconomic structure, infrastructure limitations, lack of adequate funding and general failure of the strategy in other Third World countries. The strategy was, therefore, a political statement aimed at addressing political problem.

During the 1979-1983 National Development Plan, the Nairobi City Council embarked on a comprehensive rationalization of land use and zoning of the entire city. The process resulted in new zones in line with the expanded city boundaries. With respect to the commercial sub-sector, the Nairobi City Council rezoned the central area (the CBD and the Inner City) as summarized in Table 5.2.

Table 5.2: Land Zoning Reorganization of Central Area, 1979

Zones	Location	Maximum Plot Ratio		Maximum Plot Coverage	
		Existing	New	Existing	New
A	Area South of CBD (Inner City)	4.0/4.5	5.0	0.75	0.80
B	Central Business District (CBD)	2.5/4.0/4.5/5.7	6.0	0.75	0.80
C	Area North of CBD	2.5/3.0/3.5	3.5	0.75	0.80

Source: "Rationalization of the Plot Ratios and Coverage and the Lowering of the Permitted Minimum Plot Sizes in the City" in NCC 1978-1979 Minutes as quoted in Kiamba (1984)

There was further re-organization undertaken in 1980 allowing for intensification of development in the commercial centres outside the CBD. Kiamba (1984) reports that the permitted maximum plot ratios and plot coverage were raised from 2.0 and 0.75 to 2.5 and 0.80 respectively. These changes had the immediate impact of accelerating the emergency

of Westlands as a major commercial centre.

The 1979-1983 and 1984-1988 National Development Plan identified the deteriorating state of the inner city and inadequate urban services in the Central Business District (CBD) as the major concern in Nairobi. The plan specifically noted the poor state of the road network as a major hindrance. The Plan, therefore, called for the reduction of the traveling distance to place of work. These two plans continued with the theme of decentralization of the places of employment (commercial sub-centres) that was now the official government policy on urbanization. Unfortunately these plans did not provide a policy to address the deteriorating physical and infrastructural facilities in the inner cities.

The 1984-1988 Nairobi Development Plan (CCN, 1985) undertook an analysis of the spatial and infrastructural problems of Nairobi city, especially in the original core. The Plan identified the main problems of the Nairobi Inner City to include the following:

(a) Planning regulations that discouraged further expansion of buildings;
(b) The plots were too small to allow for large-scale development;
(c) The access roads were narrow, thus hampering transportation;
(d) Occasional water shortage; and
(e) The impending end of most leases and the uncertainty of renewal had discouraged maintenance of building.

The Plan did not, however, propose any intervention programs and hence the problems of the Inner City remained unresolved.

The 1989-1993 and 1994-2003 National Development Plan continued with the dispersion theme, specifically aimed at rural-urban balance. The plans also recognized that urban planning had lagged behind development, leading to poor urban environment. During this plan period, Nairobi city authorities continued with piecemeal review of the urban land use zones and development controls. The 1993 re-zoning of Upper Hill (Zone 3) and the 2005 review of site coverage and plot ratio, as summarized in Table 5.3, allowed for intensive land use. This has increased commercial land use to accommodate the rising demand for commercial real estate.

The 2004-2009 Plan identified the problems of Nairobi to include haphazard development, inadequate and poor state of physical infrastructure, urban sprawl and inadequate human capacity to guide development. The Plan proposed a strategy to decentralize the operations of the city and the improvement of infrastructure in the satellite centres. In pursuance of this strategy, the Government of Kenya launched Kshs. 2 Billion road modernization program in 2007 (The Standard, 27th April 2007).

Table 5.3: Current Commercial Zoning Regulations

Zones	Areas Covered	Site Coverage	Plot Ratio	Minimum Plot Area (in ha)
1A- Central Business District	Core CBD	0.80	5.0/6.0	0.05
	New CBD (Uhuru Highway/University Way)	0.80	5.0	
	Inner City (east of Moi Avenue)	0.60/0.80	3.5/6.0	
1E- Upper Hill Area	Upper Hill and Community	0.60	2.5/3.0	0.05
3- Westlands	Westlands/Museum Hill Area	0.80	2.0	0.05

Source: NCC (2005)

In subsequent years, the planning of Nairobi has been based on area and subject specific initiative to address specific concerns. Such initiatives include the following:

(a) Geographical Information System (GIS) Construction and Digital Map production for Nairobi;

(b) Safety and Security- Nairobi Initiative;

(c) NEPAD City Initiative;

(d) Local Service Delivery Action Plan (LASDAP);

(e) Kenya Slum Upgrading Programme;

(f) Nairobi and Mathari River Restoration Initiative.

These initiatives have given birth to The Nairobi Metropolitan Development and Management Strategy of 2003. The proposed strategy is envisaged to have three conceptual frameworks, namely:

(a) Metropolitan Development Strategy;

(b) Metropolitan Spatial Development Framework; and

(c) Metropolitan Investment Plan.

This strategy is recognition that for effective operation of the city, the surrounding centres must, of necessity, operate efficiently. As a result, the strategy proposes the formation of Nairobi Metropolitan Area that will cover the main Nairobi Area and some selected surrounding local authorities.

5.5 Urban Development Management Challenges of Nairobi City

The management structure of Nairobi City can be traced to the Local Government Council Ordinance of 1929 (Bubba et al., 1996). This Ordinance established the District Councils, whose membership was by election and nomination. The 1961 Sessional Paper No. 2, "The Reconstruction of Local Authorities", polished the rules and the management structure of Nairobi City and other urban centres in Kenya. In 1977, the Local Government Act Cap 265 of the Laws of Kenya was passed into law and has since then been the main regulatory framework.

Nairobi City is managed by a Council of elected and nominated councilors under the direction of the Ministry of Local Government. The Council constitutes the legislative arm that is empowered to formulate policies. The Council performs its legislative function through committees. The executive arm, headed by the Town Clerk and composed of professional and administrative staff, implements the policies formulated by the Council.

The local authorities in Kenya, including Nairobi City, have used legislative and administrative tools to control and manage urban development (Kiamba, 1986, Muriithi, 1990 and Swazuri, 2002). The Government has over the years enacted several legislations to support urban development and control. The main statues include the Physical Planning Act, the Registered Land Act, Local Government Act, the Government Lands Act, the

Local Government (Adoptive By-Laws) (Grade I & II) Order of 1968 (popularly known as the Building Code), and the Land Acquisition Act Cap 295 of the Laws of Kenya. These statutes lay down the procedures to be followed for all aspects of land use starting with acquisition, subdivision, infrastructure standards and other controls.

The City Planning and Architecture Department of the Nairobi City Council, created in 1981, is charged with the management of development in the city. The Department is charged with the duty of guiding, coordinating and supervising urban development. The Development Control Section and Building & Survey Section are the sections directly charged with controlling urban development in Nairobi. The Development Control Section grants approvals for land subdivision, change of user, extension of user, land lease extension and major urban projects. The Building & Survey Section reviews all the building plans to ensure that they comply with the Building Codes. The Section issues building licenses and supervises the construction process. The controls exercised by these sections are expected to result in efficient urban form. However, this has not been the case because of poor management.

Urban centres in Kenya are poorly managed. Stren (1975) points out that this poor state has been caused by weak management structures that are unable to direct urban growth. Mulusa (1970) argues that local authorities have tended to play a subordinate role as agents of the central government rather than being independent organs with their legitimate source of power. As a result, Nairobi lacks strong administrative capacity to direct and manage sustainable urban growth (Colebatch, 1973 and Muriithi, 1990).

This unsatisfactory circumstance can be attributed to the unfavourable provisions of the Local Government Act Cap 265 of the Laws of Kenya. The Act vests all the executive powers in the hands of the Minister in charge of local authorities. Mulaa (2006) concludes that the powers welded by the Minister have created conflict between the central government and local authority politicians and staff. Olima (1993) argues that the ability of the central government to supervise local authorities is likely to diminish in the foreseeable future. This gap, between legislative authority and actual supervision, is likely to weaken urban management system of Nairobi.

Chama et al., (1996) and Bubba et al., (1996) cite endemic corruption, poor human resources management, low caliber of elected councilors, unfavourable legal regime, ineffective and inefficient accounting systems, disregard and abuse of urban planning, building codes and development control as the key management problems of Nairobi City. These management challenges have curtailed the ability of Nairobi City Council to manage urban development in Nairobi City. According to Akello (2008), 76% of Nairobi residents are dissatisfied with the quality of services provided by the Nairobi City Council.

5.6 Review of the Commercial Real Estate Market Performance in Nairobi (1990-2007)

The real estate market in Nairobi, like other markets, can be analysed in terms of market imperfection, size of participants and key performance indicators. This analysis allows the Nairobi commercial real estate market to be compared with other markets elsewhere and other investment vehicles.

The commercial real estate market in Nairobi has been characterized by market imperfections and failures that inhibit equal access to commercial space for various categories of urban dwellers (MoLH, 2005). The main causes of the inefficiency and distortion is lack of information or difficulty in acquiring the same. It is generally believed that it is difficulty to get information concerning real estate transactions and markets in Kenya (The Standard, 17th May 2007; MoLH, 2005; Njonjo, 2002; Omwenga, 2001 and Mukungi, 1997). The commercial real estate market in Nairobi is, therefore, imperfect as a result of inadequate information.

Information required for real estate development decision-making is not adequately analyzed, presented and stored in a central place. In most instances, Nairobi City Council's records are not updated and changes in the ownership, user, development and unimproved site values are not regularly updated. Cases of missing files, green cards, survey maps or incomplete records and double allocations of plots and fake title deeds at the various Land Registries and Survey Offices are common (ISK, 2000). Njonjo (2002) sums up the unreliable information system as follows:

"----*often times seals are left unsecured, green cards are freely floating around the registry and strong rooms are not locked exposing vital documents to risk----*"

The print media has also pointed out the insufficient information and its negative impact on the market as follows:

"The *Kenyan real estate market is seriously hampered by lack of credible data on new developments, vacancy inventories and house sales data that could help determine real estate trends for supply and demand.*" (Business Daily, 2nd July 2007, page 6).

The impact of the unreliable land information system is to discourage investment in real estate, lower funding to real estate and slow down economic growth (Nyoike et al., 1999). The central government has also identified inaccurate and insufficient real estate records and information system as a key impediment to investment in the real estate. The Kenya Economic Recovery Strategy for Wealth and Employment Creation (2003-2007) states as thus:

"*---is operated on outdated legal framework and too much legislation that makes conveyancing a nightmare---* " (page 35).

The poor flow of information in the real estate market has meant that the sector is dominated by few large quasi-government corporations and very many small-scale private corporate and individual investors. The dominant mode of investment is direct property investment in the form of acquisition of a complete real estate. There are few incidents of indirect investment in the form of membership to co-operative societies and shareholding in companies owning a property. The lack of a pooled investment vehicle has made entry and exit from the real estate market difficulty and hence increased illiquidity. Kowour (2009) emphasizes the need to put into operations the provisions of the 2008/2009 national budget and allow for indirect investment in real property through listed properties investment vehicles (LPIV). This will reduce barriers of entry into the real estate, results in higher yields, allow for individual and corporate investors to diversify real estate investment portfolio and enjoy transfer tax (stamp duty) exemption.

The participants from the private sector are small-scale and cannot make a significant impact on the overall performance of the real estate market. This explains why there is no company specializing in real estate listed on the Nairobi Stock Exchange (NSE). Most of the real estate companies, which are very few, do not meet minimum requirements for listing on the primary capital market of the NSE. The last property development companies listed on the NSE were Town Properties Ltd and Grosvenor Properties Ltd in 1979 (Ngugi et al., 2005). The failure to list on the NSE denies the real estate industry source of funding to expand the existing developments, undertake planned maintenance, refurbishment and additional investments. This nature of the market is, therefore, without sophisticated approach to real estate investment (Roulac, 1995). Such markets rarely achieve their full potential and would, therefore, not be considered an important investment vehicle.

As a result of lack of sophistication, the real estate market in Kenya has not developed a performance measurement. The lack of performance measurements has meant that measures for the current and predictions of future performance are not accurate and reliable. Consequently, investments in real estate, both by the locals and foreigners, have been comparatively low. Real estate markets in developed countries and South Africa, have developed property performance indices that are used as a benchmark in the analysis of the real estate market (Newell et al., 2002 and 1988). These measures have systematically reduced real estate market imperfection and exploitations and increased investments in the markets.

In Kenya, there has been no sound basis of assessing the performance of an individual or large portfolio of real estate investment. It is, therefore, difficulty to assess the performance of real estate against other investment vehicles and assets in the market. The KREX Group (2005) found out that information for real estate investment has come from own research, consultants and newspaper reports. Fletcher (1995) cautions that these data is not reliable and cannot be used to make a correct investment decision and predict future changes in demand and rental rates in commercial properties. Many informed investors, especially external investors, are susceptible about using such kind of information to make decisions.

The lack of performance yardstick discourages or delays decision-making in real estate development process (Nabarro et al., 2004). It also denies the public and the regulators a sound tool to assess the performance of the real estate market. This sets the grounds for unwarranted intervention by the government as evidenced by Minister for Housing's call for rent controls on the grounds that the forces of supply and demand are not able to set an equilibrium prices (Business Daily, 8th June 2007).

The commercial real estate market in Nairobi has been characterized by dualism along the physical regions of the commercial urban centres. Most local experts report that the current dual commercial urban form has resulted in rent inversion where rents in the inner city are lower than those of the sub centers. The *Kenya Property Report* by Knight Frank (1998) found that development levels and prices were at their highest in sub-centres areas and this was creating supply imbalance. Mr. Mwenda Makathimo, a registered valuer, reports that tenants in the CBD (and by extension the Inner City) are paying lower rents compared to the sub centers (The Standard, 29th March 2007). The inversion of the rent gradient started in 2000 in response to the infrastructure problems and the invasion of the CBD by lesser quality tenants (Regent Management Limited, 2007). For example, the average asking rents in the Upper Hill Area was Kshs. 43.50 per square foot per month compared to Kshs. 36.00 per square foot per month in the CBD.

Makena (2004) observes that the CBD (including the Inner City) has declined since 1997 as measured in terms of occupancy levels and rental rates. Makatimo et al., (2004) similarly found that the performance of the commercial real estate sector was low from mid 1990s but started showing signs of recovery after 2003. Financial Standard 24th August 2004 (page FS 10) report that the value of approved building plans in 2003 declined by 19.9% to Kshs. 5.1 Billions. The AIG Global Investment Report (quoted in Financial Standard 24th August 2004 page FS 10) indicates that the growth in the sector stood at 2.2%, which was, however, higher than the 0.3% recorded in 2002.

A survey by Regent Management Ltd (published in The East African on 31st January 2005, page 24) and Ayieko (2005) indicate that the office market recorded a slump (as measured by occupancy levels and rental rates) from 1990 but started picking up in 2004.

By 2007, the real estate market in Nairobi had started to slow down again (The East African, 9th November 2007 page 22). It was reported that demand and supply were almost at equilibrium and price increases were minimal. This essentially marked the end of the growth cycle of the real estate market.

5.7 Summary

Kenya has rapidly urbanized with Nairobi and Mombasa being the focus of urbanization. The official policy of dispersion, as stated in the various government development plans, has failed to achieve a balanced urban form. As a result, Nairobi has recorded tremendous growth, spatially, economically and demographically, since its establishment in 1898. This rapid growth is a testimony of the central role Nairobi has played in urbanization process in Kenya.

The rapid growth of Nairobi has presented challenges and opportunities. The poor physical condition of some of the sections of the city is a result of poor urban management. The restrictive regulatory and legislative regimes and low caliber of urban managers are the major causes of poor management. Nairobi has, therefore, not satisfied the residents who migrated from rural areas and other smaller urban centres in search of better living conditions.

The commercial real estate market, as measured in terms of information flow, rental rates and occupancy levels, has performed below expectations. The commercial real estate market is now characterized by high levels of imperfection, is inverted and has generally performed below other investment assets.

Chapter Six

FACTORS CAUSING CHANGES IN NAIROBI'S COMMERCIAL URBAN FORM

6.1 Introduction

The collected data is analysed to answer the objectives of the study. The main objectives of the study were to establish the commercial urban form of Nairobi City, to identify and rank the factors that had caused changes in the commercial urban form (as measured by location and relocation decisions) and their impact on the performance of commercial real estate markets in the various sub-centres and markets in Nairobi.

6.2 Distribution and Profile of the Respondents

The primary target of the study was all the owners and users (employers and employees) of commercial buildings in the four commercial sub centres of the CBD, Inner City (downtown), Upper Hill and Westlands. The secondary target was the professionals in the built environment (architects, valuers and property managers/estate agents), spatial planning, academics and other stakeholders who regularly make investment and policy decisions in real estate (such pension fund managers and investment managers).

The study identified 326 commercial buildings spread throughout Nairobi City as summarized in Table 6.1. These buildings were predominantly used for commercial purposes and owned for investment purposes. The sample, therefore, excluded government and quasi-government buildings. The study targeted 54 owners/investors (16.56%) with Upper Hill and Westlands providing the highest number of building owners. The proportion of the population of building owners was heavily in favour of Upper Hill and Westlands on the understanding that the two centres had recorded the highest number of new developments of commercial properties during the period selected for the study (1997-2007). It was envisaged that the investment decisions in Upper Hill and Westlands were current and hence offered better insight into the perception about the commercial urban form and performance of commercial real estate.

Table 6.1: Percentage Response of Sampled Owners/Investors

Commercial Centre	No. of Buildings	No. of Targeted Owners/Investors	No. of Respondent	% Respondents
Inner City	125	13	4	30.77%
CBD	109	11	6	54.55%
Upper Hill	46	10	7	70.00%
Westlands	46	10	8	80.00%
Total	**326**	**54**	**25**	**46.29%**

Source: Field Survey, 2009

Most of the respondent owners/investors were private companies/individual investors and real estate investment companies. Table 6.2 is a summary of the categories of respondent investors/owners. These categories represent the main investors in commercial real estate in Nairobi. From the reviewed literature, these owners/investors make investment and disinvestment decisions after due consideration of the current and future performance of the property and the location. The views/opinion expressed by these categories of respondent investors are, therefore, true reflections of the decision-making process and the general perception about the performance of the individual properties and the various commercial sub-centres/markets.

Table 6.2: Classification of Respondent Property Owners

Category of Investors	Number of Buildings	Percentage
Pension Funds	2	8%
Financial Sector (Banking and Insurance)	4	16%
Real Estate Investment Companies	6	24%
Private Companies/Individual Investors	9	36%
Co-operative Societies	4	16%
Total	**25**	**100%**

Source: Field Survey 2009

The study targeted 333 occupants (tenants/employers and employees) and achieved a response of 290 (82.93%). The response is summarized in Table 6.3.

Table 6.3: Summary of Occupant Respondents

	Commercial Centre	Tenants/Employers			Employees/Workers		
		Targeted	Achieved	Percentage Response	Targeted	Achieved	Percent Response
1	Inner City	45	40	88.88%	45	42	93.33%
2	CBD	49	39	79.59%	49	40	81.63%
3	Upper Hill	35	35	100.00%	40	38	95.00%
4	Westlands	35	26	74.28%	35	30	85.71%
	Total	**164**	**140**	**85.36%**	**169**	**150**	**88.75%**

Source: Field Survey, 2009

85% of the respondent employees/workers had college level of education and above. In addition, most of the respondents were in the age group of 18-40 years. They were found to be competent enough to understand the questions and answer them correctly.

The tenants/employers respondents were the proprietors or senior members of the management team that would ordinarily be involved in location and relocation decisions. All the sampled organizations/firms were in the private sector and, therefore, made location and relocations decisions after considering commercial/business implications.

The study targeted 52 professionals and achieved a response of 32 (61.54%). Most of the respondents (78.13%) were valuers/estate agents and physical planners as summarized in Table 6.4.

The valuers/estate agents interact with investors and other players in the commercial real estate sector and their views/opinions reflect the market sentiments. The physical planners play a key role in determining urban land use and directly and indirectly direct the location of commercial developments in the various commercial centres of Nairobi. Their

opinions/views, therefore, reflect the official and unofficial position about the direction of changes of commercial urban form. The architects, by virtue of their interaction with real estate investors and renters, hold valuable opinions/views about the commercial urban form and the commercial real estate market. The fund managers, in compliance with the regulations imposed by the Retirement Benefits Authority (RBA), appraise investment and disinvestment decisions of pension funds. The pension funds are key players in the commercial real estate investment market and their activities influence the commercial urban form and the performance of the real estate market.

Table 6.4: Summary of Professional/Expert Respondents

	Profession	Targeted	Achieved Responses	Percentage Response	Average Years of Practice
1	Valuation/Estate Agency	30	21	70.00%	16 years
2	Architects	10	3	30.00%	17 years
3	Physical Planners	9	4	44.44%	10 years
4	Others (Fund Managers)	3	3	100.00%	6 years
5	Not indicated		1		
	Total	**52**	**32**	**61.54%**	

Source: Field Survey, 2009

The professionals were generally well experienced as evidenced by the average age of practice of 13.8 years. Most of the respondent professionals/experts had practiced for over 10 years and had seen the changes in the commercial urban form and the performance of the commercial real estate for the period of this study (1997-2007). Their opinions/views were, therefore, considered to showcase the correct position of the commercial urban form and the performance of the real estate market.

6.3 Determination of the Commercial Urban Form of Nairobi

The study used location, relocation, investment and disinvestment decisions and opinions of professionals/experts to establish the commercial urban form in Nairobi.

The commercial form of a city will either be concentrated with one centre or dispersed with many centres. The study used the 'dispersion ratio' (Bertaud et al., 1998 and Song et al., 2004), the global average 45 minutes commuting time for a compact city (Jelinek, 1992 and Jones, 2000) and 'density ratio' (Richardson et al., 2000) to measure the commercial urban form of Nairobi. In addition, the study asked the professionals and experts to provide an opinion on the commercial urban form of Nairobi City. These measures were expected to produce different results of urban form of Nairobi city. The average of these measures was, therefore, used to determine the commercial urban form of Nairobi City for the period selected for the study.

6.3.1 Dispersion Ratio

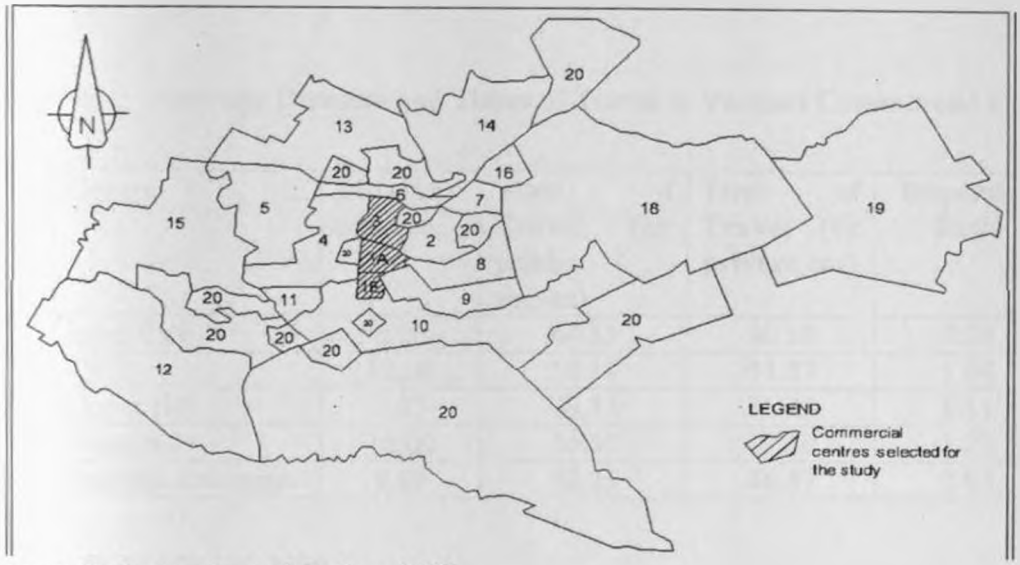
The study defined the 'dispersion ratio' as the ratio of the longest distance covered to the CBD and the average distance covered by the respondent employees to the commercial sub centres of CBD, Inner City, Westlands and Upper Hill. The 'dispersion ratio' is, in essence, a measure of the extent to which the commercial centres are dispersed towards the residential centres. Bertaud & Malpezzi (1998) indicate that a ratio of less than and more than 1.00 is monocentric city (compact) and polycentric (highly dispersed with more commercial centres located next to residential estates) respectively.

For this study, the longest distance was the average of the furthest ends of Nairobi City situated in the outer zones 12, 14, 15, 18, 19 and 20 as shown in Map 6.1. In each zone, the distance from the centre of the CBD from three furthest points (on a straight line) was taken as summarized in Table 6.5. These zones were chosen on the assumption that they are occupied by persons who travel to the CBD (Zone 1A- part) and the other commercial centres to work, shop, attend education/training institutions, among other reasons for traveling.

The positive skew and an almost equal mean and median (10.98 km and 10.67 km) respectively and a high standard deviation (3.669) indicate that the outermost edges of Nairobi City are closer to the centre of the CBD than the longest distance. This suggests that the CBD of Nairobi and the other commercial centres are located towards one section of the city and in this case, towards the west and the north. The findings, therefore,

suggested that the CBD was not located at the most central place of the Nairobi City and was off-centre. This can be explained by physical constraints such as Nairobi National Park and historical development of as explained in Chapter Four.

Map 6.1: Map of Nairobi City with Planning Zones



Source: Redrawn from Murigu, 2002

Table 6.5: Average Distances (in Kms) from the Outermost Zones of Nairobi City to the CBD

Zone	Name of Estate	CBD from 1st Point	CBD from 2nd Point	CBD from 3rd Point	Average Distance from CBD
12	Karen	9.00	12.50	11.00	10.83
13	Gigiri/Ridgeways/Garden Estate	7.00	7.00	7.00	7.00
14	Thome/Roysambu	6.50	8.00	9.00	7.83
15	Dagoretti	10.50	9.00	7.00	8.83
18	Kasarani/Ruai/Njiru	14.00	11.80	9.00	11.6
19	Githurai Kimbo/ Wendani/Kahawa Sukari	19.00	21.00	19.00	19.67
20	Nairobi National Park	8.00	15.00	7.00	10.00
20	Wilson Airport/Langata Barracks	9.00	10.00	13.00	10.67
20	Karura Forest	9.70	13.00	12.20	11.63

Source: Field Survey, 2009

The average distance of travel to the centre of the CBD from the outermost residential zones of Nairobi was 10.98 kilometres as summarized in Table 6.5. However, the average distance covered by the respondents using private cars to go to places of work was 9.69 kilometres, with those working at Upper Hill covering the least distance (3.85 kilometres). Table 6.6 is a summary of the distances and time covered by employees in the various commercial centres of Nairobi.

Table 6.6: Average Distance and Times of Travel to Various Commercial Centres

	Centre	Distance covered	Time of Travel (by public means)	Time of Travel (by private car)	Dispersion Ratio
1	Inner City	6.00	44.83	30.50	3.28
2	CBD	12.00	59.14	51.87	1.64
3	Upper Hill	3.85	49.83	36.43	5.11
4	Westlands	16.00	56.30	67.50	1.23
	Nairobi Averages	**9.69**	**52.25**	**46.57**	**2.03**

Source: Field Survey, 2009

The dispersion ratios of individual urban centres and the overall commercial urban form of Nairobi are summarized in Table 6.6. The commercial centre with the highest dispersion ratio was Upper Hill with a dispersion ratio of 5.11. This suggested that Upper Hill was dispersed towards residential estates and, therefore, met the goals of dispersed commercial urban form of having commercial centres close to places of residences. The least dispersed commercial centres were Westlands (1.23) and the CBD (1.64), suggesting that they were located away from the residential estates of Nairobi City.

The overall 'dispersion ratio' of the commercial land use of Nairobi City was 2.03. These findings suggested that Nairobi City's commercial urban form was dispersed with many commercial centres (polycentric). However, the dispersion ratio was lower than that of Bangkok (3.08) and this suggested that Nairobi was a medium dispersed city.

6.3.2 Travel Time and Cost

The time of travel and the commuting costs (bus fare) have been used as tools to assess the commercial urban form of cities. The available literature indicates that a commuting time of over 40 minutes is a sign of a concentric commercial urban form where commercial centres are located either at the centre or off-centre with high degree of residential sprawl. It is further expected that a high variance (standard deviation) between the commuting costs of workers will suggest that that the commercial centres are located off centre or the city is rapidly experiencing residential sprawl.

The mean travel time was 52.25 minutes with most (40.5%) of the respondents spending 60 minutes to travel to work and 87.4% spending 60 minutes or less. The mode and median of 60 minutes indicated that the travel time was uniform irrespective of the commercial centre. The distribution of the travel time among the respondent employees was positively skewed suggesting that most of the respondents, irrespective of the commercial centre, spent equal amount of time on the road traveling to work.

However, the standard deviation of 6.4416 indicates that there was a marked variation of travel time to the various commercial centres. Table 6.6 suggested that workers to Westlands spent more time traveling compared to those going to other commercial centres. This implied that the commercial centre was located farther away from the other centres and thus qualified as a truly dispersed centre.

In addition, respondents spent a mean cost (fare) of Kshs. 53.55 per trip to go to work in the various commercial centres. The mode and median of Kshs. 50.00 per trip and positive skew and kurtosis suggested that most of the respondents paid bus fare close to the mean and hence the mean was adopted as the most appropriate measure. This implied that the cost of commuting was almost uniform in all the commercial centres.

The findings suggest that the commercial centres were located in one region of the city and the city of Nairobi was not dispersed geographically. The fact that most respondent employees crossed the CBD to work suggested that the commercial centres of Nairobi City were clustered at one corner of the city. Majority (45%) of the respondents indicated

that they crossed the CBD (centre of the city) of Nairobi to their places of work compared to 35% who did not. This further suggested that the sampled commercial centres in Nairobi were located close to each other with residential and other land uses ringed around them.

6.3.3 Density Ratio

The mean ratio of Inner City occupancy density to other commercial sub centres, the 'density ratio', was used to measure the commercial urban form of Nairobi. This study adopted the mean office area occupied by each employee to establish the occupancy density. According to Richardson et al., (2000), the average density ratio for dispersed/polycentric cities was 11.86 while for compact/concentric city was 38.50. The study adopted these ratios to establish the commercial urban form of Nairobi.

The occupancy density (number of occupants per 1,000.00 square feet) of the selected commercial centres and the 'density ratio' is presented in Table 6.7.

Table 6.7: Occupancy Density in the Various Commercial Centres and Nairobi Occupancy Density Ratio

Commercial Centre	Mean Occupied Area	Median Occupied Area	Mean No. of Employees	Median No. of Employees	Occupancy Density	Density Ratio
Inner City	2,351.00	600.00	39.84	10.00	16.7	
CBD	3,497.13	1,890.00	16.05	16.00	8.5	
Upper Hill	2,461.94	1,020.00	57.53	22.00	21.6	
Westlands	4,438.45	2,660.00	26.19	16.00	9.8	
					Density Ratio	**14.8059**

Source: Field Survey, 2009

The mean size of occupied office space and number of staff employed by the sampled tenants/employers in the Inner City was 2,351.00 square feet and 39.84 persons respectively. The median of the occupied office space was 600 square feet and a double mode of 200 square feet and 500 square feet. The distribution of the size of the office

spaces was positively skewed with a high standard deviation. This suggested that the mean was not a true reflection of the occupied office space in the Inner City and the study consequently adopted the mode and median of 600.00 square feet. Likewise, the most common number of occupants in each office was 10 (both mode and median) suggesting that the mean of 39.84 persons was not a true reflection of the correct position. The positive skew and the fact that most of the respondents (68.4%) had 15 occupants or less in their offices, therefore, suggested that the median of 10 persons was the best measure for calculating the occupancy density of the Inner City. The mean occupancy density for Inner City was 16.7 employees per 1,000.00 square feet.

The mean size of an office space in the CBD was 3,497.13 square feet approximately. However, most of the tenants/employers (81.1%) occupied spaces of less than 3,000.00 square feet with a median of 1,890.00 square feet. The distribution had a high positive skew and kurtosis (5.126 and 28.31 respectively) indicating that most of the respondents occupied office space areas below the mean. The median was, therefore, used to establish the average occupancy density of the CBD. The mean number of employees was 16.05 and a median and mode of 16.00. The distribution of the number of employees was almost normal with a negligible positive skew. This indicated that the mean of 16.05 reflected the true position of the mean number of staff per office space. The mean occupancy density for CBD was 0.0085 employees per square foot (8.5 employees per 1,000.00 square feet).

The mode and the median of the number of occupants in the sampled offices in Upper Hill were 20 persons and 22 persons respectively. The distribution was positively skewed, suggesting that the mean of 57.53 persons might not have been an appropriate measure to be used to calculate the occupancy density in the Upper Hill. Half of the respondents had 21 members or less occupying each of the sampled office space while 58.8% had less than 40 members of staff in their offices. The study, therefore, adopted the mode of 22 persons for the purpose of calculating the occupancy density in Upper Hill. The mean of an office space in Upper Hill was 2,461.94 square feet. The difference between the minimum (500 square feet) and the maximum (14,400.00 square feet) and the standard deviation (3,187.79) was substantially high indicating that the mean might not have been an appropriate statistic to establish the mean occupied area in Upper Hill. The positive skew

of the distribution suggested that the median of 1,020.00 square feet was the most appropriate statistics for calculating the occupancy density in Upper Hill. Consequently, the occupancy density of Upper Hill was 0.0216 persons per square foot.

In Westlands, the mean occupied area of space and number of employees in each office was 4,438.45 square feet and 26.19 persons respectively. However, the distribution for the area of space occupied was positively skewed indicating that most of the observations were below the mean. Most of the respondents (72.7%) occupied spaces less than 3,700.00 square feet and this suggested that the mean was not the most appropriate statistic. The study adopted the median of 2,660.00 square feet as the most likely size of office space in Westlands. The distribution of the number of employees was almost normal suggesting that most observations were around the mean. The study, therefore, adopted the mean of 26.19 persons to calculate the occupancy density. The occupancy density of Westlands was found to be 0.0098 persons per square foot.

The most densely occupied commercial centre in Nairobi was Upper Hill followed by the Inner City, Westlands and CBD in that order as presented in Table 6.7. These findings suggested that the Nairobi commercial urban form was concentric and inverted with the secondary commercial centres having higher occupancy densities than the inner core and the CBD.

Further analysis of the occupancy densities indicated that they were normally distributed with a small positive skew (0.485) and an almost mesokurtic kurtosis (-2.860). This suggested that there was no difference between the various commercial urban centres and Nairobi had a compact commercial urban form. However, the overall density ratio of the Nairobi commercial urban form was 14.8059, slightly above the average density ratio of 11.86 for polycentric commercial urban form (Richardson et al., 2000). These findings suggested that the commercial urban form was polycentric and slightly dispersed geographically.

6.3.4 Professional/Expert Opinions on the Commercial Urban Form of Nairobi

The professionals/experts, when asked to classify the commercial urban form, suggested that Nairobi was a polycentric city. Most of them (81.3%) were of the opinion that the commercial sector of Nairobi was dispersed with many centres. A small proportion (9.4%) observed that the city was neither dispersed nor concentric but had one major commercial centre with a few satellite centres. However, the mean, median and mode score of 2 (dispersed/polycentric) and a normal distribution strongly suggested that the professionals viewed the commercial urban form of Nairobi as polycentric. It was, therefore, concluded that the urban form of Nairobi was polycentric made up of several commercial centres.

On a scale of 1 (yes) and 0 (no), the professionals/experts considered the CBD, Upper Hill and Westlands as independent commercial centres of Nairobi. The summary of the findings are presented in Table 6.8.

Table 6.8: Professionals/Experts Opinion on the Commercial Urban Form

Centre	Frequencies (are the commercial sub-centres independent?)		Descriptive Statistics		
	Yes	No	Mode	Mean	Skewness
Inner City	46.9%	53.1%	0.00	0.46	+0.131
CBD	59.4%	40.6%	1.00	0.59	-0.401
Upper Hill	68.8%	31.2%	1.00	0.67	-0.471
Westlands	84.4%	15.6%	1.00	0.84	-1.988

Source: Field Survey, 2009

Most of the respondents (53.1%) were of the opinion that the Inner City was not an independent commercial centre. The mode and median of 0 and a mean of 0.46 (not an independent centre) indicates that the Inner City was not considered an independent commercial centre. The negligible positive skew and a strong negative kurtosis suggested that the distribution of the opinions was normal. The mean was, therefore, a true reflection

of the observations. The study concluded that most professionals/experts viewed the CBD and Inner City as one commercial centre.

The mean score for responses on the CBD as an independent commercial centre was 0.5938. The median and mode of 1 indicated that the professionals/experts considered the CBD as an independent commercial centre of Nairobi City. The small negative skew and kurtosis indicated that more observations were below the mean than above the mean and hence the findings that the CBD was an independent commercial centres. However, a substantial portion of the respondents (40.6%) did not consider the CBD as an independent commercial centre and thought that the CBD and the Inner City was one joined commercial centre.

The Upper Hill was considered a separate commercial centre by 68.8% of the respondent experts/professionals. The positive skew and the negative kurtosis of the distribution suggest that most observations were above the mean of 0.6875 (yes) and hence the study concluded that Upper Hill was an independent commercial centre.

Most of the respondents (84.4%) viewed Westlands as an independent commercial centre. The mean rating of 0.8438, the mode and median of 1.00 and the normal distribution of the observations suggested that Westlands was considered as an independent commercial centre.

The experts/professionals also identified Mombasa Road as an independent commercial centre. 65.6% considered the linear developments along Mombasa Road as constituting a new commercial centre. At the conception of this study, Mombasa Road was not officially considered as a commercial centre and these findings were simply noted.

The findings of the experts/professionals indicated that the commercial urban form of Nairobi was polycentric and dispersed. The main commercial sub centres were the CBD/Inner City, Westlands and Upper Hill. Most of the professionals/experts respondents singled out the CBD/Inner City and Westlands as the main commercial sub-centres and considered the Upper Hill as a new centre that was starting to detach itself from the

CBD/Inner City. These professionals/experts perceptions led to a conclusion that the commercial urban form was polycentric but not fully dispersed geographically.

6.3.5: Summary Results and Findings of the Various Measures of Commercial Urban Form of Nairobi

The foregoing sections developed and analysed measurement tools of commercial urban form. These tools are dispersion ratio, time of travel, density ratio and professionals/experts opinions. The summary of the findings were used to rate the commercial urban form of Nairobi as summarized in Table 6.9.

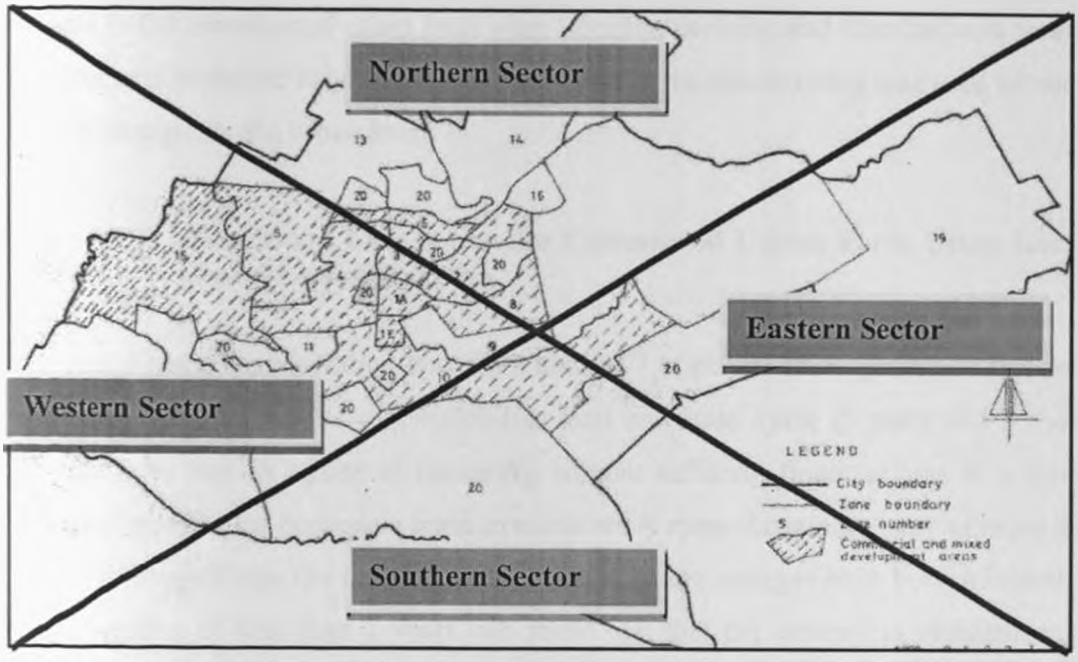
Table 6.9: Summary Findings and Conclusions on the Commercial Urban Form of Nairobi

	Measurement Tool	Decision Criteria	Score	Findings
1	Dispersion Ratio	Less than 1.00 (concentric) Above 1.00 (polycentric)	2.03	Polycentric
2	Travel Time	Less than 40 minutes (polycentric) Over 40 minutes (concentric)	52.25	Concentric
3	Density Ratio	Less than 1.00 (concentric) Above 1.00 (polycentric)	14.8059	Polycentric
4	Professional Opinion	Mean of less than 2.00 (concentric) Mean of 2.00 and over (polycentric)	2.00	Polycentric

Source: Field Survey, 2009

The findings above suggested that the commercial urban form of Nairobi was polycentric. The dispersion ratio of 2.03 was lower than what has been recorded in other highly dispersed cities such as Bombay (3.08) (Bertaud et al., 1998). The long and generally uniform commuting time further suggested that Nairobi City was not geographically dispersed. These findings, therefore, led to a conclusion that the commercial urban form of Nairobi was polycentric but not geographically dispersed. White (1999) refers to this type of commercial urban form the 'polycentric compact city'. It was observed that all the commercial centres (Zone 1A, 1E and 3) were clustered to the western sector of the city as depicted in Map 6.2. There were no commercial sub-centres to the north, south or east of the city.

Map 6.2: Locations of Commercial Sub-Centres of Nairobi



Source: Recreated from Murigu, 2002

6.4 Changes in the Commercial Urban Form

The discussion in Chapter 5 and the conclusion from Section 6.3 indicate that the commercial urban form of Nairobi has changed from the initial one-centre form to the current multiple-centres form comprising of several centres. This section will present the findings on the changes that have occurred in the various centres and causes of the changes during the period selected for the study. The basis of the analysis was the views of the employees, employers/tenants, the investors/building owners and finally, the professionals/experts.

The study assumed that the first commercial centre was the Inner City. The emergence of other sub-centres such as the CBD. Westlands and Upper Hill represents changes in the commercial urban form. The increase in the number of occupants, change in the scale and size of the occupants, changes in the rental and occupancy levels among others are signs of change in the commercial urban form.

The study used the location and relocation destinations of employers/tenants, employees and investors to measure changes in the commercial urban form. The two measures of changes in the commercial urban form were 'location decision and duration' and 'previous locations and preferred future locations'. The sum of the above rating was used to rank the level of changes in the urban form.

6.4.1 Measuring Changes in the Commercial Urban Form Using Location Decisions and Duration

The period under consideration was 1997 and 2007 (a period of 10 years). In this period, an employer/tenant will have completed at least one lease cycle (5 years and 3 months) and will have had an option of relocating without suffering financial loss as a result of penalties imposed for premature lease termination. A mean duration of stay of more than 7 years will suggest that the centre has not changed or the changes have been minimal. The mean duration of less than 7 years will mean that that the centre has changed and the departing employers/tenants were willing to incur any penalties in order to vacate the centre. The magnitude of change was rated on two horizontal scales of 1 to 5 (minimal changes to tremendous changes) as follows:

Scale 1		Scale 2	
0- 1.4 mean years	5	0%-20% under 7 years	1
1.5- 2.8 mean years	4	21%- 40% under 7 years	2
2.9- 4.2 mean years	3	41%- 60% under 7 years	3
4.3- 5.6 mean years	2	61%- 80% under 7 years	4
5.7-7.0 mean years	1	81%-100% under 7 years	5

The ratio of the age of the organization and the duration in the centre was used to assess the movement of employer/tenant over the period selected for the study. It was assumed that the business age of the employer/tenant (organization) will be equal to the duration of stay in the current commercial sub-centre. A difference between the two will indicate that the employer/tenant had changed location during its business life and that represented change in the commercial urban form. The study adopted a ratio of 1 to represent no change in the commercial urban form and any other ratio to represent change in the

commercial urban form. A ratio of above 1.00 meant that older employer/tenant firms had moved into the centre from other centres, either as a result of gentrification or expansion and moving to higher consumption level. This was considered positive growth, irrespective of the reasons for relocation. A ratio of less than 1.00 would suggest that older firms had moved out and replaced with newer firms and this was rated as negative growth.

The respondent employers/tenants had moved in the various commercial sub-centres throughout the period of review as summarized in Table 6.10.

Table 6.10: Summary of Duration and Location Dates in the Commercial Centres of Nairobi

Duration (in years)	Year of move in	Inner City	CBD	Westlands	Upper Hill
1	2007	07.80%	00.00%	8.00%	14.30%
2	2006	25.60%	7.70%	8.00%	8.60%
3	2005	25.60%	12.80%	16.00%	20.00%
4	2004	07.70%	20.50%	12.00%	5.70%
5	2003	07.70%	15.40%	12.00%	2.90%
6	2002	00.00%	05.10%	8.00%	14.30%
7	2001	05.10%	07.70%	4.00%	2.90%
8	2000	00.00%	07.70%	8.00%	11.40%
Before 2000		20.50%	23.10%	24.00%	20.00%
Mean		5.76 yrs	6.27 yrs	5.88 yrs	5.97 yrs
Median		3.00 yrs	5.00 yrs	5.00 yrs	5.00 yrs

Source: Field Survey, 2009

(i) **The Inner City**- Most of the respondents, 79.50%, had stayed in the Inner City for a period of less than 7 years and had, therefore, moved in after the year 2002. This suggested that the Inner City had recorded tremendous changes in the past seven years (more employers/tenants moving in) and on this basis, the study concluded that the centre had changed on a scale of 4 out of a maximum change score of 5.

The mean of years of operation in the Inner City was 5.7564 years, falling within the period that an ordinary tenant was still bound by a lease. However, the distribution of 'duration in the centre' was positively skewed with a positive kurtosis suggesting that the median was the most appropriate measure of 'duration in the centre'. The median of 3 years meant that most tenants/employers were relatively new in the Inner City and moved in the year 2006 replacing those who have moved out. The magnitude of change was rated 3 out of the highest possible scale of 5.

Most of the employers/tenants (72.5%) in the Inner City were relatively young companies/firms that had been in business for less than 7 years. The distribution had a high positive skew and kurtosis suggesting that the mean was not the best measure of the age of the employers/tenants in the Inner City. The median age of 4 years was, therefore, taken as the age of the employer/tenants occupants in the Inner City. This implied that most employer/tenants in the Inner City were new businesses in which the commercial sub-centre was their first area of operation. The magnitude of change was, therefore, rated 3 on a scale of 1 to 5. The occupancy/age ratio of the organization was, therefore, 1.33 and this was rated as positive change (growth).

The respondent employees/workers had worked in the Inner City for a mean period of 3.83 years. The positive skew and kurtosis suggested that the median and mode of 2 years was the most appropriate measure. The scale of change was, therefore, rated at 4 out of a possible high of 5.

(ii) **Central Business District (CBD)**- Most of the respondent businesses in the CBD, 69.2%, had stayed in the centre for a period of less than 7 years. The longest period was 14 years, indicating that most of the original occupants had moved out. The minimum period of 2 years suggested that the CBD was a vibrant centre that had kept on attracting new occupants. On this basis, the scale of change in the CBD was rated at 4 out of a maximum of 5.

The mean duration the respondent employers/tenants had stayed in the CBD was 6.27 years. However, the positive skew of the distribution suggested that the median was the

most appropriate measure of 'duration in the centre'. The median of 5 years meant that most tenants/employers were relatively new in the centre and moved in the year 2003 replacing those who have moved out. The rating of the scale of change was, therefore, 2 suggesting that CBD had not changed much during the period under review.

The respondent employees had worked in the CBD for a mean period of 3.76 years. However, the distribution was positively skewed, indicating that the median of 3 years was the most appropriate measure. The scale of change was, therefore, rated scale 3.

Most of the employers/tenants (72.5%) in the CBD were relatively young companies/firms that had been in business for a mean period of 6.78 years. The distribution had a positive skew and a negative kurtosis suggesting that the median of 5 years was the best measure of the average age of employers/tenants in the CBD. This implied that most employer/tenants in the CBD were new businesses where the centre was their first area of operation. The rating of the change was therefore, 2. This suggested that the CBD has reported a high rate of new move-ins. The ratio of the age of the firms and duration of occupancy (rage) was 1.00 and this suggested that the CBD had not changed, either positively and negatively.

(iii) **Westlands**- The maximum and minimum duration of stay in Westlands was found to be 12 years and 1 year respectively. This indicated that the centre was vibrant and continued to receive new occupants. The proportion of respondent employers/tenants who had stayed in Westlands for a period of less than 7 years was 68.00%. This implied that the magnitude of changes was rated 4 on a horizontal scale of 1 to 5. This suggested that the rate of change in Westlands in the last seven (7) years had been high.

The mean duration the respondent employers/tenants had stayed in Westlands was 5.88 years. This duration suggested that most of the respondent employers/tenants had almost completed one lease cycle and would have made a decision to vacate the centre or not. The scale of the rating was, therefore, 1. Comparing with the above score, it was concluded that Westlands had maintained a stable environment for the last 7 years.

The mean age of the years in business for the respondent employers/tenants in Westlands was 9.54 years. Most of the respondent employers/tenants (34.5%) in Westlands had been in business for periods of 7-13 years. However, the distribution of the observations had a high positive skew suggesting that the median of 7.5 years was the best measure of the average age of organizations in Westlands. This implied that most employer/tenants in Westlands were mature businesses. The scale of change was, therefore, 1. The age/duration of occupancy ratio was 1.275 and this suggested that Westlands had positively changed over the period under review (2001-2008).

The respondent employees had worked in Westlands for a mean period of 3.90 years. However, the distribution of the observations had a big positive skew and kurtosis which suggested that the median of 2.5 years was the most appropriate measure. The scale of change was rated at 4 on a scale of 1 to 5.

(iv) **Upper Hill**- The Upper Hill commercial centre was the newest centre among the commercial centres of Nairobi. It was, therefore, expected that it had recorded the highest rate of change during the period under consideration. The centre was active and was recording a new influx of occupants. The maximum duration of stay in Upper Hill reported by the respondent employers/tenants was 20 years while the minimum was 1 year. The big variance suggests that the centre had continuously changed since the planning regulations were changed in 1993 to allow for commercial development. The proportion of employers/tenants who had occupied space for less than 7 years was 68.6%, which suggested that Upper Hill had been a vibrant and changing centre during the period under review. The rating was, therefore, 4, indicating high rate of change.

The mean duration the respondent employers/tenants had stayed in Upper Hill was 5.714 years. The distribution of 'duration in the centre' was positively skewed with a positive kurtosis suggesting that the median was the correct measure of the observations. The 'duration in the centre' for employers/tenants in Upper Hill commercial centre was taken as 5 years. These findings suggested that most of the respondent employers/tenants had not completed a lease cycle and would, therefore, not have made a relocation decision.

The score for rating of change in Upper Hill was thus 2, which suggested that the centre had not changed much in the period of 7 years.

The mean age of the firms in Upper Hill was 5.88 years. This suggested that most of the employers/tenants were new business firms that were using Upper Hill as their first centre of occupation for business. Indeed, 68% of the respondent employers/tenants had been in business for less than 7 years, which suggested that Upper Hill was the centre for business formation and growth. The ratio of age of the employer/duration in the centre was 1.137, suggesting that the centre had recorded positive growth during the period under review.

The respondent employees/workers had worked in Upper Hill for a mean period of 2.72 years. The distribution of the responses/observations was normal and the study adopted the mean duration as the true position of the population. The rating under this category was, therefore, 4 on a scale of 1 to 5.

The above measures of changes in the urban form have indicated that the commercial urban form of Nairobi has changed over the period under review. The magnitude of change has been different among the various sub-centres. Table 6.11 summarises the rating/score presented above.

Table 6.11: Summary Ratings for Measure of Urban Form Using Location Decision and Duration

Measures of Change/Centres	Inner City	CBD	West lands	Upper Hill	t-value
Date of Move-in	4	4	4	4	1.567
Duration of stay in the centre	3	2	1	2	1.786
Age of firm	3	2	1	1	0.522
Age/Occupancy Ratio	1.33	1.00	1.275	1.137	0.676
Employees/Workers duration of stay	4	3	4	4	1.978
Total Score	**191.52**	**48**	**20.4**	**36.384**	**1.786**

Source: Field Survey, 2009

Note: critical t value is $\alpha = 0$

The above findings suggest that the sub-centre that recorded the highest change was the Inner City. Westlands was the sub-centre that had changed the least.

The Inner City had recorded the highest change in the occupancy characteristics over the period under review. The high age/occupancy ratio and the rating for age of firm suggested that the character of the occupants of the Inner City had changed tremendously during the period 2001-2008. It implied that most of the occupants of the Inner City were old firms that relocated from somewhere else.

Westlands sub-centre was found to have recorded the lowest level of change over the period under review. This suggested that Westlands sub-centre was a mature commercial centre that had maintained its character throughout the period of 2001-2008.

The above measures of change were subjected to a test of significance using the paired t-sample analysis to establish whether there had been differences in pace of change among the commercial sub-centres. The null hypothesis (Ho) was that there was no difference between the various commercial centres and, therefore, the commercial urban form had not changed. The alternative hypothesis (Ha) was that the means were different and hence the commercial urban form had changed. Each of the measure of difference was subjected to paired t-test of the null hypothesis (Ho: t=0) at 99% confidence level. Based on the results presented in Table 6.11, the null hypothesis was not supported by the data collected and it was concluded that there was significant change in the commercial urban form.

6.4.2 Measuring Changes in the Commercial Urban Form Using Previous Locations

Under this section, the study measured the changes in the urban form by comparing the movements from the various centres (previous locations) and inflows during the period under review to establish the net movement. The results are presented in Table 6.12.

Table 6.12: Summary of Previous Locations of Employers/Tenants

Previous Centre	Inner City	CBD	Westlands	Upper Hill	Others	None	Av. % Inflow
Current Centre							
Inner City		7.5%	2.5%	10%	12.5%	65%	19.5%
CBD	10.3%		2.6%	0.00%	17.9%	69.2%	20%
Westlands	3.8%	7.7%		3.8%	7.7%	73.1%	17.68%
Upper Hill	5.7%	25.7%	25.7%		31.4%	5.7%	18.84%
Av. % Outflows	6.6%	13.6%	10.26%	4.6%			

Source: **Field Survey, 2009**

The CBD received the highest inflows of employers/tenants respondents, with the largest inflow coming from newly formed business enterprises (69.2%). The CBD was, therefore, not an attractive destination for employers/tenants from other formal commercial centres. However, the CBD had also recorded the highest average departure of 13.6%. The net flow was, therefore, 6.4% suggesting that the net growth of the CBD had only been 6.4% during the period under review.

The Inner City recorded an average inflow of employers/tenants of 19.5% of the total movement of employers/tenants in the commercial sector of Nairobi City. On the other hand, the average outflow was 6.6%, resulting in a net inflow of 12.9%. The Inner City had, therefore, expanded by 12.9%. However, most of the inflows came from newly formed business enterprises (65%). This suggested that the Inner City had been the choice of a commercial centre for new and start up employers/tenants. However, excluding the new businesses from the analysis, the findings suggest that the centre merely replaced the departing business inhabitants. In essence, the centre had neither expanded nor shrunk during the period under review.

Most of the relocations to Upper Hill came from other non formal centres, the CBD and Westlands, with very few from the Inner City and new businesses. It was, therefore, concluded that the centre had been the favourite commercial centre for respondent

employers/tenants in Nairobi. This further confirmed that Upper Hill has recorded the highest growth among the commercial centres during the period of review (2001-2008). The net inflow of 14.24% on the overall and 14.43% excluding new business was considered a high growth rate for a commercial urban centre.

The average employers/tenants inflows in Westlands were 17.68%, being the least favoured location among the commercial centres in Nairobi. However, Westlands was the favourite centre for new businesses constituting 73.1% of its inflows. At the same time, Westlands recorded the second highest outflow of 10.26%, with most of its departing employers/tenants heading to Upper Hill. The overall net flow was 7.4%, indicating a growth rate of 7.4%.

The commercial centres received almost equal percentage of employee inflows, most of it coming from new employment. The results are presented in Table 6.13. These findings can be explained by the overall increase in wage employment in Nairobi from Kshs. 443.7M in the year 2004 to Kshs. 488.2M in the year 2008, representing a 10.03% growth (GOK, 2009). Intra-centre movements among employees were minimal, except for the 14.3% who relocated from the CBD to the Inner City.

Table 6.13: Summary of Previous Locations of Employees

Previous Centre	Inner City	CBD	Westlands	Upper Hill	Others	None	Av. % Inflow
Current Centre							
Inner City		14.3%	2.4%	2.4%	0.00%	81.00%	20.02%
CBD	0.00%		5%	0.00%	0.00%	95%	20.00%
Westlands	6.7%	10.0%		0.00%	0.00%	83.3%	20.00%
Upper Hill	7.9%	10.5%	7.9%		0.00%	73.7%	20.00%
Av. % Outflow	4.86%	11.6%	4.8%	0.8%			

Source: Field Survey, 2009

From the analysis of inflows and outflows, the study rated the stage of change of the urban form of the various sub centres as follows: positive adjusted net inflow was rated as growth while negative net inflow was rated as decline. A zero net inflow was rated as a stagnated centre. The summary of the rating is summarized in Table 6.14.

Table 6.14: Growth Rate of Commercial Centres in Nairobi (1997-2007)

Position	Name of the Centre	Overall Growth Rate	Adjusted Growth Rate	Future Inflows	Decision
1	Upper Hill	14.24%	14.43%	30.63%	Growth Stage
2	Inner City	12.90%	00.00%	3.17%	Stagnated Stage
3	Westlands	07.40%	-05.16%	30.7%	Decline
4	CBD	06.40%	-09.30%	28.37%	Decline

Source: Field Survey, 2009

The professionals/experts rated the stage of growth of the various commercial sub-centres as shown in Table 6.15.

Table 6.15: Professionals/Experts Rating of Stage of Growth of the Various Commercial Centres

Name of the Centre	Professionals/Experts Rating
Upper Hill	Growth
Inner City	Decline and Revitalization
Westlands	Growth/Stability
CBD	Stability/Revitalization

Source: Field Survey, 2009

The findings by the professionals/experts generally tied with the findings of location and relocation decisions. The study, therefore, concluded that the commercial urban form had been changing, producing a polycentric urban form with the sub-centres at different stages

of change. The low growth rating of the Inner City suggested that the urban commercial urban form of Nairobi has changed in the same pattern like other cities in the world. The findings further suggested that the emergence and rapid growth of newer commercial sub-centres had been caused by the dissatisfaction with the Inner City among other causes as discussed in section 6.5.

6.5 Factors Causing Changes in the Commercial Urban Form of Nairobi

The study used the responses from the professionals/experts to establish the factors causing the current commercial urban form. These views and opinions influence the nature and form of advice given to investors and occupants. The investors and occupants rely on this professional advice to make location and relocation decisions that, in turn, shape the commercial urban form. In addition, the views and opinions of the professionals/experts find their way in government policy on physical planning, infrastructure development and other socio-economic programs that play a big role in shaping the commercial urban form. The study, therefore, considered the views of the experts/professionals important in the determination of the factors that shape the commercial urban form.

The study identified and selected thirteen (13) factors and the respondent professionals/experts were asked to rate the causes/factors that might have influenced the changes in the commercial urban form. The rating was on a horizontal scale of 1 to 5 (least important to most important). The means of the responses were used to rank the importance of the causes/factors. The results are presented in Table 6.16.

Table 6.16: Causes of the Changes in the Commercial Urban Form

Causes of Changes in Commercial Urban Form	Mean Rating	t-value	Decision
Physical state of the Inner City	3.8276	2.883	Reject Ho
Increase in population	3.5926	2.111	Reject Ho
Increase in property prices	3.4444	1.500	Reject Ho
Individual location decisions	3.2667	0.541	Reject Ho
High economic growth rate	3.1852	0.289	Reject Ho
Increase in rents	3.1786	0.252	Reject Ho

Causes of Changes in Commercial Urban Form	Mean Rating	t-value	Decision
Changes in rental and occupancy status	3.1111	0.000	Fail to Reject Ho
Residential urban sprawl	3.1034	-0.030	Fail to Reject Ho
Planning decisions	2.8462		
Improved transport system	2.6296		
Technological advances	2.5926		
Nature of property and land rights	2.5158		
Geographical features	2.1481		

Source: Field Survey, 2009

The causes with a mean of rating of 3.00 and above were considered as the most important causes of the current commercial urban. The other causes with lower mean rating was considered not important causes of the current commercial urban form of Nairobi. However, this conclusion had the danger of excluding some causes that might have been important. Further analysis using the population mean score and test of significance was, therefore, considered important to countercheck the ranking of important and not important causes of the dispersed/polycentric form.

The study adopted the median rating of 3.111 as the populations mean rating of importance for each cause. This point indicated that this cause was an important cause of changes in the commercial urban form. Each cause had two hypotheses. The null hypothesis (Ho) was that the cause of polycentric urban form was not an important cause. The alternative hypothesis (Ha) was that the cause was important. Each of the causes was subjected to a one-tail test of the null hypothesis (Ho: $\mu<3.1111$) and a test of significance using one-sample test (critical t) to certify the ranking. The results are presented in Table 6.16.

The study concluded that the factors with calculated t-value that was higher than the critical t-value of 0.00 were important causes that influence the changes in the commercial urban form of Nairobi. The causes with calculated t-value that was lower than the critical t-value were, therefore, considered not important causes of the polycentric urban form.

The important causes of the current commercial urban form of Nairobi City are, therefore, the following:

- Physical state of the Inner City,
- Increase in population,
- Increase in property prices,
- Individual location decision,
- High economic growth rate, and
- Increase in rents.

These important factors are discussed in details below.

(a) **Physical State of the Inner City**- The poor state of the Inner City was rated the most important cause of the dispersed/polycentric commercial urban form. The standout manifestations of the Inner City, in order of importance, were:

- Inadequate and decayed infrastructure,
- Increased density of occupation,
- Physical decay of the buildings,
- Increasing obsolescence,
- Social problems,
- Rapid conversion of building use,
- Poor environmental conditions,
- Economic problems,
- Poor performance of real estate investment.

Consequently 69.8% of the present inhabitants were dissatisfied with the state of the Inner City. This meant that the dissatisfied occupants and investors naturally looked for other acceptable centres for investment and occupation and hence the creation of new commercial centres.

The study identified eight (8) possible causes of the poor state of the Inner City. The respondent experts/professionals were asked to rate these causes on a scale of 1 to 5 (least important to most important). The mean responses were used to rank the main factors as shown in Table 6.17.

Table 6.17: Causes of the Poor State of the Inner City

Causes	Mean Rating	t-value	Decision
Poor urban land management	4.1111	2.192	Reject Ho
Failed urban management	4.0526	1.969	Reject Ho
Underinvestment in infrastructure	3.8421	1.145	Reject Ho
Rigid planning ordinances	3.6667	0.652	Reject Ho
Underinvestment in building maintenance	3.3684	-0.374	Fail to Reject Ho
Individual location and investment decisions	3.2500		
Government policy of decentralization	2.9444		
Low economic growth rate	2.0000		

Source: Field Survey, 2009

The main cause of the poor state of the Inner City was 'poor urban land management'. The experts/professionals considered that poor urban land management was the key reason that the Inner City has been left to deteriorate and encourage the development of other commercial sub-centres. The poor land management was manifested in actions/omissions such as the uncertainty in renewing ground leases, land taxation, poor land information system, complicated land registration systems, expensive and protracted land delivery systems, among others. These actions stood out as the main causes of departure from the Inner City, its rapid deterioration and establishment of other centres.

The experts/professionals also rated 'failed urban management', 'underinvestment in infrastructure' and 'rigid planning ordinances' as other important causes of the poor state of the Inner City. These were identified as major shortcomings of the City Council of Nairobi in Chapter 5. The experts/professionals further rated 'underinvestment in building maintenance' and 'individual location and investment decisions' as other important factors that had contributed to the poor state of the Inner City and the emergence of a dispersed commercial urban form. The other causes, 'government policy of decentralization' and 'low economic growth rate' were below the cut off mean of 3.00 and hence they were not considered important causes of the poor state of the Inner City.

The above findings were subjected to a one-tail test of the null hypothesis to countercheck the ranking. The study adopted the median rating of 3.5 as the population's mean rating of importance for each cause. This point indicated that this cause was an important cause of the poor state of the Inner City. Each of the causes was subjected to a one-tail test of the null hypothesis (Ho: $\mu<3.5$). The results as presented in Table 6.17 shows that four (4) of the causes had their means greater than the population mean (median) of 3.5. In addition, one (1) cause namely, 'underinvestment in building maintenance' had mean rating of 3.3684. The mean was close to the population mean and this cause was considered for the next stage of analysis.

These five (5) most important causes of the current urban form were further subjected to a test of significance using one-sample test (critical t) at 99% confidence level to certify the ranking. The study concluded that the causes with calculated t-values higher than the critical t-values were important causes of the poor state of the Inner City. The results in Table 6.17 indicate that these factors are:

- Poor urban land management,
- Failed urban management,
- Underinvestment in infrastructure, and
- Rigid planning ordinances.

It can be concluded that addressing the significant causes would have prevented the dispersion of the commercial urban centres or allowed for an orderly change.

The poor state of the Inner City impacted negatively on the commercial urban form of Nairobi. The main consequences of the poor state of the Inner City, in order of importance, were distorted development pattern, inversion of rent and real estate pricing pattern, real estate market imperfection and rapid loss of the real estate stock. These consequences had the potential of stifling the growth of Nairobi City and resulting in severe social, economic and political consequences. This could be reversed by a comprehensive policy of renewal of the Inner City and other centres that were showing signs of deterioration like the Inner City, CBD and Westlands (see Table 6.14). It was a

unanimous opinion of the professionals/experts that renewal of the Inner City will rehabilitate it and reverse the negative consequences.

The study identified twelve (12) renewal/rehabilitation tools. The respondents were asked to rank the same on a scale of 1 to 5 (least important to most important). The mean score of the rating is presented in Table 6.18.

The tools that received the mean rating of above the acceptable decision point of 3.00 were considered important tools of renewal/rehabilitation. The other factors were not considered as important renewal/rehabilitation tools that would, if implemented, reverse the poor state of the Inner City and support the citywide commercial real estate market. However, this generalization had the potential of disregarding important tools of Inner City renewal/rehabilitation. Further tests, using the population mean, were considered necessary to confirm this ranking.

Table 6.18: Rating of the Inner City Renewal/Rehabilitation Tools

Renewal/Rehabilitation Tool	Mean rating	t-value	Decision
Expand infrastructure services	4.2333	6.676	Reject Ho
Re-plan the Inner City	3.9643	4.583	Reject Ho
Improve the physical conditions of the buildings	3.2143	2.018	Reject Ho
Guarantee ground lease renewal	2.7200	0.381	Reject Ho
Improve economies of the Inner City	2.7037	0.363	Reject Ho
Increase lending to inner city projects	2.6154	0.100	Reject Ho
Abolish Tenant & Landlord Act	2.5600	-0.052	Fail to Reject Ho
Offer subsidies	2.2692		
Alleviate poverty and other social problems	2.2000		
Increase the land rates for Inner City	2.1923		
Halt decentralization of commercial centres	1.6667		
Reduce residential sprawl	1.4167		

Source: Field Survey, 2009

The study adopted the median rating of 2.58 as the populations mean rating of importance for each tool. This point indicated that the tool was an important renewal/rehabilitation tool. Each tool had two hypotheses. Each of the renewal/rehabilitation tools were subjected to a one-tail test of the null hypothesis (Ho: $\mu<2.58$). The results as presented in Table 6.19 shows that six (6) of the renewal/rehabilitation tools had their means greater than the population mean (median) of 2.58. In addition, one factor had a mean rating of 2.56, which was statistically equal to the population mean of 2.58.

These seven (7) significant renewal/rehabilitation tools were further subjected to a test of significance using one-sample test (critical t) to certify the ranking. The results, at 99% confidence level, are presented in Table 6.18.

From the above analysis, the t-value for 'expand infrastructure services', 're-plan the Inner City', 'improve the physical conditions of the buildings', 'guarantee ground lease renewal', 'improve economies of the Inner City' and 'increase lending to Inner City projects' were greater than the critical t-value of 0.00. The null hypothesis that these renewal/rehabilitation tools were not important was rejected. This suggested that these tools were important. The null hypothesis for the other tools was rejected and the study concluded that they were not important tools of renewal/rehabilitation.

(b) **Increase in Population**- the increase in the overall population in Nairobi was discussed at lengthy in Chapter 5. For the purpose of this section, the study adopted the increase in the number of wage employed persons as a cause of the changes in the commercial urban form. Table 6.19 is a summary of the changes of the employment levels in Nairobi over the period 1998-2008.

Table 6.19: Wage Employment in Nairobi

Year	Number of Wage Employment	Year	Number of Wage Employment
1998	421,651	2003	433,473
1999	424,624	2004	443,372
2000	425,624	2005	453,589

Year	Number of Wage Employment	Year	Number of Wage Employment
2001	419,932	2006	466,480
2002	425,582	2007	497,300
		2008	488,200

Source: **Statistical Abstract (GOK, 2008)**

The wage employment in Nairobi has increased by 17.94% over the period under review. The results in Tables 6.12 and 6.13 indicated that most of the recent locations in the commercial sub-centres of Nairobi were new business (53.25%) and newly employed persons (83.25%). The increase of the number of wage employed persons had naturally led to increase in demand for commercial premises and hence the expansion of commercial land use in Nairobi.

(c) **Increase in Property Prices-** The increase in property prices in the original core of any city naturally leads to expansion into lower priced locations. This has happened in Nairobi as discussed in Chapter 7.

(d) **Individual Location Decisions of Employers/Tenants and Employees/Workers-** Firms and employees make individual location decisions that collectively influence the commercial urban form. The individual firms and employees in each of the four commercial sub-centres were asked to select and rank the reasons that influenced their current location decisions. The importance of each reason varied from one sub-centre to another.

(i) **Factors Affecting Location and Relocation Decisions of Employers/Tenants-** The study identified 20 factors that were likely to affect location decisions of employers/tenants. The respondents were asked to rate the factors that influenced their location and relocation decision on a scale of 1 to 5 (least important to most important). The means of the responses were used to rank the importance of the relocation and relocation factors for each commercial sub-centre. The results are presented in Table 6.20.

Table 6.20: Rating of the Location and Relocation Decisions of Employers/Tenants in Nairobi City

Location and Relocation Decision Factors	Mean Rating			
	Inner City	CBD	Westlands	Upper Hill
Economic growth	4.56	2.92	2.10	4.00
Adequate space for expansion of business	4.13	3.76	2.55	3.71
Low occupational costs (rent, service charge)	4.11	2.72	3.64	3.86
Need to locate close to customers/clients	4.10	3.71	2.00	3.63
Better transportation system to reach customers/clients	4.00	3.64	3.00	3.38
Ability to use modern communication tools to conduct business	4.00	3.20	2.64	3.43
Ability to enjoy controlled tenancy	4.00	3.54	2.91	3.13
Exploit benefits of agglomeration	3.80	3.18	2.82	3.89
Need to locate close to source of raw materials/inputs	3.80	3.66	2.64	2.29
Compatibility with neighbouring tenants/occupants	3.71	3.00	2.82	2.57
Need to lower labour costs	3.57	2.55	3.00	3.29
Desire to locate in a centre with large number of people/clients/customers	3.56	3.07	2.27	3.33
Change in cost structure	3.50	2.54	2.70	3.50
Planning regulations	3.38	2.90	3.18	3.00
Desire to locate closer to place of residence of employees	3.11	3.10	2.82	3.14
In search of adequate parking	3.00	3.50	3.36	2.43
Good physical condition of the neighbourhood and the buildings	2.70	4.31	3.55	2.63
Size of commercial neighbourhood	2.60	3.23	2.23	3.14
Desired level of urban services (water, security, shopping centres etc)	2.60	3.29	2.55	2.43
Hope that the neighbourhood will be rehabilitated/renewed	2.00	3.00	2.73	2.88
Median	**3.7**	**3.2**	**2.78**	**3.22**

Source: Field Survey, 2009

From the above analysis, 'economic growth' and the 'need for space for expansion' were the main reasons employers/tenants had relocated from the previous locations and located in the Inner City. This was expected as high economic growth rate resulted in new business formation and business expansions that could not have been accommodated in existing spaces/premises/locations. As earlier indicated, most of the respondents were first time business start ups.

The employers/tenants in the CBD ranked 'good physical condition of the neighbourhood and the buildings', 'adequate space for expansion of businesses' and 'need to locate close to customers/clients' as the three most important location and relocation factors. This suggested that the CBD, as currently delineated, offered good spatial character.

From the ranking in Table 6.20, it was found that the most important decision factors in Westlands were 'occupational costs', 'physical condition of the neighbourhood', 'search for adequate parking', 'planning regulations', 'need to lower labour costs' and 'better transportation system to reach customers/clients'. The remaining factors had low mean rating and hence were not considered important factors of location and relocation.

The most important relocation and location factors in Upper Hill were 'economic growth, 'loss of agglomeration/lack of business', 'high occupational costs (rent and service charge)', 'lack of space for expansion of business', 'need to locate close to customers/clients' and 'change in cost structure'. The factors 'ability to use modern communication tools to conduct business', 'better transport system to reach customers/clients', 'overcrowding in the neighbourhood' and 'need to lower labour costs' were also rated as important location and relocation factors.

The above analysis suggests that other factors were not important factors of location and relocation decision. However, this generalization has the potential of disregarding important tools of location and relocation factors. Further tests, using the population mean, were considered necessary to confirm this ranking.

The study adopted the median rating for each commercial sub-centre as the decision point to reject or fail to reject the null hypothesis based on the population mean. Each factor had two hypotheses. The null hypothesis (Ho) was that the factor was not an important factor in location and relocation decision making in the respective sub-centre. The alternative hypothesis (Ha) was that the factor was important. Each of the factors was subjected to a one-tail test of the null hypothesis (Ho: μ<median rating). The factors whose means were greater than the population mean (median) were further subjected to a test of significance using one-sample test (critical t), at 99% confidence level. The null hypothesis that these location and relocation factors were not important was rejected whenever the calculated t-value was greater than the critical t-value of 0.00. This confirmed that these factors were important location and relocation decision factors that influenced location and relocation decisions in the various commercial sub-centres and the entire commercial urban form of Nairobi. The results are presented in Table 6.21.

Table 6.21: Location and Relocation Decision Factors in the Various Commercial Sub-centres with t-values above the critical t-value

Location and Relocation Decision Factors	t-values			
	Inner City	CBD	Westlands	Upper Hill
Economic growth	3.533			1.911
Adequate space for expansion of business	1.440	1.578		1.043
Low occupational costs (rent, service charge)	1.057		1.703	1.152
Need to locate close to customers/clients	0.983	1.339		0.814
Better transportation system to reach customers/clients	0.680	1.145	0.396	0.274
Ability to use modern communication tools to conduct business	0.680	0.00		0.321
Ability to enjoy controlled tenancy	0.687	0.760	0.296	
Exploit benefits of agglomeration	0.214		0.039	1.904
Need to locate close to source of raw materials/inputs	0.181	1.313		
Compatibility with neighbouring tenants/occupants	0.027		0.061	

Location and Relocation Decision Factors	t-values			
	Inner City	CBD	Westlands	Upper Hill
Need to lower labour costs			0.524	0.156
Desire to locate in a centre with large number of people/clients/customers				0.182
Change in cost structure				0.524
Planning regulations			0.954	
Desire to locate closer to place of residence of employees			0.038	
In search of adequate parking		0.600	1.193	
Good physical condition of the neighbourhood and the buildings		3.379	1.640	
Size of commercial neighbourhood		0.081		
Desired level of urban services (water, security, shopping centres etc)		0.282		
Hope that the neighbourhood will be rehabilitated/renewed				

Source: Field Survey, 2009

The above analysis indicates that tenants/employers in the various commercial sub-centres considered and ranked the location and relocation decision factors differently. These differences in the ranking of the location and relocation factors reflected the differences in perceptions of the tenants/employers about the appeal and suitability of the various commercial sub-centres as places of location. The changing nature of these factors cause location and relocation decisions and hence the changes in the commercial urban form. These changes favour some and disadvantage some commercial sub-centres, creating unending circle of changes in the commercial urban form.

Based on the above analysis, the study concludes that the most important individual tenant/employer location and relocation factors that cause changes in the commercial urban form are, in the descending order of importance:

- Economic growth,
- Availability of commercial spaces for business expansion,
- Occupation costs,

- Transportation systems,
- Physical condition of the neighbourhood and buildings,
- Availability of parking spaces,
- Ability to enjoy controlled tenancy, and
- Higher benefits of agglomeration.

(ii) Factors Affecting Location and Relocation Decision of Employees/Workers- . The study identified 16 factors that were likely to be considered during the location and relocation decision of an employee. The respondents were asked to rate the factors that influenced their location and relocation decision on a scale of 1 to 5 (least important to most important). The means of the responses were used to rank the importance of the relocation and relocation factors. The results are presented in Table 6.22.

Table 6.22: Location and Relocation Factors of Employees in the various Commercial Sub-Centres of Nairobi

Reasons for change of working building/centre	Mean Rating			
	Inner City	CBD	Westlands	Upper Hill
Satisfaction with the working environment	4.3333	2.0000	2.1250	3.722
Seeking higher wages and other allowances	4.3077	2.0000	2.0000	4.117
Seeking desired level of urban services (water, security, shopping centres etc)	3.7273	3.6667	1.7143	2.400
Desire to work in a bigger centre	3.5000	4.0000	3.0000	1.933
Easy access to ICT (internet, reliable telephone lines, e-mail, fax etc)	3.4286	3.5000	2.8750	2.857
Desire to work in a less crowded place	3.3571	3.6667	2.5556	2.400
Desire to reduce commuting cost and time	3.2500	2.5000	1.8750	3.941
Compatibility with neighbouring tenants/occupants	3.2222	3.6667	2.5714	2.071
Desire to work closer to place of residence	3.1667	3.3333	2.1111	3.066
Availability of interconnection routes	2.8182	3.8000	1.8571	3.500
Escaping poor physical condition of the neighbourhood and the buildings	2.8182	4.0000	2.5000	1.714
In search of adequate parking	2.8000	4.3333	3.1250	2.000

Reasons for change of working building/centre	Mean Rating			
	Inner City	CBD	Westlands	Upper Hill
Seeking better public transportation system	2.6364	2.6667	2.6250	3.133
Hope that the neighbourhood will be rehabilitated/renewed	2.4000	3.0000	2.5714	2.200
Ownership of car	2.1111	3.6667	3.0000	1.571
Availability of affordable eating places	2.1000	3.4000	2.7143	3.066
Median	**3.2**	**3.58**	**2.56**	**2.63**

Source: Field Survey, 2009

From the above analysis, factors related to work satisfaction were rated the most important factors in the selection of the Inner City as a place of work. These factors were 'satisfaction with the working environment', and 'seeking desired levels of urban services'. The most important location and relocation factors for employees in the CBD were 'adequate parking', 'physical condition of the neighbourhood and buildings', 'desire to work in a bigger centre' and 'availability of interconnection routes'. The respondent employees in Westlands ranked 'adequate parking', 'desire to work in a bigger centre' and 'ownership of car' as the three most important location and relocation factors in the choice of the centre as a place of work. The respondent employees in Upper Hill ranked 'seeking higher wages and other allowance', 'desire to reduce commuting cost and time', 'satisfaction with the working environment', 'availability of interconnection routes', 'seeking better public transportation system', 'desire to work closer to place of residence', 'availability of affordable eating places' and 'easy access to ICT' as the most important location and relocation factors in the choice of the centre as a place of work.

The other factors recorded mean rating of less than median. This suggested that the same were not important. However, some of the employee/workers location and relocation factors recorded mean ratings that were greater than the lowest ranking of 1.00. Further analysis using the population mean score was, therefore, considered important to countercheck the ranking of important and not important factors of location and relocation for employees.

These significant factors of employee location and relocation decision in the various commercial centres were further subjected to a test of significance using one-sample test (critical t) to certify the ranking and eliminate Type I and Type II errors. The null hypothesis was rejected whenever the t-value was greater than the critical t-value of 0.00. It was then concluded that the employee/worker location and relocation factor was important. The results are presented in Table 6.23.

Table 6.23: The t-values of Significant Employee Location and Relocation Decision Factors in the various Commercial Sub-Centres

Factors	t-values			
	Inner City	CBD	Westlands	Upper Hill
Satisfaction with the working environment	3.659			3.398
Seeking higher wages and other allowances	3.036			3.709
Seeking desired level of urban services (water, security, shopping centres etc)	1.081	0.098		-0.575
Desire to work in a bigger centre	0.699	0.727	0.736	
Easy access to ICT (internet, reliable telephone lines, e-mail, fax etc)	0.518	-0.124	0.611	0.544
Desire to work in a less crowded place	0.309	0.098	-0.009	-0.505
Desire to reduce commuting cost and time	0.117			3.768
Compatibility with neighbouring tenants/occupants	0.048	0.065	0.018	
Desire to work closer to place of residence	-0.68	-0.205		1.014
In search of adequate parking		1.130	0.787	
Escaping poor physical condition of the neighbourhood and the buildings		0.594	-0.100	
Availability of interconnection routes		0.377		2.643
Ownership of car		0.065	0.582	
Availability of affordable eating places		-0.353	0.326	1.014
Seeking better public transportation system			0.115	1.338
Hope that the neighbourhood will be rehabilitated/renewed			0.022	

Source: Field Survey, 2009

From the above analysis, the t-value for the following employee/workers location and relocation decision factors were greater than the critical value of 0.00:

- Satisfaction with the working environment,
- Seeking higher wages and other allowances,
- Desire to reduce commuting cost and time,
- Availability of interconnection routes,
- Seeking better public transportation system,
- Seeking desired levels of urban services (water, security, shopping etc)', 'easy access to ICT (internet, reliable telephone links etc),
- Desire to work in less crowded places, and
- Compatibility with neighbouring tenants/occupants.

The null hypothesis that these employees' location and relocation factors were not important was rejected. This confirmed that these factors were important employees' location and relocation factors. The above factors consequently influenced the changes in the commercial urban form and the performance of the commercial real estate market of Nairobi city.

6.6 Summary

The study used the 'dispersion ratio', the commuting time and 'density ratio' to measure the existing commercial urban form. The study further used the location, relocation, investment and disinvestment decisions to establish the speed of change and factors/causes of the changing commercial urban form.

The existence of many commercial centres was evidence that the commercial urban form was dispersed and/or polycentric. Based on the 'dispersion ratio', the study concluded that the current commercial urban form of Nairobi City was polycentric. The study, based on the time travel, concluded that the commercial urban form of Nairobi was polycentric (many centres) but not geographically dispersed. The analysis of the 'density ratio' confirmed that Nairobi City commercial urban form comprised of several centres with different occupancy densities. In sum, the study concluded that the commercial urban form

of Nairobi was polycentric (with several commercial centres) but was less dispersed (concentrated in one corner of the city).

The analysis of the inflows and outflows for the period of 1997 to 2008 (ten years) was used to measure the extent of change. Based on the findings, it was concluded that the rapidly changing commercial centre was Upper Hill while the Inner City had not changed at all during the period of review. The most important causes of the current commercial urban form were the physical state of the Inner City, increase in population, increase in property prices, individual location decisions, high economic growth rate and increase in rents.

Chapter Seven:

THE PERFORMANCE OF COMMERCIAL REAL ESTATE MARKET IN NAIROBI 1997-2007

7.1 Introduction

The chapter analyses data on the performance of the commercial real estate market for the period 1997-2007. The performance of commercial real estate market was measured using perception of the market participants/stakeholders and the financial aspects (rent, occupancy, inflation hedging, risk and rate of return).

7.2 The Perception of the Various Real Estate Market Players on the Performance of the Various Commercial Sub-centres

The professionals/experts rated the performance of the real estate sector on a mean rating of 3.6563 out of a possible highest score of 5.00. The professionals acknowledged that there existed differences in the performance of the commercial real estate among the various sub-markets. The professionals/experts were asked to rate the perception the various participants (investors and tenants) had about the performance of the various sub-centres (sub-markets) on a scale of 1 to 5. The views were rated on the basis of the mean or the median, depending on the shape of the distribution. Table 7.1 presents the results. The results were used to rank the demand for investment and occupancy among the various sub-markets.

Table 7.1: Ranking of the Professional/Experts of the Appeal to Investors and Tenants on the Performance of the Sub-Markets

Sub-Market	Investors	Tenants
Upper Hill	4.20000	4.1333
Westlands	4.1333	4.1000
CBD	3.3548	3.5517
Inner City	2.6000	2.9000

Source: **Field Survey, 2009**

The mean rating of the appeal to investors and tenants for the various commercial sub-markets fell between 2.600 and 4.2. Based on the results presented in Table 7.1, the best sub-market with the highest perception rating was Upper Hill. This suggested that real estate investment in Upper Hill had high chances of disposal and at higher price because of higher demand by investors. The sub-market with the least demand/appeal was the Inner City. This implied that it was the lowest performing sub-market. These findings were similar to what had occurred in other cities that had undergone similar pattern of changes in their commercial urban form.

In terms of risk profile, the sub-market that posed the highest risk was the Inner City as presented in Table 7.2. This suggested that the experts/professionals considered that the chances of the real estate investment failing to achieve the projected returns were highest in the Inner City and lowest in Upper Hill. This perception was attributed to the poor rating of the spatial condition of the Inner City as indicated in Table 6.16. This perception of risk by the professionals/experts was expected to influence the advice given to investors and renters. This, in turn, was expected to influence the financial performance of commercial real estate sub-markets and market.

Table 7.2: Professional/Experts Perception about Risk Occurrence in the Commercial Sub-Markets

Risk/Centre	Inner City	CBD	Upper Hill	Westlands
Market Risk	3.3214	2.2593	2.0800	1.9231
Tenant Risk	3.3214	2.1154	1.7778	2.111
Planning Risk	3.4643	2.1538	2.5385	2.5357
Legislation Risk	3.2500	2.1538	2.2963	2.0714
Liquidity Risk	3.2857	2.5185	2.3214	2.5926
Legal Risk	3.4286	2.5000	2.0769	2.1111
Financial Risk	3.5556	2.5200	2.1600	2.0400
Pure Risk	3.2273	2.3636	2.0909	2.1364
Mean Risk	**3.3567**	**2.3232**	**2.1680**	**2.1900**

Source: Field Survey, 2009

7.3: Commercial Sub-Markets Investment Decisions and Trends

Most of the respondents (58.3%) had invested in other sub-markets before investing in their current sub-market. However, a reasonable majority (41.7%) indicated that the current sub-market was their first investment market. This suggested that there had been investment opportunities in old and new sub-market during the period under review.

The initial location decision for real estate investment was influenced by many factors. The study identified twelve (12) reasons from the review of literature. The respondents were asked to rank the factors on a horizontal scale of 1 to 5 (from not important to most important). The results are presented in Table 7.3.

The most important factors that investors considered before selecting a commercial centre or sub-market were 'high returns', 'size of the commercial centre', and 'high rental income'. The other important factors were 'planning regulations', 'nature of property ownership (land tenure)', 'cost of the property', 'renewed nieghbourhood' and 'good quality tenants'.

Table 7.3: Sub-Market Investment Location Factors

	Reasons for Investing in the current sub-market	Mean Rating
1	High returns	4.2222
2	Size of the commercial centre	3.8333
3	High rental income	3.5556
4	Planning regulations	3.4000
5	Nature of property ownership (land tenure)	3.3333
6	Cost of the property	3.3000
7	Renewed neighbourhood	3.1429
8	Good quality tenants	3.1000
9	Portfolio diversification	2.7500
10	Speculation	2.7143
11	Availability of cheap land for construction	1.4286
12	Lack of alternative investment sites	1.2857

Source: Field Survey, 2009

The other reasons/factors were not considered important. These results were tested using the population mean to countercheck the ranking. The study adopted the median rating of 3.22 as the populations mean rating of importance for each reason/factor. This point indicated that this was an important reason for selecting the sub-market for investment. Each of the reasons were subjected to a one-tail test of the null hypothesis (Ho: $\mu<3.22$). The results, as presented in Table 7.3, showed that six (6) reasons/factors had their means greater than the population mean (median) of 3.22. In addition, two reasons had a mean rating of 3.1429 and 3.1000 respectively. The mean ratings were close to the decision point and were, therefore, considered to be a likely important reason for selecting the sub-market for investment in real estate. The above eight (8) significant reasons for selecting a sub-market for investment were further subjected to a test of significance using one-sample test (critical t) to certify the ranking. The results are presented in Table 7.4.

Table 7.4: Comparison of the t-values with the Mean Score of the Reasons for Selecting a Sub-Market for Investment

	Reasons for Investing in the current sub-market	Mean Rating	t-value	Decision
1	High returns	4.2222	4.510	Reject Ho
2	Size of the commercial centre	3.8333	1.448	Reject Ho
3	High rental income	3.5556	0.579	Reject Ho
4	Planning regulations	3.4000	0.398	Reject Ho
5	Nature of property ownership (land tenure)	3.3333	0.278	Reject Ho
6	Cost of the property	3.3000	0.169	Reject Ho
7	Renewed neighbourhood	3.1429	-0.130	Fail to Reject Ho
8	Good quality tenants	3.1000	-0.198	Fail to Reject Ho

Source: Field Survey, 2009

Based on the above analysis, the study concluded that the most important reasons for selecting a sub-market for investing in real estate were:

- High returns,
- Size of the commercial centre,

- High rental income,
- Planning regulations,
- Nature of property ownership (land tenure), and
- Cost of the property.

Most of the respondent investors (80%) who had invested elsewhere before investing in the current sub-market had retained their investment in the other sub-markets. There were several reasons for this decision. The study identified ten (10) likely reasons that can encourage an investor to retain an investment property in one sub-market while making a decision to invest in another sub-market. The investors were requested to rate the importance of each of the identified reasons on a scale of 1 to 5 (not important to very important). The mean rating is summarized in Table 7.5.

Table 7.5: Comparison of the calculated t-values with the Mean Score of the Reasons for Retaining Property in another Sub-Market

	Reasons for Retaining	Mean Rating	Calculated t-value	Decision
1	Good tenants	3.5000	1.237	Reject Ho
2	High rental yields	3.3000	0.845	Reject Ho
3	Portfolio diversification	3.2857	0.567	Reject Ho
4	Secure land tenure	2.8889	0.225	Reject Ho
5	Improved commercial sub-market	2.8889	0.193	Reject Ho
6	Low running costs	2.6667	-0.240	Fail to Reject Ho
7	High capital appreciation	2.5556	-0.372	Fail to Reject Ho
8	Hoping the sub-market will improve	2.2857		
9	Low land taxation	2.0000		
10	No good offer for purchase	1.0000		

Source: Field Survey, 2009

The most important reasons investors retained investments in the initial sub-markets were 'good tenants', 'high rental yield' and 'portfolio diversification'. These reasons recorded mean rating of 3.00 and above suggesting that these were the most important factors. The

second sets of reasons were those that were mean rated between 2.50 and 3.00. These were 'secure land tenure', 'improved commercial sub-market', 'low running costs' and 'high capital appreciation'. The other factors were rated very low and were, therefore, not considered important.

The results presented in Table 7.5 were tested to countercheck the ranking of important and not important reasons for retaining the other investment. The study adopted the median rating of 2.78 as the population's mean rating of importance of each reason/factor. This point indicated that this was an important reason for retaining the earlier investment in commercial real property in the other sub-market. Each of the reason was subjected to a one-tail test of the null hypothesis (Ho: $\mu<2.78$). The results, as presented in Table 7.5, showed that five (5) reasons/factors had their means greater than the population mean (median) of 2.78. However, two (2) reasons had mean rating that was statistically close to the population mean. These factors were 'low running costs' and 'high capital appreciation'. These were important reasons that were considered by investors in making retention or disposal decision.

The above seven (7) important reasons were further subjected to a test of significance using one-sample test (critical t), at the confidence level of 99%, to certify the ranking. The results are presented in Table 7.5.

From the above analysis, the study concluded that a commercial centre will still retain investors as long as it commands good tenants, the rental yield is high, has secure land tenure and there are attempts to improve on its physical conditions. Investors will also retain a property while investing in another in order to achieve portfolio balance as a means of enhancing the returns from an investment pool and hedging against risks.

The respondent investors were generally satisfied with the various locations/sub-markets as investment locations. The investors, therefore, remained in the various sub-markets because of several reasons that were discovered after moving in. The study identified five (5) possible reasons and requested the respondents to rank the same on a horizontal scale of 1 to 5 (least important to most important). The mean rating is presented in Table 7.6.

Table 7.6: Reasons for Liking the Present Sub-Market

	Reasons for liking present sub-market	Mean Rating				
		Overall	Inner City	CBD	Westlands	Upper Hill
1	Ability to increase rent to match inflation	3.8824	4.0000	4.0000	4.3333	3.4000
2	Ability to pass over the entire running costs to tenants	3.6842	2.2500	3.4000	4.2500	4.6667
3	The returns are higher than the market average rate of return	3.5294	4.2500	2.4000	3.0000	4.5000
4	High quality tenants	3.3158	2.2500	2.0000	4.0000	5.000
5	Good quality of neighbouring properties	3.2778	3.2500	3.8000	3.0000	3.000

Source: Field Survey, 2009

The investors in the Inner City liked the sub-market because the returns were higher than the market average rate of return and the ability to increase rents to match inflation. The poor physical conditions of the Inner City and low property values were compensated by the higher rate of return and mitigated market risks. The ability to increase rents to match inflation mitigated investors in the Inner City against financial risks. The mean rating for the 'ability to pass over the entire running costs to tenants' and 'high quality tenants' were very low suggesting that the Inner City sub-market was heavily exposed to tenant and market risks. The low rating of the 'good quality of neighbouring properties' suggested that the Inner City sub-market was considered moderately exposed to planning risks.

The CBD was liked as an investment sub-market because of the 'ability to increase rent to match inflation' and 'good quality of neighbouring properties'. This suggested that real estate investment in the CBD was less likely to be exposed to financial risks and planning risks (contagious decay). The low rating of 'the returns are higher than the market average rate of return' and 'high quality tenants' is an indication that the CBD sub-market is highly exposed to market, tenant and liquidity risks.

Commercial real estate investors who remained in Westlands sub-market were attracted by its 'ability to increase rent to match inflation', 'ability to pass over the entire running costs

to tenants' and 'high quality tenants'. The sub-market was, therefore, considered a safe investment location for real estate due to low exposure to tenant, financial and market risks. The poor rating of 'the returns are higher than the average market rate of return' and 'good quality of neighbouring properties' suggested that the investment climate in Westlands sub-market was increasingly getting bad.

The Upper Hill sub-market was rated as the most attractive investment location. The high rating for most of the identified reasons for liking a commercial submarket suggested that most investors who have invested in the Upper Hill sub-market liked it. However, the low rating for 'ability to increase rent to match inflation' and 'good quality of neighbouring properties' suggested that the sub-market is a growing sub-market with potential to exposure to market and financial risks.

7.4 Financial Measures of the Performance of the Commercial Real Estate Market in the Various Sub-Markets (1997-2007)

The financial measures of commercial real estate investment selected for this study were the rate of return (capital appreciation and rental yield) and risk exposure. The determination of these measures required the establishment of the cost of development and the rental income.

7.4.1 Cost of Development

(a) **Land Values**- The values of land were averages obtained from valuation reports prepared by the mainstream real estate valuation firms for mortgage and sale purposes and NCC for rating purposes. These valuation reports were used by the major financial and mortgage firms to make lending decisions. It was, therefore, assumed that the values in these valuation reports were true reflection of the land values in the commercial sub-markets in Nairobi.

Land values in the CBD and Inner City were found to have been higher than all other commercial sub-markets as presented in Table 7.7.

Table 7.7: Mean Land Values in the Various Commercial Sub-Markets (Kshs. per square foot) and Paired t-test of Means

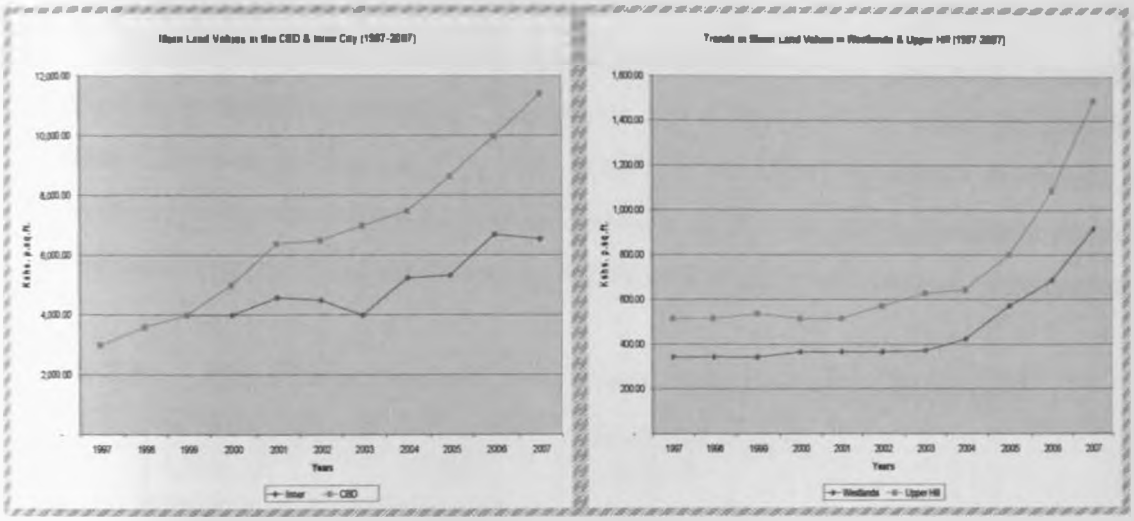
Year	Inner City	CBD	Westlands	Upper Hill	t-values
1997	3,000.00	3,000.00	344.15	516.50	2.304
1998	3,600.00	3,600.00	344.35	516.50	2.197
1999	4,000.00	4,000.00	344.15	539.60	2.157
2000	4,000.00	5,000.00	367.30	516.50	2.074
2001	4,585.00	6,394.50	367.30	516.50	1.970
2002	4,500.00	6,500.00	367.30	573.90	1.976
2003	4,000.00	7,000.00	373.00	631.30	1.912
2004	5,250.00	7,500.00	424.70	647.20	1.975
2005	5,333.30	8,654.80	573.90	803.50	1.975
2006	6,700.00	10,000.00	688.70	1,090.45	2.044
2007	6,550.70	11,408.20	918.30	1,492.20	2.072

Source: Field Survey, 2009

As demonstrated above, the values of land were equal in the Inner City and the CBD during the period of 1997 to 1999. However, the value of land in the Inner City and the CBD started recording different results after 1999. The Inner City has recorded lower and fluctuating growth rate while the CBD has generally been high and growing steadily. For example, the value of land had increased by 280.27% and 118.36% in the CBD and Inner City respectively during the period under review. The land values in the Inner City recorded positive growth rates in the years 2000 to 2001, stagnated in the next three years before rising again, but a lower gradient. On average, the land values in the Inner City have increased (capital appreciation) by 8.90% per year compared to 14.55% in the CBD.

The land values in the secondary commercial sub-markets were generally stable until 2004 when they increased substantially. For example, the value of land appreciated by an average of 3.16% and 3.40% for Westlands and Upper Hill respectively for the period 1997 and 2004 compared to 29.49% and 32.24% for the period of 2005 and 2007.

Figure 7.1: Trends of Land Values in the various Commercial Sub-Markets



Source: Field Survey, 2009

The above mean land values of the various commercial sub-markets for the years under review were subjected to a paired t-test to ascertain whether there were differences between the commercial sub-markets. The findings were used to establish whether the changes in the commercial urban form resulted in differentiated performance of the commercial real estate market. The null hypothesis (Ho) was that there was no difference in the land values over the period under review and hence changes in the commercial urban form did not impact on the performance of the commercial real estate market. The alternative hypothesis (Ha) was that the means were different and hence the changes in the commercial urban form affected the performance of the commercial real estate market. Each of the measure of difference was subjected to paired t-test of the null hypothesis (Ho: t=0) at 99% confidence level.

Based on the results presented in Table 7.7, the calculated t-value of the mean land values for each year was higher than the critical t-values. The null hypothesis was not supported by the data collected for this study. The data supported the alternative hypothesis and the study concluded that the sub-markets showed significant differences in the trends of mean land values. The periods of considerable differences were 1997-2000 and again 2006-2007. This, therefore, suggested that sub-markets exhibited two land market supply cycles.

(b) **Cost of Construction**- The average cost of construction for commercial properties is taken to be uniform throughout Nairobi on the account of the same geographical location. The cost of construction was based on the final payment certificates to contractors as prepared by project quantity surveyors (QS). The study, therefore, assumed that the mean construction costs presented in Table 7.8 were correct costs of construction.

Table 7.8: Mean Construction Cost of Commercial Properties in Nairobi

Year	In (Kshs. p.sq.ft)	Year	In (Kshs. p.sq.ft)
1997	1,285.58	2003	1,836.55
1998	1,362.11	2004	1,928.37
1999	1,438.63	2005	2,081.42
2000	1,545.76	2006	2,203.86
2001	1,622.28	2007	2,418.12
2002	1,714.11		

Source: Field Survey, 2009

The cost of construction has steadily increased over the years as depicted in Figure 7.2. The actual cost of construction has increased by 188.1%, affecting the performance of commercial real estate as an investment.

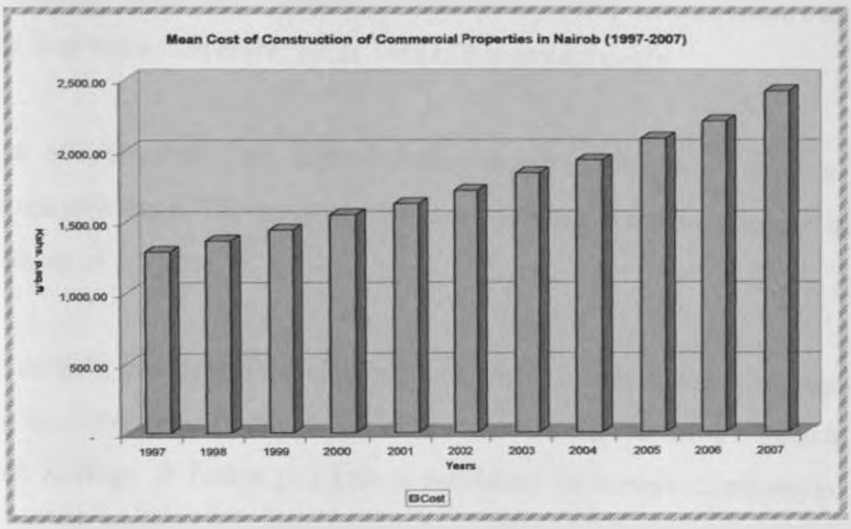
The above costs exclude professional fees. The professional fees, based on the various professional scales of fees, can be summarized as follows:

- Architect 6.0%
- Civil/Structural Engineer 2.0%
- Electrical Engineer 1.5%
- Mechanical Engineer 1.5%
- Quantity Surveyor 3.5%

The sum of the above fees is 14.5% of the total construction costs. However, in practice, the professional fees for the design and the supervision stages have been capped at 10% of

the total professional fees. The study, therefore, adopted 10% as the professional fees in establishing the total cost of development.

Figure 7.2: Trends in Mean Cost of Construction of Commercial Properties In Nairobi (1997-2007)



Source: Field Survey, 2009

In the recent past, there has been a tendency to engage one of the professionals in the design team (especially the architect) or an independent party to act as a project manager. The role of the project manager is to coordinate the activities of the design team, the contractors and other stakeholders to ensure that the project is completed on time, costs and specifications and is disposed (either by sale or letting) within the projected time and income. Gichunge (2000) and Talukaba (1999) note that formal project management has the ability to drastically reduce time and cost overruns, thus ensuring that the project achieves the projected returns. The project managers have tended to quote a fee of 2 % to 4% of the project cost. For the purpose of this study, the fee for the project manager was set at 2% of the project costs.

In addition, there are statutory payments made to the various bodies. These include charges for approving architectural/building and engineering plans, change of user (where needed), issuance of certificate of occupation and fees for routine inspection during construction and pre-occupation. The Environmental Management and Conservation Act

(EMCA) of 1999 imposed additional levies in the preparation of environmental impact assessment reports and approval fees. The fee payable to NEMA is 0.5% of the estimated construction cost and the EIA expert charge 1% of the construction cost. The fees for statutory expenses have been capped at 2% of the total construction costs. The total professional fees were, therefore, set at 14% of the project costs.

(c) **Cost of Finance**- The capital outlay required for developing a commercial property is usually large. The tendency has been to have a combination of both debt and equity financing of projects.

The source of debt has been financial institution with a bias towards mortgages or long-term financing. The main financial institutions have been Housing Financing of Kenya (HFCK) and Savings & Loans (K) Ltd (a subsidiary of Kenya Commercial Bank Ltd). These institutions advance a percentage of the total project costs, depending on the mode of development. The mortgage firms have set their exposure at 85% and 65% for purchase and construction cases respectively. The interest rates charged constitute the cost of finance. Table 7.9 is a summary of the average bank lending rates for the period 1997 to 2007.

There are many sources of equity financing. Equity financing has to compete with alternative investment assets. An investor will direct equity funds towards an investment project that promises the best returns. In the alternative, an investment in real estate will be a lost opportunity for investing in other secure and less risky investment mediums. In general, bank deposits and government debt instruments have the lowest risk profiles (Chandra, 2008). The study adopted bank deposits and 90 days Treasury Bills as the lowest opportunity cost of investing equity in commercial real estate. Table 7.9 presents interest rates on bank deposits and treasury bills for the period 1997 to 2007.

The cost of finance will be incurred for the entire period of the project. According to Gichunge (2000), the average period of the construction phase of a commercial building was 69.85 weeks. The design and statutory approval phase was found to take an average of 24 weeks, bring the total to 93.85 weeks. The project period for the purpose of this study

was taken as 2 years. The funds, both debt and equity, were, therefore, expected to be held up for 2 years.

The cost of finance was the average of the cost of finance considering a combination of equity and debt (65%) and full equity. The total cost of finance was, therefore, taken as presented Table 7.9.

Table 7.9: Medium-Term Bank Lending, Savings Accounts and 90 Days Treasury Rates, 1997-2007

Year	Average Medium-Term Lending Rates	Interest on Bank Deposits	90 Days Treasury Bills Rate	Total Cost of Finance
1997	24.99%	9.73%	19.50%	42.72%
1998	26.66%	7.89%	11.70%	41.52%
1999	25.20%	6.15%	20.00%	41.90%
2000	19.73%	4.51%	12.90%	31.75%
2001	19.50%	5.42%	11.00%	31.10%
2002	18.56%	4.83%	10.90%	29.64%
2003	13.47%	1.38%	1.41%	20.94%
2004	12.69%	0.98%	8.29%	19.75%
2005	13.67%	1.38%	8.14%	21.10%
2006	14.01%	1.36%	5.83%	20.73%
2007	14.40%	1.67%	6.87%	21.71%

Source: GOK (2007, 2008 and 2009) and Field Survey (2009)

(d) Total Cost of Development- The total development cost was taken as a sum of the cost (value) of land, actual cost of construction, cost of finance, professional fees and statutory fees as summarized in Table 7.10.

The commercial sub centre with the highest cost of development was found to be the CBD, followed by the Inner City. The sub-market with the lowest cost of development was found to be Westlands.

On average, the cost of development had been increasing as demonstrated by Figure 7.3. For the period of 1997 to 2007, the cost of development in Nairobi City's commercial properties had increased 2.01 times. The biggest change had been found in the CBD (2.71 times) on account of increase in land values (Table 7.7) and the resultant high cost of finance. The increase in other centres had averaged 1.78 times.

Table 7.10: Average Cost of Development of Commercial Properties (Kshs. per square foot) in the Various Commercial Sub-Markets

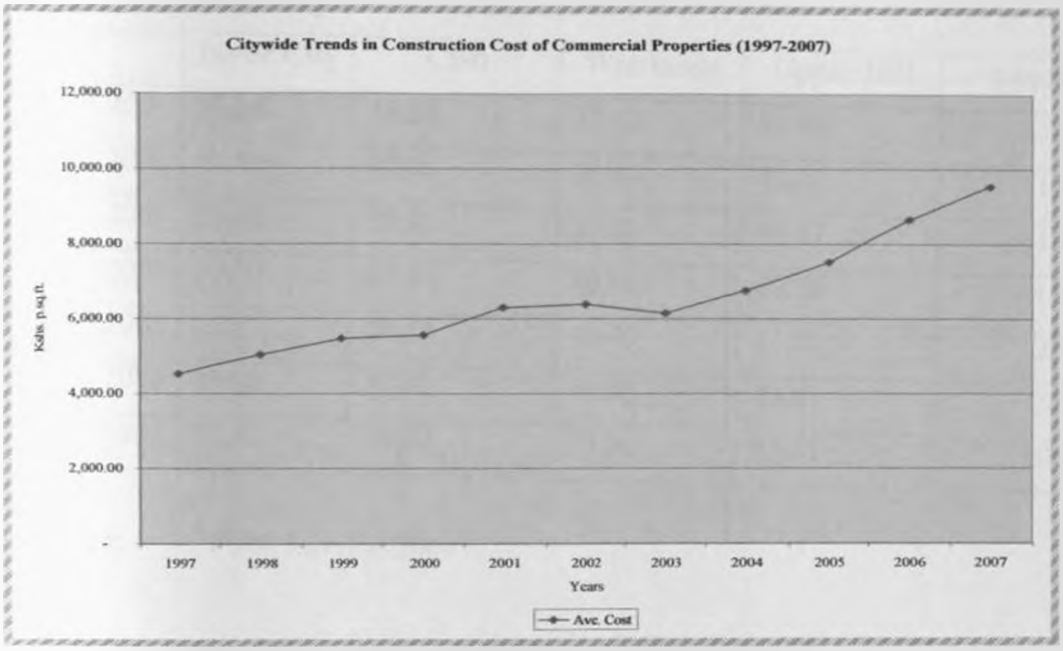
Year	Inner City	CBD	Westlands	Upper Hill
1997	6,373.25	6,373.25	2,582.82	2,828.80
1998	7,292.25	7,292.25	2,684.85	2,928.48
1999	8,003.21	8,003.21	2,815.56	3,092.91
2000	7,591.65	8,909.15	2,805.57	3,002.14
2001	8,435.50	10,807.75	2,906.09	3,101.69
2002	8,367.08	10,959.88	3,009.44	3,277.28
2003	7,369.68	10,997.88	2,983.19	3,295.58
2004	8,919.39	11,613.76	3,141.09	3,407.54
2005	9,332.11	13,354.45	3,568.48	3,846.52
2006	11,122.13	15,106.22	3,864.69	4,349.72
2007	11,327.98	17,240.05	4,472.79	5,171.28

Source: Field Survey, 2009

7.4.2 Rental Income

It has been believed that rental income is the key measure of the performance of real estate, especially commercial real estate. The study sampled several buildings in the four commercial sub-markets and asked the property managers/caretakers to indicate the asking rents per square foot per month for the years of 1997 to 2007. For purposes of calculating the rental yield, the rental income was adjusted depending on the sub-market average occupancy levels. It was assumed that the vacancy levels reflected the appeal of the sub-market and it was also a measure of the performance of the sub-market.

Figure 7.3:



Source: **Field Survey, 2009**

(a) Rental Rate 1997-2007- The average rental rate in the various commercial centres of Nairobi city ranged from Kshs. 24.82 and Kshs. 52.00 per square foot per month for the period under review as shown in Table 7.11. The Upper Hill and Westlands commercial sub-markets recorded the highest mean rental rates for the period under review. Upper Hill showed considerable fluctuation in the rental rates during its initial years of conversion from residential to commercial. Figure 7.4 shows the sharp increase in the rental rate between 1997 and 2001.

Table 7.11: Mean Rental Rate (Kshs. per square foot per month) in Various Commercial Sub-Markets in Nairobi (1997- 2007) and Comparison with Paired t-values

	Inner City	CBD	Westlands	Upper Hill	t-value
1997	24.82	32.90	36.20	43.00	10.107
1998	24.82	35.40	36.20	46.00	8.916
1999	25.27	34.40	37.60	46.00	9.132
2000	27.13	35.33	37.40	52.00	7.771

	Inner City	CBD	Westlands	Upper Hill	t-value
2001	27.88	35.38	37.40	52.00	8.040
2002	28.71	35.95	38.40	42.45	14.993
2003	29.42	35.92	39.20	43.17	15.148
2004	30.00	37.14	40.60	43.56	15.399
2005	32.57	38.51	41.60	41.88	22.819
2006	33.00	39.62	43.00	43.41	20.425
2007	35.87	39.62	43.00	43.41	32.963

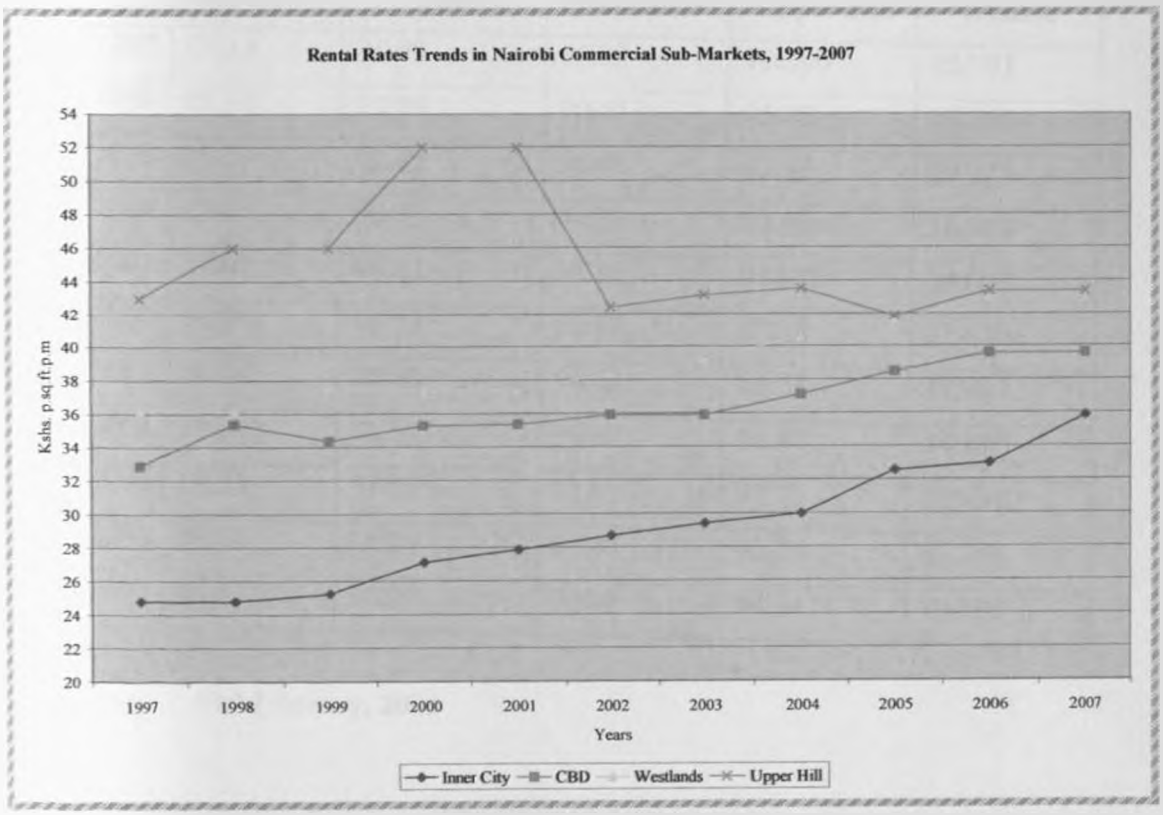
Source: **Field Survey, 2009**

The rental rates of the various commercial sub-markets for the years under review were subjected to a paired t-test to ascertain whether there were differences between the commercial sub-markets. The findings were used to test the study hypothesis that the changing urban form had resulted in distorted performance of the commercial real estate investment market. The null hypothesis (Ho) was that there was no difference in the mean rental rates and hence the changes in the commercial urban form did not impact on the performance of the commercial real estate market. The alternative hypothesis (Ha) was that the means were different and hence the changes in the commercial urban form affected the performance of the commercial real estate market. The mean rental rate for each year were subjected to paired t-test of the null hypothesis (Ho: t=0) at 99% confidence level.

Based on the results presented in Table 7.11, the calculated t-value for each year was higher than the critical values. The null hypothesis was not supported. The alternative hypothesis was supported by the data collected for this study and it was concluded that the sub-markets showed significant differences in the mean rental rates for the years 1997-2007. It was further observed that the difference of the means was remarkably higher in some years compared to others. The absolute calculated t-values for the years 1997, 2002-2004 and 2005-2007 were substantially high, indicating that the differences in the performance of the commercial real estate markets were easily noticeable. These findings further imply that the commercial real estate market had two distinct mean rental rate

cycles as depicted in Figure 7.05. The two cycles also coincided with immense changes in the commercial urban form with rapid expansion of the new centres and rapid deterioration of the Inner City and general stagnation of the CBD. The study, therefore, concluded that the performance of the commercial real estate market was distorted during the period under review.

Figure 7.4:



Source: **Field Survey, 2009**

(b) Occupancy Trends 1997-2007- During the period under review, the four commercial sub-markets recorded high occupancy levels as summarized in Table 7.12.

The Westlands commercial sub-market had recorded the highest average occupancy levels throughout the period of 1997-2007 of 92.15%. The Inner City, on the other hand, recorded the lowest average occupancy level of 85.98% during the period under review. The CBD and Upper Hill commercial sub-markets recorded average occupancy levels of

90.73% and 89.20% respectively, within the minimum occupancy threshold (Born et al., 1994).

Table 7.12: Mean Occupancy Levels in Various Commercial Sub-Markets in Nairobi (1997- 2007) and Comparison with t-values

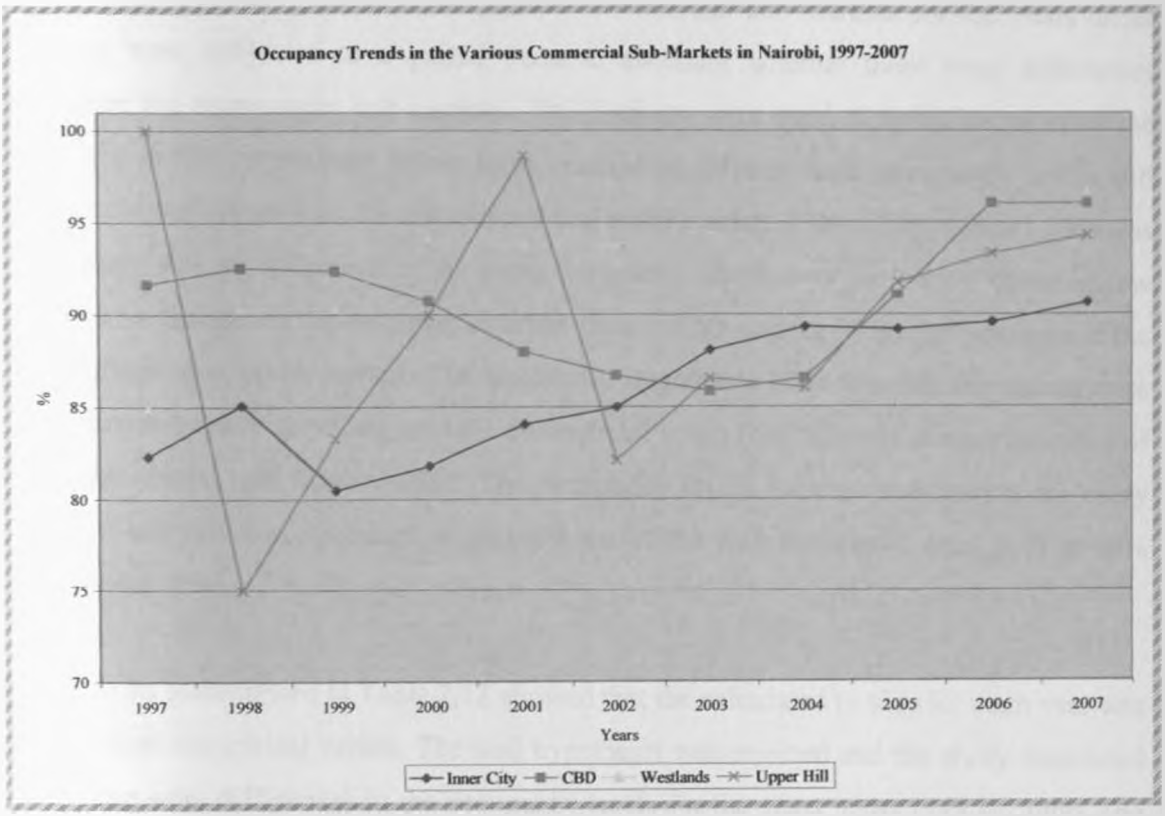
	Inner City	CBD	Westlands	Upper Hill	t-value
1997	82.33	91.69	85.00	100.00	25.091
1998	85.10	92.59	90.40	75.00	19.366
1999	80.50	92.41	90.40	83.33	29.974
2000	81.83	90.77	94.20	90.00	38.942
2001	84.08	88.03	93.80	98.67	34.603
2002	85.00	86.73	93.80	82.14	32.610
2003	88.08	85.88	94.60	86.58	42.967
2004	89.36	86.59	91.60	86.07	54.580
2005	89.21	91.13	91.60	91.77	305.882
2006	89.60	96.09	91.40	93.34	67.104
2007	90.67	96.09	96.80	94.34	80.180

Source: Field Survey, 2009

The mean occupancy levels in all the commercial sub-markets were on an upward trend as depicted in Figure 7.5. As at the close of the year 2007, Westlands was the sub-market with the highest average occupancy level of 96.80%, followed by CBD (96.08%), Upper Hill (94.34%) with the Inner City recording the lowest occupancy level of 90.67%.

It was observed that the Upper Hill commercial sub-market recorded fluctuating occupancy levels, depicting its changing character during the period under review. This was more distinct during the early years of 1997 and 2002 during the era of conversion from residential to commercial land use. The above findings suggested that the steady rise in the occupancy levels from 82.14% in 2002 to 94.34% in 2007, being a 14.85% increase in a period of five (5) years.

Figure 7.5:

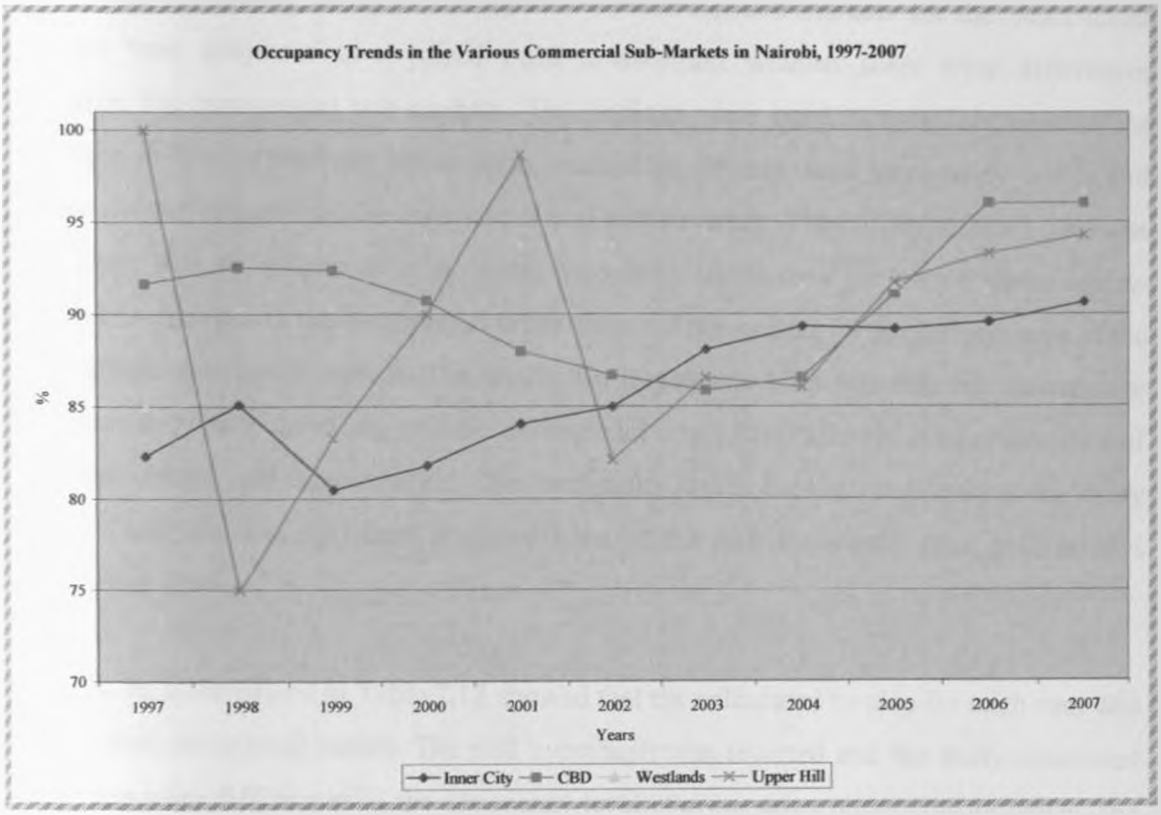


Source: **Field Survey, 2009**

The CBD commercial sub-market recorded falling occupancy levels between 1998 (92.59%) and 2004 (86.59%) as graphically shown in Figure 7.5. This coincided with the period of poor physical conditions and deteriorating infrastructure and urban services. Major rehabilitations/renewal programs during the period 2004 and 2007 increased the occupancy level from 86.59% to 96.09% respectively. It was also observed that the CBD recorded the second highest increase in the occupancy level between the years 2002 and 2007 of 10.79%.

The Inner City recorded positive changes in the occupancy levels from the year 2001, even though the occupancy level remained below the 90% threshold until 2007. The steady increase of the mean occupancy level in the Inner City suggested that the occupancy character had not changed.

Figure 7.5:



Source: **Field Survey, 2009**

The CBD commercial sub-market recorded falling occupancy levels between 1998 (92.59%) and 2004 (86.59%) as graphically shown in Figure 7.5. This coincided with the period of poor physical conditions and deteriorating infrastructure and urban services. Major rehabilitations/renewal programs during the period 2004 and 2007 increased the occupancy level from 86.59% to 96.09% respectively. It was also observed that the CBD recorded the second highest increase in the occupancy level between the years 2002 and 2007 of 10.79%.

The Inner City recorded positive changes in the occupancy levels from the year 2001, even though the occupancy level remained below the 90% threshold until 2007. The steady increase of the mean occupancy level in the Inner City suggested that the occupancy character had not changed.

The mean occupancy levels of the various commercial sub-markets for the years under review were subjected to a paired t-test to ascertain whether there were differences between the commercial sub-markets. The findings were used to establish whether the changes in the commercial urban form resulted in differentiated occupancy levels and hence the performance of the commercial real estate market. The null hypothesis (Ho) was that there was no difference in the mean occupancy levels over the period under review and hence changes in the commercial urban form did not impact on the performance of the commercial real estate market. The alternative hypothesis (Ha) was that the means were different and hence the changes in the commercial urban form affected the performance of the commercial real estate market. The occupancy levels for each sub-market for every year of analysis was subjected to paired t-test of the null hypothesis (Ho: t=0) at 99% confidence level.

The results summarized in Table 7.12 showed that the calculated t-value for each year was higher than the critical values. The null hypothesis was rejected and the study concluded that there were differences in the occupancy levels for the years under consideration. The alternative hypothesis was not rejected and the study concluded that the sub-markets showed significant differences in the mean occupancy levels. The magnitude of change heightened in the years 2004 to 2007 as demonstrated in Figure 7.6. This period was found to have recorded tremendous changes in the commercial urban form and the study concluded that the changing commercial urban form resulted in distorted performance of the commercial real estate market.

(c) Effective Net Rental Rate 1997-2007- The total rental income received from a property is a function of the occupancy level and the rental rate. For this study, the mean asking rental rate was multiplied by the mean occupancy level to determine effective rental rate for each year for each commercial sub-market. The results of the analysis are presented in Table 7.13.

Table 7.13: Effective Rental Rates in Various Commercial Sub-Markets in Nairobi (1997- 2007) and Comparison with t-values

	Inner City	CBD	Westlands	Upper Hill	t-value
1997	20.43	30.17	30.77	43.00	7.127
1998	21.12	32.78	32.72	34.50	10.838
1999	20.34	31.79	33.99	38.33	8.840
2000	22.20	32.07	35.23	46.80	7.115
2001	23.44	31.15	35.08	51.31	6.228
2002	24.40	31.18	36.02	34.87	14.125
2003	25.91	30.85	37.08	37.38	14.165
2004	26.81	32.16	37.19	37.49	16.146
2005	29.06	35.09	38.11	38.43	20.501
2006	29.57	38.07	39.30	40.52	17.770
2007	32.52	38.07	41.62	40.95	23.571

Source: Field Survey, 2009

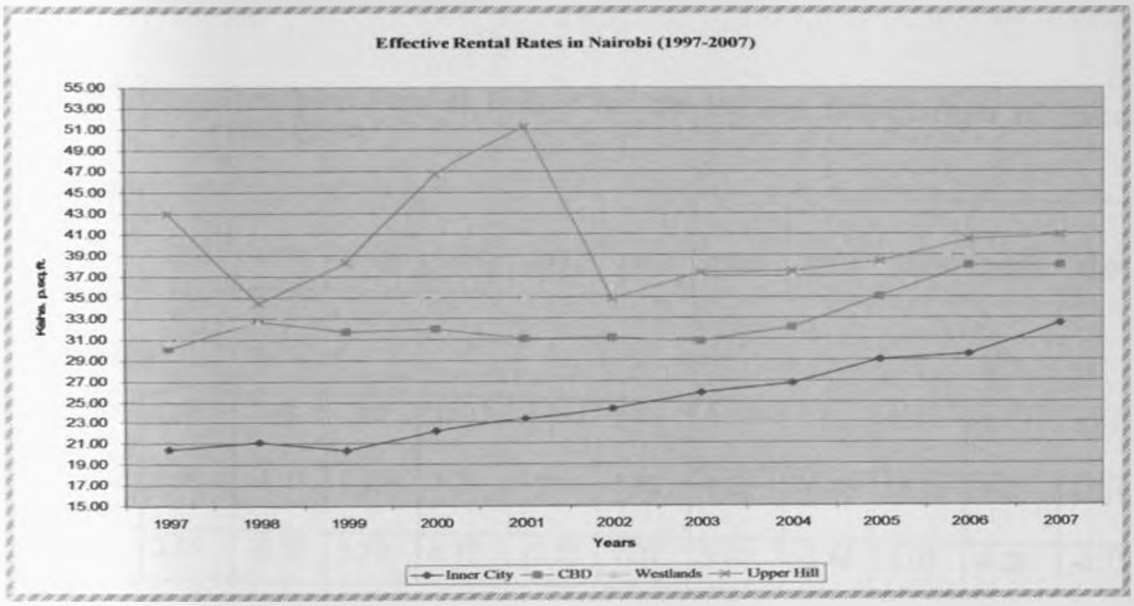
The Upper Hill commercial sub-market was observed to have recorded the highest average effective rental rate of Kshs. 40.33 per square foot per month during the period 1997-2007. The lowest effective rental rate was recorded in the Inner City at Kshs. 25.07 per square foot per month for the same period. However, Westlands had the highest effective rental rate in 2007 followed by Upper Hill commercial sub-markets.

The trend of effective rental rates in the various commercial sub-markets was positive as graphically presented in Figure 7.6. The exception was observed in Upper Hill (1997-2002) with high fluctuations and CBD (2002-2004) where there was a decline.

Based on the results presented in Table 7.13, the calculated t-value for each year was higher than the critical values. The study concluded that the sub-markets showed significant differences in the mean 'effective rental rate' for the years 1997-2007. The differences were noticeably huge in the years 2002 to 2007 and this implied that the performance of the commercial real estate market as measured by mean 'effective rental

rate' changed tremendously. The study concluded that the performance of the commercial real estate market varied between the sub-markets and was, therefore, affected by the changes in the commercial urban form.

Figure 7.6:



Source: **Field Survey, 2009**

7.4.3 Rate of Return

The total rate of return was taken as the summation of rental yield and capital appreciation.

(a) Rental Yield- For the purpose of this study, the rental yield was the quotient of the rental income and the total cost of development. The total development cost and the effective rental rate were presented in Table 7.10 and Table 7.13 respectively.

The calculated rates of returns are presented in Table 7.14. The sub-markets that recorded the highest rental yield for the period 1997-2007 were Upper Hill (14.37%) and Westlands (13.88%). Inner City (3.53%) and CBD (3.87%) were the lowest performing sub-markets.

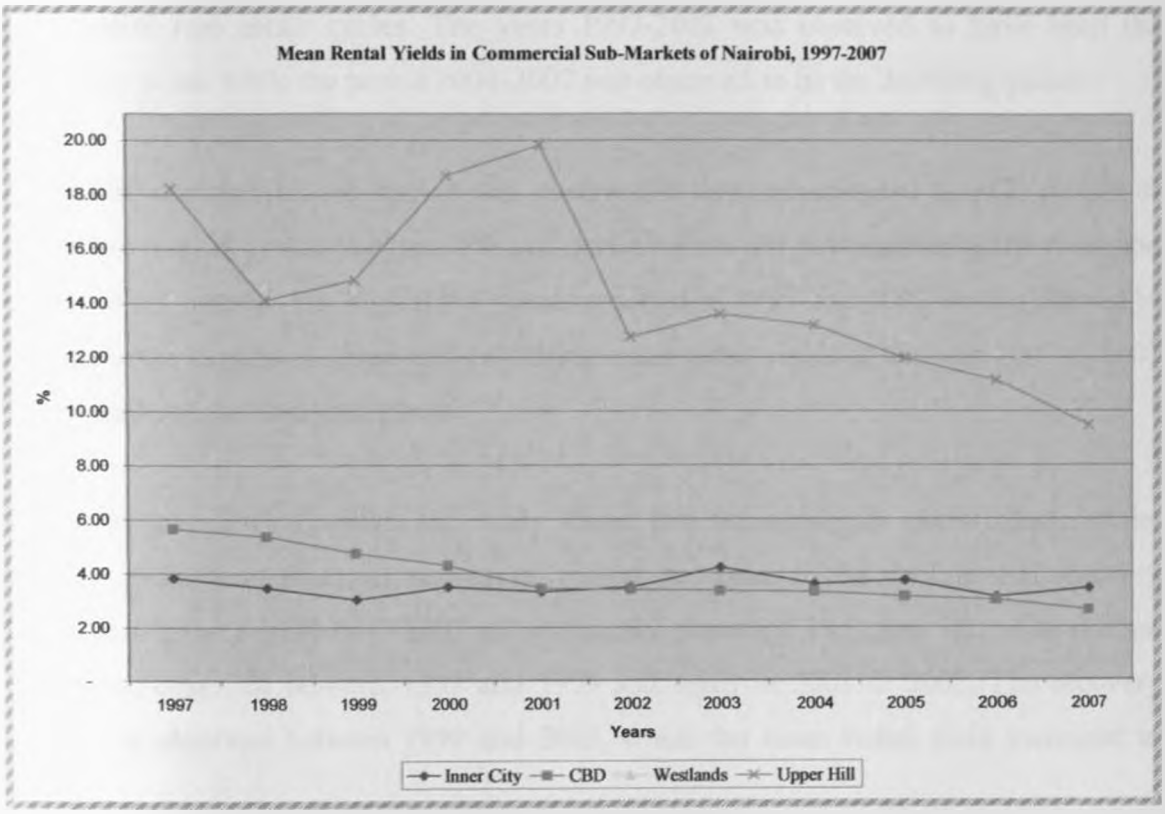
In general, the rental yield had been falling in the various commercial sub-markets during the period under review. Figure 7.7 shows the trends in the rental yield. This suggested that the performance of the commercial real estate had been declining over the period as the commercial urban form changed.

Table 7.14: Calculated Rate of Return for the Various Sub-Markets of Nairobi (1997-2007)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Inner City											
Rental Yield	3.85	3.48	3.05	3.51	3.33	3.50	4.22	3.61	3.74	3.13	3.45
Capital Apprec	0.00	-4.37	6.74	3.26	-5.54	3.82	4.80	-6.46	-1.72	1.07	-4.19
TROR	3.85	-0.89	9.79	6.77	-2.50	7.32	9.02	-2.86	2.02	4.20	-0.75
CBD											
Rental Yield	5.68	5.39	4.77	4.32	3.46	3.41	3.37	3.32	3.15	3.02	2.65
Capital Apprec	0.00	-4.36	6.74	2.78	-5.35	3.74	4.22	-7.41	-1.56	1.15	-3.67
TROR	5.68	1.03	11.50	7.10	-1.90	7.15	7.58	-4.90	1.59	4.17	-1.02
Westlands											
Rental Yield	14.30	14.63	14.49	15.07	14.49	14.36	14.92	14.21	12.81	12.20	11.17
Capital Apprec	0.00	-4.80	7.05	3.11	-6.27	3.66	4.26	-7.24	-1.58	1.20	-3.62
TROR	14.30	9.82	21.53	18.18	8.22	18.03	19.18	6.78	11.23	13.40	7.55
Upper Hill											
Rental Yield	18.24	14.14	14.87	18.71	19.85	12.77	13.61	13.20	11.99	11.18	9.50
Capital Apprec	0.00	-4.83	7.01	3.19	-6.28	3.59	4.21	-7.57	-1.59	1.15	-3.53
TROR	18.24	9.31	21.88	21.90	13.57	16.36	17.82	5.63	10.40	12.33	5.97

Source: **Field Survey, 2009**

Figure 7.7



Source: **Field Survey, 2009**

It has been observed that Inner City had generally recorded three cycles during the period under review. The period 1997 to 1999 was found to be the declining phase, the years 2000 to 2003 was a recovery phase while the period 2004- 2007 was a recession phase. The Inner City did not, therefore, experience an expansion phase over the ten (10) years period under review.

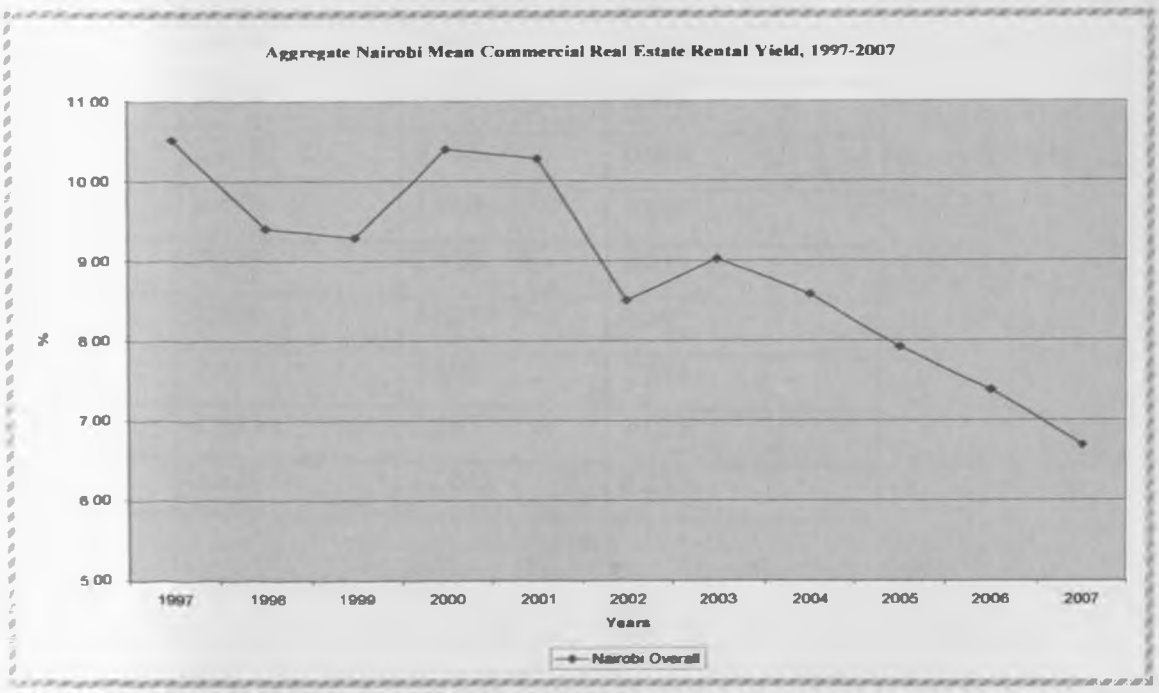
The CBD had recorded a decline and recession phases for the years 1997-2007 in respect of rental yield. The period 1997-2001 was found to have been the decline phase (cycle) while the remaining years were considered to have been the recession phase (cycle). The falling rental yield could be attributed to the increase in land values but slow changes in the rental rates.

The Westlands commercial sub-market was observed to have had two cycles out of the four typical real estate cycles. The years 1997-2003 was observed to have been the expansion phase while the period 2004-2007 was observed to be the declining phase.

Upper Hill commercial sub-market was observed to have experienced two (2) phases of real estate market cycles of expansion and declining but did not experience the recession and recovery phases. The high rental yields reported in 1997 and 2001 were observed to have been the expansion phase and the falling mean rental yields of the year 2002 to 2007 was considered the declining phase.

Based on the above findings, the study found that the aggregate performance of the citywide Nairobi commercial real estate market had been in the decline and recovery phase during the period 1997-2007 as graphically presented in Figure 7.8. The decline phase was observed between 1997 and 1999 and again in 2003 to 2007. The recovery phase was observed between 1999 and 2003, where the mean rental yield increased to 10.4%.

Figure 7.8:



Source: **Field Survey, 2009**

The above results were subjected to a paired t-test to test the hypothesis that the changes in the commercial urban form had resulted in distorted performance of the commercial real estate market. Table 7.15 presents the results of the calculated t-values. Based on the results, the calculated t-value for each year was higher than the critical values. The null hypothesis was rejected. The alternative hypothesis was not rejected and the study concluded that the sub-markets showed significant differences in the mean rental yields for the years 1997-2007. The study concluded that the performance of the commercial real estate market varied between the sub-markets and was, therefore, affected by the changes in the commercial urban form.

Table 7.15: Comparison of Means Using t-values of Rental Yield, Capital Appreciation and Total Rate of Return for the Aggregate Nairobi Commercial Real Estate Market

	t-values		
	Rental Yield	Capital Appreciation	Total Rate of Return
1997	2.849	3.873	2.849
1998	2.975	9.268	1.057
1999	2.676	7.629	5.214
2000	2.459	0.905	3.374
2001	2.212	9.736	0.979
2002	2.493	1.730	4.093
2003	2.593	2.456	4.419
2004	2.506	11.237	0.492
2005	2.623	6.609	1.833
2006	2.483	2.165	3.035
2007	2.524	12.042	0.253

Source: **Field Survey, 2009**

(b) Capital Appreciation- This was a measure of the changes in capital values/open market value/sale price of the properties over the period under review. The capital

appreciation took into account the changes in the rate of inflation and capital expenditure to improve or rehabilitate the property.

The formulae for calculating the capital appreciation for this study was as follows:

$$\text{Capital Appreciation} = \left\{ \frac{CVp - CX}{CVc} \right\} X \text{ Infi}$$

Where:
- CVp: was the capital value of the previous year
- CX: was the capital expenditure
- CVc: was the capital value in the current year
- Infi: was change in the annual inflation rate

The determination of the mean capital value of the four commercial sub-markets of Inner City, CBD, Westlands, Upper Hill and the aggregate of Nairobi took into account the changes in the inflation rate for the years 1997 to 2007 and the average annual capital injection required to maintain the buildings in habitable and tenantable condition.

The rate of inflation in Kenya had averaged 8.94% for the period under review. However, the fluctuations in the annual rate of inflation were found to be big as depicted in Figure 7.9. This had the impact of lowering capital appreciation and increasing the capital appreciation in equal measure.

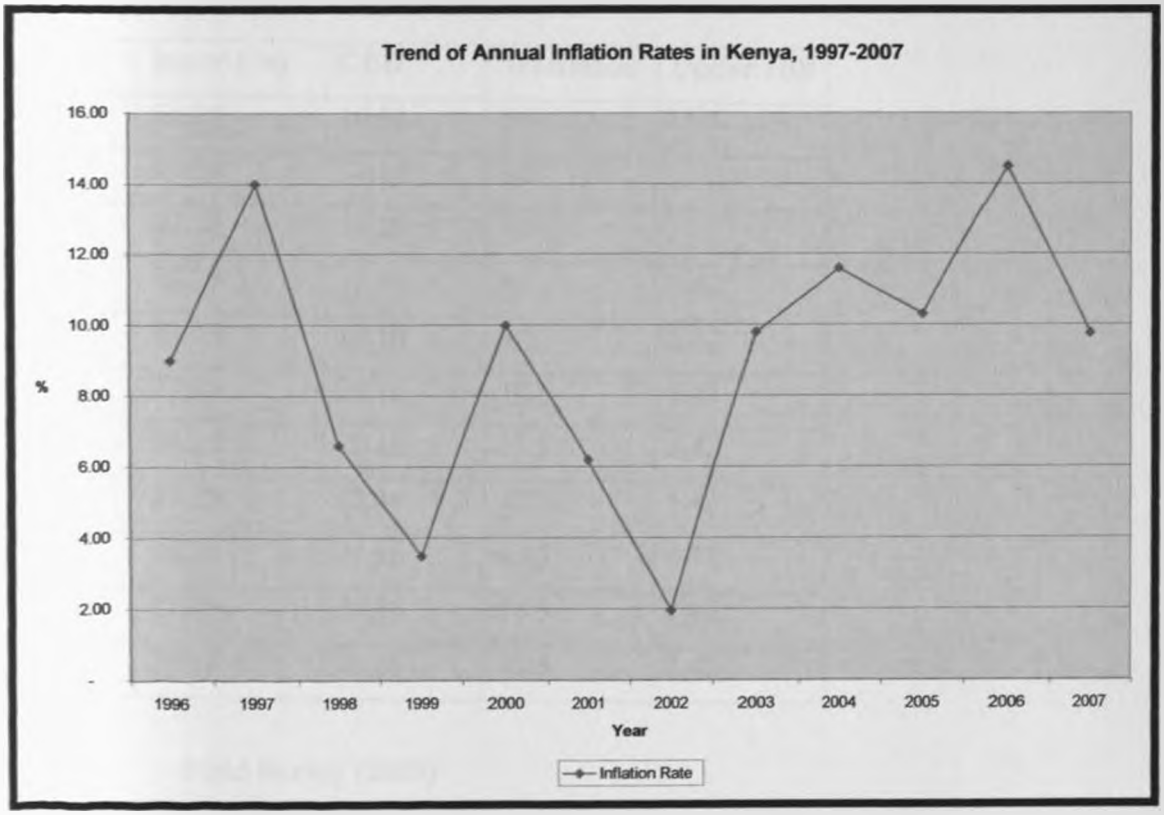
The capital expenses (capex) required to maintain or rehabilitate/refurbish buildings were deducted from the resulting capital appreciation. The study held the view that older properties required more capital injections than newer buildings in order to maintain them in habitable conditions. The sub-markets with older buildings were expected to attract higher capital allowances. The allowances for capital expenses for each age of the properties for each year under consideration were set as follows:

0-10 years	1% of the rental income per year

11- 20 years	2% of the rental income per year
21-30 years	5% of the rental income per year
31-40 years	8% of the rental income per year
41-50 years	10% of the rental income per year

The average age of the sampled buildings in the various commercial sub-markets at different years during the period under review are summarized in Table 7.16.

Figure 7.9:



Source: **Field Survey, 2009**

The effect of the changes in the inflation rate and the capital expenditure produced capital appreciation summarized in Table 7.14.

The capital appreciation in the four commercial sub-markets showed a discernible pattern throughout the period under review as shown in Figure 7.10. This was attributed to the

uniform rate of construction and inflation rate. On average, the mean capital appreciation was negative throughout the period under review, with Upper Hill reporting the least mean capital appreciation of -0.47% over the period of 1997-2007. The Inner City, at a mean of -0.29%, recorded the best performance in terms of capital appreciation during the period under review.

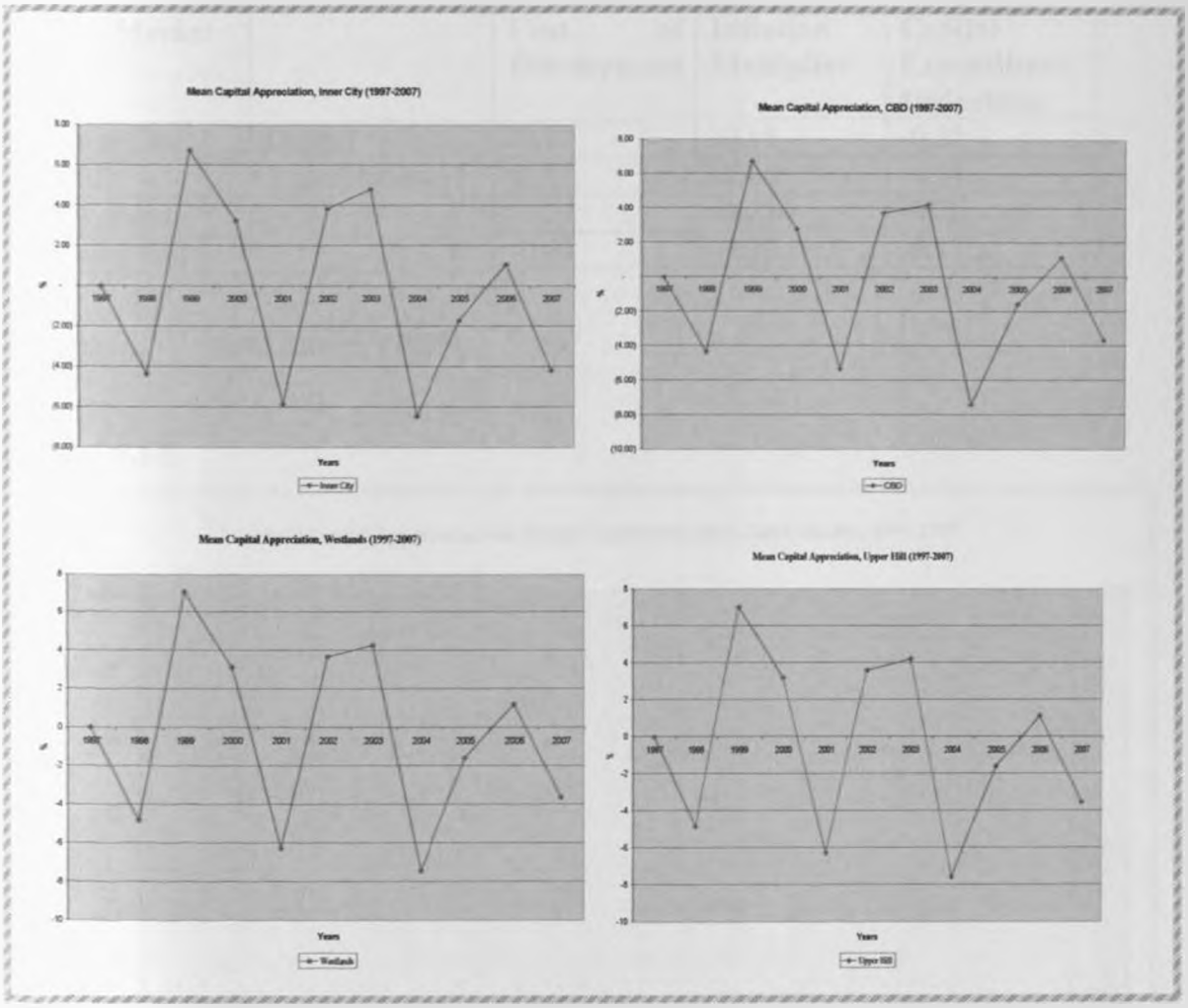
Table 7.16: Mean Age of Commercial Buildings in the Various Commercial Sub-Markets in Nairobi (in Years)

Year	Inner City	CBD	Westlands	Upper Hill
1997	18.25	16.16	5.5	
1998	19.25	17.16	6.5	
1999	20.25	18.16	7.5	
2000	21.25	19.16	8.5	1.42
2001	22.25	20.16	9.5	2.42
2002	23.25	21.16	10.5	3.42
2003	24.25	22.16	11.5	4.42
2004	25.25	23.16	12.5	5.42
2005	26.25	24.16	13.5	6.42
2006	27.25	25.16	14.5	7.42
2007	28.25	26.16	15.5	8.42

Source: Field Survey (2009)

The mean capital appreciation of entire Nairobi commercial real estate market recorded two cycles. The positive trends were recorded in 1999, 2003 and 2006 as illustrated in Figure 7.11. The periods of negative mean capital appreciation were 1998, 2001, 2004 and 2007.

Figure 7.10: Trends in Capital Appreciation in the Various Commercial Sub-Markets in Nairobi (1997-2007)



Source: Field Survey, 2009

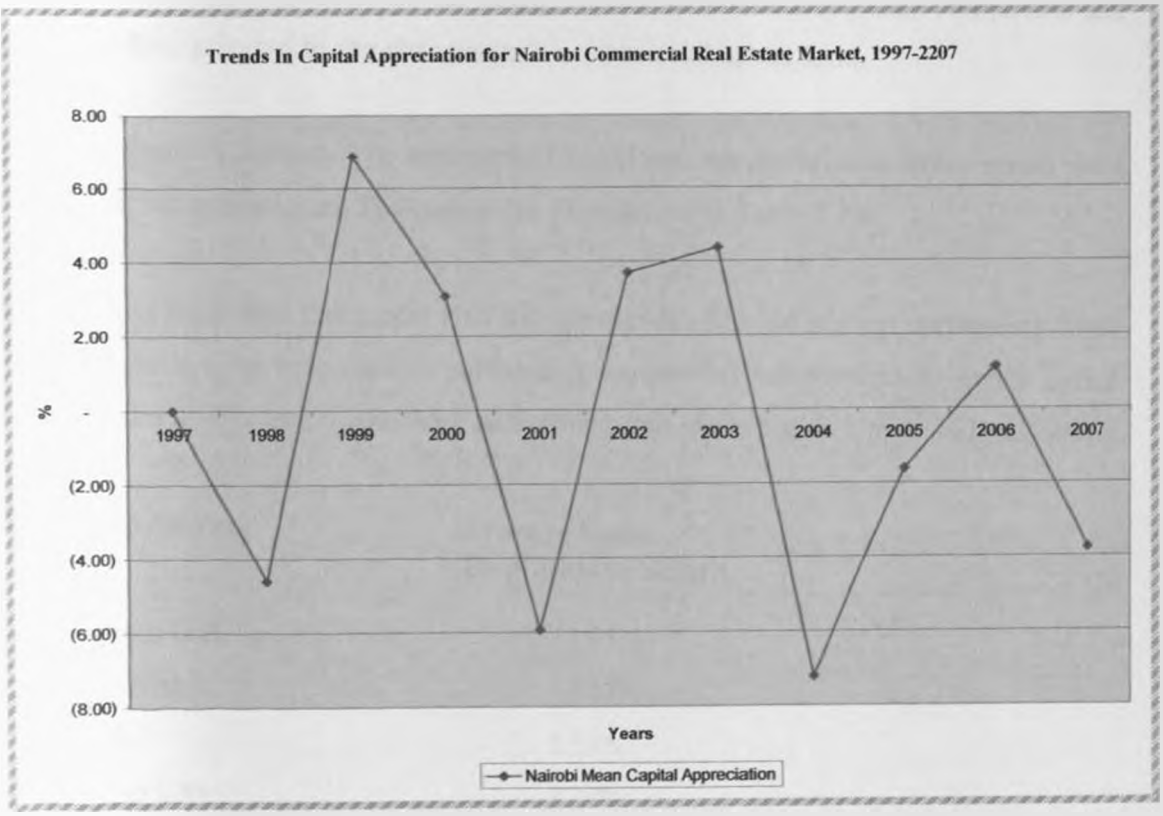
The key factors of consideration in capital appreciation was the cost of development, rate of inflation (inflation multiplier) and capital injections required to maintain the property in habitable conditions. The key factors found to influence changes in the capital appreciation are summarized in Table 7.17.

Table 7.17: Correlation Matrix for Capital Appreciation Determinants

Sub-Market		Cost of Development	Inflation Multiplier	Capital Expenditure Deductions
Inner City	Capital Appreciation	-0.23	-0.15	-0.27
CBD		-0.12	-0.06	-0.24
Westlands		-0.27	-0.21	-0.20
Upper Hill		-0.03	-0.30	-0.17

Source: Field Survey (2009)

Figure 7.11:



Source: Field Survey, 2009

The main causes of the low mean capital appreciation in the Inner City were cost of development and capital deductions as a result of relatively old age of the buildings. Capital deduction was also found to be the main factor for mean low capital appreciation in the CBD sub-market. The effects of cost of development, inflation multiplier and capital deductions were key factors contributing to the low mean capital appreciation. The main

determinant of the low mean capital appreciation in Upper Hill was inflation multiplier. It was, therefore, concluded that the cost of development and capital deductions were the key determinants of the capital appreciation in the four commercial sub-markets.

The above results were subjected to a paired t-test to test the study hypothesis. Based on the results presented in Table 7.15, the calculated t-value for each year was higher than the critical values. The null hypothesis was rejected. The alternative hypothesis was not rejected and the study concluded that the sub-markets showed significant differences in the means of capital appreciation for the years 1997-2007. The study concluded that the performance of the commercial real estate market varied between the sub-markets and was, therefore, affected by the changes in the commercial urban form.

(c) **Total Rate of Return**- The total rate of return was the summation of the rental yield and the capital appreciation. The results are summarized in Table 7.14.

The findings suggested that Upper Hill and Westlands were the highest performing while CBD and Inner City were the low performing commercial sub-markets. Over the period under review (1997-2007), the best performing sub-market was Upper Hill as shown below:

	Sub-Market	**Average Mean Total Rate of Return**
1.	Upper Hill	13.95%
2.	Westlands	13.47%
3.	CBD	3.53%
4.	Inner City	3.27%

It can be concluded that the changes in the urban commercial form of Nairobi as discussed in Chapter 6 benefited the sub-centres more than it did to the original centres. The differences in the average mean total rate of return supported this conclusion.

The above results were subjected to a paired t-test to test the study hypothesis that the changes in the commercial urban form had resulted in distorted performance of the

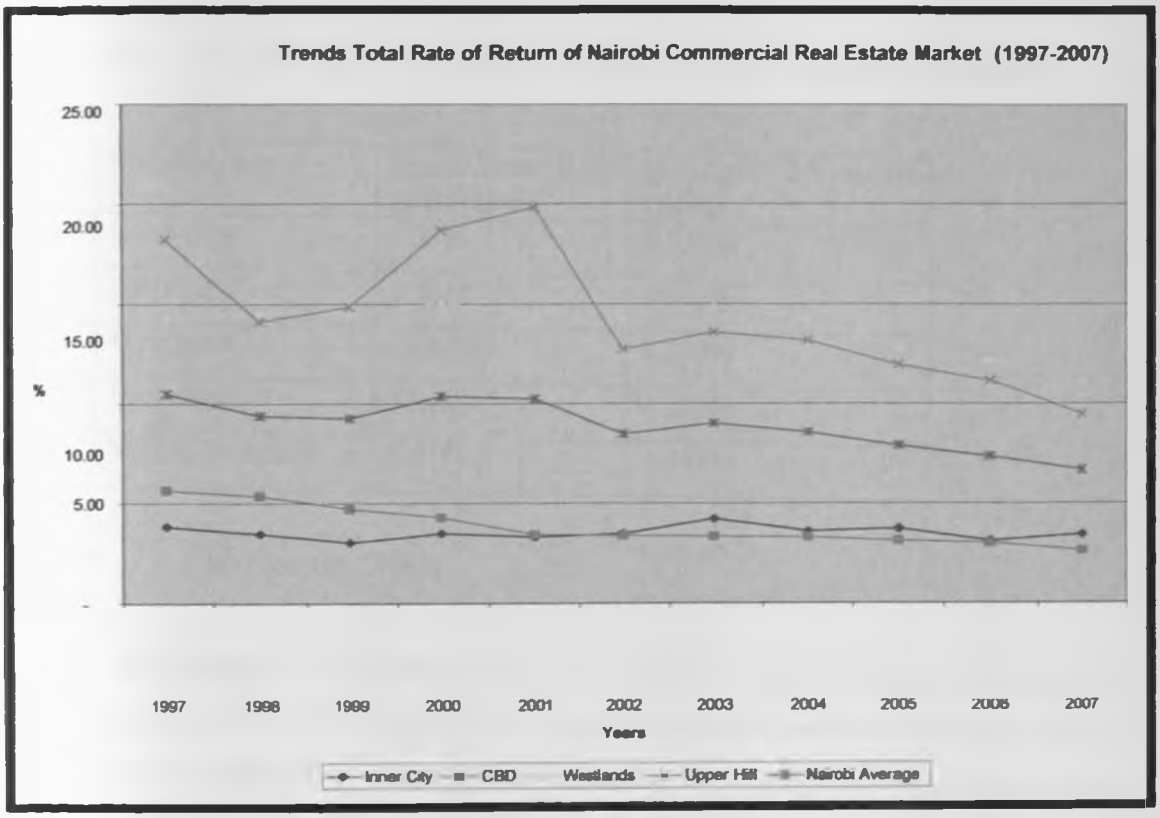
commercial real estate market. Based on the results presented in Table 7.15, the calculated t-value for each year was higher than the critical values. The null hypothesis that there were no differences was rejected. The alternative hypothesis was not supported by the data and the study concluded that the sub-markets showed significant differences in the means of total rate of return for the years 1997-2007. The study concluded that the performance of the commercial real estate market varied between the sub-markets and was, therefore, affected by the changes in the commercial urban form.

It was also observed that the total rate of return had been declining in the past few years as illustrated in Figure 7.12. The commercial sub-markets of Westlands, CBD and Inner City generally recorded declining total rate of return during the period under review of 1997-2007. However, Westlands and Inner City recorded fluctuating total rate of returns, with the years of 1997 to 2001 recording modest growth while the subsequent years were observed to have been the declining phase. The Upper Hill recorded sharp changes in the years 1997 and 2002, before embarking on a general downward trend in the subsequent years.

The overall Nairobi mean total rate of return was observed to have generally declined over the period under review as the commercial sector of the city expanded. The performance of commercial real estate market was further observed to have generally been in the declining phase in the ten (10) years under review as illustrated in Figure 7.12. There were signs of recovery between 1998 and 2000 but it was too minimal to make any major impact in the general trend. The exception was the Upper Hill (due to rapid expansion) that had undergone two phases of expansion and declining during the period under review.

The above findings led to the conclusion that changes in the commercial urban form of Nairobi had had a direct and negative impact on the performance of the commercial real estate market.

Figure: 7.12:



Source: **Field Survey (2009)**

7.4.4 Risk

Risk was defined as the deviation from the expected rate of return. For purpose of this study, risk was measured as the deviation of the total rate of return over the entire period of the study (ten years, 1997-2007) from the mean total rate of return. The measure of risk adopted for this study was the standard deviation. The risk was, therefore, taken as the fluctuation of the returns over the period which was an indication of unpredictability or volatility of the market.

Table 7.18 is a summary of the risk (standard deviation) of the various commercial sub-markets and the entire Nairobi.

Table 7.18: Commercial Real Estate Investment Risks in Nairobi (1997-2007)

	Sub-Market	Mean Total Rate of Return	Standard Deviation (Risk)
1	Inner City	3.27%	0.326%
2	CBD	3.53%	1.012%
3	Westlands	13.47%	1.249%
4	Upper Hill	13.95%	3.289%
	Nairobi (whole)	8.91%	1.248%

Source: Field Survey (2009)

The risk of investing in commercial real estate in Nairobi was observed to be generally low, ranging from 0.326% to 3.289%. This suggested that fluctuations in the rate of return had been low compared to other markets (Newell et al., 1996). The most riskiest sub-market was found to be Upper Hill while the least was the Inner City as illustrated in Figure 7.13.

The high risk associated with Upper Hill was due to the rapid changes in the spatial character and real estate performance as was indicated in Table 6.12. These findings suggested that changes in the commercial urban form affected the risk associated with investing in those centres. The faster the speed of change, the higher was the risk. The study, therefore, concluded that rapid changes were not good for real estate investments.

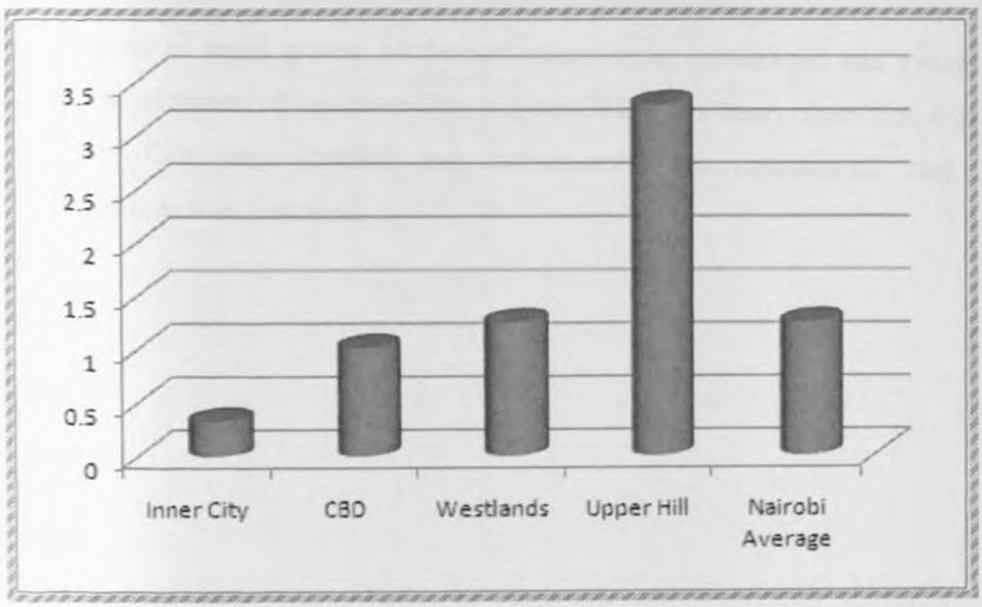
7.5 Summary

The study analysed the performance of commercial real estate market in Nairobi City in terms of perception of the stakeholders and the financial measures of performance (rate of return and risk).

The study found that the commercial sub-market with the highest appeal to both investors and renters was Upper Hill with a mean score of 4.17 out of the highest score of 5. These findings suggested that the performance of the commercial real estate market in Nairobi City was not uniform. The study, therefore, concluded that the commercial real estate

market was segrated between the various commercial sub-markets. This indicated that the changes in the commercial urban form that resulted in several commercial sub-centres had resulted in differentiated performance of the commercial real estate market.

Figure 7.13: Comparison of Commercial Real Estate Risk in Nairobi Commercial Sub-Markets



Source: **Field Survey (2009)**

The study used the total rate of return (rental yield and capital appreciation) and risk to measure the financial performance of the various sub-markets. The sub-market with the highest total rate of return was Upper Hill (13.95%). Westlands, CBD and Inner City followed in that order, thus establishing a hierarchy of real estate sub-markets in Nairobi City. However, it was observed that the overall trend was a fall in the performance of commercial real estate investment over the period considered for this study.

In terms of risk, the sub-market that recorded the highest risk (high volatility in total returns) was Upper Hill (3.289%). This suggested that total rate of returns in Upper Hill had substantially fluctuated over the period of 1997-2007. The sub-market with the least risks was Inner City, suggesting that the sub-market had generally been stable.

The study found that the performance of the commercial real estate was differentiated among the various commercial centres. It was also found that subsidiary centres that were located away from the original core recorded the highest rate of returns, contrary to expectations of the rent theory. It was also observed that the overall performance of commercial real estate market declined during the period 1997-2007. This coincided with the period of rapid growth of the new commercial sub-centres and general deterioration and loss of appeal of the Inner City and the CBD. This study, therefore, concluded that the Nairobi City was inverted and consequently the commercial real estate market performance was distorted.

Chapter Eight:

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

The study developed from a framework that commercial urban forms were a changing phenomenon all over the world, in response to and in reaction to various public and private decisions and actions. The commercial urban form of Nairobi City had likewise changed. However, the changes in the commercial urban form revealed a pattern of neglected and deteriorated Inner City and rapid expansion of new sub-centres. Over time, the new sub-centres had replicated the services, the quality and the problems of the Inner City, thus defeating the key purpose of suburbanization of the centres. There was parity between the various commercial sub-centres of Nairobi and there were no substantial benefits in locating, for example in Upper Hill instead of the CBD. The changing commercial urban form, therefore, resulted in a distorted and underperforming commercial real estate market. This suggested that there was no understanding on the forces of change in the commercial urban form of Nairobi. The changes could, therefore, not be managed properly to maximize the twin benefits of a polycentric urban form namely an efficient city (both to the local governing authorities and the residents) and a high performing commercial real estate market.

The research was, therefore, conceptualized to address the above problem. The objectives of the study were to:

(a) Establish the commercial urban form of Nairobi City;
(b) Identify and rank factors that encouraged the location, relocation and return of office users and investors in and out of the selected commercial centres of Nairobi;
(c) Evaluate the impact of these location and relocation decisions and the resultant commercial urban form on the performance of the commercial real estate market in the various commercial centres;
(d) Make recommendations that will result in efficient and sustainable growth of

the commercial urban form of cities in Kenya and elsewhere in Africa and balanced and achieve highest performance of the commercial real estate market.

It was expected that the meeting of the above objectives would allow the urban authorities in Nairobi and other cities in Kenya and the rest of the Third World to formulate urban development management policies and strategies. This would result in balanced urban development patterns and satisfactory performing commercial real estate markets. The objectives of the study were met and the main findings and conclusions are presented in the following section.

8.2 Summary of Key Findings

The key findings of the study were as follows:

1. The study identified the main commercial sub-centres of Nairobi City as the Inner City, CBD, Westlands and Upper Hill. It was found that the Inner City and CBD were considered as one integrated commercial centre within the same geographical location and with similar spatial characteristics. Westlands was considered an independent commercial centre with distinct geographical boundaries and spatial character while Upper Hill was viewed as a new and nascent centre that was yet to acquire the status of a commercial centre. Based on the perception by the experts/professionals, the study found that the Nairobi commercial urban form was dispersed and polycentric. The key characteristics that differentiated the identified commercial centres, in order of importance, were:
    - Infrastructural developments and urban services;
    - Rental rates;
    - Type of development;
    - Occupancy density; and
    - Land values.

    These findings indicated that the commercial urban form can be profiled and measured based on the above characteristics and attributes.

2. Based on the above findings and the reviewed literature, the study measured the commercial urban form by use of 'dispersion ratio', commuting time, 'density ratio' and professionals/experts opinions. The 'dispersion ratio' and time and cost of travel were tools used to measure the extent to which the commercial urban form was dispersed towards residential neighbourhoods and the results were used to categorize Nairobi as exhibiting either a dispersed or a compacted commercial urban form. The 'density ratio' was used to indicate whether the commercial urban form of Nairobi was either polycentric or concentric. The experts/professionals viewed the commercial urban form in terms of polycentric versus concentric and dispersed versus compact.

The longest distance covered to the CBD and the average distance covered by workers to the various commercial centres (Inner City, CBD, Westlands and Upper Hill) were used to calculate the 'dispersion ratio'. A high ratio was an indication of a highly dispersed commercial urban form. The average travel distance from the outermost residential zone of Nairobi was 10.98 kilometres while the average distance covered by those traveling in private cars was 9.69 kilometres. The 'dispersion ratio' of the identified commercial centres, in descending order, was as follows:

Centre	Dispersion Ratio
Westlands	1.23
CBD	1.64
Inner City	3.28
Upper Hill	5.11

The study found that the most dispersed commercial centre (located closer to residential neighbourhoods) was Upper Hill while the least dispersed was Westlands. The study concluded that Upper Hill met the main aim of dispersion while Westlands did not. The overall 'dispersion ratio' of the Nairobi commercial urban form was 2.03, which was categorized as low level. The study further found that all the commercial sub-centres were located within the western sector of the

city and were not fully dispersed to the residential neighbourhoods. The study, therefore, concluded that the commercial urban form of Nairobi City was polycentric (with many centres) but least dispersed compared to other dispersed cities of the world.

The study found that the mean travel time to places of work was 52.25 minutes while the cost of travel was Kshs. 53.55 per trip. The time of travel was above the average travel time in a compact city and study concluded that Nairobi City exhibited a dispersed commercial urban form. With the exception of Westlands, the distance of travel and cost was almost the same to all other commercial centres, suggesting that the commercial urban form was dispersed away from residential neighbourhoods and located at one point of the city. Based on the time and cost of travel measure, the study found and concluded that the commercial urban form of Nairobi was polycentric but compact (clustered in one geographical area).

According to the reviewed literature, the occupancy densities in a polycentric and dispersed commercial urban form will be higher in the inner cores than the other commercial sub-centres. The average 'density ratio' of a polycentric commercial urban form was 11.86 and 38.50 for a concentric commercial urban form. The occupancy density of the four commercial sub-centres of Nairobi was as presented below:

Centre	Occupancy Density (persons per 1,000.00 square feet)
CBD	8.5
Westlands	9.8
Inner City	16.7
Upper Hill	21.6

The above findings suggested that the commercial urban form was compacted since the newer sub-centres had higher occupancy densities. However, excluding Upper Hill, the original core (Inner City and CBD) had the highest occupancy densities and the study consequently concluded that Nairobi met the criteria to be

classified as a polycentric city. The 'density ratio' was 14.8059 and the study concluded that the commercial urban form of Nairobi was polycentric.

The experts/professionals likewise rated the level of dispersion/polycentrism at 0.64 out of a maximum score 1.00. This suggested that the commercial urban form was polycentric but at medium scale. These findings were consistent with the conclusions arrived by use of the 'dispersion ratio', time and cost of travel and the 'density ratio'.

In the final analysis, the study found that the commercial urban form of Nairobi City recorded a score of 2.62 out of a possible highest score of 5.00 (highly dispersed and polycentric). Based on this score, the study concluded that the commercial urban form was dispersed and polycentric to the medium level. The study further concluded that the commercial urban form of Nairobi City was polycentric but geographically compacted.

3. The reviewed literature postulated that the existence of multiple commercial sub-centres was an indication that the commercial urban form had changed. As discussed in Chapter 5 of this study, the initial commercial centre of Nairobi was Inner City (bounded by the present Tom Mboya Street and River Road). The mere existence of other centres was found to be a clear indication that the commercial urban form of Nairobi had changed over the years. The study used location decisions and duration of location, previous locations and expert/professionals opinions to measure the direction and pace of change of the commercial urban form of Nairobi City.

   Under the location decisions and duration of location, the changes in the commercial urban form was rated in terms of date of move-in, duration of stay in the centre, age of firm, age of firm/duration of occupancy ratio and employees duration of stay. The results indicated that Inner City recorded the highest score of change during the period under review. The sub-centre that recorded the lowest score of change was Westlands, suggesting that the centre was already mature

during the period 1997-2007. Subjecting the scores to a paired t-test of significance showed that there was significant differences among the various centres and the study, therefore, concluded that the commercial urban form had changed.

The study used previous locations to establish the inflows and outflows in the various commercial sub-centres. The net inflows were used to measure the changes in the various commercial centre and the overall commercial urban form. The study found that the CBD (20%) received the highest average employers/tenants inflow while Westlands (17.68%) received the lowest inflows. The CBD, ironically, recorded the highest average outflows of 13.6%, followed by Westlands (10.26%). The centre with the highest net inflows was Upper Hill (14.24%), suggesting that it recorded the highest growth rate and was the main driver in the changing urban form of Nairobi. The gross inflows for each of the commercial centres were further adjusted putting into consideration the employees' movements and the results are presented below.

Rank	Centre	% Growth Rate	Stage of Change
1.	Upper Hill	14.43%	Growth
2.	Inner City	0.00%	Stagnant
3.	Westlands	-5.16%	Decline
4.	CBD	-9.30%	Decline

The above findings suggested that most of the commercial centres declined or remained stagnant. These findings led to a conclusion that the Upper Hill commercial centre was the centre of growth of the commercial urban form. The study, therefore, concluded that the commercial urban form had changed over the period 1997-2007. This conclusion was confirmed by the results of professional/experts opinion on the stages of change among the various commercial urban forms.

4. The conclusion that Nairobi City's commercial urban form had changed over the period selected for this study naturally required an analysis of the factors causing

changes in the commercial urban form. The study identified thirteen (13) factors that were likely to cause location and relocation decisions and hence changes in the commercial urban form. The means of these factors were subjected to a test of significance to rank the most important factors. The most important factors influencing location and relocation decisions and hence the commercial urban form were:

Rank	Factor
1.	Physical state of Inner City
2.	Increase in population
3.	Increase in property prices
4.	Individual location decisions
5.	High economic growth rate
6.	Increase in rents

The above factors can be placed into three ranks, namely spatial factors, natural factors and economic factors. The poor physical state of the Inner City constituted the main spatial factor while increase in property prices and rents and high economic growth rate were categorized as economical factors of change of the commercial urban form. The increase in population, both overall and wage employment, were natural factors in location and relocation decisions. The study concluded that the above ranked factors were the main causes of the changing commercial urban form. The study held the view that the understanding, directing and managing the same would result in an orderly and efficient city that offered the most competitive performance of the commercial real estate investment.

The study found that the poor physical state of the Inner City was the main cause of the location and relocation decisions and changes in the commercial urban form for the period 1997-2007. The main standout manifestations of the poor state of the Inner City, in order of importance, were:

- Inadequate and decayed infrastructure;
- Increased density of occupation;
- Physical decay of the buildings;

- Increasing obsolescence;
- Social problems;
- Rapid conversion of building use;
- Poor environmental conditions;
- Economic problems; and
- Poor performance of real estate investment.

This meant that residents of Nairobi City compared and rated the Inner City relative to other commercial centre using the above observations. The study found that the causes of the above negative aspects and generally the Inner City were many. The study identified and ranked the main causes as follows:

- Poor urban land management;
- Failed urban management;
- Underinvestment in infrastructure; and
- Rigid planning regulations.

The study held the view that addressing the above causes would have and will, in future, result in orderly, efficient and working city and consequently a financial and socially rewarding commercial real estate market. The study found that the above causes can be tackled by instituting a deliberate and citywide programme of Inner City renewal and rehabilitation. The study analysed various renewal and rehabilitation programmes and tools and ranked the most effective tools in descending order of importance as follows:

- Expanding infrastructure services;
- Re-planning the Inner City; and
- Improving the physical conditions of the buildings.

The overall population of Nairobi City increased tremendously as discussed in Chapter 5 above. The increase in wage employment population by 17.94% between 1997 and 2007 was an important pointer to the scale of change in the commercial urban form. The study concluded that increase in the overall population and the wage employment was an important reason for location and

relocation decision and hence the commercial urban form.

Each stakeholder (renters, investors and employees) in the commercial sector of Nairobi City made a location and relocation decision in a particular commercial centre after considering some factors. The study identified and ranked these important individual location and relocation decisions of renters as follows (in descending order of importance):

Rank	Renters Decision Factors
1.	Occupational costs (rent and service charge)
2.	Space for business expansion
3.	Economic growth
4.	Easy access to customers/clients
5.	Transportation system

The above factors fall into two broad categories of business related and physical factors. The need to select a centre with low occupational costs, space for business expansion and general economic growth was an indication that location and relocation decisions were motivated by business and economic factors. The changes in locations and subsequent relocation in response to economic and business factors implied that these individual decisions would have a direct impact on the performance of the commercial real estate market. The above ranking also showed that physical infrastructure was an important individual location decision factor.

The employees were found to play an important role in the changing commercial urban form through their individual location and relocation decisions. The importance of their decisions was based on the fact that commercial sector of Nairobi was predominantly under the service sector that relied heavily on employees to achieve business goals. Each employee considered some factors before making a decision on where to seek employment. The most common factors were found to be the most important location and relocations decisions among

employees in the Nairobi City commercial urban sector. These important factors were identified and ranked as follows:

Rank	Employee's Decision Factors
1.	Size of the commercial centre
2.	Working environment
3.	Wages and salaries
4.	Adequate parking
5.	Transportation system
6.	Urban services

The above factors were found to be the main factors/causes influencing location and relocation decisions of employees. The continuous location and relocation decisions shaped the commercial urban form and the pace of changes. The study held the view that giving special attention to these factors might help a commercial centre change itself orderly, hence affording value to all stakeholders.

5. The physical commercial sub-centres constituted the commercial real estate sub-markets. The study held the view that changes in the spatial condition of commercial centers would have a direct impact on the performance of the commercial real estate market and sub-market. The analysis of the performance of the commercial real estate market during the period of changing urban form was considered an important aspect of the study. The performance of the commercial real estate market was analysed on the basis of perceptions (professionals/experts and investors) and financial/economic measures.

6. The study found that the commercial real estate market was perceived to have performed moderately during the period of review. The professionals/experts rated the performance of the commercial real estate market at a mean of 3.6563 on a scale of 1 to 5. The study further found that the various sub-markets were perceived to have performed differently. The results showed that Upper Hill was the sub-market that received the highest appeal to both tenants and investors. In

addition, it was found that Upper Hill had the lowest risk exposure. The study concluded that based on the perception of experts/professionals, Upper Hill was the peak of the commercial real estate market of Nairobi City.

7. Most of the investors in commercial real property in the various sub-markets during the period under review were 'repeat' investors. This showed that the changes in the commercial urban form through expansion of the commercial sector of Nairobi City presented investment opportunities in real estate.

The study identified key factors that influenced the choice of the centre for real estate investment. These factors were identified and ranked in the following order:

Rank	Reasons for Selecting Sub-Market
1.	High returns
2.	Size of the commercial centre
3.	High rental income
4.	Planning regulations
5.	Nature of property ownership (land tenure)

These findings are consistent with past researches. The high ranking of the rate of return and rental income strongly suggested that investors in any commercial sub-market conducted formal analysis before making investment decisions. The importance attached to the size of the commercial centre, the planning regulations and land tenure clearly indicated that investors considered both economic and geographical attributes in making commercial real estate investment decisions. The study concluded that the spatial conditions and the performance of the real estate market were related.

Once an investment decision had been made and implemented, the study found that investors continuously evaluated the performance of the sub-markets and made decisions to either remain or disinvest. Most of the investors were found to have remained in the sub-markets and the reasons given, in descending order of

importance, were:

Rank	Reasons for Liking Present Sub-Market
1.	Ability to increase rent to match inflation
2.	Ability to pass over the entire running costs to tenants
3.	Returns are higher than the market average rate of return

The study concluded that investors elected to retain an investment in a commercial sub-market, irrespective of its changing spatial quality, as long as the financial performance was higher than other investment vehicles.

The 'repeat' investors retained commercial properties in other sub-markets because these sub-markets offered good tenants, high rental yields, portfolio diversification and secure land tenures. These findings showed that if changes in commercial urban form were properly managed, it would result in a more vibrant and balanced commercial real estate market.

8. The study used the total rate of return (rental yield and capital appreciation) and risk to analyse the performance of the commercial real estate market. This analysis required the determination of the cost of development and the rental income. The basis of analysis was the mean rate per square foot.

9. The value of land exhibited differences between the various commercial sub-markets for the period under review (1997-2007). The CBD was found to have recorded the highest increase in land values of 280.27% to close the period at Kshs. 11,408.20 per square foot. The mean land values in the secondary sub-markets (excluding the Inner City) were found to be generally low and increased at a slower pace than both the Inner City and the CBD. These findings showed that the peak of land values was the CBD followed by the Inner City. The results were subjected to a significance paired t-test of means and the findings showed that there were considerable differences in land values among the various sub-markets. Arising out of the fact that the commercial urban form had changed during the

period selected for this study, it was concluded that changes in the commercial urban form resulted in a distorted performance of the commercial real estate market.

The study adopted a uniform construction cost (actual cost, professional/consultants fees and cost of finance) and assumed that the same was uniform throughout the city. This meant that the cost of constructing a square feet of a commercial building was the same in all the commercial sub-markets. The cost of finance was incorporated in the analysis on the grounds that investment in commercial real estate was a lost investment opportunity. The rate of interest was the opportunity cost and hence the cost of finance. The financial commitments, either debt or equity, were required for the entire period of the project (design and approval stage and actual construction stage). It was found that period of construction for a typical commercial building in Nairobi was 93.85 weeks. However, the study adopted a project period of 100 weeks (2 years) in calculating the cost of finance.

The total cost of development was the sum of the cost of land, actual construction, cost of finance and professional/consultants fees. The results showed considerable variations between the various commercial sub-markets. The study found that the variations were caused by variations in mean land values as explained above. As at end of the year 2007, the commercial sub-market with the highest total cost of development was the CBD (Kshs. 17,240.05 per square foot) while the lowest was Westlands (Kshs. 4,472.79). It was generally observed that the total cost of development was highest in the original core (Inner City and CBD) and lowest in the new sub-markets. These findings clearly showed that the commercial real estate market of Nairobi City was split into two groups.

10. The mean rental rates showed considerable differences among the commercial sub-markets selected for this study. The Inner City had generally recorded lower mean rental rates for the period 1997-2007 but had recorded the highest change of 44.52% (1997- Kshs. 24.82 and 2007- Kshs. 35.87 per square foot per month).

Upper Hill was found to have had a fairly stable mean rental rate for the period and with least changes (0.95%) but reported the highest rental rate (for example Kshs. 43.41 compared to Kshs. 39.62 for the CBD in the year 2007). These results were subjected to a paired t-test of significance and the results showed that the commercial sub-markets showed considerable differences in the mean rental rates. The study concluded that, using the rental rate measure, the performance of the commercial real estate market was distorted.

In order to ascertain the true mean rental income for each sub-market for each year under consideration, the mean rental rates were discounted by the mean occupancy levels. This produced an 'effective rental rate' that was used to calculate the rental yield and the total rate of return. The differences between the commercial sub-markets in the mean rental rates were also found to have been replicated in the mean occupancy levels. The differences were significant in the year 2005 to 2007, indicating a phase of rapid changes in the commercial urban form and the hierarchy of the commercial sub-markets. As at the end of the year 2007, Westlands (96.80%) had the highest mean occupancy levels, followed by the CBD (96.09%). However, the differences were very low between the CBD, Westlands and Upper Hill, suggesting that there was a growing trend towards parity in the demand and appeal of these sub-markets. The comparatively low mean occupancy levels for Inner City was an indication that the same was lagging behind the rest as a result of the poor spatial character. These observations and findings implied that the commercial urban form had influenced the mean occupancy levels and hence the overall performance of the commercial real estate market.

The product of the mean rental rates and the mean occupancy levels was the 'effective rental rate'. The commercial sub-markets showed differences in the mean 'effective rental rates' with the highest being observed in Upper Hill (average of Kshs. 40.33 per square foot per month over the period) while the lowest was recorded in the Inner City (Kshs. 38.07 per square foot per month). This implied that the peak of the commercial real estate market had shifted from the centre to the periphery hence resulting in an inverted city. The inversion was a

result of changes in the commercial urban form and the study concluded that these changes resulted in distorted performance of the commercial real estate market.

11. The total rate of return was taken as the sum of the rental yield and capital appreciation. The study held the view that the total rate of return was the ultimate and the most refined measure of performance of commercial real estate market. This measure allowed real estate to be compared with other investment vehicles and made comparison between the various markets objective.

The sub-market with the highest average mean rental yield for the period under review was Upper Hill (14.37%) and the lowest was the Inner City (3.53%). The result of the paired t-test of significance confirmed that there were differences in the mean rental yields between the various sub-markets for the period 1997-2007. The study found that the peak of the commercial real estate had shifted to new centres, contrary to the rent theory. The study, therefore, concluded that the city of Nairobi was inverted and the performance of the commercial real estate market was distorted. The distortion, the study observed, was caused by differential changes in the urban form in favour of the newer sub-markets. The changes in the commercial urban form, therefore, had a direct impact on the performance of the commercial real estate market and sub-markets.

The study found that there was, on average, negative capital appreciation in all commercial sub-markets for the period 1997 to 2007. However, it was observed that Upper Hill recorded the lowest capital appreciation. The means of capital appreciation showed considerable differences and this confirmed that there were differences in the performance of the commercial real estate among the sub-markets.

Finally, the study ranked the performance of the commercial real estate sub-markets over the period 1997-2007 as follows:

Rank	Sub-Market	Average Mean TROR
1.	Upper Hill	13.95%
2.	Westlands	13.47%
3.	CBD	3.53%
4.	Inner City	3.27%

The above ranking and the results of the paired t-test of significance clearly showed that there were marked differences in the performance of the commercial real estate sub-markets. The reasons for differentiated performance were attributed to high land values and age of the properties. It was found that the value of land in the Inner City and CBD was higher than in the secondary sub-markets. Conversely, the rental income in these sub-markets remained low or significantly closer to the citywide average. The disparity between the pace of change of the land values and rental incomes were evidenced by the low rental yields in the original centres compared to new ones. The relatively high average age of the buildings in the Inner City and CBD necessitated higher capital allowances that lowered the capital appreciation.

The above findings led to the conclusion that the changes in the commercial urban form that occurred between the years 1997-2007 resulted in distorted performance of the commercial real estate market. The study hypothesis was, therefore, accepted.

12. The risk of investing in a commercial sub-market was found to be a key consideration in selecting the investment location. The reviewed literature suggested that there were differences in the risk occurrence between the various commercial sub-markets. The differences indicated a difference in the spatial quality of the centre, the perception of the participants (investors, renters and financiers) and actual volatility of projected returns and returns over the period selected for the analysis.

The study analysed the risk occurrence in the various commercial centre for the period 1997-2007 and the results indicated that the most risky sub-market was Upper Hill (3.289%) and the lowest was Inner City (0.326%). The differences in the mean risk confirmed that the performance of the commercial real estate market was differentiated.

13. Based on the findings and the conclusions so far made, the hypothesis was accepted. The study, therefore, concluded that the changes in the commercial urban form had an impact on the performance of the commercial urban form.

8.3 Test of the Study Hypothesis and Final Conclusion

The hypothesis of the study was that "the emergence of multiple commercial sub-centres in Nairobi City resulted in distorted performance of the commercial real estate market".

In order to undertake a test of the hypothesis, the study developed the two contrasting null and alternative hypothesis as follows:

Ho: That the emergence of multiple commercial sub-centres in Nairobi City did not result in distorted performance of the commercial real estate;

Ha: That the emergence of multiple commercial sub-centres in Nairobi City resulted in distorted performance of the commercial real estate;

For the purpose of this study, 'distorted performance' of the commercial real estate market was viewed in two ways:

(a) If there were differences in the means of the various performance measures;
(b) If the performance of the other sub-centres/markets (Westlands and Upper Hill) was higher than the original centres/sub-markets (Inner City and CBD).

Change in commercial urban form was measured in terms of differences in the selected indicators of urban form.

The average measures of commercial urban form and real estate performance were used to test the hypothesis using paired t-test of significance.

The selected indicators and measures were subjected to a paired t-test to ascertain whether there were differences between the commercial sub-centres/markets. The findings were used to test the hypothesis that the changes in the commercial urban form had not resulted in distorted performance of the commercial real estate market. The paired t-test null hypothesis was (Ho: t=0) at 99% confidence level. The results are presented in Table 8.1.

Based on the results presented in Table 8.1, the calculated t-values for each indicator of commercial urban form and measure of performance of commercial real estate market were higher than critical values (t=0). The null hypothesis that the urban form did not result in distorted performance of the commercial real estate market was not accepted. The alternative hypothesis was supported by the data collected and the study concluded that the changes in the commercial urban form (as measured by the emergence of several centres) resulted in a distorted performance of commercial real estate market.

This simply means that a rapidly changing urban form results in distorted performance of the commercial real estate. In the context of Nairobi City, the rapid growth of the city as evidenced by the increase in the number of commercial sub-centres (between 1997 and 2007) resulted in falling total rate of return, high volatility of the returns (as measured by risk) and differences in performance among the various commercial sub-centres.

Table 8.1: Comparison of Means Using t-values of Urban Form Indicators and Total Rate of Return for the Various Commercial Sub-Centre/Markets

Pair-Centres	t-value
Dispersion Ratio	0.264
Time of Travel	16.961
Expert Opinion	3.281
Occupancy Density	3.848

Pair-Centres	t-value
Occupancy Characteristics	1.786
Net Growth Rate	0.520
Net Future Inflows	3.347
Total Rate of Return	2.529

Source: **Field Survey (2009)**

The conclusion that the changes in the commercial urban form resulted in distorted performance of the commercial real estate markets is, on its own, not adequate for decision making by investors and other stakeholders. A further analysis of the data was found necessary in order to establish the most important surrogates of the measures of commercial urban form that made the highest contribution towards the performance of the commercial real estate markets and sub-markets. This will allow investors, urban managers and other stakeholders to direct urban resources and efforts towards those factors that have the highest impact on the performance of commercial real estate markets.

Swazuri (1996) and Talukaba (1999) used the step-wise regression analysis in studies aimed at determining the contribution each independent variable had on the dependent variable. The aggregated data of this study was, therefore, subjected to a regression analysis to rank the contribution of the various measures of commercial urban forms (independent variables) listed in Table 8.1 and the performance of the commercial real estate markets (dependent variable) as measured by the total rate of return. The study adopted the beta coefficient as proposed by Crockett (1988).

The independent variables (dispersion ratio, time of travel, expert opinion, occupancy density ratio, occupancy characteristics, net growth rate and future net inflows) were subjected to correlation analysis to rank the most important factors. The results are presented in Table 8.2.

Table 8.2: Correlation Coefficient of Independent Variables against Dependent Variable

	Dependent Variable: Total Rate of Return (TROR)
Dispersion Ratio (DR)	0.217
Time of Travel (TOT)	0.117
Expert Opinion (EO)	0.845
Occupancy Density Ratio (ODR)	0.275
Occupancy Characteristics (OC)	-0.679
Net Growth Rate (NGR)	0.518
Net Future Inflows (NFI)	0.655

Source: Field Survey (2009)

The above analysis indicates that expert opinion, occupancy characteristics, net growth rate and net future inflows were the surrogate measures of commercial urban form that contributed the most towards the performance of commercial real estate market. This simply means that attention these factors will allow investors, urban managers and other stakeholders manage changes in the commercial urban to result in a highly performing and efficient real estate market.

A further review of the results indicated that some independent variables were explained by and were closely associated with other variables. They were assumed that their removal or elimination from the equation will not substantially affect the outcome of the analysis. These variables tended to have strong correlation with the dependent variable (total rate of return). These variables were 'expert opinion' and 'occupancy characteristics'. The study assumed that the expert opinion was informed by prior knowledge about the performance of the various commercial sub-markets and hence the results of the 'expert opinion' were a summation of the other measures of commercial urban form. The occupancy characteristics were, in the opinion of the researcher, a reflection of the occupancy density and net growth rate and vice versa. Two other variables, 'time of travel' and 'dispersion ratio' had correlation coefficient that did not meet the criteria set by Kane (1990) and were

eliminated from the analysis. The elimination of these two variables is consistent with findings presented in Section 6.3 that concluded that the commercial sub-centres were clustered in one geographical location of Nairobi City. These variables did not, therefore, have any significant impact on the performance of the commercial real estate in the various sub-markets.

The remaining independent variables, namely 'occupancy density ratio (ODR)', 'net growth rate (NGR)' and 'net future inflows (NFI)' were found to contribute the highest to the outcome of the dependent variables. The results of the regression analysis are presented below:

Constant:	-7.568
R^2 Regression Coefficient (Coefficient of Determination)	1.00
R^2 Change	1.00
Beta Coefficients:	
Occupancy Density Ratio (ODR):	0.614
Net Growth Rate (NGR):	0.637
Net Future Inflows (NFI):	0.765

The model can now be fashioned as follows:

Total Rate of Return (TROR) = -7.568 + 0.614(ODR) + 0.637(NGR) + 0.765(NFI)

The negative constant suggests that the relationship between the performance of the commercial real estate markets and changes in the commercial urban form is an inverse relationship. This implies that changes in the commercial urban form results in falling performance of the commercial real estate markets. These findings are consistent with the conclusions drawn from the test of hypothesis using the comparison of means and the initial study conceptualization.

The strong R^2 of 1 suggests that the 'occupancy density ratio', 'net growth rate' and 'net future inflows' completely account for variations in performance of the commercial urban

form. This implies that the three independent variables can allow investors and experts to predict the likely performance of the commercial real estate market of any urban centre during the period of change in the commercial urban. These factor and model (equation) can now be used to predict the likely average performance of commercial real estate investment in any given urban centre that has similar urban form as Nairobi City.

Finally, the study concluded that changes in the commercial urban form of a rapidly changing city results in distorted performance of the commercial real estate markets. The changes in the commercial urban form take the pattern of establishment of new commercial sub-centres in addition to the existing inner core sub-centres. The most important factors causing changes in the commercial urban form is the state of the inner city, increase in population and individual (employers, employees and investors) location and relocation decisions. The resultant commercial urban form can be measured by several surrogates or measures of commercial urban form. These measures are dispersion ratio, time of travel, expert opinion, occupancy density ratio, occupancy characteristics, net growth rate and net future inflows.

The changes in the commercial urban form caused by the above factors inevitably leads to distorted performance of the commercial real estate market. The distortion in the commercial real estate market is manifested in performance inversion where newer centres record higher performance and general fall in the average market rate of return. The most important factors accounting for changes in the performance of commercial real estate market are occupancy density ratio, net growth rate and net future inflows. It is now trite to conclude that the spatial quality (in terms of infrastructure, standards of building maintenance among others) of an commercial urban centre or sub-centre and the perception the market holds about that centre, now and in the future, determines the average performance of its commercial real estate investment. To maximize returns from the real estate investments, the urban managers must now focus on improving the spatial quality of the urban centres.

It is possible that the imbalance and falling performance of the commercial real estate markets experienced in Nairobi during the period 1997-2007 would have been avoided

had the urban authority (City Council of Nairobi and the Government of Kenya) made concerted and proactive efforts to achieve an acceptable and sustainable level of occupancy density and net growth rate and ensured a balanced distribution of renters and investors in the various commercial sub-centres.

8.4 Recommendations

The study has concluded that the commercial urban form of Nairobi had changed over the period selected for the study (1997-2007). The analysis of the measures of commercial urban form has revealed that spatial character of an urban centre has the highest the impact on the changes in the performance of commercial real estate market. The overall impact of changes in the commercial urban form is distorted (and falling) performance of commercial urban form. The changes in the commercial urban form will continue as the population of Nairobi City increases and the general economy improves. It is incumbent upon the Government (both central and local), the inhabitants, investors and other stakeholders to formulate workable policies and management structures to ensure that the changes are orderly and result in the highest returns to the investors in real estate.

The study recommends the following:

1) That the Inner City and the CBD must be provided with adequate infrastructure and urban services. This will ensure that they are appealing to renters and investors in the same way as the new sub-centres. This will require well coordinated urban regeneration programs, both at the sub-centres and the entire city. This will result in the commercial urban form that is differentiated on the basis of use and scale of operation instead of quality of buildings and the neighbourhood.

2) That the Nairobi City Council should review the current urban management policies and practices. This will achieve a sustainable and market responsive occupancy densities, a manageable growth rate of the various commercial sub-centres and sustainable net future tenants and investors' inflow to the various commercial sub-centres.

3) That the management of urban authorities should address areas of weakness such as management of developments (both buildings and infrastructure) and urban services. The focus should be the review of legal, institutional and personnel frameworks.

4) That the real estate industry should develop real estate measurement benchmarks and tools and regularly publish the results to enable investors make informed investment and disinvestment decisions between the various sub-markets and property types. The availability of information on real estate investment will enhance real estate investment analysis, improve the accuracy of investment decisions and generally increase the performance of real estate investment. The performance benchmarks should be used by the Government to initiate sound market intervention programmes during the period of rapid changes in the commercial urban form.

5) That the Government should invest heavily in research on the changing urban forms to understand the impacts they have on the efficient and sustainable development and management of urban centres. The findings of these researches will guide the Government on the most sustainable urbanization policy to be adopted.

8.5 Areas of Further Research

The study was exploratory and identified several factors/causes of the commercial urban form and real estate market. The initial conceptualization of the study and the limitations imposed by resources (time, financial and availability of information) meant that a small part of the phenomenon was discussed. The study, therefore, identified areas that require further research as follows:

- The suburbanization of Nairobi (residential, commercial and industrial) and its impact on the efficiency and sustainability of Nairobi City and the neighbouring urban centres.

- A comparative study between Nairobi and another city in the more developed countries to establish the impact of urban management (all encompassing) on rate of return on investments and businesses and welfare of the inhabitants.

- A long-term and quantitative study to allow for the determination of property performance cycles.

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Appendix

Questionnaires

UNIVERSITY OF NAIROBI

PhD Thesis Research

Commercial Real Estate Investment Decision and Performance

Interview Form

"The Impact of Urban Forms on the Performance of Commercial Real Estate Markets: A Case Study of Nairobi"

The information that you provide will be used for academic purposes only. You are, therefore, assured of confidentiality of the information you will provide. In case of any inquiries, please contact the student, Mr. Oundo on telephone 0736122083/0722737901. Thank you!

1. **Building Details**

   (a) Name of the Building.....

   (b) Approximate Age of Building.....

   (c) No. of Floors (include ground floor but exclude basement).....

   (d) L.R./Title Number of the plot.....

   (e) Area of the plot (in acres).....

   (f) Total Built-up Area (in square feet but exclude basement).....

2. **Date of Investment/Purchase:**.....

3. **Street Name/Road**.....

4. **Centre** (*Inner City, CBD, Westlands, Upper Hill*).....

5. Is this your first investment? YES ☐ or NO ☐

6. If YES,

(a) What were the reasons for investing in the property located in this centre? S*elect your reasons for investing from the list below and rank them on a scale of 1 to 5 (Not Important to Very Important)*

(i)	Size of commercial centre	_____
(ii)	Planning regulations	_____
(iii)	Availability of cheap land for construction	_____
(iv)	Cost of property	_____
(v)	Renewed neighbourhood	_____
(vi)	Nature of property ownership (land tenure)	_____
(vii)	Lack of alternative investment sites	_____
(viii)	Speculation	_____
(ix)	Good quality tenants	_____
(x)	High rental income	_____
(xi)	High returns	_____
(xii)	Portfolio diversification	_____

(b) Are you satisfied with the state of the commercial centre as an investment location?

YES ☐ NO ☐

(c) If YES, what have you have liked about this commercial centre as an investment location? *Select and rank the reasons from a list below of a scale of 1 to 5 (Not Important to Very Important)*

(i) The returns are higher than market average rate of return _____

(ii) Ability to increase rent to match inflation _____

(iii) Ability to pass over the entire running costs to tenants _____

(iv) High quality tenants _____

(v) Good quality of neighbouring properties _____

(vi) Others (state)_____

(d) If NO, what are the reasons for dissatisfaction- *select your reasons for dissatisfaction with the current centre from the list below and rank them on a scale of 1 to 5 (Not Important to Very Important)*

(i) The overall quality of the centre has not improved _____

(ii) The overall quality of the centre has deteriorated _____

(iii) The speed of improvement is very slow _____

(e) Are you considering moving out of the centre? YES ☐ NO ☐

(f) If YES, when are you moving out?- *select and rank the following likely event(s) that you will consider the most appropriate time to move out on a scale of 1 to 5 (Not Important to Very Important)*

(i) As soon as a buyer is found for the property _____

(ii) As soon as an alternative property is found _____

(iii) When the condition of the centre does not improve _____

(iv) When the economy does not improve _____

(v) When the financial performance of the property does not improve_____ _____

(vi) If the capital value of the property does not appreciate above the rate of inflation _____

(vi) As soon as the consultant advices to move _____

(g) If NO, what are your reasons for staying in the centre?-*select your reasons for staying within the current centre from the list below and rank them on a scale of 1 to 5 (Not Important to Very Important)*

(i) Hoping that the centre will improve _____

(ii) High rate of return _____

(iii) Lack of alternative and affordable properties _____

(iv) Chances of rebate on taxation _____

(v) Advised to stay by consultant _____

(vi) Expecting nature of businesses/tenants to improve _____

7. If you had invested elsewhere before this centre:

(a) Where had you invested before you decided to invest in this centre?_____

(c) Did you sell or retain the property in the other centre?

SOLD ☐ RETAINED ☐

(b) If SOLD, what were the reasons that you divested from the previous centre- *select your reasons for leaving the previous centre from the list below and rank them on a scale of 1 to 5 (Not Important to Very Important)*

(i) Decay of the commercial centre _____

(ii) Overcrowding in the commercial centre _____

(iii) Inadequate size of the centre _____

(iv) Lack of urban and infrastructure services _____

(v) Restrictive planning regulations _____

(vi) Lack of land for expansion _____

(vii) Unsecure land tenure _____

(viii) Excessive government control _____

(ix) Poor land management practices _____

(x) Low rental rates _____

(xi) Lack of good quality tenants _____

(xii) Low returns on investment _____

(xiii) Low capital appreciation _____

(xiv) High land taxation _____

(xv) High running costs _____

(c) If RETAINED, what were the reasons for retaining?- *select the likely reasons from the list below and rank them on a scale of 1 to 5 (Not Important to Very Important)*

(i)	Portfolio diversification	_____
(ii)	No good offers for purchase	_____
(iii)	Commercial centre improved	_____
(iv)	Hoping the centre improved	_____
(v)	High rental yields	_____
(vi)	High capital appreciation	_____
(v)	Low land taxation	_____
(vi)	Secure land tenure	_____
(vii)	Good tenants	_____
(viii)	Low running costs	_____

-END-

UNIVERSITY OF NAIROBI

PhD Thesis Research

Professionals and Experts Interview Form

The Impact of Urban Forms on the Performance of Commercial Real Estate Markets: A Case Study of Nairobi"

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General

(a) Name/Number (Optional).....

(b) Years of practice.....

(c) Profession .....

Urban Form

(a) What do you think is the form of the commercial section of the Nairobi City?

(i) Dispersed with many centres ☐

(ii) Concentrated with only one centre ☐

(iii) Others (specify)_____

(b) If (i), what do you think are the causes of the dispersion? *(Rank the following causes on a scale of 1 to 5 in terms of Least Important to Most Important)*

(i) Increase in population ☐

(ii) Planning decisions ☐

(iii) Increase in rents ☐

(iv) Increase in property prices ☐

(v) High economic growth rate ☐

(vi) Location decisions ☐

(vii) Improved transport system ☐

(vii) Urban sprawl ☐

(viii) Geographical features ☐

(ix) Technological advances ☐

(x) Physical state of the inner city ☐

(xi) Nature of property and land rights ☐

(xii) Changes in rental and occupancy status ☐

(xiii) Others (specify)_____

(c) (i) Do you think there are differences between the various commercial centres?.....

(ii) If YES, what are the main factors/characteristics that differentiate the centres? *(Rank the following factors/characteristics on a scale of 1 to 5 in terms of Least Important to Most Important)*

- Use ☐
- Land values ☐
- Real estate prices ☐
- Rental rates ☐
- Density ☐
- Type of development ☐
- Sizes of occupied spaces ☐
- Size of businesses/firms ☐
- Type of communication channels for business ☐
- Infrastructural developments and urban services ☐
- Others (specify) _____

Commercial Subcentres

(a) Would you consider the following centres as separate and independent commercial centres?

Centre Name	Boundary	Is it an independent centre	
		YES	NO
CBD	Uhuru Highway, University Way, Kimathi Street and Haile Selassie Avenue		

Nairobi Downtown (Inner City)	Kimathi Street, Nairobi River and Ronald Ngala		
Upper Hill/Hurlingham	Uhuru Highway, Argwings Kodhek, Masaba Road and Ngong Road		
Westlands	Chiromo Road, Museum Hill Road, Parklands Road, Sports Road and School Lane		
Mombasa Road	Nyayo Stadium to Airport North Road junction		

(b) Which of the centres have the highest appeal to tenants and receive the largest nu of inquiries for properties/plots to purchase? (*Rate your opinion on a scale of 1 with Least to Highest*)

Centre Name	Boundary	Appeal to Tenants	Appeal to Investors
CBD	Uhuru Highway, University Way, Kimathi Street and Haile Selassie Avenue		
Nairobi Downtown (Inner City)	Kimathi Street, Nairobi River and Ronald Ngala		
Upper Hill/Hurlingham	Uhuru Highway, Argwings Kodhek, Masaba Road and Ngong Road		
Westlands	Chiromo Road, Museum Hill Road, Parklands Road, Sports Road and School Lane		
Mombasa Road	Nyayo Stadium to Airport North Road junction		

(c) Based on your answer above, do you think the appeal of the currently good centr waning?.....

(d) Do you think that the physical and infrastructure conditions of various centres changing?.....

(e) If Yes, at what stage of change is each of the centres?.....

(*Growth, Stability, Decline, Revitalization*)

Centre Name	Boundary	Stage of Growth
CBD	Uhuru Highway, University Way, Kimathi Street and Haile Selassie Avenue	
Nairobi Downtown (Inner City)	Kimathi Street, Nairobi River and Ronald Ngala	
Upper Hill/Hurlingham	Uhuru Highway, Arwings Kodhek, Masaba Road and Ngong Road	
Westlands	Chiromo Road, Museum Hill Road, Parklands Road, Sports Road and School Lane	
Mombasa Road	Nyayo Stadium to Airport North Road junction	

Inner City

(a) In your opinion, which is the inner city of Nairobi? (*Describe using* *roads)*……

……

(b) How would you rate the state of the inner city compared to other centres? (*Rate on a sc* *of 1 to 5- Worse to Good*)……..

(c) If your rating is less than 3, why do you think are the main causes of the poor state of inner city? *(Rate your view on a scale of 1 to 5- not important to main cause)*

(i) Low Economic Growth Rate ☐

(ii) Underinvestment in infrastructure ☐

(iii) Underinvestment in building maintenance ☐

(iv) Rigid planning ordinances ☐

(v) Failed urban management ☐

(vi) Poor urban land management

(vii) Government policy of decentralization ☐

(viii) Individual location and investment decision ☐

(ix) Others (specify)_____

(d) What are the standout manifestations of the inner city? (*Rate on a scale of 1 to 5- least outstanding to most outstanding)*

(i) Physical decay of the buildings ☐

(ii) Increasing obsolescence ☐

(iii) Increased density of occupancy ☐

(iv) Rapid conversion of building use ☐

(v) Inadequate and decayed infrastructure ☐

(vi) Social problems (e.g., poverty etc) ☐

(vii) Economic problems ☐

(viii) Poor environmental conditions ☐

(ix) Poor performance of real estate investment ☐

(e) What are the consequences of the poor state of the inner city to the whole of Nairobi? (*Rate on a scale of 1 to 5- least to highest consequences)*

a. Real estate market imperfections ☐

b. Inversion of rent and real estate pricing ☐

c. Distorted development patterns ☐

d. Rapid loss of real estate stock ☐

e. Others (specify) _____

(f) Do you think rehabilitation/renewal will improve the state of the inner city?.....

(g) If YES, what do you think are the most effective renewal/rehabilitation tools? (*Rate the tools below on a scale of 1 to 5- least effective to most effective)*

(i)	Improve economies of the inner city	☐
(ii)	Improve the physical condition of buildings	☐
(iii)	Expand infrastructure services	☐
(iv)	Alleviate poverty and other social problems	☐
(v)	Reduce residential sprawl	☐
(vi)	Halt decentralization of commercial centres	☐
(viii)	Re-plan the inner city	☐
(ix)	Increase the land rates for inner city	☐
(x)	Increase lending for inner city projects	☐
(xi)	Guarantee ground lease renewal	☐
(xii)	Abolish Tenants & Landlord Act	☐
(xiii)	Offer subsidies	☐

Commercial Real Estate Markets

(a) In your opinion, what has been the performance of the real estate market in the year 1997 to 2007? (*Rate your opinion on a scale of 1 to 5- Bad to Very Good)*.....

(b) Among the several investment vehicles (**commercial real estate, government bonds, stocks/share, saving accounts and secondary financial tools**), where will you place commercial real estate? (*Rank between 1 and 5)*.....

(c) Do you think that the Inner City, CBD, Upper Hill and Westlands are separate real estate sub-markets?

(d) If YES, do you think there is a difference in the performance of the commercial real estate among the centres?.....

(e) If YES, rank the performance of the real estate sub-markets (*rank from No. 1 to No. 4)*

Centre	Position
• Inner City	_____
• CBD	_____
• Upper Hill	_____
• Westlands	_____

(f) Among the centres, which is the most risky to invest in? (*Rate your response of the risks listed below on a scale of 1 to 5- Low Risk to High Risk)*

Centre	Market Risk	Tenant Risk	Planning Risk	Legislative Risk	Liquidity Risk	Legal Risk	Financial Risks	Pure Risk
Inner City								
CBD								
Upper Hill								
Westlands								

-END-

UNIVERSITY OF NAIROBI

PhD Thesis Research

Employees' Location Decisions

"The Impact of Urban Forms on the Performance of Commercial Real Estate Markets: A Case Study of Nairobi"

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1. **Name of Commercial Centre** (*Select between CBD, inner city, Westlands & Upper Hill*).....

2. **Interviewee Name/No. (Optional):** .....

3. **Sex:**.....

4. **Age of Interviewee:** Below 18 years ☐ 18-27 years ☐

   28-40 years ☐ 40-55 years ☐ Over 55 yrs ☐

5. **Highest Level of Education:** Primary ☐ Secondary ☐ University ☐

   College ☐ Polytechnic ☐

   Others (indicate)----------

6. (a) What is your mode of travel to work? Road Public Transport ☐

Public Train Transport ☐ Walking (on foot) ☐

Private Car ☐

(b) If public means, how many minutes/hours does it take you to travel to your place of work?.....

(c) If public means, how much money do you pay as bus fare (one way)?.....

(d) If you have a car, how many kilometers do you cover to work?.....

(e) If you have a car, how many hours/minutes do you take to travel to work?.....

(f) How much do you spend on fuel to travel to work on each day? .....

(g) Did the ownership of the car influence the choice of your place of work? Yes ☐

NO ☐

7. Do you cross the CBD on your way to work? YES ☐ NO ☐

8. For how long have you worked in this centre?.....

9. If less than 2 years, which centre were you before? (*Select between the CBD, inner city, Upper Hill and Westlands*).....

10. If you have changed location in the past two (2) years, why did you change? (*Select and rank the reasons in terms of importance on a scale of 1 to 5).*

	Reasons for change of working building/centre	**Rating**
a)	Desire to work in a less crowded place	
b)	Desire to work in a bigger centre	

c)	Desire to work closer to place of residence	
d)	Desire to reduce commuting cost and time	
e)	Seeking desired level of urban services (water, security, shopping centres etc)	
f)	In search of adequate parking	
g)	Escaping poor physical condition of the neighbourhood and the buildings	
h)	Ownership of car	
i)	Seeking better public transportation system	
j)	Availability of interconnection routes	
k)	Hope that the neighbourhood will be rehabilitated/renewed	
l)	Seeking higher wages and other allowances	
m)	Satisfaction with the working environment	
n)	Compatibility with neighbouring tenants/occupants	
o)	Availability of affordable eating places	
p)	Easy access to ICT (internet, reliable telephone lines, e-mail, fax etc)	

11. (a) Are you satisfied with your current working environment?.....

(b) Does the current working environment affect your work performance?.....

(c) Would you change from this centre to another if you were given an opportunity?.....

(d) If Yes, which centre would you wish to work in?.....

-END-

UNIVERSITY OF NAIROBI

PhD Thesis Research

Tenant/Employer Location and Relocation Decision

"The Impact of Urban Forms on the Performance of Commercial Real Estate Markets: A Case Study of Nairobi"

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1. **Commercial Centre** (*Select between CBD, Inner Core, Westlands & Upper Hill*).....

2. **Interviewee Basic Details**

   (a) Age of the company (Number of years in operations).....

   (b) Sector of the economy: Professional consultancy sector ☐

   Logistics and supplies ☐

   ICT ☐

   Retails and resellers ☐

   Training and educational ☐

   Small-scale manufacturing ☐

Financial ☐

Others ☐

(c) Size of the organization- No. of employees.....

(d) Category of employees- % of Professional/Graduates .....

% of Skilled staff .....

% of Semi- skilled.....

% of Unskilled and subordinate.....

% of Male staff.....

% of Female staff.....

(e) Size of the organization- Area occupied in square feet.....

(f) Size of the organization- Turnover in Kshs. (Millions).....

(g) Is your business sensitive to changes in labour costs?.....

3. **Business client/customer base**

(a) Where are majority of your clients located? Within the centre ☐

In other centres ☐

(b) Are your customers/clients satisfied with your current location?

YES ☐ NO ☐

(c) If NO, are you contemplating moving to another centre in order to satisfy your clients/customer?

YES ☐ NO ☐

4. **Location Decision**

(a) For how long have you been in this centre?.....years

(b) Is this the first location of your business?----------

(c) If NO, where were you before?.....

5. If less than 5 years, which centre were you located before? (*Select between the CBD, downtown, Upper Hill and Westlands)*.....

6. If you have changed location in the past five (5) years, what were the reasons for change? *(Select and rank the reasons in terms of importance on a scale of 1 to 5).*

	Reasons for change of building/centre	**Rating**
a)	Overcrowding in the neighbourhood	
b)	Size of commercial neighbourhood	
c)	Desire to locate closer to place of residence of employees	
d)	Loss of agglomeration/lack of business	
e)	Lack of desired level of urban services (water, security, shopping centres etc)	
f)	In search of adequate parking	
g)	Poor physical condition of the neighbourhood and the buildings	
h)	High occupational costs (rent, service charge)	
i)	Better transportation system to reach customers/clients	
j)	Need to locate close to customers/clients	
k)	Need to locate close to source of raw materials/inputs	

l)	Hope that the neighbourhood will be rehabilitated/renewed	
m)	Need to lower labour costs	
n)	Ability to use modern communication tools to conduct business	
o)	Compatibility with neighbouring tenants/occupants	
p)	Planning regulations	
q)	Ability to enjoy controlled tenancy	
r)	Economic growth	
s)	Lack of space for expansion of business	
t)	Change in cost structure	

7. (a) Area you satisfied with your current office space in this neighbourhood?.....

(b) If Yes, would you move if the conditions changed?.....

(b) If No, are you planning to move?.....

(d) If you were to move, which commercial centre will you go to?.....

-END-