Property-Level Performance Attribution: Demonstrating a Practical Tool for Real Estate Investment Management Diagnostics

by

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Submitted to the Program in Real Estate Development in Conjunction with the Center for Real Estate in Partial Fulfillment of the Requirements for the Degree of

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ABSTRACT

Real estate investment firms have the ever increasing need for understanding their firm's strengths and weaknesses, their performance relative to their peers and competitors, and for developing assessment tools for facilitating more informed investment and management decisions. One potentially very useful tool to further these objectives, a tool that is so far underutilized and underappreciated, is investment performance attribution analysis. Such performance attribution may be broadly characterized as the partitioning of the total investment return of a particular manager or portfolio in order to quantify and help to understand and assess the components and determinants of the overall investment performance.

Traditional investment attribution analysis, adopted from the securities investment industry, has focused primarily on the portfolio level, where property selection and allocation factors are the two primary attributes of total return that can be parsed and benchmarked. In the case of real estate investments, property-level investment functions such as operational management and asset transaction execution, which are not captured by a traditional attribution analysis, also play a major role in the overall investment returns.

During the past two decades a system to drill the investment performance attribution down to a deeper level, separating the asset "selection" component into further breakouts, including income return and components of the capital return (cash flow change and yield change), have been propounded by influential firms such as the Investment Property Databank (IPD) based in the UK. In a 2003 article David Geltner proposed a system for property-level performance attribution (PPA) based on the since-inception IRR of each individual property investment.

This thesis furthered Geltner's work on PPA by an in depth exploration of the application of the IRR-Based Property-Level Performance Attribution analysis based on a large-scale, real-world-based case study of a complete set of actual core-asset round-trip transactions completed by several internally managed funds in the institutional investment industry. Furthermore, this thesis explored the use of PPA for organizational management diagnostics, and thereby demonstrated the potential of using the PPA analysis as an investigative tool for developing plausible hypotheses about a firm's investment management strengths and weaknesses.

Thesis Supervisor: David Geltner

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This thesis would not have been possible without the advice and support of many people and organizations. I would like to sincerely thank my thesis advisor Professor David Geltner for his guidance and support throughout the process. Professor David Geltner developed the IRR-based property-level performance attribution methodology that serves as the foundation for the analytical work performed in this thesis. His assistance with the sourcing of industry data made this thesis possible.

I would like to thank the various real estate investment firms that contributed the financial returns information related to their investment deals. The names of the firms and individuals who have assisted with providing the data necessary to complete this thesis will not be specified so as to maintain their confidential status, however, I would like to thank them for their generosity and willingness to provide such sensitive information to further the pool of knowledge relating to property performance attribution.

I would also like to thank all of my fellow classmates, the faculty and staff of the MIT Center for Real Estate for making this year such a memorable and enriching experience. Special thanks go to Kevin Fagan, a classmate who explored this thesis topic along with me and provided valuable input.

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CHAPTER 1: INTRODUCTION

Research Motivation

The motivation for this thesis responds to the ever increasing need that real estate investment firms have for understanding their firm's strengths and weaknesses, their performance relative to their peers and competitors, and for developing assessment tools for facilitating more informed investment and management decisions. The development of quantitative tools for assessing, analyzing, and diagnosing real estate investment performance can help increase transparency in the industry and attract more investment capital into the real estate sector, as well as promote better asset management practice for the benefit of investors. The less mystery there is in real estate investment returns and risk exposure, the more effectively real estate will be able to compete with other asset classes for investment capital.

One potentially very useful tool to further these objectives, a tool that is so far underutilized and underappreciated, is investment performance attribution analysis. Such performance attribution may be broadly characterized as the partitioning of the total investment return of a particular manager or portfolio in order to quantify and help to understand and assess the components and determinants of the overall investment performance.

Traditional investment attribution analysis, adopted from the securities investment industry, has focused primarily on the portfolio level, where property selection and allocation factors are the two primary attributes of total return that can be parsed and benchmarked. In the case of real estate investments, property-level investment functions such as operational management and asset transaction execution, which are not captured by a traditional portfolio attribution analysis, also play a major role in the overall investment returns. These property-level factors may be viewed as "missing links", and they will be the focus of this thesis.

IRR-Based Property-Level Attribution

As noted, traditional investment performance attribution has focused primarily at the portfolio level, on sector allocation and asset selection components of the total return performance. Such portfolio level attribution is understandably based on time-weighted average returns at the portfolio level. During the past two decades a system to drill the investment

performance attribution down to a deeper level in real estate, separating the asset "selection" component into further breakouts, including income return, and components of the capital return (cash flow change and yield change), have been propounded by influential firms such as the Investment Property Databank based in the UK. As thusly traditionally developed, such a "property level" of performance attribution is also based on time-weighted average returns, in part so as to enable a comprehensive and consistent tie-back to the portfolio-level "selection" attribute. But in basing property-level performance attribution on time-weighted returns something is lost, in particular, the ability to sharply focus the analysis on the actual property-level investment management functions performed by asset managers "in the trenches".

With this in mind, in a 2003 article David Geltner proposed a system for property-level performance attribution based on the since-inception IRR of each individual property investment. The primary focus of this thesis is to perform a large-scale, real world based practical "test" of this new performance attribution system, by applying it to a large set of typical institutional core real estate investment assets.

Purpose & Hypothesis

This thesis explores the application of the IRR-Based Property-Level Performance Attribution analysis based on a case study of a complete set of actual core-asset round-trip transactions completed by several internally managed funds in the institutional investment industry. In effect, this thesis operated as if it were a "consulting project" for a "client" consisting of a group of institutional real estate investment funds who came together out of a sense that they shared a similar management and operational environment, and hence could benefit from an integrated look at their property-level investment performance. The specific fund's desire to remain anonymous, and certain minor aspects of their data have been modified or transformed for purposes of the analysis herein without substantively changing the results. The analysis in this thesis is based on a large number of the combined individual property investment histories from the "client" group of funds, consisting of "cradle-to-grave" property investment histories, that is, from acquisition through final disposition. These investment properties consist of the totality of the client funds' core assets dispositions during the 1999-2009 decade. With this dataset the thesis seeks to answer the following types of questions:

- How can IRR-Based Property-Level Performance Attribution be used to help evaluate investment management performance?
- Do the subject real estate investment firms consistently perform certain investment functions better than the industry benchmark (their peers), and can this be determined through the attribution analysis?

The overall hypothesis is that since-inception IRR-based property performance analysis can help real estate investment firms perform organization management diagnostics to better understand their strengths and weaknesses with respect to the various investment management functions, indicating areas where they outperform or underperform their peers, and enable the firm to make more informed investment decisions. Results from such analysis may also have some implications on a firm's hiring and training programs, manager performance assessments, and acquisition and disposition policies.

Interviews with executives from several major institutional investment firms with core investment strategies indicate that although income and appreciation returns are typically tracked on an annual basis, since-inception property performance attribution (PPA) similar to the ones discussed in this thesis are not currently being applied on a systematic basis, nor are they being compiled and analyzed on a look-back basis after investments have been completed. After listening to a brief explanation of the PPA methodology, most executives agreed that such analysis can provide additional information for better understanding investment performance and help them make more informed decisions on the aforementioned areas.

Chapter Overview

Chapter 2

Chapter 2 provides an overview of core real estate funds and describes the various investment strategies and styles ranging from core, core-plus, value-added and opportunistic. This section is meant to provide context to the core investment data set examined in later sections of this thesis.

Chapter 3

Chapter 3 provides a literature review on the topic of investment performance measurement. The two primary types of performance measurements, time-weighted rate of return (TWR) and money-weighted return (IRR) are explained. The concept of property-level attribution analysis with an IRR-based approach developed by David Geltner is introduced in this chapter.

Chapter 4

Chapter 4 begins by providing background information on the data collection process and details related to the data set examined. A thorough explanation of the methodology for performing the IRR-based property-level performance attribution (otherwise referred simply as property performance attribution, or "PPA" for short) developed by Geltner is provided in this chapter, followed by a simple example. The types of insights and interpretations that can be derived from the outcome of the PPA analysis is explained, as well as the methodology used in benchmarking the various return components of an investment to a synthetic benchmark created from the sub-indexes of the NCREIF Property Index (NPI). A brief discussion on the benefits and limitations of the attribution analysis is also provided.

Chapter 5

Chapter 5 provides the PPA results for the real world data set we obtained from the several anonymous funds (which we are treating as if they all came from a single "client" firm). This includes parsing the IRR returns of each investment, the results from the parsing of the IRR returns derived from the synthetic benchmarks created from the sub-indexes of the NPI, as well as the relative performance of the investments to the benchmarks. The relative performances of the investments are analyzed in aggregate by comparing the results of each of the three major return components of initial yield (IY), cash flow change (CFC), and yield change (YC). Plausible interpretations for the performance of the investment portfolio are discussed after examining the results based on cross section analysis by property type and by division. The patterns to each investment's total IRR, IY, CFC and YC components, relative to the benchmark, are examined to provide additional insight to the firm's strengths and weaknesses. Discussion on

any persistence in certain strengths and weaknesses of the "investment firm" examined (or the hypothesized "client") is also provided in this section.

Chapter 6

Finally, Chapter 6 concludes with an overview of the findings from the analysis performed and provides a discussion on potential research extensions that are available to further the research on the topic of property performance attribution.

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CHAPTER 2: OVERVIEW OF INVESTMENT STYLES AND CORE REAL ESTATE FUNDS

Real estate investment strategies for institutional investors are typically categorized into several distinct levels of perceived investment risk and the associated risk premium in the *ex ante* (expected) returns required by the investor. Because of direct real estate investment's nature as including the operational management of the investment assets, the different levels of risk are also typically associated with different so-called "styles" of investment, in the U.S., termed "core", "core-plus", "value-added" and "opportunistic", ranging from the lowest risk and return requirements to the highest in that order.

Historically, core funds represent the bulk of institutional investors' real estate portfolios. The classic "core" investment strategy involves investments in stabilized Class-A properties located in relatively liquid primary markets, comprising multi-tenanted properties with credit tenants, of the four major property types (retail, multifamily, office and industrial), without excessive capital reinvestment required, owned with minimal or no mortgage debt, and with stated equity total return requirements of approximately 7% to 10% (net of fees, on a "stated" basis, i.e., *ex ante pro forma*) as measured by the IRR.

Each investor or investment manager may have slightly different definitions for the various investment styles, however, general industry consensus define core-plus as an investment property or an investment fund strategy that would add a slightly higher level of risk and expected return to the core category of property types, which could include a modest level of leasing risk or slightly higher leverage. A value-added investment strategy involves assets that require an active investor to take moderate leasing risk on an unstabilized property, or buying a property with below market contract rents, and often require leverage ratios up to 70%. Opportunistic investments are characterized by the highest level of risk and expected return. Opportunistic investments come in many forms ranging from land speculation, development, structured finance (subordinated debt positions), investments at the entity level in operating or development firms, international investments (including emerging markets), or investment in existing properties that require either rehabilitating through physical upgrades, or repositioning by replacing the management team, and often require leverage ratios exceeding 70% (at least,

prior to the financial crisis of 2008). (Kendall, 2006, pp. 27-28). The levels of risk from tenant, geographic, economic and leverage, as related to the various investment styles, is illustrated by Kendall as follows:

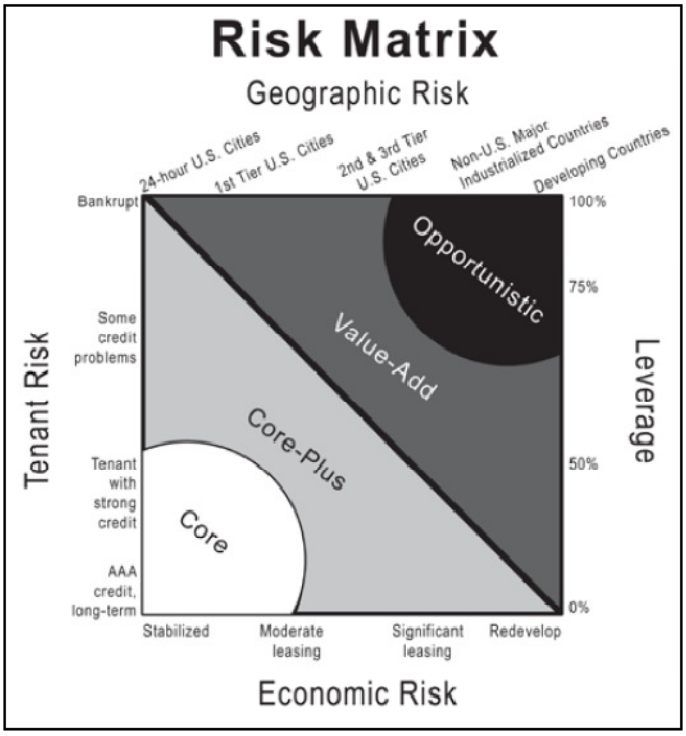

Figure 1 - Risk Matrix (Kendall, 2006, p. 28)

Total equity return requirements for core-plus investments generally range from 10% to 13%, while equity return requirements for value-added and opportunistic investments generally range from 13% to 16% and over 16%, respectively. These return requirements, which may also vary slightly for different investors, decline during periods when equity capital for real estate investments is abundant and increase during periods when equity capital for real estate investments tightens (though the direction of causality in this relationship is not clear).

As reported in the 2009 Pension Real Estate Association (PREA) Plan Sponsor Survey, core investments totaled 55.4%, or $57.3 billion of the $103.5 billion currently invested in the real estate sector by members of PREA including public and private retirement plans, endowments, foundations, and other funds. Compared to 2002 survey results, core investments declined as a percentage of total investments from 66.5% to 55.4%, as investors sought higher

returns in exchange for higher risk exposure by allocating more of their investments into value-added and opportunistic investments.

The property performance attribution analysis conducted within this thesis is applied to a set of core investments made by a group of institutional management firms which we will treat as if they are a single client management group. The core investment style is chosen as it represents the bulk of institutional investors' real estate portfolios, and can be more accurately benchmarked against the NCREIF Property Index (NPI), which is based on the performance of institutionally-held core investments.

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CHAPTER 3: LITERATURE REVIEW

The literature review for this thesis has primarily focused on the topic of investment performance measurement. There are several generally accepted investment performance measurements in the real estate industry. As described in the Performance Measurement Resource Manual published by the Real Estate Information Standards (REIS), common performance measurement methodologies used by institutional real estate investors include time-weighted returns (TWR), money-weighted returns (IRRs), equity multiples, and other performance metrics such as disaggregated income returns, leverage ratios and measures of dispersion within a group. REIS is the set of investment information reporting standards administered by members of the National Council of Real Estate Fiduciaries (NCREIF), the Pension Real Estate Association (PREA) and the National Association of Real Estate Investment Managers (NAREIM), in order to provide guidance in the various practices in the areas of real estate valuation, accounting, performance measurement and reporting.

The REIS Performance Measurement Resource Manual (April, 2010) provides a thorough explanation of the various performance measurement methodologies. The time-weighted returns and money-weighted returns methods are the primary performance measurements used for analyzing investment performance and are summarized as follows:

- A **time-weighted return (TWR)** is defined as the geometric average of the yields (total returns) to an investment portfolio during a specific holding period (multi-period span of time). Since the TWR measures the performance of a manager during the measurement period by removing the effects of the size of the investment, timing of cash flows and capital contributions, it is the preferred performance measure to use when a manager does not have control over the timing of cash flows of the investment. Such managers with a lack of control over timing of cash flows typically include open-end funds and non-discretionary single investor investment account portfolios. TWRs are also used for performance comparison across multiple asset classes and when it is necessary to compare to the performance of an industry benchmark such as NCREIF that is TWR based. TWRs can be calculated at the property, investment and fund levels, either on a leveraged or unleveraged basis.

The property-level TWR reflects the performance of investment asset(s) when all cash flows resulting from ownership activities at the entity level such as advisory fees, use of working capital, and entity-level expenses are removed. The investment level TWR reflects the performance of investment asset(s) at the equity level, factoring in the effect of any debt or joint venture partnership structure and ownership level cash flows. The fund or portfolio level TWR reflects the performance of an aggregation of investments made by an entity, providing measurements for how well the management team performed its specified investment strategy.

The Modified-Dietz Method is the basic TWR formula that is widely used throughout the financial industry. The following represents a simple Modified-Dietz TWR formula:

$$R_{hp} = \frac{EFV - BFV +/- CF}{BFV + WCF}$$

R_{hp} =	Return for the measurement period
EFV =	Ending fair value of the investment
BFV =	Beginning fair value of the investment
CF =	Net cash flows for the period
WCF =	Sum of weighted cash flows for the period

Figure 2 - A Simple Modified-Dietz TWR Formula (REIS PMRM, p. 6)

- A **money-weighted return** refers to the internal rate of return (IRR) of an investment, which is the annualized implied discount rate that equates the sum of the present value of all of the cash flows associated with an investment (or net present value) to zero. In contrast to the TWR method, the IRR calculation does factor in the impact of the timing and of cash flows and the size of the capital effectively invested at different points in time. IRRs are generally regarded as a good measure of investment performance when the manager has control over the timing of cash flows. Such managers typically include closed-end funds and discretionary single investor investment accounts (or separate accounts).

IRRs can also be calculated at the property, investment and fund levels, either on a leveraged or unleveraged basis. Property-level IRRs typically start with the initial cash flow on the acquisition date and end with the final cash flow occurring on the disposition date of the investment. For purpose of calculating the IRR during the holding period of an investment, prior to its disposition, the final cash flow for the property's sale or reversion may be substituted by the property's estimated fair market value based on an appraisal or internal valuation.

The following represents a simple IRR formula:

$$F_0 + \frac{F_1}{1+IRR} + \frac{F_2}{(1+IRR)^2} + \frac{F_3}{(1+IRR)^3} \ldots + \frac{F_x}{(1+IRR)^x} = 0$$

Figure 3 - A Simple IRR Formula (REIS PMRM, p. 30)

The IRR formula discounts cash flows F_1 through F_x back to F_0, where F_0 is the original investment, and F_1 through F_{x-1} represent net cash flows for each applicable period followed by F_x, the ending cash flow either represented by an actual sale price or an estimated residual value.

The focus of this thesis is on the methodologies and interpretations of an IRR-based property-level performance attribution analysis. Performance attribution can be used to provide additional investment performance measurements. As previously discussed, investment performance attribution analysis may be broadly characterized as partitioning of the total investment return of a particular manager or portfolio or property investment in order to understand and assess the cause and nature of investment performance resulting from various factors. Such analysis typically requires the use of a benchmark investment over the same span of time that is also partitioned in a similar fashion to allow for fair or more revealing comparisons that highlight the relative performance of the subject investment asset or manager.

Investment performance attribution originated in the security investment industry, where it is limited to what in real estate is called the portfolio-level attribution analysis. Such analysis is used to explain a portfolio's total returns compared to a benchmark by quantifying the portfolio manager's performance within the two primary portfolio-level investment functions of sector

allocation and asset selection. In a similar fashion, portfolio-level analysis, typically based on the time-weighted rate of return (TWR) are also applied to real estate investments to measure the contributions of sector allocation and property selection to the total returns of an investment portfolio. However, for real estate investments, a second level of analysis can be performed at the property-level, in effect drilling down deeper into the selection attribute, looking at the performance attribution of each investment. This property-level performance is interesting because it provides an added layer of information on the performance of the real estate investment manager on additional functions such as operational management of the investment assets and execution of transactions that are not captured by a portfolio-level analysis. Such property-level operational management functions are an unavoidable and key part of the job of direct real estate investment management in the private property market world and can largely determine the success of the investment manager.

With respect to performance attribution analysis for real estate investments on the property-level, limited literature is available. In the 2003 "IRR-Based Property-Level Performance Attribution", Geltner described a framework for the parsing of property-level since-inception IRRs into separate components for better understanding of investment performance. A discussion of the topic is also presented in Geltner, Miller, Clayton, and Eichholtz (2007, pp. 221-225 & 689-693). Geltner identified four property-level investment management functions as the major functions whose performance can be quantitatively analyzed through the thoughtful and artful use of property-level performance attribution: property selection, acquisition transaction execution, operational management, and disposition transaction execution. Operational management, which includes revenue management functions such as leasing and marketing strategy as well as management of operating expenses and capital improvements, is important particularly to real estate investments due to their generally longer holding periods versus other asset classes that have lower transaction costs. Deal execution is important to real estate transactions since the value of properties in the private market are generally difficult to precisely quantify due to the uniqueness of each property, therefore, returns can be enhanced by manager's ability to acquire properties at below market value and sell at above market value.

Geltner also suggests the use of the since-inception internal rate of return (IRR) as the more appropriate investment performance metric for these management diagnostic purposes at

the property-level rather than TWR, because IRR is sensitive to the size and timing of cash flows, a key part of property-level investment management, and because only a since-inception metric can capture the performance in the property selection and acquisition transaction execution functions. Failure to accurately reflect all four property-level management functions will bias or obfuscate the quantitative assessment of any of the other functions as well. At the property level, cash flow timing decisions such as capital improvements and leasing costs are within the responsibility of the investment manager. Therefore, a since-inception IRR-based performance metric that is more consistent with the manager's responsibility and authority, and is deemed more appropriate.

This thesis seeks to further Geltner's work on property performance attribution (PPA) by applying the IRR-based analysis on a set of real world institutional real estate investments, to explore in depth the use of PPA for organizational management diagnostics, and thereby demonstrate the potential of using the PPA analysis as an investigative tool for developing plausible hypothesis about a firm's investment management strengths and weaknesses, and to simulate the use of the tool in practice. A thorough explanation of the mechanics of the PPA methodology will be provided in the next chapter.

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CHAPTER 4: DATA COLLECTION & METHODOLOGY

Investment Transaction Data Collection

The data used for the analysis discussed in this thesis were gathered from several internally managed real estate funds in the institutional investment industry. The various funds that provided data to further this research came together cooperatively and anonymously to explore the use of the property performance attribution (PPA) technique, in the role collectively as the "client" of the thesis, based on their belief that they all shared common strengths, weaknesses and constraints, as well as a similar organizational context. Considering the similarities in the various own-account funds, we are treating in this thesis as if all of the property investment cases can be considered as if they came from a single investment management firm for purposes of analyzing and interpreting the PPA results, in terms of the management implications for the firm. Therefore, for convenience, the source of the data pool analyzed in this thesis will be referenced going forward as the "Investment Fund", while the "Investment Portfolio" refers to the data pool.

All 42 of the property transactions included in the analysis represent actual "cradle-to-grave" round-trip individual investment transactions that the funds acquired, held, and sold individually over the past decade. The portfolio of investment properties are located throughout the U.S. and include a diverse mix of property types. Actual cash flows were provided on a monthly basis throughout the holding period, including pertinent figures such as the acquisition and disposition prices, the net operating incomes during each period, as well as the size and timing of any capital expenditures.

As a condition for providing the sensitive financial information relating to their investments and performance, the institutional funds requested to remain anonymous and have asked for the maintenance of certain disaggregate investment details to remain as confidential. In order to disguise the identity of each investment within the Investment Portfolio, each property is randomly assigned a property number between 1 and 42, and will be referred to by their assigned property numbers throughout this thesis.

Core Investment Data Set

For purposes of providing some context to the types of core real estate investments that are part of the Investment Portfolio analyzed, the following are some pertinent facts about the data set (the percentages of investment allocation by region and division, as shown in the following charts, are based on number of properties rather than market value):

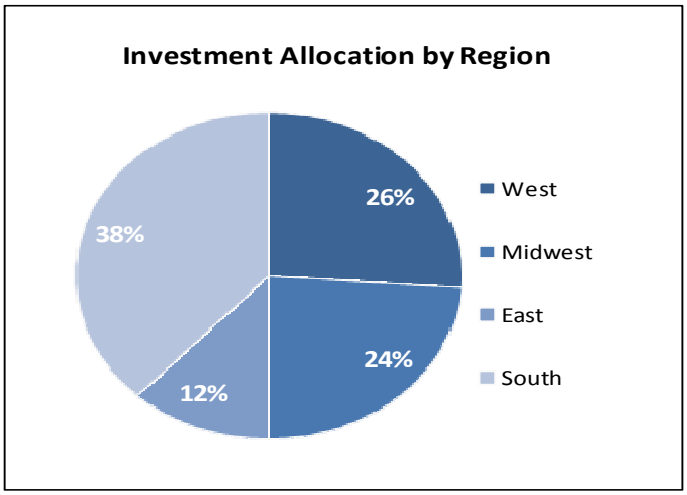
Investment Portfolio Statistics:

Total No. of Properties/Investments		42
Avg. Holding Period (Years)		10.3
Avg. Deal Size (Based on Sale Price)		$51.3 MM
Acquisition Period	Earliest:	Jan-81
	Latest:	May-00
Sale Period	Earliest:	Aug-01
	Latest:	Feb-08

Region	Total #	%
West	11	26%
Midwest	10	24%
East	5	12%
South	16	38%
	42	100%

Division	Total #	%
Pacific	10	24%
Mountain	1	2%
East North Central	10	24%
Northeast	4	10%
Mideast	1	2%
Southwest	8	19%
Southeast	8	19%
	42	100%

Property Type	Total #	%
Office	21	50%
Industrial	8	19%
Apartment	6	14%
Retail	7	17%
	42	100%



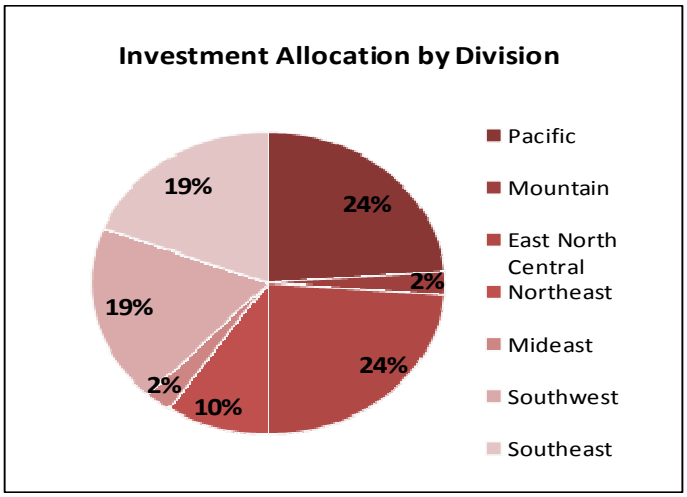


Figure 4 - Investment Portfolio Statistics and Allocation

It is also necessary to point out that although the investment transaction data used in this thesis were provided by various investment funds who regard themselves in the "core" investment style, many of the investments involved some level of capital improvements and repositioning of the asset at some point during the investment lifetime, or in some cases required

a significant level of lease up after their acquisition, with a few even representing development deals.

The majority of the assets within the data set that has been compiled are wholly owned properties without any debt or leverage, therefore, the cash flows of these investments represent property-level cash flows. However, eight of the 42 investments within the data set were identified as having significant leverage, and the cash flow history provided for those investments were effectively like "entity-level" equity cash flows, due to the involvement of leverage or joint venture partnership agreements with distributions that were not on a pari passu basis between the parties. (These include Properties #1, 12, 14, 19, 20, 32, 33 and 36 of the data set).

A summary table providing property level details for the Investment Portfolio, such as their property type, and location in terms of region and division can be found in *Appendix A*.

IRR-Based Property-Level Performance Attribution Analysis Methodology

As previously mentioned, the IRR-based property-level performance attribution method can be used to measure the investment manager performance on a direct property investment based on a procedure for decomposing the since-acquisition IRR returns of an investment into the three major return components or determinants of initial yield (IY), cash flow change (CFC), and yield change (YC), defined as follows:

- Initial yield (IY): The property's initial annual net cash flow as a fraction of its acquisition price.
- Cash flow change (CFC): This component measures the portion of the since-acquisition IRR attributable to changes in the property's annual net cash flow subsequent to the first year after the acquisition. If the property's net cash flow increased since the first year, this component will be positive, whereas if the property's net cash flow declined, this component will be negative.
- Yield Change (YC): This component represents the portion of the total IRR attributable to the change in the yield between the acquisition and the terminal yield. The terminal yield is typically represented by the annual net cash flow in-place as of the property's

disposition, as a fraction of its sale price, or by the annual projected net cash flow in the year following the sale as a fraction of its sale price. This component is positive when the terminal yield is lower than the initial yield and negative when the terminal yield is higher than the initial yield.

Once the three major components are decomposed from the since-acquisition IRR of an investment, these components can be benchmarked to the corresponding components exhibited by a suitable benchmark that consists of properties within the same category as the subject property in terms of market segment, inception date, and holding period. The comparative analysis of the three IRR components will provide indications of the investment manager's relative performance as regards to the four basic property-level real estate investment functions: property selection, acquisition transaction execution, property operational management during the holding period, and disposition transaction execution. A conceptual diagram indicating the relationship between each of the three IRR components and the four primary investment functions is as follows:

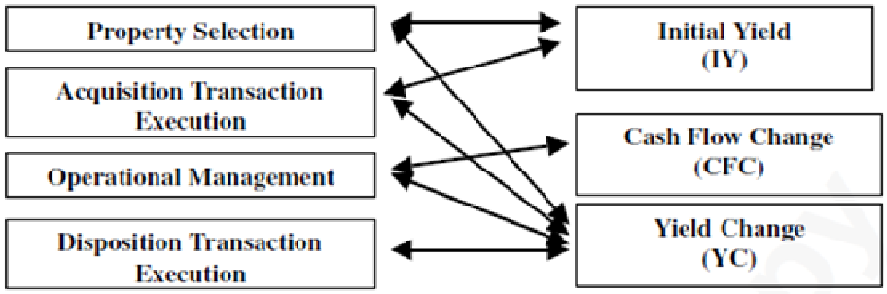


Figure 5 - Relationship Between Four Major Property-Level Investment Management Functions and Three Performance Attributes of IRR (Geltner, 2003, p. 4)

As indicated by the previous diagram, each IRR component can reflect at least one of the four basic property-level investment management functions, each function will tend to be reflected in at least one of the IRR components, and each IRR component will tend to reflect a different mix of the four basic management functions. We may describe the relationship between each of the three IRR components and the four basic investment management functions as follows:

- Initial yield (IY): Will often reflect either both or two functions: (i) performance regarding traditional property (asset) selection, or the ability to identify and acquire properties that are relatively superior within a given category of assets (as represented by the benchmark); (ii) acquisition transaction execution performance, or the investment manager's ability in obtaining "a good deal" (or below market value) through the acquisition transaction process (negotiation, deal structuring). A higher initial yield relative to the benchmark will tend to reflect better selection and/or acquisition performance.
- Cash flow change (CFC): As measured relative to a good benchmark, the CFC attribute of the IRR will often primarily reflect the performance of the property operational management function during the holding period, including marketing, leasing, vacancy management, expense management, and capital improvement management. While a high CFC component (relative to the benchmark) is *prima facie* a "good result" other things being equal, in effect this attribute should not be viewed in isolation and can be indicative of various different strategies for overall performance. For example, there often tends to be an offsetting relationship between the CFC component and either the IY of YC component. A high CFC result compared to the benchmark may simply reflect favorable circumstances that were already in the property's lease structure at acquisition as recognized by a low IY attribute relative to the benchmark.

  Alternatively, a low CFC may be paired with high scores in the IY and/or YC attributes (purchase at a high yield and/or sale at a yield lower than the initial yield, all relative to the benchmark), as a temporarily unfavorable lease structure is turned around, or perhaps capital investments are made to position the property well for resale. For example, a negative CFC relative to the benchmark, may reflect the realization of the expected expiration of leases at above market rents, excess capital improvement requirements for deferred maintenance, and any credit and/or rollover risks exhibited by the tenancy, which if known in advance might have been reflected by a positive IY relative to the benchmark.

- Yield change (YC): Reflects a combination of all four basic investment management functions. The YC component reflects the property selection and acquisition transaction

execution since a lower terminal yield relative to the initial yield may be more achievable for a relatively superior property chosen at the point of acquisition, and it is relatively easier to achieve a lower terminal yield relative to the initial yield if the property's initial yield is relatively higher than the benchmark to begin with. The YC also reflects the disposition transaction execution performance, or the investment manager's ability to achieve lower terminal yields by selling properties at above their market values. Additionally, YC also reflects the operational management performance during the holding period, which is a function of how well management has positioned the property for the future beyond the terminal period with respect to capital improvement requirements, lease expirations, leasing strategy, and so forth.

It should be clear that the relationship between the four property-level investment management functions and the three since-acquisition IRR performance attributes (relative to a benchmark) is not a lock-step, mathematical correspondence. The relationship between the quantifiable IRR attributes and the qualitative performance in the management functions is subtle and flexible, and the use of IRR-based performance attribution is therefore as much "art" as "science" (indeed, probably more "art" than "science"), requiring careful judgment and weighing of other evidence. For this reason the application of quantitative performance attribution should be viewed as an exercise that when skillfully applied can be useful in various ways, perhaps for discovering management strengths and weaknesses, but also perhaps as a tool for accountability and self-analysis, even as a stimulator of the telling of "stories" about success and failure, stories which may enlighten the teller or the hearer as a result of the telling.

The mechanics of quantifying the above-described attributes (or components), the initial yield (IY), cash flow change (CFC) and yield change (YC), will be discussed in the following sections.

In the main part of the analysis in this thesis which will be presented in Chapter 5, the IRR-based property-level performance attribution method will be performed on the set of actual investment transactions acquired, held and sold by the Investment Fund. The IRR based PPA will be computed for each investment to derive its attribution results, and then all the individual investments will be aggregated and studied for systematic results that may provide observable

insights to the Investment Fund's overall performance, strengths and weaknesses. However, it may be useful for the reader to walk through a single, individual investment in order to gain understanding about how the PPA method works. But to do this, in order to maintain the confidentiality of the identity of the data sources, as well as details pertaining to each individual property transaction, a hypothetical example transaction will be described and used throughout the current chapter in order to provide an illustration of the methodology subsequently applied to the actual data set. A subsequent section in this chapter will then provide a thorough explanation of the use of the Full PPA Method, followed by a section providing an explanation of an Abbreviated PPA Method.

Simple Example

For the investment example, suppose the subject property is a 250,000 square foot multi-tenant office building located in the Boston CBD, and is acquired by an internally managed core investment fund at the end of 2000 for a purchase price of $150,000,000. The property was acquired at a capitalization rate of 7.25% on the pro forma NOI of $10,875,000 in the first year of the holding period. Considering the property is relatively new and is stabilized with 95% of the building leased, no capital expenditures and leasing costs were expended during the property's five year holding period. Therefore, the property's net cash flow during the initial year of the holding period was $10,875,000. Annual net cash flows increased by 2% per annum during the five year holding period, followed by a projected growth of 2% into Year 6. The property was sold at the end of 2005 at a net sales price of$200,000,000, based on a capitalization rate of approximately 6%. There are no capital improvement expenditures and leasing costs projected into Year 6.

Ex-Post Analysis of Full Cash Flow: Full PPA Method

The first set of PPA analysis on the data set involves the ex-post analysis of the "full cash flow" streams of each transaction, or the cash flow stream during the lifetime of the investment (acquisition-through-disposition). A walkthrough of the Full PPA Method developed by Geltner is explained in this section using the simple example provided in the prior section. An Abbreviated PPA Method actually used in analyzing the data set in the next chapter will then be

described in the next section. Based on the facts provided, the IRR decomposition computations are as follows:

IRR-Based Property-Level Performance Attribution - Full PPA Example

IRR			12.69%			7.25%		9.25%		10.61%
Year	(1) Actual Operating CF	(2) Actual Capital CF	(3) Actual Total CF (1+2)	(4) Initial Operating CF Constant	(5) Capital CF @ Initial Yield on (4)	(6) Initial CF @ Initial Yield (=4+5)	(7) Capital CF @ Initial Yield on (1)	(8) Actual Operating CF @ Initial Yield (=1+7)	(9) Capital CF @ Actual Yield on (4)	(10) Initial CF @ Actual Yield (=4+9)
2000 (Acquisition)		(150,000,000)	(150,000,000)		(150,000,000)	(150,000,000)	(150,000,000)	(150,000,000)	(150,000,000)	(150,000,000)
2001	$10,875,000		10,875,000	10,875,000		10,875,000		10,875,000		10,875,000
2002	$11,092,500		11,092,500	10,875,000		10,875,000		11,092,500		10,875,000
2003	$11,314,350		11,314,350	10,875,000		10,875,000		11,314,350		10,875,000
2004	$11,540,637		11,540,637	10,875,000		10,875,000		11,540,637		10,875,000
2005 (Disposition)	$11,771,450	$200,000,000	211,771,450	10,875,000	150,000,000	160,875,000	165,612,120	177,383,570	181,146,162	192,021,162
2006	$12,006,879			10,875,000						

(a) Overall Total IRR	12.69%
(b) Initial Yield (IY) Component = (6) IRR	7.25%
(c) Cash Flow Change (CFC) Component = (8) IRR - (6) IRR	2.00%
(d) Yield Change (YC) Component = (10) IRR - (6) IRR	3.36%
(e) Interaction	0.08%
(f) Actual Terminal Yield	6.00%

Figure 6 - IRR Based Property-Level Performance Attribution - Example Computation Based on Full PPA Method

In this example, the total IRR of the investment is 12.69%, which is calculated on the total cash flow representing the sum of the operating cash flow stream and the capital cash flow stream (negative cash flow for the acquisition of the property and positive cash flow to the investor at the property's disposition). The first component of the IRR performance attribution, the initial yield attribute, is 7.25%, derived by the initial year ratio of operating cash flow to purchase price ($10,875,000/$150,000,000 = 7.25%). The IY component can be viewed as the base component of the actual total realized IRR as it represents the yield that could be achieved from the investment if the property's cash flow remains unchanged throughout the holding period, and the terminal yield remains unchanged from the initial yield. Thus, the CFC and YC components reflect the incremental effect within the overall IRR of any (pure) cash flow change and yield relative to the IRR that would be provided simply by holding the cash flow and yield constant (like a classical bond).

The pure effect of the CFC component within the total realized IRR can be computed by first calculating the IRR of a hypothetical cash flow stream that is equal to the actual realized operating cash flow stream, except with the terminal value or sale price revised to equal what the property's terminal value would have been if the terminal yield equaled the initial yield. The IY can then be subtracted from this hypothetical IRR to derive the CFC component. The effect of the YC component on the total realized IRR can be computed by first calculating the IRR of a hypothetical cash flow stream that is represented by constant cash flows equivalent to the initial year cash flows throughout the holding period, followed by a hypothetical terminal value derived by applying the actual terminal yield on the initial cash flow level. The IY can then be subtracted from this hypothetical IRR to derive the pure YC component.

Column (1) in Figure 6 shows the actual annual operating cash flows since the acquisition. Column (2) shows the actual capital cash flows, indicating both the negative cash flow for the acquisition of the property, and the positive cash flow from the disposition of the property. Column (3) shows the sum of the first two columns, which represents the actual total cash flows, indicating a total actually realized IRR of 12.69% per year.

Column (4) shows the hypothetical operating cash flow assuming the initial year cash flow remains constant throughout the holding period. Column (5) shows the actual initial capital

outflow and a hypothetical terminal value that is derived from applying a terminal yield that is the same as the initial yield on the constant cash flow exhibited in column (4). Column (6) represents the sum of columns (4) and (5), and provides the alternative method for calculating the initial yield, which is the IRR calculated based on a hypothetical cash flow assuming the property's cash flows remain constant since the first year of the holding period, while the terminal yield also remain unchanged from the initial yield. The IRR of the column (6) cash flow stream equals 7.25%, representing the IY component of the performance attribution.

Column (7) equals the hypothetical capital cash flow derived by applying the actual initial yield to the actual operating cash flow for the year beyond the terminal year ($12,006,879/7.25% = $165,612,120). Column (8) is the sum of columns (1) and (7), which represents the hypothetical cash flow representing the actual operating cash flows and a terminal value representing what the property's terminal value would have been if the terminal yield equaled the initial yield. The IRR computed for the hypothetical cash flow stream indicated in column (8) is 9.25%. The difference between the IRR indicated by the cash flow stream in column (8) and the initial yield rate of 7.25% equals the 2% actual annual constant growth rate in the operating cash flows, or the result of the CFC component.

Column (9) indicates the actual initial capital outflow and a hypothetical terminal yield computed by applying the actual terminal yield rate on the hypothetical constant cash flows in column (4). Column (10) is computed by the sum of columns (4) and (9), which represents the hypothetical cash flow stream that reflects the actual change in yields while holding the operating cash flow constant at the initial level, indicating an IRR of 10.61%. Subtracting the IY of 7.25% from the 10.61% IRR computed from column (10) results in the YC component of 3.36%, or the contribution of the effect of yield change on the total IRR. The YC component is positive due to the decrease in yield from the 7.25% initial yield rate to the 6% terminal yield rate (calculated by dividing the cash flow projected for the year after the terminal year by the actual sale price).

The sum of the IY, CFC, and YC equals 12.61% (7.25% + 2% + 3.36% = 12.61%), which is not equal to the total actually realized IRR of 12.69%. The residual difference is assigned to an "interaction effect" component so that the four components of IY, CFC, YC and

the interaction effect sums to the actual realized total IRR. The interaction effect variable as the result from the combined effects of all three of the pure attributes, and notes that there is no way to define pure attributes that always exactly sum to the total IRR due to the multi-period IRR not being a linear function of the pure attributes. There is no way to disentangle the three pure effects within an interaction effect, however, in most cases of the performance of stabilized income property the interaction effect will be quite small.[1] (Geltner, 2003, p.8).

Ex-Post Analysis of Full Cash Flow: Abbreviated PPA Method

An Abbreviated PPA Method that is mathematically equivalent to the above procedure is also possible (and this method will be used in the empirical analysis presented in the next chapter). The concept of the Abbreviated PPA Method is identical to the Full PPA Method previously described, however the mechanics and formulas used for the computations are slightly different. For a thorough explanation of the mechanics of the Abbreviated PPA Method, please refer to *Appendix D*.

Stylizations and Adjustments for Computing the PPA

In order to perform the PPA analysis for each of the investments within the data set, some adjustments to the actual monthly comptroller-reported (accounting based) investment cash flow streams and yield computations were necessary to derive apple-to-apple IRR components for comparative purposes (e.g., with a benchmark). These adjustments include the stylization of the investment holding periods, the inflation of the initial investment by a reasonable yield rate to offset the effect of stylizing the holding period, and the selection of more stabilized annual cash flow for computing the terminal yields when necessary. A thorough explanation of the stylization adjustments made for computing the PPA of the data set can be found in *Appendix E*.

[1] Care must be taken to consistently apply forward-looking and backward-looking yields, both within the subject property and in the corresponding benchmark computations. For example, if a forward-looking terminal yield is not available due to lack of a cash flow forecast beyond the terminal year, then a backward-looking terminal yield must be applied to the terminal year's cash flows rather than to the year beyond the terminal year.

Simulation of On-Going PPA with Partial Cash Flow (Holding Period PPA)

A second set of PPA analysis, in addition to the PPA analysis completed on the full cash flows of each investment from the point of acquisition to their disposition/sale, is also conducted on partial holding periods of the full investment holding period for each transaction in order to simulate the types of information that can be gathered when the analysis is performed on an on-going basis prior to property disposition, and to provide a view of the interplay of the various attributes throughout the holding period. Partial period PPA analysis can be performed on any segment of a property's actual realized net cash flows as long as the period starts from the property's date of acquisition. The PPA analysis on the data set can be repeated with different ending periods, say at an annual frequency, to simulate the actual performance of such analysis on an annual basis in practice.

This analysis required the substitution of appraisal-based fair market values in place of the terminal value for each period analyzed prior to the property's actual sale. End of the year appraisal values (from either formal external appraisals completed by third parties or internal appraisals completed by the management team) were provided by the data sources for the majority of the investments within the Investment Portfolio examined. However, for 9 of the 42 properties, actual appraisal values were only available from the data sources for parts of the holding period, therefore, for the years in which appraisal values were unavailable, a simple straight-lined method is used to bridge the gap in the years were appraisal values were unavailable, using a combination of either the initial acquisition price, appraisal values available in subsequent years, or the actual sale price.

For each investment within the data set, the PPA was repeated on several intervals throughout the stylized holding period, at an annual frequency, to produce the Holding Period PPA for each investment. The initial interval (Period 1) in which the first PPA is completed for each property is defined as the interval starting from the date of acquisition, and ending at the end of the first calendar year immediately following the year the property was acquired. The initial period is the same for each of the intervals examined during the holding period, while the ending period of each interval following the initial interval represent the end of each calendar year following the end of the second calendar year since property acquisition. For example, if the

property was acquired on March 17, 2002, the initial interval would start on March 17, 2002, and end on December 31, 2003. These intervals were chosen to match the annual appraisal values that are available at the end of each calendar year. The final interval for each investment will end on their actual disposition dates. The results from the Holding Period PPA analysis will be discussed in the following chapter.

Performance Benchmarking Methodology

The mere exercise of an attribution analysis in isolation may provide some insights relating to the performance of an investment. However, more insights can be gained through the benchmarking of attribution results of an investment to a suitable benchmark. Such a benchmark should consist of properties within the same category as the subject property in terms of market segment, inception date, and holding period, so as to gain insight about the relative performance of each investment on as "apples-to-apples" basis as possible. The relative performance of each investment to the benchmark can then be compared to other investments within the investment portfolio to gain additional insights to manager performance.

External Benchmarking to Synthetic NCREIF Property Index Benchmark

Thus, results from the attribution analysis are first externally benchmarked to a suitable benchmark. For core investments held by institutional investors, the National Council of Real Estate Investment Fiduciaries (NCREIF) has compiled a database used to create the NCREIF Property Index (NPI) market segment sub-indices that represent suitable benchmarks. The NPI consists of both unleveraged and leveraged properties, but the leveraged properties are reported on an unleveraged basis, so the index is completely unleveraged, which provide an apples-to-apples comparison to property-level performance.

In this thesis we create synthetic benchmarks from the NPI sub-indices for each investment in an effort to control for factors such as market segment, market condition (time span), style and region. The series of individual periodic income and appreciation returns in the NCREIF Index (cash flow based version) are used first to synthesize the IRR that an investor in the (appropriate sub-index of the) NCREIF Index would have achieved, over the subject time span. Then these NCREIF-based synthetic IRRs are parsed into a comparable set of attributes or

components (IY, CFC, and YC) for attribute-by-attribute comparison to the performance of each investment.

The following is a summary of the procedure for creating a synthetic benchmark from the NPI (Geltner, 2003, pp.10-11):

- First, define the simple periodic return components. The general formula for relating income and appreciation return components to relative cash flow levels is as follows:

$$\text{Income Return} = y_t = \frac{CF_t}{V_{t-1}}$$

$$\text{Appreciation Return} = g_t = \frac{V_t - V_{t-1}}{V_{t-1}}$$

Figure 7 - Income and Appreciation Return Formulas (Geltner, 2003, p. 10)

In the prior formula, CF_t represents the net operating cash flow net of capital improvement expenditures during period t, and V_t is the property's market value as of the end of period *t*.

- Then, an index of the periodic relative net cash flow levels can be derived from the published NCREIF return components as follows:

$$\frac{CF_t}{CF_{t-1}} = (1 + g_{t-1})\frac{y_t}{y_{t-1}}$$

Figure 8 - Relative Net Cash Flow Formula (Geltner, 2003, p. 10)

This gives a cash flow-level index with an arbitrary starting value.

- The property value levels at the beginning and end of any specified holding period, V_s and V_t, can be synthesized by compounding the appreciation returns through the respective periods *s* and *t*. The relative cash flow levels derived from the equation presented in Figure 8 can then be calibrated to the asset values by multiplying all the relative cash flow levels by a constant that equates the first cash flow in the holding

period (CF_{s+1}) to the value (y_{s+1})Vs, the actual first period's cash flow level relative to the initial asset value level. This allows for the measurement of the adjusted cash flow-level index in dollars per dollar of the initial property asset value level (V_s).

- The IRR of the NCREIF sub-index during the specified holding period is then computed from the cash flow stream: ($-V_s + CF_{s+1} + CF_{s+2} + \ldots + CF_t + V_t$). This synthesized cash flow stream can also be used to decompose the IRR based on either the Full PPA or Abbreviated PPA methods explained previously. The IRR and its constituent IY, CFC, and YC performance attribution components can be calculated in this way for any NCREIF sub-index.

To further illustrate the method in which synthetic benchmarks are created based on the NPI sub-index for analyzing the Investment Portfolio, a walkthrough of the creation of a benchmark for the investment example described in the *Ex-Post Analysis of Full Cash Flow: Abbreviated PPA Method* section is provided in *Appendix F*.

Based on the NCREIF-based synthetic benchmark created, the following table provides a summary of the example subject property PPA results, the benchmark PPA results, as well as the relative PPA performance results by subtracting the benchmark from each of the IRR component results.

Property (Example)	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	13.08%	7.25%	1.95%	4.07%	-0.19%
NPI Cohort (Office - NE)	10.22%	6.36%	-5.16%	9.78%	-0.75%
Relative Stat (Office - NE)	2.86%	0.89%	7.11%	-5.71%	0.56%
Over (O) / Under (U) Performance	O	O	O	U	O

Figure 9 - Performance Comparison: Subject Property (Example) vs. NCREIF Cohort

The following three tables provide visual illustrations of the example subject property's relative performance when compared to the benchmark. The first table provides a side-by-side comparison of the subject and the benchmark's performance on the total IRR, IY, CFC and YC components. The second table provides an illustration of the subject's relative performance to the benchmark for each of the components. The last table provides a stacking diagram illustrating the impact of the subject's relative performance to the benchmark on the various components and the total IRR.

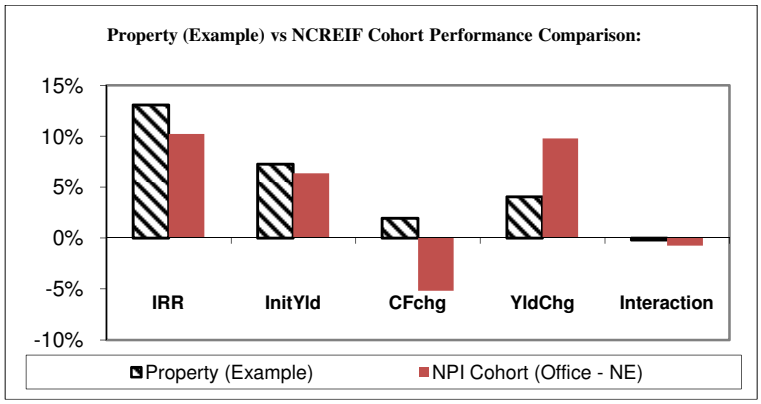


Figure 10 - Subject vs. Benchmark PPA Side-by-Side Comparison Sample Chart

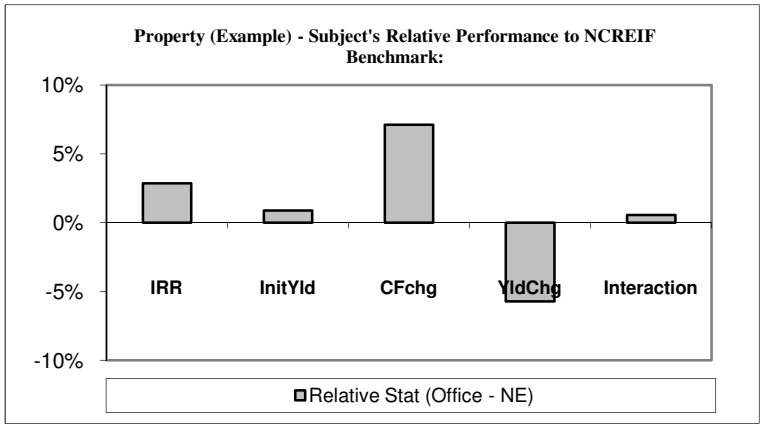


Figure 11 - Relative PPA Results Sample Components Chart

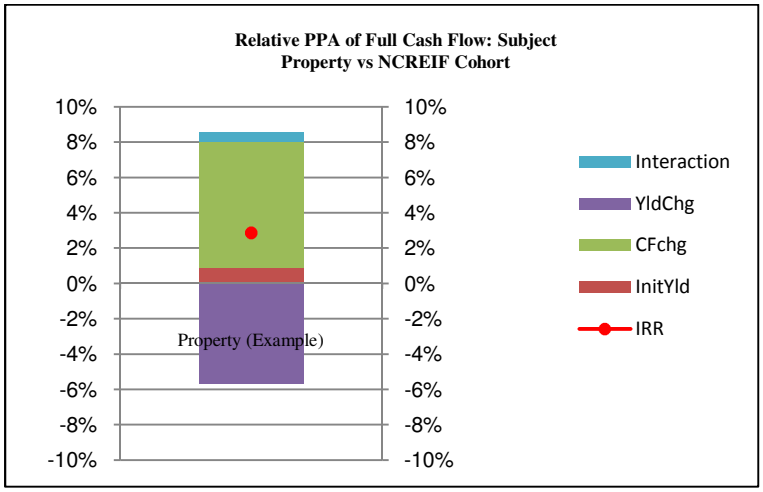


Figure 12 - Relative PPA of Full Cash Flow Sample Stacking Chart

Based on the relative performance statistics, it appears the example subject property outperformed the benchmark in terms of total IRR return (Subject total IRR of 13.08% versus benchmark total IRR of 10.22%), which is partially attributed to a 89 basis points slightly higher IY going into the property (Subject IY of 7.25% versus benchmark of 6.36%), indicating the possibility of manager's outperformance in the property selection and/or acquisition transaction execution investment function, or the possibility that the property had relatively lower upside potential in cash flow growth (perhaps rent roll or capital improvement issues), relative to the benchmark, that was known to the market at the time of acquisition. The subject property significantly outperformed in the CFC component by 711 basis points. This contributed significantly to the property's total IRR outperformance (Subject CFC of 1.95% versus benchmark CFC of -5.16%), indicating the possibility of manager's outperformance in the operation management investment function, either through relatively superior revenue or expense management compared to its peers, or the realization of the higher upside potential in cash flow growth.

However, considering the subject property's significant underperformance in the YC component of 571 basis points (Subject YC of 4.07% versus benchmark YC of 9.78%), it appears that the manager may have underperformed in the disposition investment management function, or the lower terminal yield may represent the property's additional vacancy risk or additional required capital expenditures in the future, which could in turn explain the significant positive outperformance of the CFC component. The CFC outperformance may be partially attributed to higher cash flow during the holding period due to management's under spending on capital improvements, or a leasing strategy with a shorter term upside. Overall, the PPA results appear to suggest that most of the credit for the investment's overall outperformance may be due to manager's operational management and/or property selection performance that netted such a high cash flow change during the holding period.

Note that these interpretations are only plausible hypothesis suggested by the PPA analysis, and can assist in identifying follow-up questions for the management team to increase manager accountability.

The benchmarking technique described in this section is performed on a property by property basis to provide comparative statistics on the performance of each investment property based on attribute-by-attribute comparisons of each of the three decomposed IRR components, as well as the total realized IRR. The results of the analysis will be discussed in the following chapter.

Internal Comparison of PPA Relative Performance

Once the relative performance result of each investment compared to their corresponding benchmark has been computed, the relative performance of each investment is compared to the relative performance of other investments within the Investment Portfolio and analyzed in aggregate to explore plausible hypotheses about the firm's relative strengths and weaknesses in the various investment management functions. Such internal comparisons of the relative performance of each investment are examined in various ways, including a comparison in aggregate, a cross section comparison by property type or by region and division, a comparison of the interaction of the various IRR components grouped by relative total IRR outperformance or underperformance, and so forth. The results and interpretation of these comparisons will be discussed in the following chapter.

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CHAPTER 5: DATA ANALYSIS AND INTERPRETATION

Property-Level Performance

The Abbreviated PPA Method described in the previous chapter was applied to each of the 42 investments within the empirical Investment Portfolio. PPA results analyzed include the total realized acquisition-through-disposition IRR, and the IY, CFC, YC, and interaction components for both the subject investment property as well as for the benchmark, and the relative performance indicated by subtracting the benchmark component results from the subject's component results. These results are presented in *Appendix B* individually for all 42 investments. The one-page analysis summaries included in *Appendix B* for each property also include a PPA side-by-side comparison chart, a relative PPA results components chart, as well as a relative PPA of holding period stacking chart. One of the contributions of this thesis is to demonstrate various ways of visually displaying the PPA results, so as to facilitate intuitive communication of the implications of the analysis. The reader may wish to peruse through *Appendix B* to gain some feeling for these suggested formats.

Property-Level Performance Relative to Benchmark and Interpretation of Results

Portfolio Relative Performance in Aggregate

PPA Result Summary

Figures 13 to 15 (below) provide a summary of the full cash flow (i.e., acquisition-through-disposition lifetime) PPA results for the subject investment property, the synthetic NCREIF benchmark, and the relative results (subject minus benchmark), sorted by property number (which has been randomly assigned).

Subject Property PPA

Property #	IRR	InitYld	CFchg	YldChg	Interaction
1	6.76%	9.03%	-2.06%	0.27%	-0.47%
2	13.40%	12.04%	0.88%	1.33%	-0.86%
3	6.01%	8.41%	-4.35%	2.33%	-0.38%
4	7.35%	6.61%	-6.32%	6.95%	0.11%
5	13.35%	8.46%	-4.35%	11.67%	-2.43%
6	7.25%	11.43%	-15.34%	13.22%	-2.06%
7	4.59%	10.47%	-3.49%	-1.80%	-0.59%
8	2.88%	14.17%	-9.91%	-0.48%	-0.91%
9	8.90%	7.71%	-1.92%	3.44%	-0.33%
10	8.41%	6.75%	0.58%	1.33%	-0.25%
11	9.06%	6.23%	2.92%	0.09%	-0.19%
12	29.08%	7.58%	16.35%	4.77%	0.38%
13	8.85%	11.33%	-7.79%	4.86%	0.46%
14	12.03%	9.60%	0.14%	2.78%	-0.50%
15	5.35%	12.13%	-7.49%	0.94%	-0.24%
16	1.65%	6.14%	-7.19%	2.05%	0.64%
17	7.52%	6.22%	-0.65%	2.18%	-0.24%
18	11.05%	7.58%	1.60%	1.10%	0.77%
19	0.54%	7.84%	-3.21%	-3.93%	-0.16%
20	14.17%	8.72%	3.69%	3.94%	-2.18%
21	8.34%	8.70%	-1.89%	1.92%	-0.39%
22	6.57%	2.56%	10.71%	-6.57%	-0.13%
23	10.88%	11.29%	-8.87%	9.30%	-0.84%
24	8.20%	10.21%	-3.45%	1.80%	-0.36%
25	14.85%	12.96%	-0.50%	3.09%	-0.69%
26	14.85%	12.96%	-0.50%	3.09%	-0.69%
27	14.95%	5.90%	9.86%	-0.86%	0.05%
28	11.63%	10.09%	0.15%	1.64%	-0.24%
29	14.82%	7.35%	2.33%	5.32%	-0.17%
30	21.49%	8.83%	-0.86%	13.60%	-0.08%
31	-1.65%	-5.84%	15.77%	-9.85%	-1.73%
32	7.28%	4.26%	1.51%	1.60%	-0.10%
33	13.67%	5.58%	6.75%	1.67%	-0.33%
34	7.07%	8.00%	0.17%	-0.51%	-0.60%
35	20.93%	7.95%	2.41%	10.52%	0.06%
36	17.18%	4.21%	17.80%	-3.62%	-1.20%
37	1.25%	6.66%	-9.13%	2.63%	1.10%
38	6.65%	8.12%	-0.15%	-1.05%	-0.28%
39	-0.78%	3.89%	8.39%	-12.16%	-0.90%
40	8.25%	7.36%	5.15%	-3.66%	-0.60%
41	14.50%	7.93%	2.00%	4.89%	-0.33%
42	10.67%	7.37%	-5.66%	9.60%	-0.64%

Subject Property PPA Summary					
Min	-1.65%	-5.84%	-15.34%	-12.16%	-2.43%
Max	29.08%	14.17%	17.80%	13.60%	1.10%
Average	9.76%	7.97%	0.10%	2.13%	-0.44%
Range	30.74%	20.02%	33.14%	25.75%	3.53%

NCREIF Cohort PPA

Property #	IRR	InitYld	CFchg	YldChg	Interaction
1	3.04%	4.53%	-0.24%	-1.06%	-0.19%
2	6.65%	6.31%	-0.31%	0.79%	-0.15%
3	10.90%	4.91%	-2.82%	9.99%	-1.17%
4	11.69%	5.46%	6.63%	-0.26%	-0.14%
5	8.67%	5.63%	-2.90%	6.43%	-0.49%
6	1.89%	5.89%	-6.65%	2.97%	-0.32%
7	4.56%	2.62%	20.97%	-16.01%	-3.01%
8	4.35%	2.40%	25.43%	-19.10%	-4.38%
9	8.76%	4.94%	3.01%	0.95%	-0.14%
10	8.76%	4.94%	3.01%	0.95%	-0.14%
11	8.76%	4.94%	3.01%	0.95%	-0.14%
12	14.95%	7.52%	3.35%	4.13%	-0.05%
13	10.11%	5.22%	0.68%	4.86%	-0.65%
14	9.77%	6.92%	-3.31%	6.96%	-0.81%
15	5.87%	5.25%	0.96%	-0.23%	-0.11%
16	4.68%	5.22%	-0.10%	-0.31%	-0.12%
17	10.10%	5.64%	6.02%	-1.35%	-0.21%
18	6.17%	5.67%	1.78%	-1.17%	-0.11%
19	6.85%	6.00%	1.91%	-0.90%	-0.16%
20	8.30%	5.78%	2.73%	-0.08%	-0.13%
21	7.60%	6.42%	1.14%	0.19%	-0.16%
22	7.67%	5.91%	2.31%	-0.40%	-0.15%
23	9.58%	7.52%	-1.46%	3.76%	-0.23%
24	9.38%	5.00%	4.63%	-0.16%	-0.10%
25	9.11%	7.57%	-2.46%	4.22%	-0.23%
26	9.11%	7.57%	-2.46%	4.22%	-0.23%
27	9.27%	5.17%	4.04%	0.17%	-0.10%
28	11.49%	8.40%	2.04%	1.23%	-0.17%
29	6.75%	5.85%	-8.39%	10.21%	-0.92%
30	9.62%	4.98%	-7.18%	12.78%	-0.96%
31	7.06%	5.14%	-6.60%	9.22%	-0.69%
32	13.38%	6.29%	4.25%	3.02%	-0.17%
33	10.61%	5.67%	2.29%	2.80%	-0.15%
34	6.24%	5.28%	2.02%	-0.83%	-0.23%
35	18.35%	7.70%	5.30%	5.26%	0.09%
36	11.66%	4.91%	1.11%	5.94%	-0.29%
37	10.01%	4.91%	6.74%	-1.49%	-0.14%
38	10.64%	4.96%	7.33%	-1.48%	-0.17%
39	15.00%	6.99%	6.38%	1.70%	-0.07%
40	11.28%	6.65%	4.97%	-0.16%	-0.18%
41	9.58%	5.90%	4.61%	-0.73%	-0.19%
42	12.63%	5.58%	-8.66%	19.20%	-3.48%

NCREIF Cohort PPA Summary					
Min	1.89%	2.40%	-8.39%	-19.10%	-4.38%
Max	18.35%	8.40%	25.43%	12.78%	0.09%
Average	8.98%	5.72%	2.29%	1.41%	-0.44%
Range	16.46%	6.00%	33.81%	31.88%	4.47%

Relative Performance of Real Estate Investments vs NCREIF Cohort

Property #	IRR	InitYld	CFchg	YldChg	Interaction
1	3.73%	4.50%	-1.82%	1.33%	-0.28%
2	6.75%	5.73%	1.20%	0.54%	-0.71%
3	-4.89%	3.50%	-1.53%	-7.65%	0.79%
4	-4.34%	1.15%	-12.95%	7.21%	0.25%
5	4.68%	2.83%	-1.45%	5.24%	-1.94%
6	5.36%	5.55%	-8.69%	10.25%	-1.74%
7	0.02%	7.86%	-24.45%	14.21%	2.41%
8	-1.47%	11.77%	-35.33%	18.62%	3.47%
9	0.13%	2.77%	-4.93%	2.49%	-0.20%
10	-0.35%	1.81%	-2.43%	0.38%	-0.11%
11	0.29%	1.29%	-0.09%	-0.86%	-0.05%
12	14.13%	0.06%	13.00%	0.64%	0.43%
13	-1.26%	6.10%	-8.48%	0.00%	1.11%
14	2.26%	2.68%	3.46%	-4.19%	0.31%
15	-0.52%	6.88%	-8.45%	1.17%	-0.13%
16	-3.03%	0.92%	-7.09%	2.37%	0.76%
17	-2.58%	0.58%	-6.67%	3.53%	-0.03%
18	4.88%	1.92%	-0.18%	2.26%	0.88%
19	-6.31%	1.85%	-5.12%	-3.04%	0.00%
20	5.87%	2.94%	0.96%	4.01%	-2.05%
21	0.74%	2.27%	-3.03%	1.73%	-0.23%
22	-1.11%	-3.35%	8.40%	-6.17%	0.01%
23	1.30%	3.78%	-7.41%	5.54%	-0.60%
24	-1.18%	5.20%	-8.09%	1.96%	-0.26%
25	5.74%	5.38%	1.95%	-1.13%	-0.46%
26	5.74%	5.38%	1.95%	-1.13%	-0.46%
27	5.68%	0.73%	5.83%	-1.03%	0.15%
28	0.14%	1.69%	-1.90%	0.41%	-0.07%
29	8.07%	1.51%	10.71%	-4.89%	0.74%
30	11.86%	3.85%	6.31%	0.81%	0.88%
31	-8.71%	-10.98%	22.38%	-19.07%	-1.04%
32	-6.11%	-2.03%	-2.73%	-1.41%	0.07%
33	3.06%	-0.09%	4.46%	-1.13%	-0.18%
34	0.82%	2.72%	-1.85%	0.32%	-0.37%
35	2.58%	0.25%	-2.89%	5.25%	-0.03%
36	5.52%	-0.70%	16.69%	-9.56%	-0.91%
37	-8.76%	1.75%	-15.87%	4.12%	1.24%
38	-3.99%	3.16%	-7.48%	0.43%	-0.11%
39	-15.78%	-3.10%	2.01%	-13.85%	-0.83%
40	-3.03%	0.72%	0.18%	-3.50%	-0.42%
41	4.91%	2.03%	-2.60%	5.62%	-0.13%
42	-1.96%	1.80%	3.00%	-9.60%	2.84%

Subject's Relative Stats to Benchmark Summary					
Min	-15.78%	-10.98%	-35.33%	-19.07%	-2.05%
Max	14.13%	11.77%	22.38%	18.62%	3.47%
Average	0.69%	2.25%	-1.93%	0.29%	0.07%
Range	29.90%	22.75%	57.71%	37.69%	5.52%

Figure 13 - PPA Results of Full Cash Flows Sorted by Property Number

Another way to visually present the relative results by property and by component, given in the right-hand column in Figure 13, is the graphical portrayal in Figure 14 below. This chart thus provides a summary of each investment's relative performance to the benchmark on the various components, showing the magnitude and sign of the contribution of each of the IRR components, as well the relative total IRR performance indicated by the dashed red lines keyed to the right-hand vertical axis.

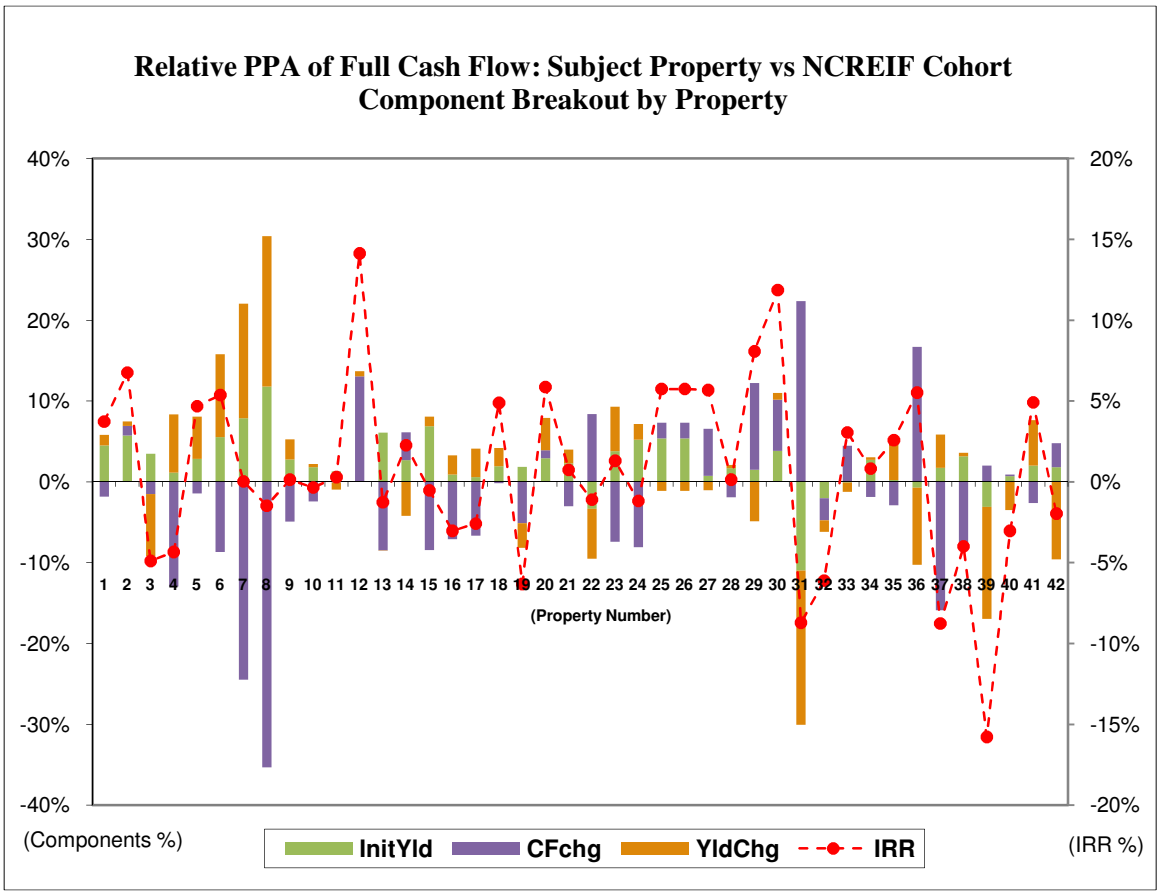

Figure 14 – Stacking Chart of the Relative PPA Results of Full Cash Flows[1]

Finally, a color-coded summary table of each investment's relative performance to the benchmark on the various components, in terms of whether the subject properties outperformed or underperformed the benchmarks on each component, is provided in Figure 15 below.

[1] Property numbering is randomly assigned as described in Chapter 4.

Relative Performance of Subject Properties vs NCREIF Cohort

	IRR	InitYld	CFchg	YldChg
Property #1 - (Office - Southeast)	O	O	U	O
Property #2 - (Industrial - EN Central)	O	O	O	O
Property #3 - (Office - Pacific)	U	O	U	U
Property #4 - (Industrial - Pacific)	U	O	U	O
Property #5 - (Office - Pacific)	O	O	U	O
Property #6 - (Office - Pacific)	O	O	U	O
Property #7 - (Office - Southwest)	O	O	U	O
Property #8 - (Office - Southwest)	U	O	U	O
Property #9 - (Apartment - Southwest)	O	O	U	O
Property #10 - (Apartment - Southwest)	U	O	U	O
Property #11 - (Apartment - Southwest)	O	O	U	U
Property #12 - (Retail - Pacific)	O	O	O	O
Property #13 - (Office - EN Central)	U	O	U	U
Property #14 - (Office - EN Central)	O	O	O	U
Property #15 - (Office - EN Central)	U	O	U	O
Property #16 - (Office - EN Central)	U	O	U	O
Property #17 - (Retail - Pacific)	U	O	U	O
Property #18 - (Retail - EN Central)	O	O	U	O
Property #19 - (Retail - Northeast)	U	O	U	U
Property #20 - (Retail - EN Central)	O	O	O	O
Property #21 - (Apartment - Southeast)	O	O	U	O
Property #22 - (Apartment - Southeast)	U	U	O	U
Property #23 - (Industrial - EN Central)	O	O	U	O
Property #24 - (Industrial - Southeast)	U	O	U	O
Property #25 - (Industrial - Southeast)	O	O	O	U
Property #26 - (Industrial - Southeast)	O	O	O	U
Property #27 - (Industrial - Southeast)	O	O	O	U
Property #28 - (Retail - EN Central)	O	O	U	O
Property #29 - (Office - Southwest)	O	O	O	U
Property #30 - (Office - Southwest)	O	O	O	O
Property #31 - (Office - Southwest)	U	U	O	U
Property #32 - (Office - Northeast)	U	U	U	U
Property #33 - (Office - Northeast)	O	U	O	U
Property #34 - (Office - EN Central)	O	O	U	O
Property #35 - (Apartment - Pacific)	O	O	U	O
Property #36 - (Office - Pacific)	O	U	O	U
Property #37 - (Office - Pacific)	U	O	U	O
Property #38 - (Industrial - Southeast)	U	O	U	O
Property #39 - (Office - Northeast)	U	U	O	U
Property #40 - (Office - Mideast)	U	O	O	U
Property #41 - (Retail - Mountain)	O	O	U	O
Property #42 - (Office - Pacific)	U	O	O	U
Total # Outperformed	24	36	16	25
Total % Outperformed	57%	86%	38%	60%
Total # Underperformed	18	6	26	17
Total % Underperformed	43%	14%	62%	40%

Outrperform vs. Benchmark =	O
Underperform vs. Benchmark =	U

Figure 15 - Color-Coded Relative PPA Results of Full Cash Flows

Because the PPA method is primarily a diagnostic tool, to help portfolio and asset managers gain a better understanding of the nature and causes of their property-level investment performance, we feel that methods of presenting the results of the analysis in a contextual and visually intuitive way are important to the successful use of the technique. As noted, we feel that the charts and color-coded tables presented here and in *Appendix B* are part of the contribution of this thesis. Of course, the systematic implications of the analysis can come out more clearly when the properties are not sorted randomly (as here), but rather ranked and sorted by various criteria, as we will present below. Initially, however, let us simply examine the overall results of the PPA analysis of our hypothetical "client".

As indicated in Figure 13, on average the "client's" Investment Portfolio outperformed the benchmark in total realized IRR by 69 basis points (Portfolio's 9.76% performance versus benchmark's 8.98%).[1] The average investment outperformed the benchmark in the IY attribute by 225 basis points on average (Portfolio's 7.97% versus benchmark's 5.72%), underperformed the benchmark in CFC by 193 basis points on average (Portfolio's 0.10% versus benchmark's 2.29%), and outperformed the benchmark in YC by 29 basis points on average (Portfolio's 2.13% versus benchmark's 1.41%). One thing that this type of PPA analysis does is to immediately provide a quantitative picture of the overall nature of the client's property-level investment performance.

For example, one way one might use this type of overview PPA quantification is to postulate that a performance outcome that occurs more than half of the times (50% frequency mark) would tend to indicate a firm's higher probability (or ability) of achieving either an outperformance or underperformance (depending on the outcome) on average compared to the benchmark. This could be taken as *prima facie* evidence of a relative strength or weakness of the firm (compared to the benchmark). While quantitative analysis like this should never be presumed to be determinative, it can make a useful starting point in a discussion of the firm's management strengths and weaknesses. As indicated in Figure 15, when only considering the direction of the relative performance of each component (either outperform or underperform the

[1] Keep in mind that this is an average that is equally weighted across the 42 investments that were sold by the client between 2001 and 2008, and that these investments span various different historical holding periods averaging 9 years and ranging from 3 to 24 years during the 1981-2008 period.

benchmark) and not factoring in the magnitude of the relative performance, the client's Investment Portfolio outperformed the benchmark on total IRR 57% of the times (24 out of 42). Interestingly, and confirming a similar result in the average reported above, the outperformance is not uniform across the since-inception IRR attributes. Rather, this client outperformed the benchmark on IY 86% of the times (36 out of 42), but only 38% of the times (16 out of 42) in the CFC component, with their YC performance being in the middle (outperforming 60% of the times or - 25 out of 42).

Based on these relative performance results indicated by the Investment Portfolio in aggregate, the "client" Investment Firm appeared to demonstrate slightly above average investment management performance compared to its peers as a whole, as demonstrated by the slightly higher average total IRR achieved, and the slightly higher outperformance frequency of 57%.[1]

Furthermore, we can venture the proposition that the Investment Firm appears to have achieved its total IRR outperformance mainly through functions that are reflected largely in the IY attribute. The client outperformed in IY on 86% of the investments. This could indicate consistent relative superiority in property selection and/or acquisition execution ability. Alternatively, it could indicate an investment strategy to focus on slightly "problem assets", that face more downside potential (or less upside potential) than the average asset in the benchmark. However, the firm's underperformance in the CFC component given by the -193 basis point relative performance and the outperformance frequency of only 38% (or underperformance frequency of 62%) in that attribute, suggest that the firm may have relatively inferior operational management capability. This could reflect inferior revenue or expense management. On the other hand, the sub-par CFC performance could simply be a realization of the downside potential

[1] Note that outperformance as we're defining it here may or may not indicate superior skill relative to the NCREIF universe, as many factors can come into play to cause a given result, and the result applies only to the given set of specific historical investments. Nevertheless, this type of "Lake Wobegon" outperformance on average, relative to a good benchmark (as NCREIF probably is in this case), is obviously a nice result to find. However, an important caveat is the matter of risk. The only control for risk in this type of analysis is the presumption that the benchmark contains the same amount of investment risk as the subject investments (at least in terms of the type of risk that the property market cares about, and hence prices into asset values).

inherent in the types of assets targeted by the fund based on the aforementioned "problem asset" strategy. In the real world of course, the client fund would presumably inherently understand their own investment strategy, what they were trying to do (i.e., whether they were trying to target troubled assets or not). The firm's slightly average outperformance in the YC component, along with an outperformance frequency of 60%, may be attributable to a mix of relatively superior property selection, acquisition transaction execution, operational management, and/or disposition transaction execution. In other words, this could be simply the back-side reflection of the superior IY performance, or it could represent some degree of pay-back for capital improvements that are reflected in the relatively poor CFC performance.

One plausible explanation for the PPA outcome of the Investment Portfolio is that management has the ability to select and acquire above average properties that provide a superior total return compared to the benchmark, which is mostly attributed to the property's superior cash flows at the time of acquisition, however, cash flows of these assets have a tendency to erode during the holding period either through poor leasing performance or poor control of operating/capital expenditures. These properties are then sold at below average yields (good prices) as a reflection of the assets' superior quality and upkeep as a result of the superior initial selection and/or the spending in capital improvements.

PPA Result Correlation

A computation of the correlation by paring each of the three IRR components for the relative PPA results shows an average correlation of -69.6% between the IY and CFC components, +71.5% between the IY and YC components, and -79.7% between the CFC and YC components, across all of the investments within the portfolio.

Considering the firm's consistent performance in achieving outperforming IY, the significant negative correlation between the IY and CFC components may suggest that the firm may be targeting investments with higher initial yields but with some anticipated cash flow problems or exposure to higher downside potential, which the firm seeks but fails to overcome as indicated by the fact that the YC component is less favorable than the IY component even though the firm takes a major hit during the holding period reflected in the sub-par CFC performance. The significant positive correlation between the IY and YC components can be generalized by

the realization of a good property selection or acquisitions strategy where a terminal yield lower than the initial yield is achieved.

Other things being equal, if a firm is "good" at acquiring properties (as reflected in above-benchmark yield at acquisition) then one would expect a corresponding positive YC component (other things being equal) even if the firm only sells the properties at benchmark yields going out. Going from high yield (low price) at acquisition to (relatively) average yield (average price) at disposition would result in a positive YC attribute, as the going-out yield would tend to be more favorable (relative to the going-in yield) than is the case in the benchmark. The fact that the "client" firm beat the benchmark 86% of the time going in, but only 60% of the time going out, actually suggests a relative deterioration in performance post acquisition (especially when combined with the negative CFC result).

The significant negative correlation between the CFC and YC components could indicate that the firm may be achieving CFC outperformance by saving on capital expenditures during the holding period or by executing a leasing strategy that has provides short term upside, which would then result in the firm achieving YC underperformance as a result of the property's future capital needs for deferred improvements or the property's future tenancy risks.

Of course, all of the above reasoning may be totally false. The point is actually not whether it is accurate or not. The point is that this type of systematic and comprehensive and structured quantitative break-out of the investment results leads to *hypotheses* like these, and this exercise can lead to fruitful discussion and accountability, self-analysis and diagnosis, within the investment management firm. If this 42-property analysis represented an actual real world firm, then the management team within that firm would be able to take this sort of quantitative information and combine it with their internal knowledge about the specific deals and the specific managers and groups within the organization, and the particular history that is reflected in the analysis. This should lead to a more in-depth understanding of the nature and causes of any systematic characteristics of the firm's investment performance.

Property Performance Patterns

Now stepping back a bit, let us note that, as a mathematical fact, there are a total of 16 different property performance patterns that are possible based on a combination of an

investment's outperformance or underperformance in the overall total IRR and the three IRR components of IY, CFC and YC. [1] Defining the PPA performance patterns by an "O" for outperformance and "U" for underperformance for the four performance measurements in the order of total IRR, IY, CFC and YC, a tally of the patterns exhibited by the relative PPA results indicated in Figure 15 is presented as follows:

Total IRR Outperformers			
O - O - O - O	O - O - O - U	O - O - U - O	O - U - O - O
4	5	12	0
O - O - U - U	O - U - U - O	O - U - O - U	O - U - U - U
1	0	2	0
Total IRR Underperformers			
U - O - O - O	U - O - O - U	U - O - U - O	U - U - O - O
0	2	9	0
U - O - U - U	U - U - U - O	U - U - O - U	U - U - U - U
3	0	3	1

Figure 16 – Possible Portfolio Performance Patterns

The 42 cases examined empirically here include examples of 10 among the 16 mathematically possible patterns. But three of the possible 16 patterns dominated in the 42 cases. Among the "winners" (cases beating the benchmark in the overall IRR) two patterns were widespread. The O-O-U-O pattern was by far the most common (12 occurrences), with O-O-O-U also occurring 5 times (and the "grand slam" O-O-O-O also occurred 4 times.) Among the "losers" (cases where the benchmark beat the client), the U-O-U-O pattern was by far the most common.

The portfolio performance patterns exhibited by the Investment Fund show that the Investment Firm outperformed the benchmark in total IRR most often when it outperformed on the IY and YC components, regardless of whether the firm outperformed or underperformed the benchmark in the CFC component, as demonstrated by the 17 out of 24 occurrences of total IRR outperformance (12 properties outperformed in total IRR when the firm outperformed in IY and YC while underperforming in CFC, and 4 properties outperformed in total IRR when the firm

[1] Two of these patterns (O-U-U-U, & U-O-O-O) are only possible if the "interaction" component reverses the main effect of the other three components, which would be very unlikely unless the overall result is very near zero (relative to the benchmark).

outperformed in IY and YC while also outperforming in CFC). The firm also outperformed the benchmark in total IRR more often when the firm outperformed in the IY and CFC components, while either underperforming or outperforming the benchmark in the YC component, as demonstrated by 9 out of 24 occurrences of total IRR outperformance (5 properties outperformed in total IRR when the firm outperformed in IY and CFC while underperforming in YC, and 4 properties outperformed in total IRR when the firm outperformed in IY and CFC while outperforming in YC).

On the other hand, the portfolio performance patterns also indicate that the firm underperformed the benchmark in total IRR most often when the firm outperformed in the IY and YC components, but underperformed in the CFC component, as indicated by the 9 out of 17 occurrences of total IRR underperformance.

Broadly, this pattern suggests the type of hypotheses we suggested in the previous section. In particular, one my hypothesize that the firm is strong in its ability to source good acquisitions, through some combination of finding good deals as presented in the market, and/or strong execution in the acquisition transaction process. But the firm apparently has less ability (or anyway, less performance results) than the average firm in the benchmark regarding what happens after the acquisition, on average overall. The firm seems to run into trouble in the operating cash flow, and is not able to fully recoup via the exit yield (to the extent one would expect given the favorable acquisition yield). Nevertheless, the firm's acquisition performance is sufficiently good that, overall, the firm tends to beat the benchmark more often than not.

Portfolio Relative Performance Based on Cross Sectional Analysis

Digging deeper into the Investment Firm's PPA performance, a cross sectional comparison of the full cash flow (full history) PPA results can be done based on property type as shown in the following tables.

OFFICE	IRR	InitYld	CFchg	YldChg
Property #1 - (Office - Southeast)	O	O	U	O
Property #3 - (Office - Pacific)	U	O	U	U
Property #5 - (Office - Pacific)	O	O	U	O
Property #6 - (Office - Pacific)	O	O	U	O
Property #7 - (Office - Southwest)	O	O	U	O
Property #8 - (Office - Southwest)	U	O	U	O
Property #13 - (Office - EN Central)	U	O	U	U
Property #14 - (Office - EN Central)	O	O	O	U
Property #15 - (Office - EN Central)	U	O	U	O
Property #16 - (Office - EN Central)	U	O	U	O
Property #29 - (Office - Southwest)	O	O	O	U
Property #30 - (Office - Southwest)	O	O	O	O
Property #31 - (Office - Southwest)	U	U	O	U
Property #32 - (Office - Northeast)	U	U	U	U
Property #33 - (Office - Northeast)	O	U	O	U
Property #34 - (Office - EN Central)	O	O	U	O
Property #36 - (Office - Pacific)	O	U	O	U
Property #37 - (Office - Pacific)	U	O	U	O
Property #39 - (Office - Northeast)	U	U	O	U
Property #40 - (Office - Mideast)	U	O	O	U
Property #42 - (Office - Pacific)	U	O	O	U
Total # Outperformed	10	16	9	10
Total % Outperformed	48%	76%	43%	48%
Total # Underperformed	11	5	12	11
Total % Underperformed	52%	24%	57%	52%

INDUSTRIAL	IRR	InitYld	CFchg	YldChg
Property #2 - (Industrial - EN Central)	O	O	O	O
Property #4 - (Industrial - Pacific)	U	O	U	O
Property #23 - (Industrial - EN Central)	O	O	U	O
Property #24 - (Industrial - Southeast)	U	O	U	O
Property #25 - (Industrial - Southeast)	O	O	O	U
Property #26 - (Industrial - Southeast)	O	O	O	U
Property #27 - (Industrial - Southeast)	O	O	O	U
Property #38 - (Industrial - Southeast)	U	O	U	O
Total # Outperformed	5	8	4	5
Total % Outperformed	63%	100%	50%	63%
Total # Underperformed	3	0	4	3
Total % Underperformed	38%	0%	50%	38%

APARTMENT	IRR	InitYld	CFchg	YldChg
Property #9 - (Apartment - Southwest)	O	O	U	O
Property #10 - (Apartment - Southwest)	U	O	U	O
Property #11 - (Apartment - Southwest)	O	O	U	U
Property #21 - (Apartment - Southeast)	O	O	U	O
Property #22 - (Apartment - Southeast)	U	U	O	U
Property #35 - (Apartment - Pacific)	O	O	U	O
Total # Outperformed	4	5	1	4
Total % Outperformed	67%	83%	17%	67%
Total # Underperformed	2	1	5	2
Total % Underperformed	33%	17%	83%	33%

RETAIL	IRR	InitYld	CFchg	YldChg
Property #12 - (Retail - Pacific)	O	O	O	O
Property #17 - (Retail - Pacific)	U	O	U	O
Property #18 - (Retail - EN Central)	O	O	U	O
Property #19 - (Retail - Northeast)	U	O	U	U
Property #28 - (Retail - EN Central)	O	O	U	O
Property #20 - (Retail - EN Central)	O	O	O	O
Property #41 - (Retail - Mountain)	O	O	U	O
Total # Outperformed	5	7	2	6
Total % Outperformed	71%	100%	29%	86%
Total # Underperformed	2	0	5	1
Total % Underperformed	29%	0%	71%	14%

Total # Outperformed	24	36	16	25
Total % Outperformed	57%	86%	38%	60%
Total # Underperformed	18	6	26	17
Total % Underperformed	43%	14%	62%	40%

Figure 17 - Color-Coded Cross Sectional Relative PPA Results by Property Type

	% of Properties Outperformed				
	Office	Industrial	Apartment	Retail	Total
Total Properties	21	8	6	7	42
IRR	48%	63%	67%	71%	57%
InitYld	76%	100%	83%	100%	86%
CFchg	43%	50%	17%	29%	38%
YldChg	48%	63%	67%	86%	60%
Interaction	52%	25%	17%	29%	38%
	% of Properties Underperformed				
	Office	Industrial	Apartment	Retail	Total
Total Properties	21	8	6	7	42
IRR	52%	38%	33%	29%	43%
InitYld	24%	0%	17%	0%	14%
CFchg	57%	50%	83%	71%	62%
YldChg	52%	38%	33%	14%	40%
Interaction	48%	75%	83%	71%	62%

Figure 18 – Summary Cross Sectional Relative PPA Results by Property Type

Based on the cross sectional analysis of the Investment Portfolio's relative PPA results by property type, as shown in Figure 17 and summarized in Figure 18, it appears the Investment Firm is relatively stronger than its peers in terms of overall investment management capabilities in the industrial, apartment and retail property types, and slightly weaker in office assets, as indicated by the firm's relative total IRR performance of only 48% of the times for office properties, and 63%, 67% and 71% for the industrial, apartment and retail property types, respectively. This finding is interesting considering the portfolio's larger number of office properties compared to the other property types, and may suggest a re-examination of the firm's allocation strategy in terms of property types based on the firm's expertise and historical performance in the various property types.

It appears the firm's outperformance in industrial properties results from the outperformance in all three components of IY, CFC and YC, whereas the firm's outperformance in apartment and retail properties generally rely on the outperformance in IY and YC, which more than compensates for the underperformance in the CFC component. The firm's underperformance in office properties occurs, on average, in spite of an outperformance in the IY attribute 76% of the time. But it is in the office sector that the firm's weakness in the subsequent-to-acquisition dimensions of CFC and YC take the biggest bite. In only 1 out of 21 office investments did the firm not fall below the benchmark in at least one of the CFC or YC attributes.

Additionally, we compare the PPA results based on the investments' location in terms of division as shown in the following tables.

SOUTHEAST	IRR	InitYld	CFchg	YldChg
Property #1 - (Office - Southeast)	O	O	U	O
Property #21 - (Apartment - Southeast)	O	O	U	O
Property #22 - (Apartment - Southeast)	U	U	O	U
Property #24 - (Industrial - Southeast)	U	O	U	O
Property #25 - (Industrial - Southeast)	O	O	O	U
Property #26 - (Industrial - Southeast)	O	O	O	U
Property #27 - (Industrial - Southeast)	O	O	O	U
Property #38 - (Industrial - Southeast)	U	O	U	O
Total # Outperformed	5	7	4	4
Total % Outperformed	63%	88%	50%	50%
Total # Underperformed	3	1	4	4
Total % Underperformed	38%	13%	50%	50%

EAST NORTH CENTRAL	IRR	InitYld	CFchg	YldChg
Property #2 - (Industrial - EN Central)	O	O	O	O
Property #13 - (Office - EN Central)	U	O	U	U
Property #15 - (Office - EN Central)	U	O	U	O
Property #16 - (Office - EN Central)	U	O	U	O
Property #18 - (Retail - EN Central)	O	O	U	O
Property #23 - (Industrial - EN Central)	O	O	U	O
Property #28 - (Retail - EN Central)	O	O	U	O
Property #34 - (Office - EN Central)	O	O	U	O
Property #14 - (Office - EN Central)	O	O	O	U
Property #20 - (Retail - EN Central)	O	O	O	O
Total # Outperformed	7	10	3	8
Total % Outperformed	70%	100%	30%	80%
Total # Underperformed	3	0	7	2
Total % Underperformed	30%	0%	70%	20%

SOUTHWEST	IRR	InitYld	CFchg	YldChg
Property #7 - (Office - Southwest)	O	O	U	O
Property #8 - (Office - Southwest)	U	O	U	O
Property #9 - (Apartment - Southwest)	O	O	U	O
Property #10 - (Apartment - Southwest)	U	O	U	O
Property #11 - (Apartment - Southwest)	O	O	U	U
Property #29 - (Office - Southwest)	O	O	O	U
Property #30 - (Office - Southwest)	O	O	O	O
Property #31 - (Office - Southwest)	U	U	O	U
Total # Outperformed	5	7	3	5
Total % Outperformed	63%	88%	38%	63%
Total # Underperformed	3	1	5	3
Total % Underperformed	38%	13%	63%	38%

PACIFIC	IRR	InitYld	CFchg	YldChg
Property #3 - (Office - Pacific)	U	O	U	U
Property #4 - (Industrial - Pacific)	U	O	U	O
Property #5 - (Office - Pacific)	O	O	U	O
Property #6 - (Office - Pacific)	O	O	U	O
Property #12 - (Retail - Pacific)	O	O	O	O
Property #17 - (Retail - Pacific)	U	O	U	O
Property #35 - (Apartment - Pacific)	O	O	U	O
Property #36 - (Office - Pacific)	O	U	O	U
Property #37 - (Office - Pacific)	U	O	U	O
Property #42 - (Office - Pacific)	U	O	O	U
Total # Outperformed	5	9	3	7
Total % Outperformed	50%	90%	30%	70%
Total # Underperformed	5	1	7	3
Total % Underperformed	50%	10%	70%	30%

NORTHEAST	IRR	InitYld	CFchg	YldChg
Property #19 - (Retail - Northeast)	U	O	U	U
Property #32 - (Office - Northeast)	U	U	U	U
Property #33 - (Office - Northeast)	O	U	O	U
Property #39 - (Office - Northeast)	U	U	O	U
Total # Outperformed	1	1	2	0
Total % Outperformed	25%	25%	50%	0%
Total # Underperformed	3	3	2	4
Total % Underperformed	75%	75%	50%	100%

MIDEAST	IRR	InitYld	CFchg	YldChg
Property #40 - (Office - Mideast)	U	O	O	U
Total # Outperformed	0	1	1	0
Total % Outperformed	0%	100%	100%	0%
Total # Underperformed	1	0	0	1
Total % Underperformed	100%	0%	0%	100%

MOUNTAIN	IRR	InitYld	CFchg	YldChg
Property #41 - (Retail - Mountain)	O	O	U	O
Total # Outperformed	1	1	0	1
Total % Outperformed	100%	100%	0%	100%
Total # Underperformed	0	0	1	0
Total % Underperformed	0%	0%	100%	0%

Total # Outperformed	24	36	16	25
Total % Outperformed	57%	86%	38%	60%
Total # Underperformed	18	6	26	17
Total % Underperformed	43%	14%	62%	40%

Figure 19 - Color-Coded Cross Sectional Relative PPA Results by Division

	% of Properties Over Perform							
	SE	EN Central	SW	Pacific	NE	Mid East	Mountain	Total
Total Properties	8	10	8	10	4	1	1	42
IRR	63%	70%	63%	50%	25%	0%	100%	57%
InitYld	88%	100%	88%	90%	25%	100%	100%	86%
CFchg	50%	30%	38%	30%	50%	100%	0%	38%
YldChg	50%	80%	63%	70%	0%	0%	100%	60%
Interaction	25%	40%	50%	50%	25%	0%	0%	38%
	% of Properties Under Perform							
	SE	EN Central	SW	Pacific	NE	Mid East	Mountain	Total
Total Properties	8	10	8	10	4	1	1	42
IRR	38%	30%	38%	50%	75%	100%	0%	43%
InitYld	13%	0%	13%	10%	75%	0%	0%	14%
CFchg	50%	70%	63%	70%	50%	0%	100%	62%
YldChg	50%	20%	38%	30%	100%	100%	0%	40%
Interaction	75%	60%	50%	50%	75%	100%	100%	62%

Figure 20 - Summary Cross Sectional Relative PPA Results by Division

Based on the cross sectional analysis of the Investment Portfolio's relative PPA results by division, as shown in Figure 19 and summarized in Figure 20, the firm appears to exhibit relatively stronger overall investment management capabilities across the southeast, east north central and southwest divisions, while performing similar to the benchmark in the pacific division, and underperforming the benchmark in the northeast division. These observations are indicated by the firm's outperformance frequencies for total IRR of 63%, 70% and 63% for the southeast, east north central and southwest divisions, 50% for the pacific division, and 25% for the northeast division. Due to the limited number of investments in each of the mid-east and mountain division (one property each), the PPA performance frequency results cannot be relied on for plausible interpretations relating to the firm's strengths and weaknesses regarding these markets.

With respect to the three divisions where the firm exhibited overall outperformance in terms of total IRR (southeast, east north central and southwest), the firm's outperformance appeared result from the outperformance of the IY and YC, while the CFC is generally equal to or below the benchmark on average. The same interaction between the firm's performance in the IY, CFC and YC holds true for the pacific division where the firm exhibited an equal chance of outperforming or underperforming the benchmark. In the northeast market where the firm underperformed the benchmark on average, the underperformance appeared to be attributable to underperformance in IY and YC, while the firm exhibited an equal chance of outperforming or underperforming the benchmark with respect to the CFC component. Thus, the northeast broke the firm's usual pattern by actually doing relatively better in the CFC component, but alas, without the firm's usual outperformance in IY the overall result was negative. (However, this is based on a very small sample size of only 4 deals, mostly office.)

Portfolio Relative Performance Based on Total IRR Sorting ("Winners" vs "Losers")

A particularly interesting way to break out the PPA analysis is to sort by overall IRR performance (relative to the benchmark), to focus on possible systematic differences between "winners" (those beating the benchmark in overall acquisition-to-disposition IRR) versus "losers" (those deals falling below the benchmark in total IRR). Figure 21 through Figure 24 address this important analysis (all of the performance results represent relative performances to the benchmark).

Total IRR Outperformers					
Property #	IRR	InitYld	CFchg	YldChg	Interaction
12	14.13%	0.06%	13.00%	0.64%	0.43%
30	11.86%	3.85%	6.31%	0.81%	0.88%
29	8.07%	1.51%	10.71%	-4.89%	0.74%
2	6.75%	5.73%	1.20%	0.54%	-0.71%
20	5.87%	2.94%	0.96%	4.01%	-2.05%
25	5.74%	5.38%	1.95%	-1.13%	-0.46%
26	5.74%	5.38%	1.95%	-1.13%	-0.46%
27	5.68%	0.73%	5.83%	-1.03%	0.15%
6	5.36%	5.55%	-8.69%	10.25%	-1.74%
36	5.52%	-0.70%	16.69%	-9.56%	-0.91%
41	4.91%	2.03%	-2.60%	5.62%	-0.13%
18	4.88%	1.92%	-0.18%	2.26%	0.88%
5	4.68%	2.83%	-1.45%	5.24%	-1.94%
1	3.73%	4.50%	-1.82%	1.33%	-0.28%
33	3.06%	-0.09%	4.46%	-1.13%	-0.18%
35	2.58%	0.25%	-2.89%	5.25%	-0.03%
14	2.26%	2.68%	3.46%	-4.19%	0.31%
23	1.30%	3.78%	-7.41%	5.54%	-0.60%
34	0.82%	2.72%	-1.85%	0.32%	-0.37%
21	0.74%	2.27%	-3.03%	1.73%	-0.23%
11	0.29%	1.29%	-0.09%	-0.86%	-0.05%
28	0.14%	1.69%	-1.90%	0.41%	-0.07%
9	0.13%	2.77%	-4.93%	2.49%	-0.20%
7	0.02%	7.86%	-24.45%	14.21%	2.41%

Relative Stats (IRR Outperformers):					
Min	0.02%	-0.70%	-24.45%	-9.56%	-2.05%
Max	14.13%	7.86%	16.69%	14.21%	2.41%
Average	4.35%	2.79%	0.22%	1.53%	-0.19%
Range	14.10%	8.56%	41.15%	23.77%	4.46%

Total IRR Underperformers					
Property #	IRR	InitYld	CFchg	YldChg	Interaction
10	-0.35%	1.81%	-2.43%	0.38%	-0.11%
15	-0.52%	6.88%	-8.45%	1.17%	-0.13%
22	-1.11%	-3.35%	8.40%	-6.17%	0.01%
24	-1.18%	5.20%	-8.09%	1.96%	-0.26%
13	-1.26%	6.10%	-8.48%	0.00%	1.11%
8	-1.47%	11.77%	-35.33%	18.62%	3.47%
42	-1.96%	1.80%	3.00%	-9.60%	2.84%
17	-2.58%	0.58%	-6.67%	3.53%	-0.03%
40	-3.03%	0.72%	0.18%	-3.50%	-0.42%
16	-3.03%	0.92%	-7.09%	2.37%	0.76%
38	-3.99%	3.16%	-7.48%	0.43%	-0.11%
4	-4.34%	1.15%	-12.95%	7.21%	0.25%
3	-4.89%	3.50%	-1.53%	-7.65%	0.79%
32	-6.11%	-2.03%	-2.73%	-1.41%	0.07%
19	-6.31%	1.85%	-5.12%	-3.04%	0.00%
31	-8.71%	-10.98%	22.38%	-19.07%	-1.04%
37	-8.76%	1.75%	-15.87%	4.12%	1.24%
39	-15.78%	-3.10%	2.01%	-13.85%	-0.83%

Relative Stats (IRR Underperformers):					
Min	-15.78%	-10.98%	-35.33%	-19.07%	-1.04%
Max	-0.35%	11.77%	22.38%	18.62%	3.47%
Average	-4.19%	1.54%	-4.79%	-1.36%	0.42%
Range	15.42%	22.75%	57.71%	37.69%	4.52%

Figure 21 - PPA Results of Full Cash Flows Sorted by Total IRR Performance

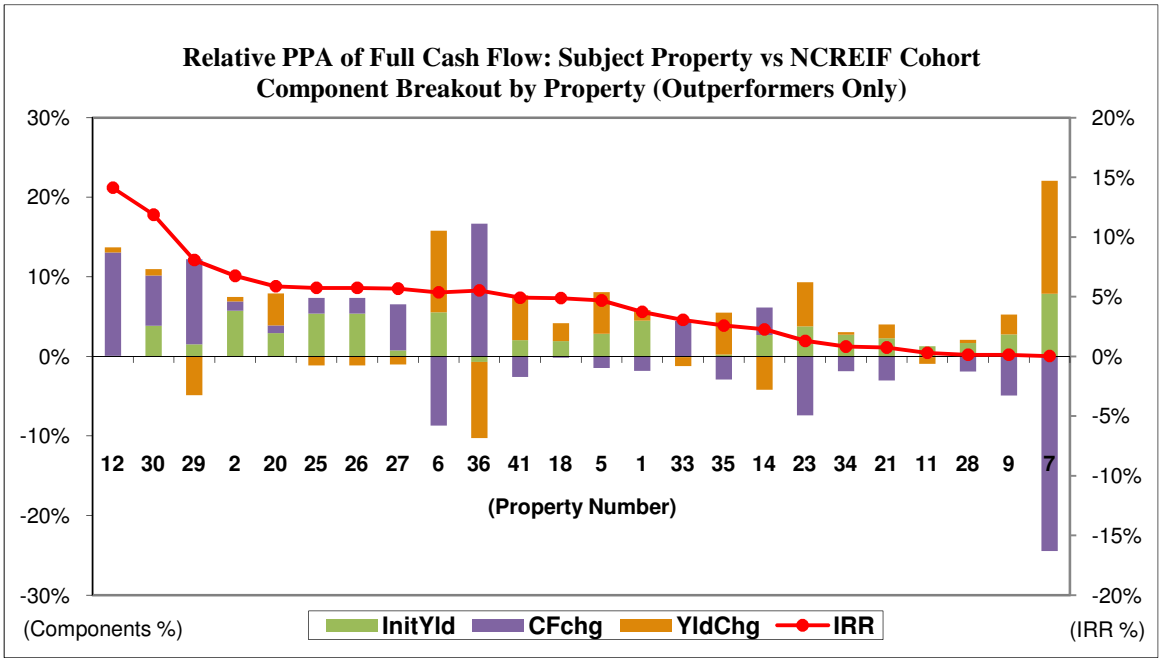

Figure 22 - Stacking Chart of the Relative PPA Results Sorted by Total IRR Performance (Outperformers Only)

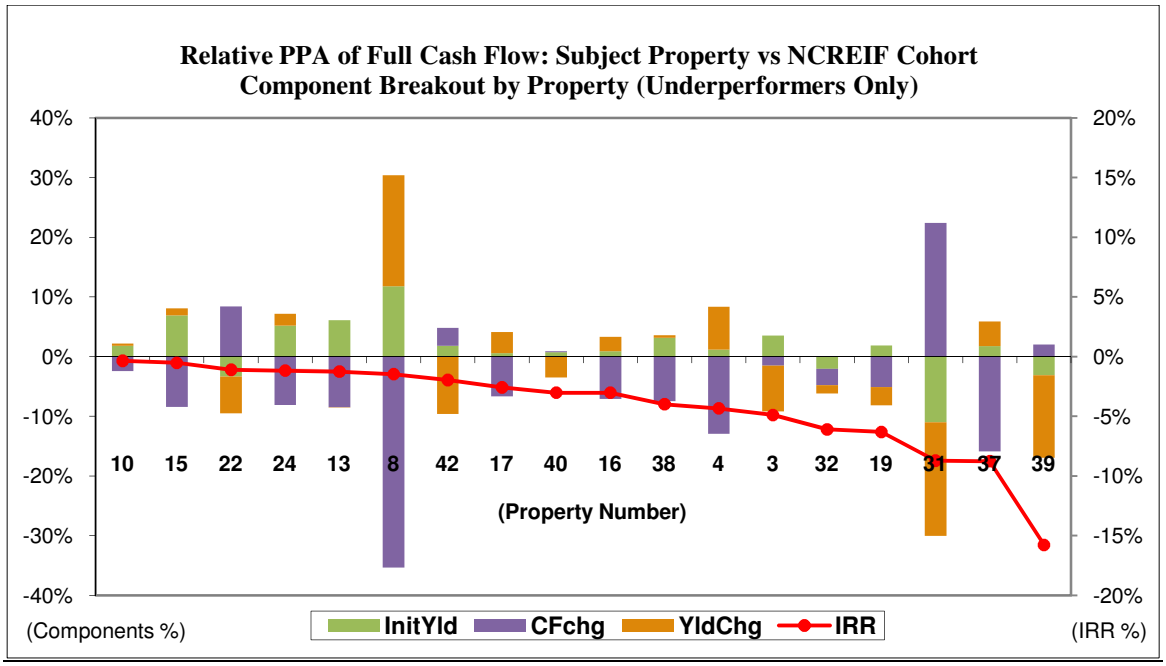

Figure 23 - Stacking Chart of the Relative PPA Results Sorted by Total IRR Performance (Underperformers Only)

Total IRR Outperformers

Property Number	NCREIF Bechmark	IRR	InitYld	CFchg	YldChg
12	Retail - Pacific	14.13%	O	O	O
30	Office - Southwest	11.86%	O	O	O
29	Office - Southwest	8.07%	O	O	U
2	Industrial - EN Central	6.75%	O	O	O
20	Retail - EN Central	5.87%	O	O	O
25	Industrial - Southeast	5.74%	O	O	U
26	Industrial - Southeast	5.74%	O	O	U
27	Industrial - Southeast	5.68%	O	O	U
36	Office - Pacific	5.52%	U	O	U
6	Office - Pacific	5.36%	O	U	O
41	Retail - Mountain	4.91%	O	U	O
18	Retail - EN Central	4.88%	O	U	O
5	Office - Pacific	4.68%	O	U	O
1	Office - Southeast	3.73%	O	U	O
33	Office - Northeast	3.06%	U	O	U
35	Apartment - Pacific	2.58%	O	U	O
14	Office - EN Central	2.26%	O	O	U
23	Industrial - EN Central	1.30%	O	U	O
34	Office - EN Central	0.82%	O	U	O
21	Apartment - Southeast	0.74%	O	U	O
11	Apartment - Southwest	0.29%	O	U	U
28	Retail - EN Central	0.14%	O	U	O
9	Apartment - Southwest	0.13%	O	U	O
7	Office - Southwest	0.02%	O	U	O
Total # Outperformed		24	22	11	16
Total % Outperformed		100%	92%	46%	67%
Total # Underperformed		0	2	13	8
Total % Underperformed		0%	8%	54%	33%

Total IRR Underperformers

Property Number	NCREIF Bechmark	IRR	InitYld	CFchg	YldChg
10	Apartment - Southwest	-0.35%	O	U	O
15	Office - EN Central	-0.52%	O	U	O
22	Apartment - Southeast	-1.11%	U	O	U
24	Industrial - Southeast	-1.18%	O	U	O
13	Office - EN Central	-1.26%	O	U	U
8	Office - Southwest	-1.47%	O	U	O
42	Office - Pacific	-1.96%	O	O	U
17	Retail - Pacific	-2.58%	O	U	O
40	Office - Mideast	-3.03%	O	O	U
16	Office - EN Central	-3.03%	O	U	O
38	Industrial - Southeast	-3.99%	O	U	O
4	Industrial - Pacific	-4.34%	O	U	O
3	Office - Pacific	-4.89%	O	U	U
32	Office - Northeast	-6.11%	U	U	U
19	Retail - Northeast	-6.31%	O	U	U
31	Office - Southwest	-8.71%	U	O	U
37	Office - Pacific	-8.76%	O	U	O
39	Office - Northeast	-15.78%	U	O	U
Total # Outperformed		0	14	5	9
Total % Outperformed		0%	78%	28%	50%
Total # Underperformed		18	4	13	9
Total % Underperformed		100%	22%	72%	50%

Figure 24 - Color-Coded Relative PPA Results Sorted by Total IRR Performance

As indicated by Figure 21, the firm's investments that resulted in outperformance in total IRRs is characterized on average by outperformance in IY (279 basis points), CFC (22 basis points) and YC components (153 basis points), whereas the group of investments that resulted in underperformance in total IRRs is characterized on average by outperformance in the IY (154 basis points), and underperformance in the CFC (-479 basis points) and YC (-136 basis points) components. Given by the fact that the firm only averaged a slight outperformance of 22 basis points in the CFC component for the group of properties that outperformed in total IRR, and the significant underperformance in the CFC component of -479 basis point on average exhibited by the total IRR underperforming group, these results suggest that the Investment Firm is relatively weaker in the operational management investment management function compared to its peers.

By far the greatest differential in performance between the winners and losers for this client occurred in the CFC attribute (501 basis-point differential, versus only a 125 basis point differential in IY and a 289 basis point differential in YC). To a first approximation, what is causing this firm's "losers" is problems with the operating cash flows subsequent to acquisition. Whether it is rent roll problems (leasing, marketing), or expense and capital expenditure management problems (including capital expenditure that is not sufficiently recouped in the exit yield), relative to the average firm in the benchmark, the operational management phase is the Achilles heel (relatively speaking) of this hypothetical client firm. Thus, we might take these results as at least presenting a "straw man" to challenge the firm to further explain and understand where and how they might improve their operational management. Perhaps, for example, if the firm faces an inherent disadvantage relative to its peers in this regard, it might benefit from an acquisitions strategy that seeks to find assets that do not require as significant operational management capabilities.

As indicated by Figure 24, the firm's investments that resulted in total IRR outperformance exhibited outperformance in the IY at a 92% frequency (22 of 24), while exhibiting a slightly higher chance of underperformance in CFC at a 54% frequency (13 of 24 time), and outperformance in the YC at a 67% frequency (16 of 24). The firm's investments that resulted in total IRR underperformance also exhibited outperformance in the IY, albeit at a slightly lower frequency of 78% (14 of 18), while exhibiting a significant higher chance of underperformance in CFC at a 72% frequency (13 of 18), and exhibiting an equal probability of

achieving either outperformance or underperformance in the YC component (9 of 18). Once again, these results confirm the prior assessment that the firm's primary strength is in its above average property selection and acquisition execution capability, as evident from the outperformance in the IY components for both the group that outperformed in the total IRR and the group that underperformed. However, the firm is generally challenged by its below average operational management performance as indicated by the underperformance in the CFC component. Considering the firm's ability to acquire properties with higher initial yields, it should be easier for the firm to sell at a lower terminal yield and achieve outperformance in the YC component. This is also evident in the results, though not as frequently as one might expect given the IY performance at the acquisition end of the histories This too is consistent with a stylized depiction of a firm that has relative strength in sourcing and acquiring properties but relative weakness thereafter.

PPA Results Based on Acquisition Date and Holding Period

Ranking by Stylized Acquisition Date

For purpose of analyzing the effect of vintage (as a function of the acquisition date) on the relative performance of investments in general, investment results have been split into 2 groups representing the earlier and latter half of acquisitions, with properties ranked based on stylized acquisition date, as indicated in the following tables. (Recall that all of these results are *relative to* the benchmark measured in each investment over the same holding period, so the effect of the broad property market cycle should be netted out of these results.)

Earlier Half of Acquisitions

Property Number	NCREIF Bechmark	Stylized Acq Date	IRR	InitYld	CFchg	YldChg
34	Office - EN Central	Jun-82	0.82%	O	U	O
15	Office - EN Central	May-83	-0.52%	O	U	O
28	Retail - EN Central	Jun-83	0.14%	O	U	O
16	Office - EN Central	Jul-85	-3.03%	O	U	O
1	Office - Southeast	Jul-87	3.73%	O	U	O
2	Industrial - EN Central	May-88	6.75%	O	O	O
21	Apartment - Southeast	Jun-88	0.74%	O	U	O
22	Apartment - Southeast	Nov-88	-1.11%	U	O	U
41	Retail - Mountain	Dec-94	4.91%	O	U	O
20	Retail - EN Central	Jan-95	5.87%	O	O	O
17	Retail - Pacific	Jan-95	-2.58%	O	U	O
18	Retail - EN Central	Mar-95	4.88%	O	U	O
11	Apartment - Southwest	Mar-95	0.29%	O	U	U
9	Apartment - Southwest	Mar-95	0.13%	O	U	O
10	Apartment - Southwest	Mar-95	-0.35%	O	U	O
38	Industrial - Southeast	Apr-95	-3.99%	O	U	O
26	Industrial - Southeast	Aug-95	5.74%	O	O	U
24	Industrial - Southeast	Aug-95	-1.18%	O	U	O
19	Retail - Northeast	Aug-95	-6.31%	O	U	U
27	Industrial - Southeast	Dec-95	5.68%	O	O	U
13	Office - EN Central	Dec-95	-1.26%	O	U	U
Total # Outperformed			12	20	5	15
Total % Outperformed			57%	95%	24%	71%
Total # Underperformed			9	1	16	6
Total % Underperformed			43%	5%	76%	29%

Latter Half of Acquisitions

Property Number	NCREIF Bechmark	Stylized Acq Date	IRR	InitYld	CFchg	YldChg
25	Industrial - Southeast	Feb-96	5.74%	O	O	U
23	Industrial - EN Central	Nov-96	1.30%	O	U	O
32	Office - Northeast	Dec-96	-6.11%	U	U	U
35	Apartment - Pacific	Jan-97	2.58%	O	U	O
14	Office - EN Central	Jan-97	2.26%	O	O	U
39	Office - Northeast	Apr-97	-15.78%	U	O	U
36	Office - Pacific	Apr-98	5.52%	U	O	U
37	Office - Pacific	Apr-98	-8.76%	O	U	O
3	Office - Pacific	May-98	-4.89%	O	U	U
40	Office - Mideast	Nov-98	-3.03%	O	O	U
33	Office - Northeast	Jan-99	3.06%	U	O	U
42	Office - Pacific	May-99	-1.96%	O	O	U
12	Retail - Pacific	Jun-99	14.13%	O	O	O
5	Office - Pacific	Jul-99	4.68%	O	U	O
4	Industrial - Pacific	Jul-99	-4.34%	O	U	O
7	Office - Southwest	Dec-99	0.02%	O	U	O
8	Office - Southwest	Mar-00	-1.47%	O	U	O
6	Office - Pacific	Apr-01	5.36%	O	U	O
29	Office - Southwest	Jun-01	8.07%	O	O	U
31	Office - Southwest	Feb-02	-8.71%	U	O	U
30	Office - Southwest	Apr-03	11.86%	O	O	O
Total # Outperformed			12	16	11	10
Total % Outperformed			57%	76%	52%	48%
Total # Underperformed			9	5	10	11
Total % Underperformed			43%	24%	48%	52%

Figure 25 - Color-Coded Relative PPA Results Sorted by Stylized Acquisition date

As indicated by the performance result totals shown in Figure 25, on average, the PPA results did not show any major differences in the likelihood of the Investment Firm in outperforming or underperforming the benchmark on total IRR as related to the vintage or acquisition date of the investments, given by the identical outperformance frequency of 57% for both groups. The results did show that the earlier group of acquisitions had a higher tendency in outperforming in the IY (95%) and YC (71%) components, and lagging the benchmark in the CFC (24%) component, while the latter group of acquisitions had a higher tendency in outperforming in the CFC (52%) components. But overall, we would have to say there is no clear indication of an acquisition date or vintage effect on the systematic relative outperformance or underperformance.

Ranking by Holding Period

For purpose of analyzing the effect of holding period on the relative performance of investments in general, we split the investment results into 2 groups representing the shorter and longer half of holding periods, with properties ranked based on holding period, as indicated in the following tables.

Shorter Half of Holding Periods

Property Number	NCREIF Bechmark	Stylized Hldg Pd (Yrs)	IRR	InitYld	CFchg	YldChg
30	Office - Southwest	2.9	11.86%	O	O	O
6	Office - Pacific	3.3	5.36%	O	U	O
8	Office - Southwest	3.5	-1.47%	O	U	O
7	Office - Southwest	3.8	0.02%	O	U	O
31	Office - Southwest	4.1	-8.71%	U	O	U
40	Office - Mideast	4.2	-3.03%	O	O	U
29	Office - Southwest	4.8	8.07%	O	O	U
12	Retail - Pacific	4.8	14.13%	O	O	O
35	Apartment - Pacific	4.9	2.58%	O	U	O
4	Industrial - Pacific	4.9	-4.34%	O	U	O
39	Office - Northeast	5.1	-15.78%	U	O	U
5	Office - Pacific	5.1	4.68%	O	U	O
37	Office - Pacific	5.8	-8.76%	O	U	O
33	Office - Northeast	6.0	3.06%	U	O	U
38	Industrial - Southeast	6.3	-3.99%	O	U	O
23	Industrial - EN Central	6.8	1.30%	O	U	O
19	Retail - Northeast	7.0	-6.31%	O	U	U
3	Office - Pacific	7.1	-4.89%	O	U	U
18	Retail - EN Central	7.4	4.88%	O	U	O
17	Retail - Pacific	7.6	-2.58%	O	U	O
36	Office - Pacific	7.8	5.52%	U	O	U
Total # Outperformed			11	17	5	15
Total % Outperformed			52%	94%	24%	71%
Total # Underperformed			10	1	16	6
Total % Underperformed			48%	6%	76%	29%

Longer Half of Holding Periods

Property Number	NCREIF Bechmark	Stylized Hldg Pd (Yrs)	IRR	InitYld	CFchg	YldChg
25	Industrial - Southeast	8.0	5.74%	O	O	U
27	Industrial - Southeast	8.2	5.68%	O	O	U
32	Office - Northeast	8.3	-6.11%	U	U	U
26	Industrial - Southeast	8.5	5.74%	O	O	U
24	Industrial - Southeast	8.6	-1.18%	O	U	O
42	Office - Pacific	8.8	-1.96%	O	O	U
14	Office - EN Central	8.9	2.26%	O	O	U
41	Retail - Mountain	9.0	4.91%	O	U	O
20	Retail - EN Central	9.9	5.87%	O	O	O
11	Apartment - Southwest	10.3	0.29%	O	U	U
9	Apartment - Southwest	10.3	0.13%	O	U	O
10	Apartment - Southwest	10.3	-0.35%	O	U	O
13	Office - EN Central	10.8	-1.26%	O	U	U
22	Apartment - Southeast	13.0	-1.11%	U	O	U
21	Apartment - Southeast	13.4	0.74%	O	U	O
2	Industrial - EN Central	16.6	6.75%	O	O	O
1	Office - Southeast	16.9	3.73%	O	U	O
16	Office - EN Central	18.3	-3.03%	O	U	O
34	Office - EN Central	20.2	0.82%	O	U	O
15	Office - EN Central	20.5	-0.52%	O	U	O
28	Retail - EN Central	24.5	0.14%	O	U	O
Total # Outperformed			13	19	8	12
Total % Outperformed			62%	90%	38%	57%
Total # Underperformed			8	2	13	9
Total % Underperformed			38%	10%	62%	43%

Figure 26 - Color-Coded Relative PPA Results Sorted by Holding Period

In Figure 26 there is only a very slight difference in relative overall IRR performance among properties with longer or shorter holding periods, and what little difference there is actually suggests that properties being held longer slightly outperform those sold more quickly. The Investment Firm outperformed the benchmark 62% of the time for the half of investments that were held for longer periods compared to 52% for the group of investments that were held for shorter periods.

This is an interesting finding considering the widely documented "disposition effect" in behavioral finance. The disposition effect relates to the tendency of investors to sell assets that have performed well in order to recognize gains, while keeping assets that have underperformed due to loss aversion, in hopes that the underperforming assets will turnaround in the future. Considering the higher probability of the firm in outperforming the benchmark for properties that are held for longer duration, it appears the firm is not subject to the disposition effect and is capable of holding assets that perform well in the long run while selling the relatively underperforming assets earlier. This may be due to the Investment Firm being a conglomeration of self managed investment firms, rather than firms that rely on third party investment managers where disposition decisions are heavily influenced by management fee structures that involve significant promotes (fee bonuses above a predetermined hurdle).

The interactions between the three IRR components between the 2 groups of properties with different holding periods did not indicate any major differences.

Simulation of On-going PPA with Partial Cash Flow (Holding Period PPA)

For each investment within the data set, the PPA was repeated at an annual frequency throughout the holding period, to produce the Holding Period PPA, or a simulation of on-going PPA analysis for each investment, based on the current *appraisal* of each investment each year. As previously mentioned, the initial interval (Period 1) in which the first PPA is completed for each property is defined as the period starting from the date of acquisition, and ending at the end of the first calendar year immediately following the year the property was acquired. The initial period is the same for each of the intervals examined during the holding period, while the ending period of each interval following the initial interval represent the end of each calendar year following the end of the second calendar year since property acquisition. These Holding Period PPA results are illustrated by stacking charts as shown on the bottom of *Appendix B* for each of the 42 investments.

The Holding Period PPA were completed for each investment and reviewed in aggregate in search for any insights or generalizations that can be made with regard to the firm's strengths and weaknesses and for a deeper understanding into the interaction of the total IRR, IY, CFC and YC components throughout the holding period of an investment. However, based on a cursory review of the Holding Period PPA results for each of the investments within the Investment Portfolio, there does not appear to be any recognizable trend or generalization that can be made based on the results.

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CHAPTER 6: CONCLUSION

Conclusion

This thesis sought to explore in depth the application of the since-acquisition IRR-Based Property-Level Performance Attribution analysis method (PPA) based on a case study of a complete set of actual core-asset round-trip transactions completed by several internally managed funds in the institutional investment industry. Furthermore, this thesis aimed to explore the use of PPA for organizational management diagnostics, and thereby demonstrate the potential of using the PPA analysis as an investigative tool for developing plausible hypothesis about a firm's investment management strengths and weaknesses, and to simulate the use of the tool in practice.

Through the case study, a thorough analysis of PPA results provided the following key observations relating to the hypothetical "client" Investment Firm's investment management strengths and weaknesses:

- The firm demonstrated above average investment management capability compared to its peers and competitors as a whole, in terms of overall averaged total IRR performance across all property types and geographic regions.
- The firm demonstrated very consistent relative outperformance in either property selection, acquisition execution, or a combination of the two, functions reflected most directly and purely in the initial yield (IY) attribute of the IRR.
- The firm demonstrated consistent relative underperformance on operational management functions relating to either revenue or expense management during an investment's holding period, functions reflected most directly in the cash flow change (CFC) attribute of the since-acquisition IRR.
- With respect to property types, the firm demonstrated relatively stronger investment management skills compared to its peers and competitors in the industrial, apartment, and retail asset types, in terms of total IRR performance, however, demonstrated slightly weaker investment management skills in office assets.
- With respect to geographic locations, the firm demonstrated relatively stronger investment management skills compared to its peers and competitors in the southeast,

east north central and southwest divisions, in terms of total IRR performance, while underperforming its peers and competitors in the northeast divisions, and performing consistent to its peers and competitors in the pacific division.

- The firm did not exhibit a behavioral "disposition effect" (loss aversion), as its relative performance was not significantly worse among properties held longer.
- One plausible generalization of the firm's overall investment performance is that the firm exhibited superior ability in identifying and acquiring superior properties at good prices, perhaps by exploiting a superior local broker or acquisition officer network. However, it is possible that the investment properties targeted typically include some anticipated future cash flow problems or exposure to high downside potential that the firm seeks to but fails to overcome through operational management.

  The firm demonstrates the ability to sell assets at lower terminal yields than initial yields more often than not. But this would be a natural reflection of the firm's strength in identifying and acquiring superior assets which high initial yields. And it is not clear that the firm is able to capitalize equally well in the disposition, as its outperformance in the yield change (YC) attribute of the since-acquisition IRR is less than its outperformance in the IY attribute.

Based on the foregoing observations through the PPA analysis, some logical adjustments the Investment Firm may wish to adopt to improve its investment management performance results may include:

- Reduce allocation and exposure to office assets while increasing allocation and exposure to the industrial, apartment, and retail asset types.
- Reduce or eliminate allocation and exposure to the northeast division while increasing allocation and exposure to the southeast, east north central and southwest divisions.
- Adopt an acquisitions strategy that focuses on investment properties that requires less operational management capabilities in order to achieve total IRR outperformance, or consider hiring third party property managers or forming joint ventures with firms that exhibit operational management expertise.

As demonstrated by the types of observations and insights that were gained through the extensive real world case study described in this thesis, it seems that the IRR-Based Property-Level Performance Attribution analysis shows much promise as a useful tool for organizational management diagnostics and perhaps should be more widely used in practice to provide an additional layer of information to facilitate more informed investment and management decisions.

Topics for Further Study

Research opportunities that are available to extend the work on the topic of performance attribution analysis completed in this thesis include research on the ways in which the real estate investment industry can adopt and implement the IRR-based PPA analysis in practice, the use of PPA for creating disposition strategies, and the application of the PPA analysis on different investment styles and their implications.

Industry Adoption and Implementation

Further research on the application of property performance attribution analysis can take the form of interviews with investment managers to determine the possibility of applying the methodology in practice, ways to implement an on-going attribution analysis internally, possible challenges to implementation, the various ways in which the analytical results from the PPA analysis would be used, and explore reasons why the tool is not currently commonly used in practice.

Use of PPA for Creating Disposition Strategies

Possible ways of using the results of an on-going IRR-based property-level performance attribution analysis to help investment firms structure disposition strategies that would increase portfolio returns can also be studied. Once the relative performance of each investment to the benchmark in total IRR, IY, CFC and YC are obtained through a PPA analysis, perhaps a ranking system can be applied to the investments based on their PPA results to help firms identify properties that they should sell in order to maximize returns, and a sell rule can be developed perhaps based on establishing hurdles rates on certain combinations of total IRR, IY, CFC and YC. The premise for the development of a sell rule and disposition strategy using the PPA results revolves around the idea of mean reversion and those investments that have

outperformed the benchmark would more likely mean revert to underperform the benchmark in the future than continue to outperform for prolonged periods. Therefore, further research on property-level performance attribution and its use in establishing sell rules and disposition strategies can be conducted to investigate how such strategies can be developed, their effectiveness, and ways to implement the PPA analysis for developing sell rules in practice.

Attribution Analysis for Alternative Investment Styles & Development

Further study can focus on the application of property performance attribution on alternative investment styles such as core-plus, value-added and opportunistic to compare and contrast the effect of investment style on attribution performance. Possible application of the attribution analysis for decomposing development investment returns can also be studied.

APPENDIX A: PROPERTY LEVEL DETAILS FOR THE DATA SET

Property Level Details for the Data Set ("Investment Portfolio")

Property Number	Region	Division	Property Type	Stylized Acquisition Date	Stylized Holding Period	Cash Flows	Actual IRR	Stylized IRR	IRR Variance (Stylized minus Actual)
1	South	SE	Office	Jul-87	16.9	Entity/Equity Level	6.71%	6.76%	0.05%
2	Midwest	E N Central	Industrial	May-88	16.6	Property Level	13.32%	13.40%	0.07%
3	West	Pacific	Office	May-98	7.1	Property Level	6.15%	6.01%	-0.14%
4	West	Pacific	Industrial	Jul-99	4.9	Property Level	8.39%	7.35%	-1.04%
5	West	Pacific	Office	Jul-99	5.1	Property Level	13.80%	13.35%	-0.45%
6	West	Pacific	Office	Apr-01	3.3	Property Level	7.03%	7.25%	0.22%
7	South	SW	Office	Dec-99	3.8	Property Level	4.75%	4.59%	-0.16%
8	South	SW	Office	Mar-00	3.5	Property Level	3.43%	2.88%	-0.56%
9	South	SW	Apartment	Mar-95	10.3	Property Level	8.96%	8.90%	-0.06%
10	South	SW	Apartment	Mar-95	10.3	Property Level	8.48%	8.41%	-0.06%
11	South	SW	Apartment	Mar-95	10.3	Property Level	9.12%	9.06%	-0.06%
12	West	Pacific	Retail	Jun-99	4.8	Entity/Equity Level	28.09%	29.08%	0.99%
13	Midwest	E N Central	Office	Dec-95	10.8	Property Level	8.98%	8.85%	-0.13%
14	Midwest	E N Central	Office	Jan-97	8.9	Entity/Equity Level	12.02%	12.03%	0.01%
15	Midwest	E N Central	Office	May-83	20.5	Property Level	5.14%	5.35%	0.21%
16	Midwest	E N Central	Office	Jul-85	18.3	Property Level	2.23%	1.65%	-0.58%
17	West	Pacific	Retail	Jan-95	7.6	Property Level	7.60%	7.52%	-0.08%
18	Midwest	E N Central	Retail	Mar-95	7.4	Property Level	10.45%	11.05%	0.60%
19	East	NE	Retail	Aug-95	7.0	Entity/Equity Level	1.00%	0.54%	-0.46%
20	Midwest	E N Central	Retail	Jan-95	9.9	Entity/Equity Level	13.07%	14.17%	1.09%
21	South	SE	Apartment	Jun-88	13.4	Property Level	8.34%	8.34%	0.00%
22	South	SE	Apartment	Nov-88	13.0	Property Level	6.51%	6.57%	0.05%
23	Midwest	E N Central	Industrial	Nov-96	6.8	Property Level	10.86%	10.88%	0.03%
24	South	SE	Industrial	Aug-95	8.6	Property Level	8.26%	8.20%	-0.06%
25	South	SE	Industrial	Feb-96	8.0	Property Level	13.32%	14.85%	1.53%
26	South	SE	Industrial	Aug-95	8.5	Property Level	14.20%	14.85%	0.65%
27	South	SE	Industrial	Dec-95	8.2	Property Level	14.90%	14.95%	0.05%
28	Midwest	E N Central	Retail	Jun-83	24.5	Property Level	11.02%	11.63%	0.60%
29	South	SW	Office	Jun-01	4.8	Property Level	14.39%	14.82%	0.43%
30	South	SW	Office	Apr-03	2.9	Property Level	19.13%	21.49%	2.35%
31	South	SW	Office	Feb-02	4.1	Property Level	-1.65%	-1.65%	0.00%
32	East	NE	Office	Dec-96	8.3	Entity/Equity Level	7.76%	7.28%	-0.48%
33	East	NE	Office	Jan-99	6.0	Entity/Equity Level	13.18%	13.67%	0.49%
34	Midwest	E N Central	Office	Jun-82	20.2	Property Level	6.77%	7.07%	0.30%
35	West	Pacific	Apartment	Jan-97	4.9	Property Level	20.98%	20.93%	-0.04%
36	West	Pacific	Office	Apr-98	7.8	Entity/Equity Level	17.24%	17.18%	-0.05%
37	West	Pacific	Office	Apr-98	5.8	Property Level	1.40%	1.25%	-0.15%
38	South	SE	Industrial	Apr-95	6.3	Property Level	6.81%	6.65%	-0.16%
39	East	NE	Office	Apr-97	5.1	Property Level	-0.16%	-0.78%	-0.62%
40	East	Mideast	Office	Nov-98	4.2	Property Level	8.12%	8.25%	0.13%
41	West	Mountain	Retail	Dec-94	9.0	Property Level	13.06%	14.50%	1.44%
42	West	Pacific	Office	May-99	8.8	Property Level	10.60%	10.67%	0.07%

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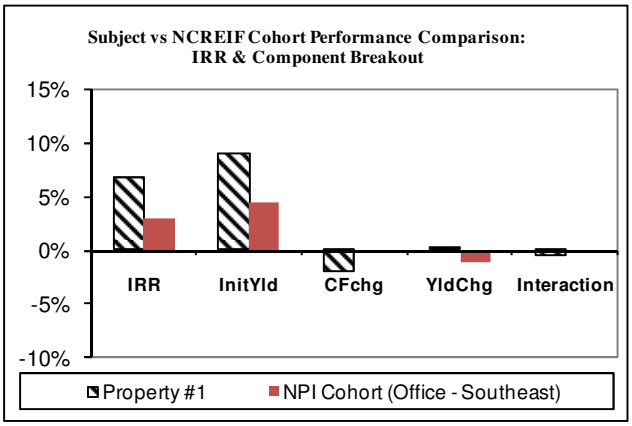
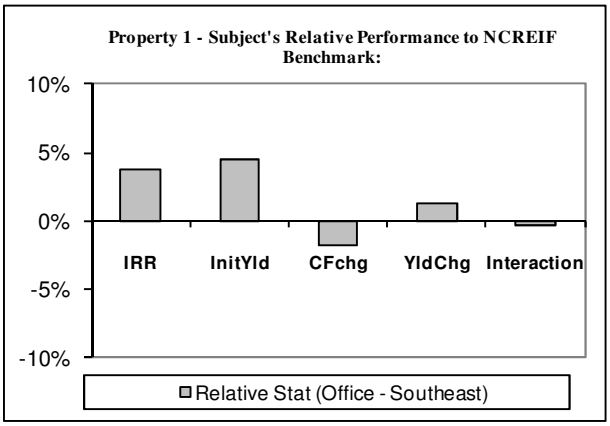
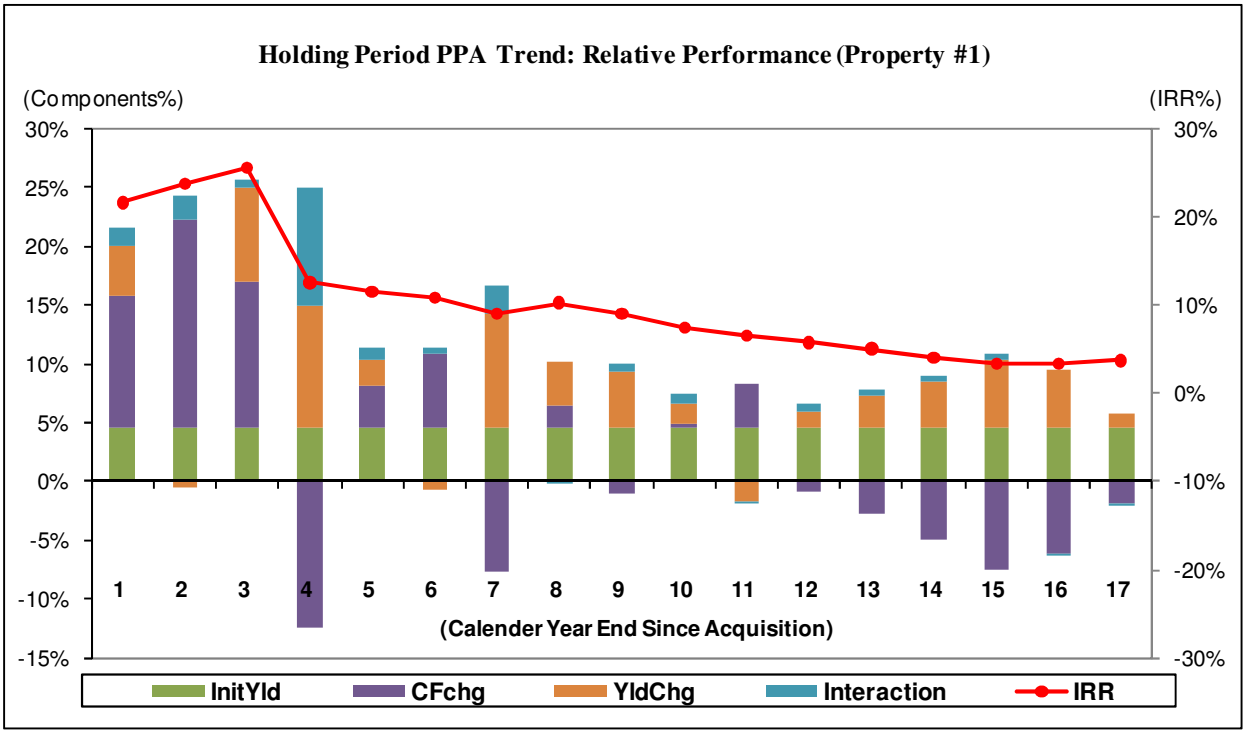
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #1

Property #1	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	6.76%	9.03%	-2.06%	0.27%	-0.47%
NPI Cohort (Office - Southeast)	3.04%	4.53%	-0.24%	-1.06%	-0.19%
Relative Stat (Office - Southeast)	3.73%	4.50%	-1.82%	1.33%	-0.28%
Over (O) / Under (U) Performance	O	O	U	O	U





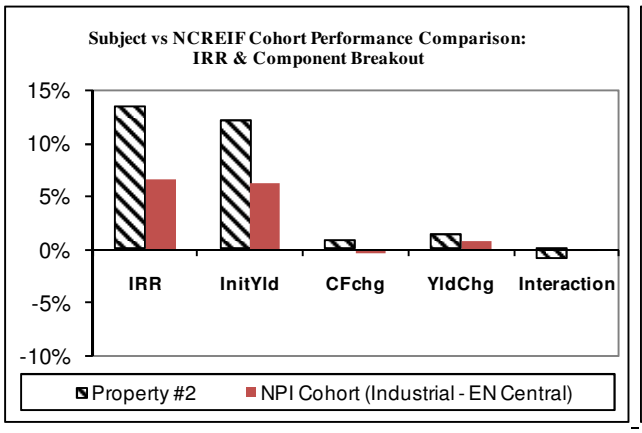


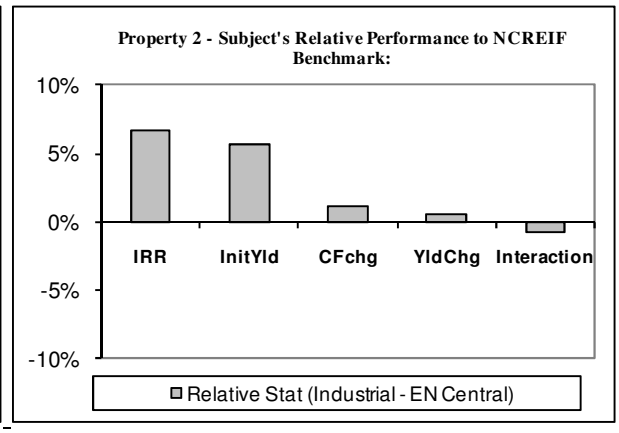
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

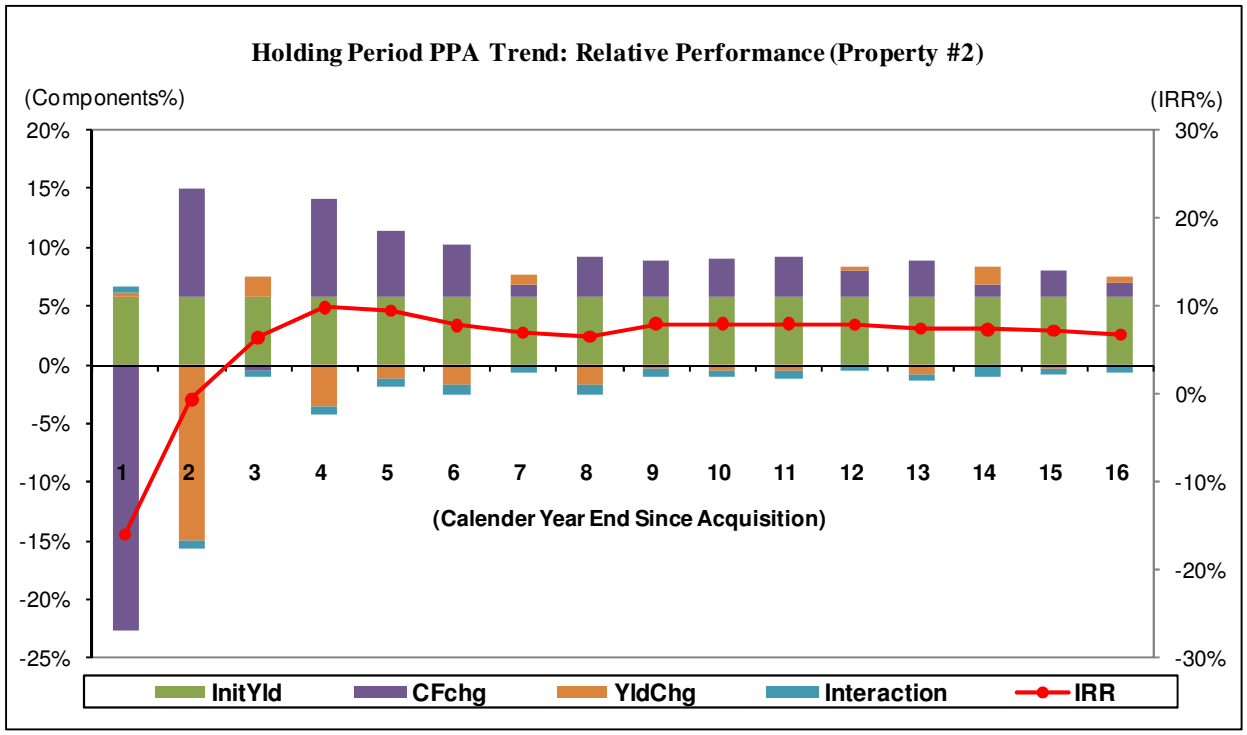
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #2

Property #2	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	13.40%	12.04%	0.88%	1.33%	-0.86%
NPI Cohort (Industrial - EN Central)	6.65%	6.31%	-0.31%	0.79%	-0.15%
Relative Stat (Industrial - EN Central)	6.75%	5.73%	1.20%	0.54%	-0.71%
Over (O) / Under (U) Performance	O	O	O	O	U





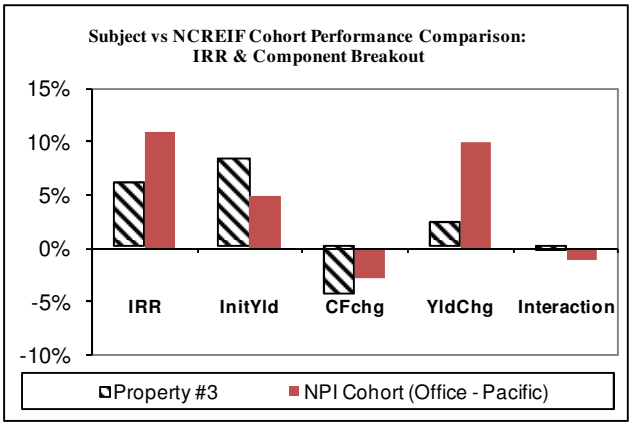


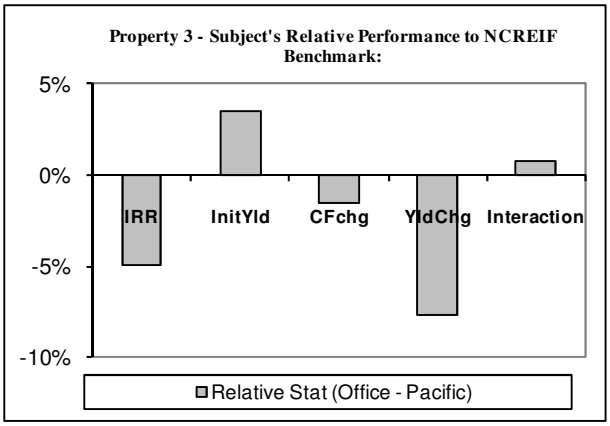
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

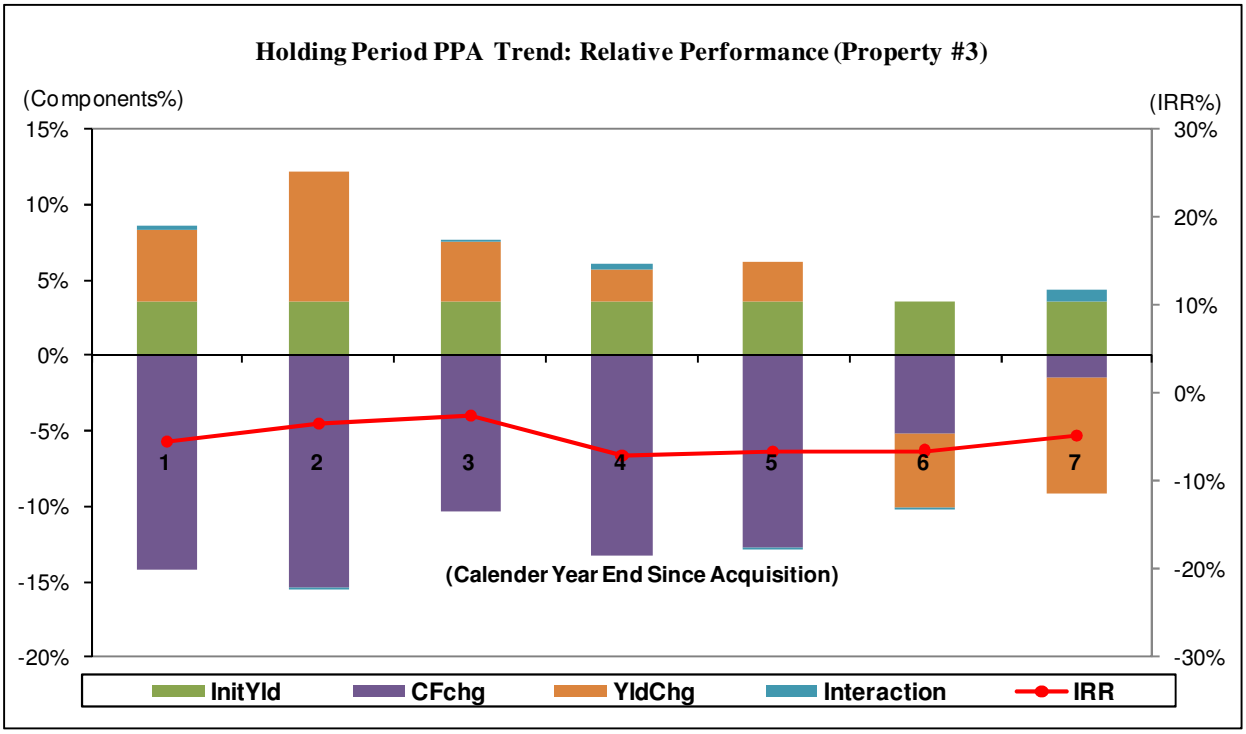
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #3

Property #3	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	6.01%	8.41%	-4.35%	2.33%	-0.38%
NPI Cohort (Office - Pacific)	10.90%	4.91%	-2.82%	9.99%	-1.17%
Relative Stat (Office - Pacific)	-4.89%	3.50%	-1.53%	-7.65%	0.79%
Over (O) / Under (U) Performance	U	O	U	U	O





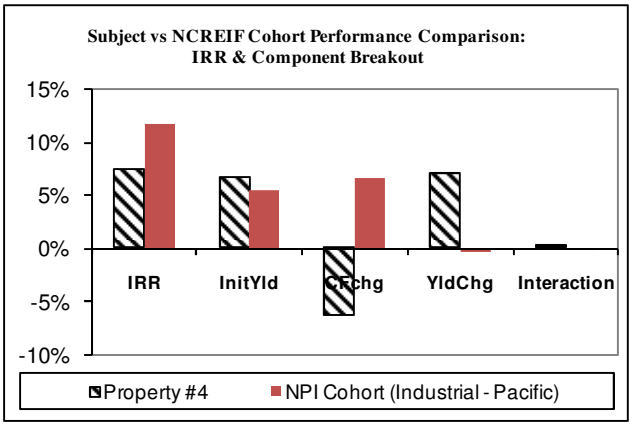


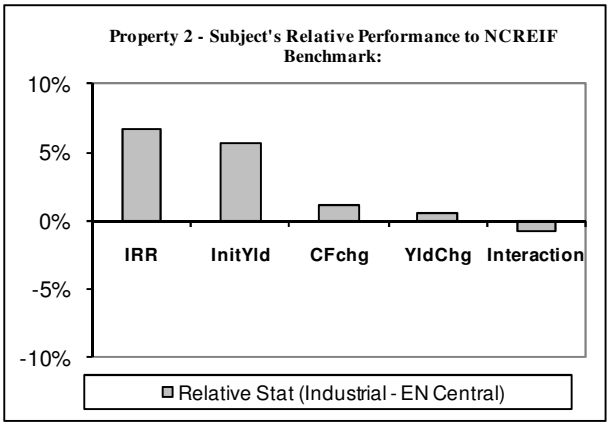
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

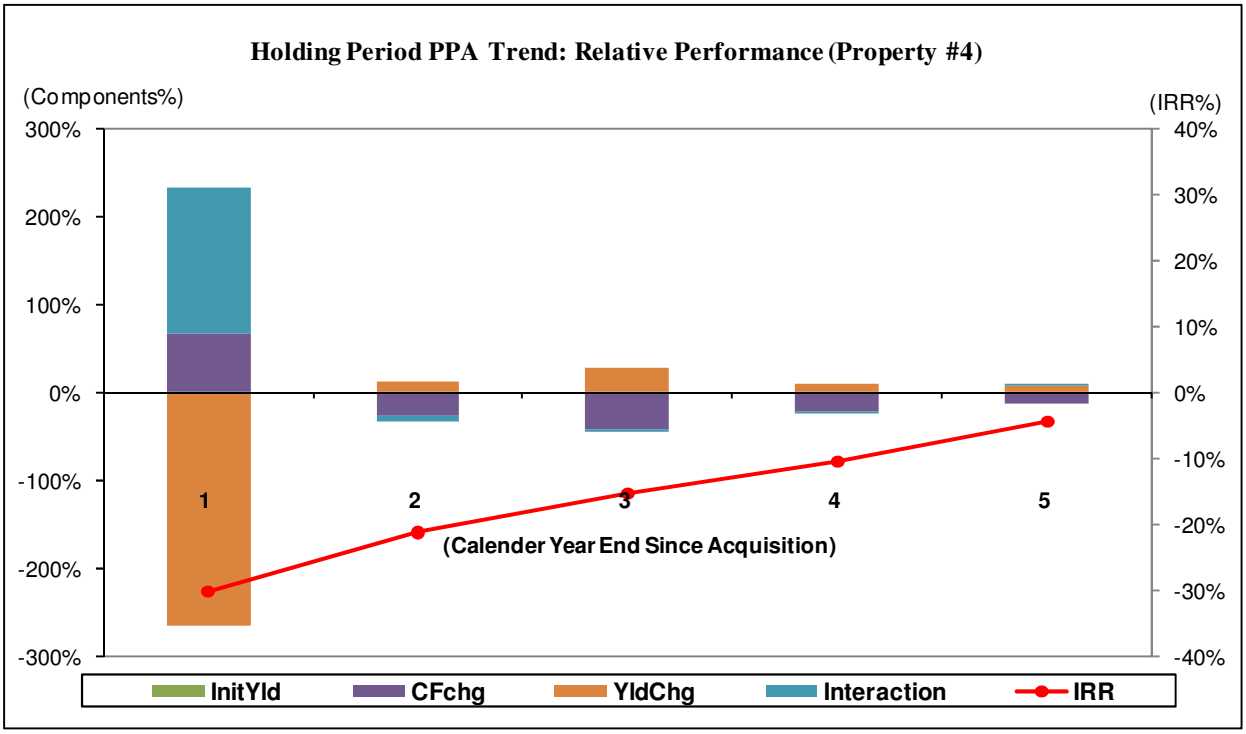
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #4

Property #4	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	7.35%	6.61%	-6.32%	6.95%	0.11%
NPI Cohort (Industrial - Pacific)	11.69%	5.46%	6.63%	-0.26%	-0.14%
Relative Stat (Industrial - Pacific)	-4.34%	1.15%	-12.95%	7.21%	0.25%
Over (O) / Under (U) Performance	U	O	U	O	O





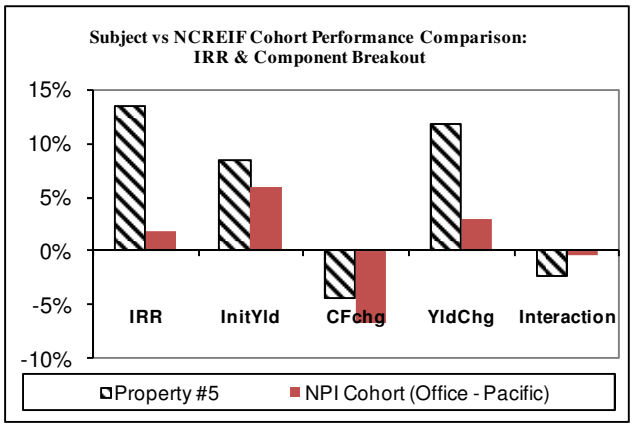


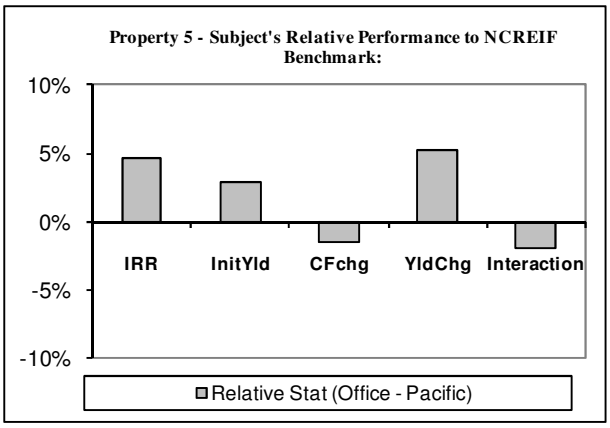
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

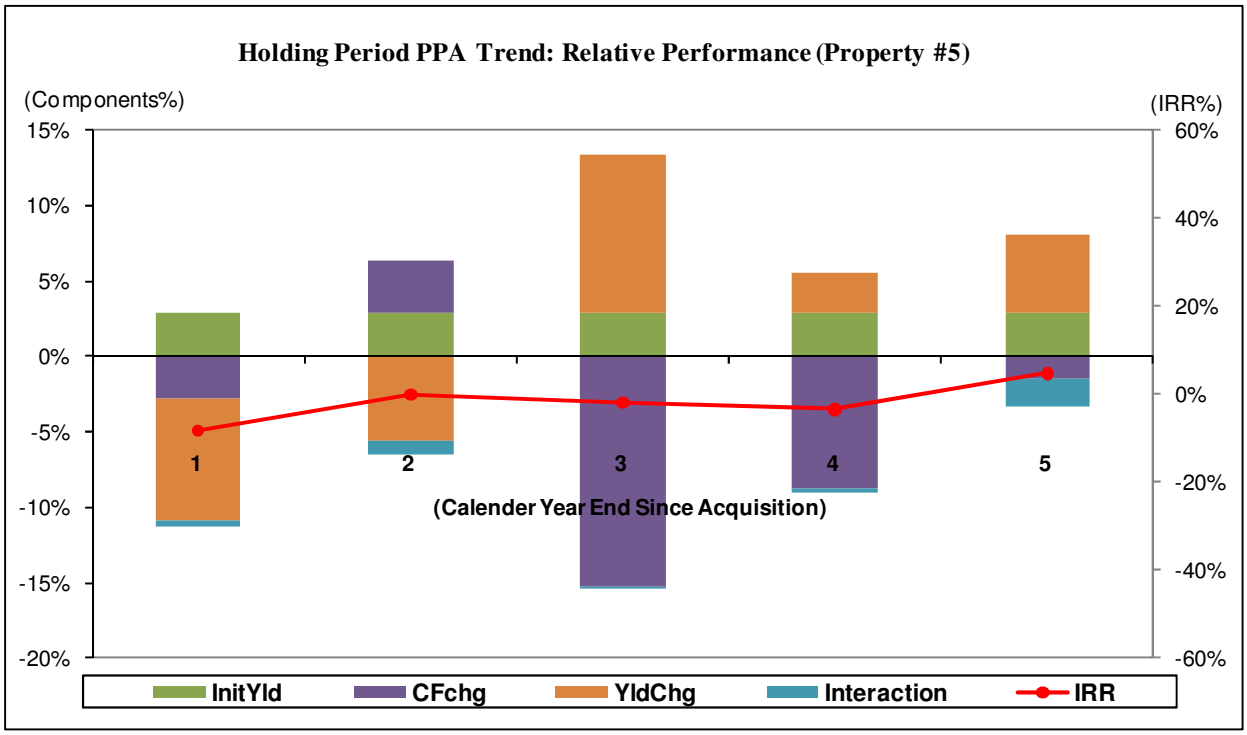
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #5

Property #5	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	13.35%	8.46%	-4.35%	11.67%	-2.43%
NPI Cohort (Office - Pacific)	8.67%	5.63%	-2.90%	6.43%	-0.49%
Relative Stat (Office - Pacific)	4.68%	2.83%	-1.45%	5.24%	-1.94%
Over (O) / Under (U) Performance	O	O	U	O	U





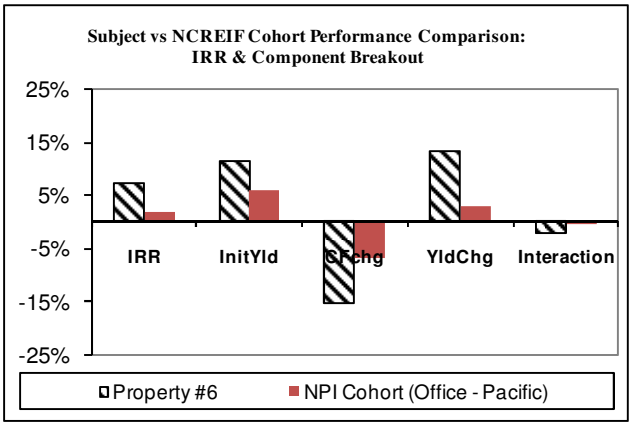


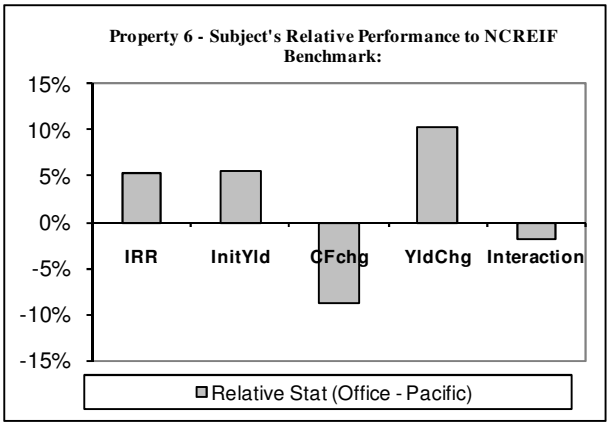
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

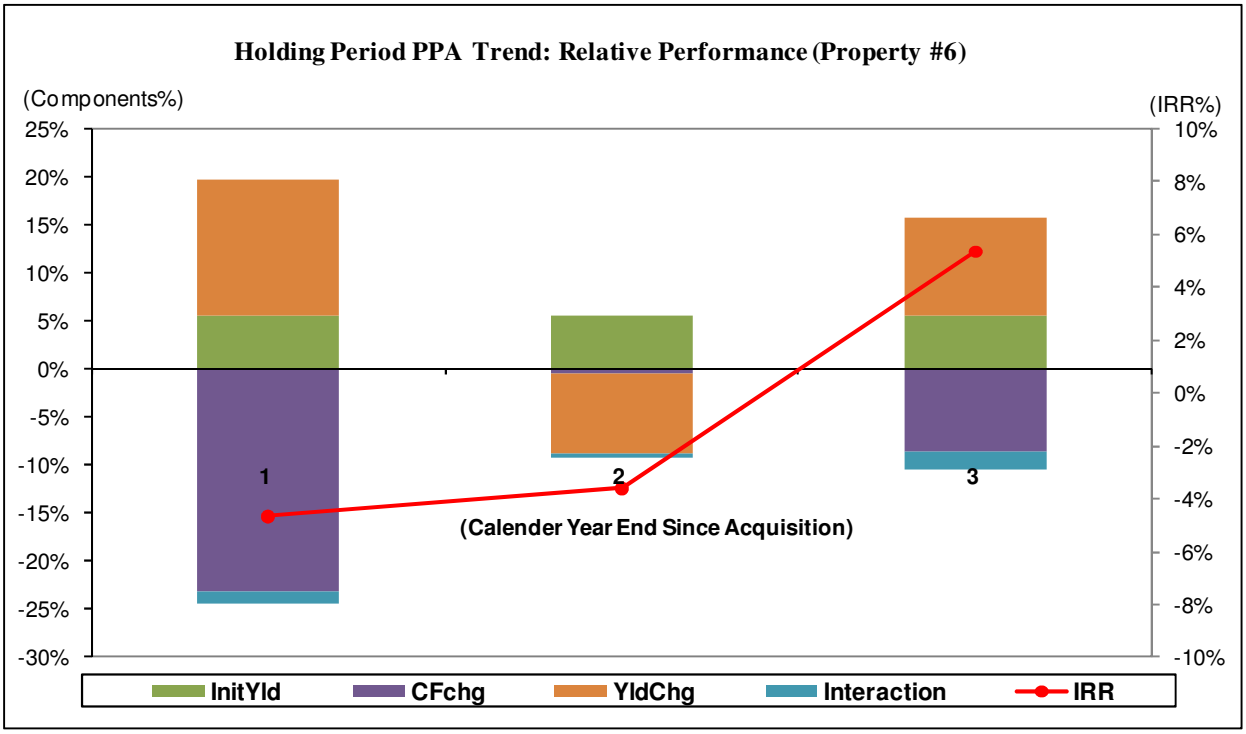
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #6

Property #6	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	7.25%	11.43%	-15.34%	13.22%	-2.06%
NPI Cohort (Office - Pacific)	1.89%	5.89%	-6.65%	2.97%	-0.32%
Relative Stat (Office - Pacific)	5.36%	5.55%	-8.69%	10.25%	-1.74%
Over (O) / Under (U) Performance	O	O	U	O	U





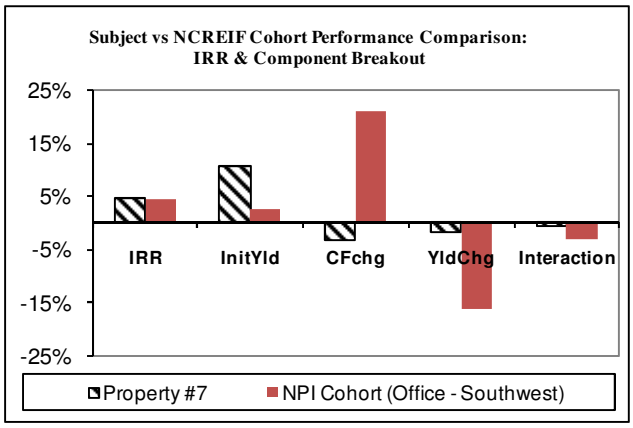


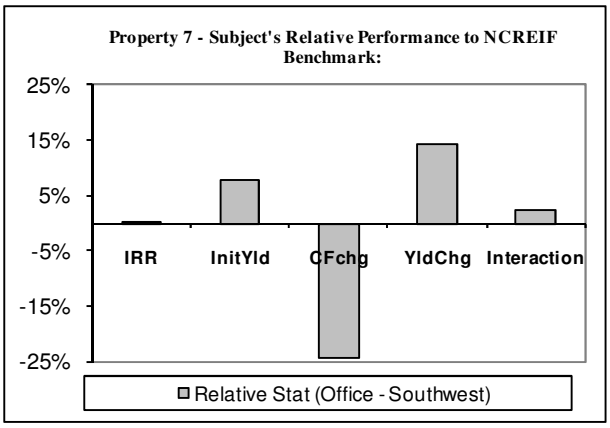
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

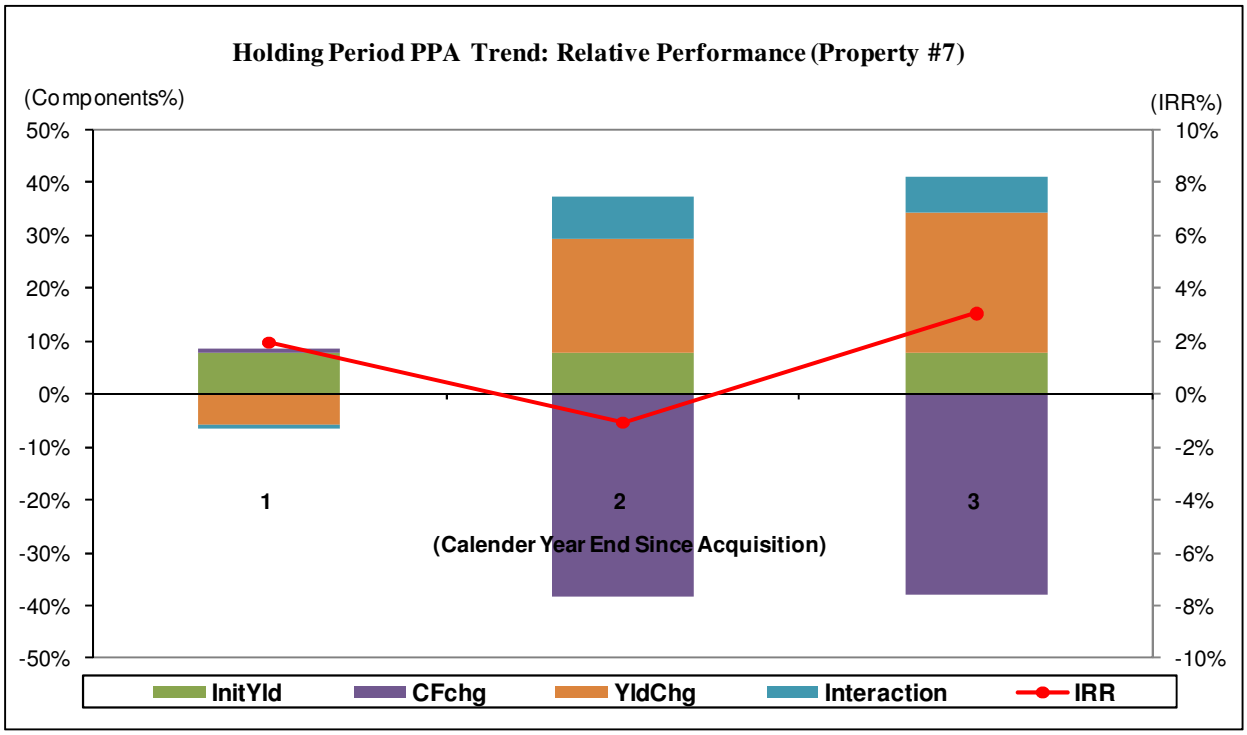
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #7

Property #7	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	4.59%	10.47%	-3.49%	-1.80%	-0.59%
NPI Cohort (Office - Southwest)	4.56%	2.62%	20.97%	-16.01%	-3.01%
Relative Stat (Office - Southwest)	0.02%	7.86%	-24.45%	14.21%	2.41%
Over (O) / Under (U) Performance	O	O	U	O	O





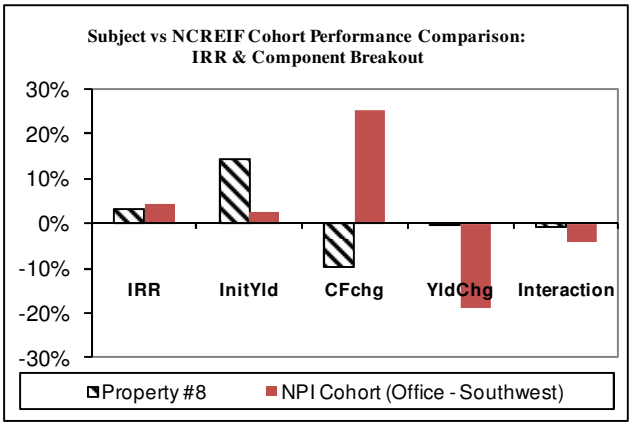


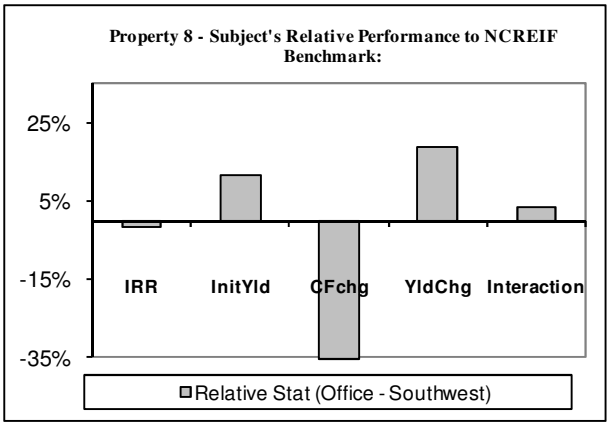
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

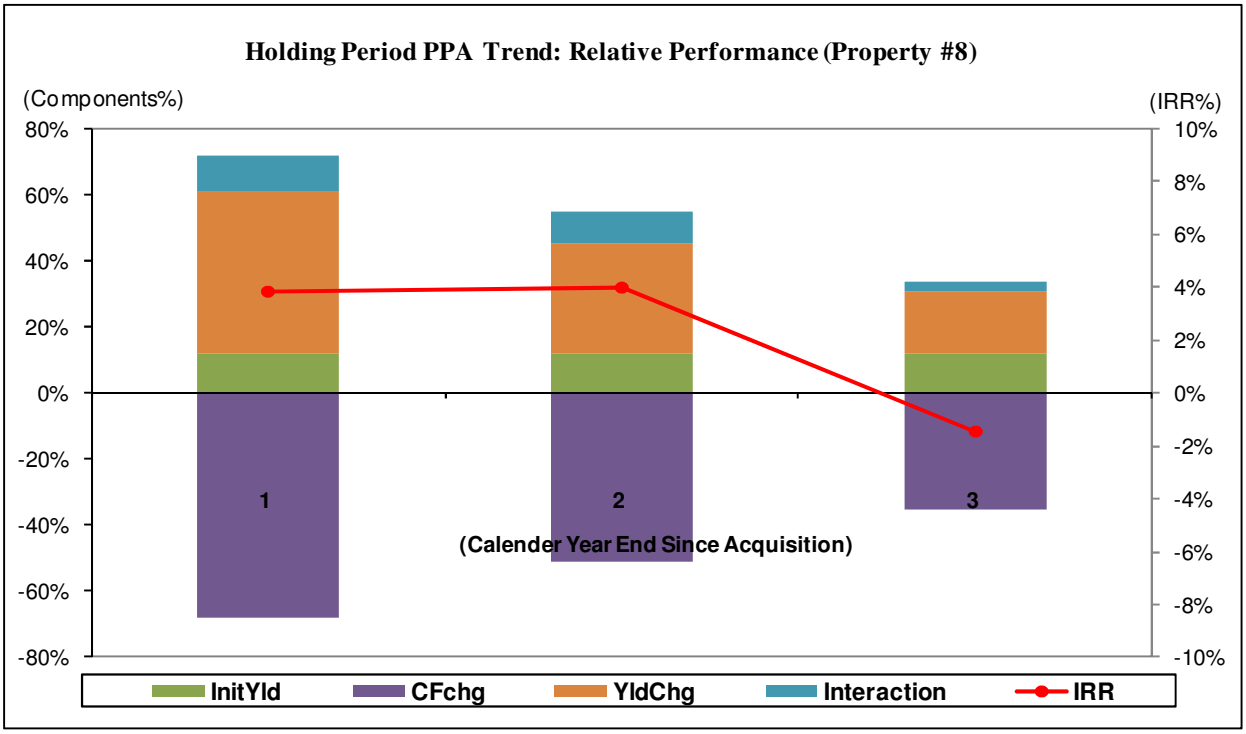
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #8

Property #8	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	2.88%	14.17%	-9.91%	-0.48%	-0.91%
NPI Cohort (Office - Southwest)	4.35%	2.40%	25.43%	-19.10%	-4.38%
Relative Stat (Office - Southwest)	-1.47%	11.77%	-35.33%	18.62%	3.47%
Over (O) / Under (U) Performance	U	O	U	O	O





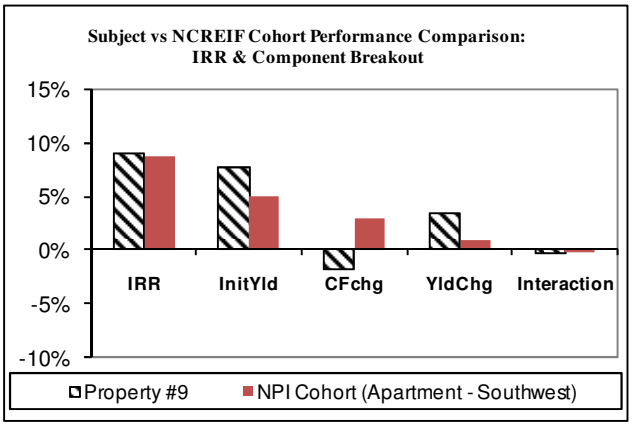


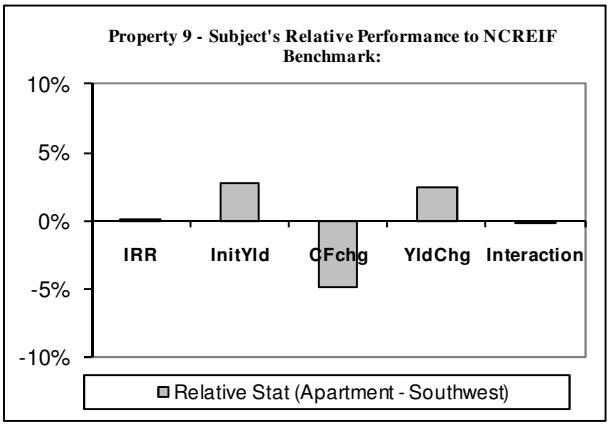
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

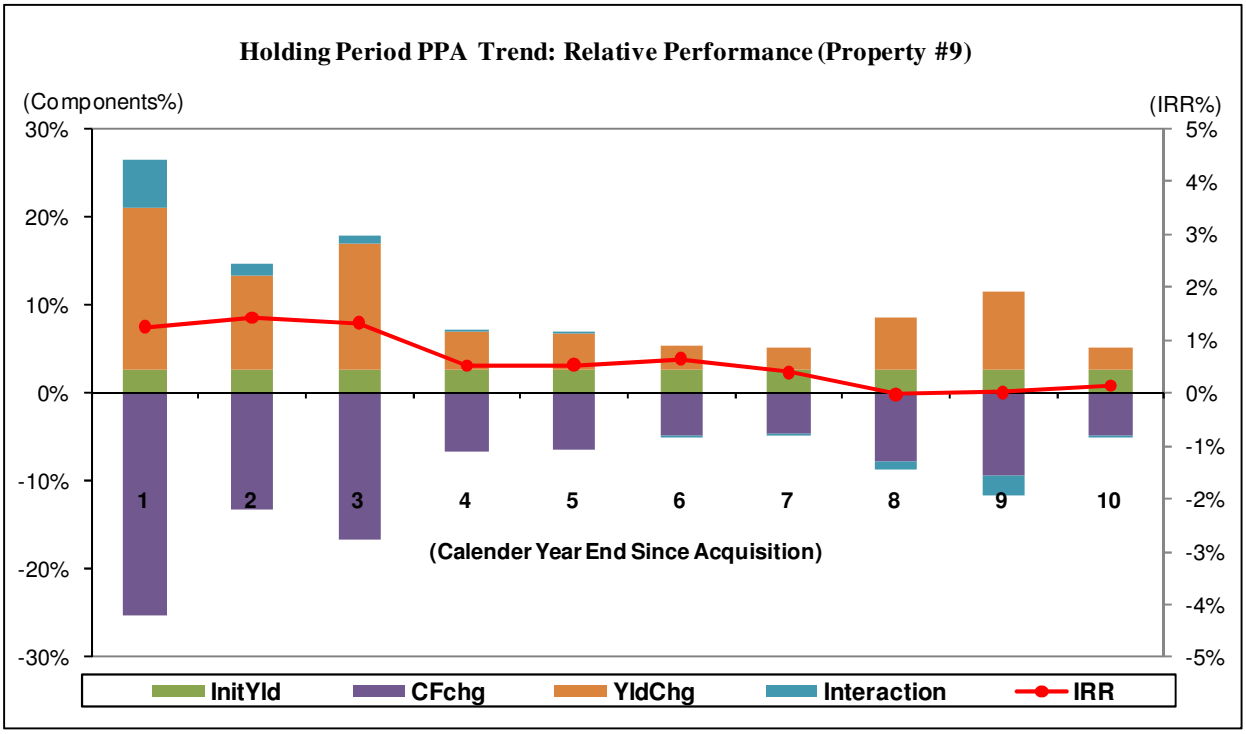
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #9

Property #9	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	8.90%	7.71%	-1.92%	3.44%	-0.33%
NPI Cohort (Apartment - Southwest)	8.76%	4.94%	3.01%	0.95%	-0.14%
Relative Stat (Apartment - Southwest)	0.13%	2.77%	-4.93%	2.49%	-0.20%
Over (O) / Under (U) Performance	O	O	U	O	U





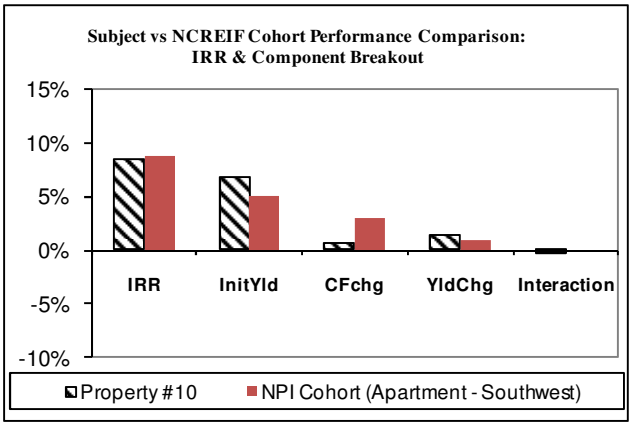


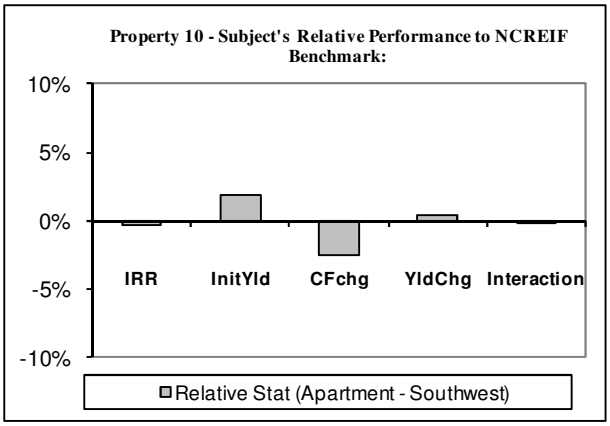
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

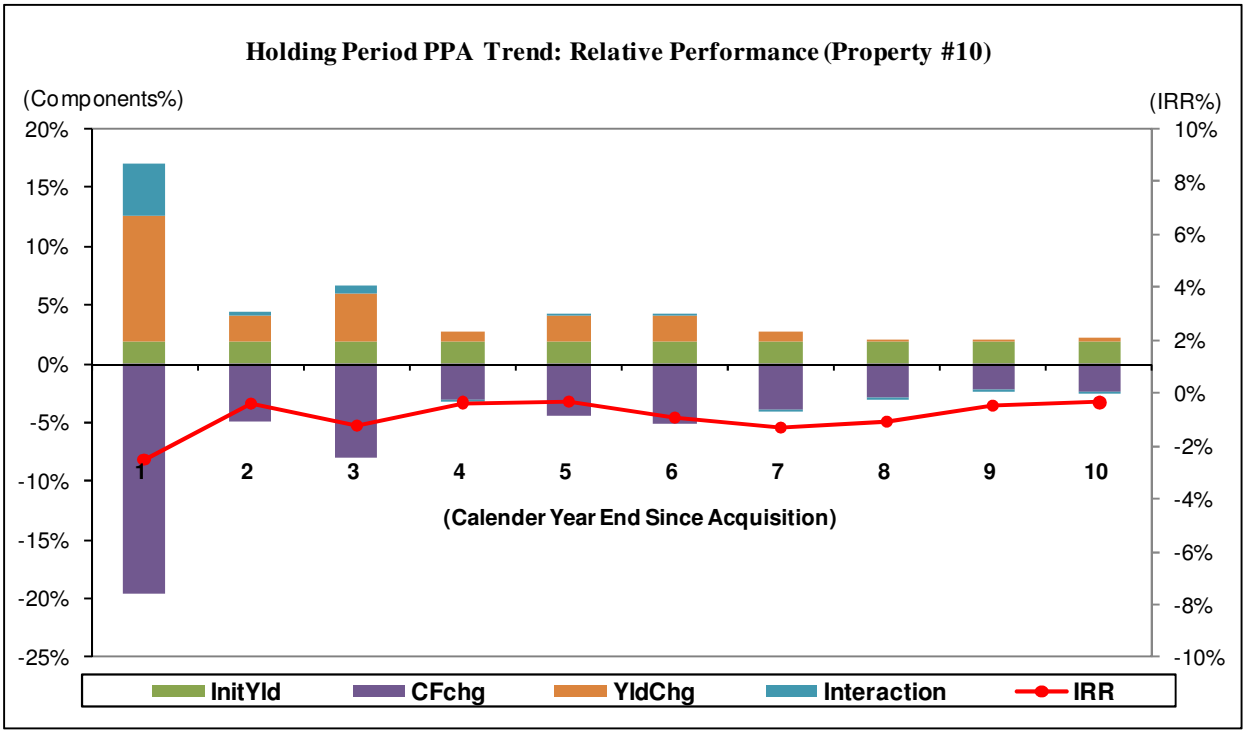
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #10

Property #10	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	8.41%	6.75%	0.58%	1.33%	-0.25%
NPI Cohort (Apartment - Southwest)	8.76%	4.94%	3.01%	0.95%	-0.14%
Relative Stat (Apartment - Southwest)	-0.35%	1.81%	-2.43%	0.38%	-0.11%
Over (O) / Under (U) Performance	U	O	U	O	U





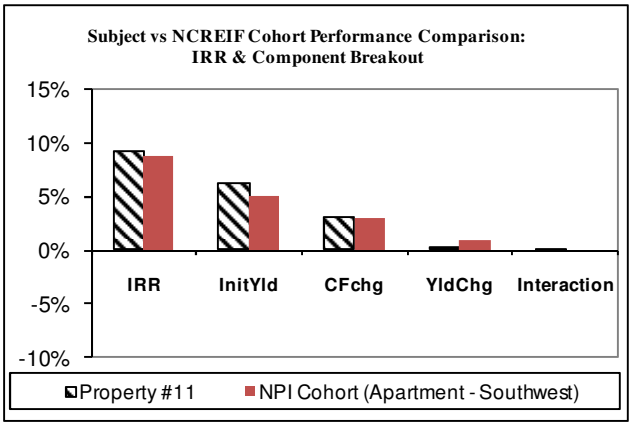


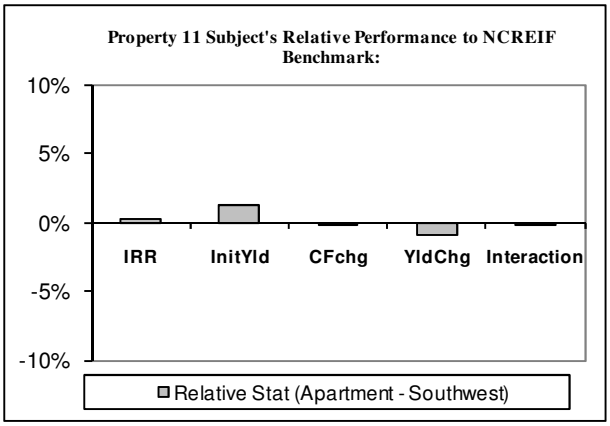
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

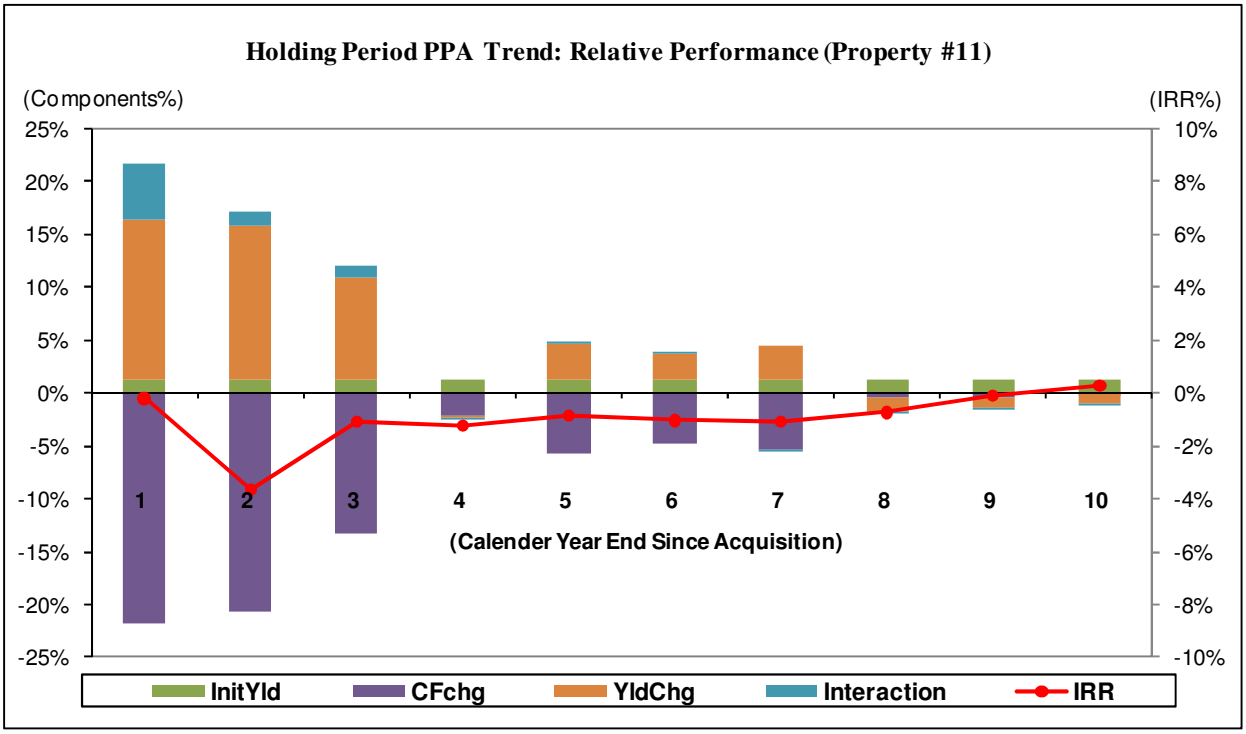
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #11

Property #11	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	9.06%	6.23%	2.92%	0.09%	-0.19%
NPI Cohort (Apartment - Southwest)	8.76%	4.94%	3.01%	0.95%	-0.14%
Relative Stat (Apartment - Southwest)	0.29%	1.29%	-0.09%	-0.86%	-0.05%
Over (O) / Under (U) Performance	O	O	U	U	U





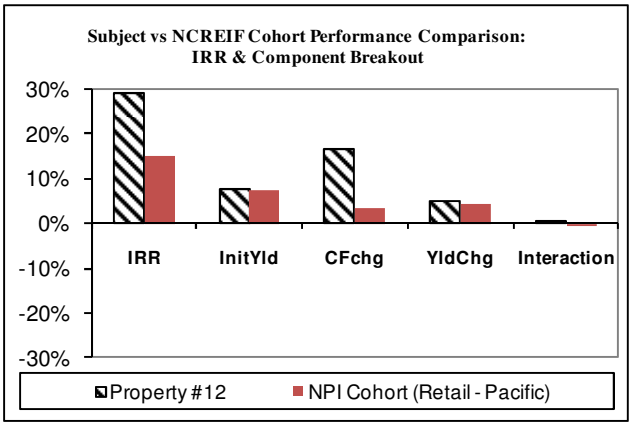


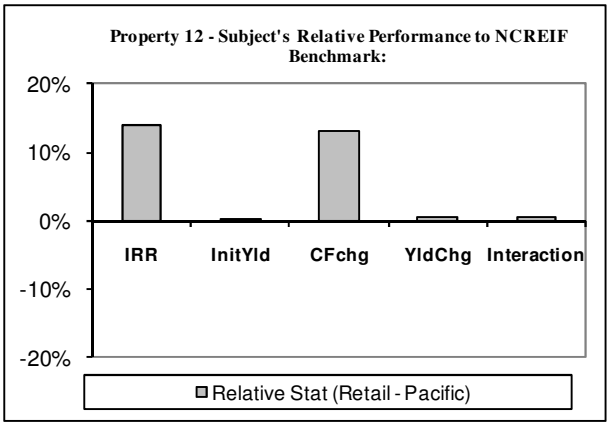
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

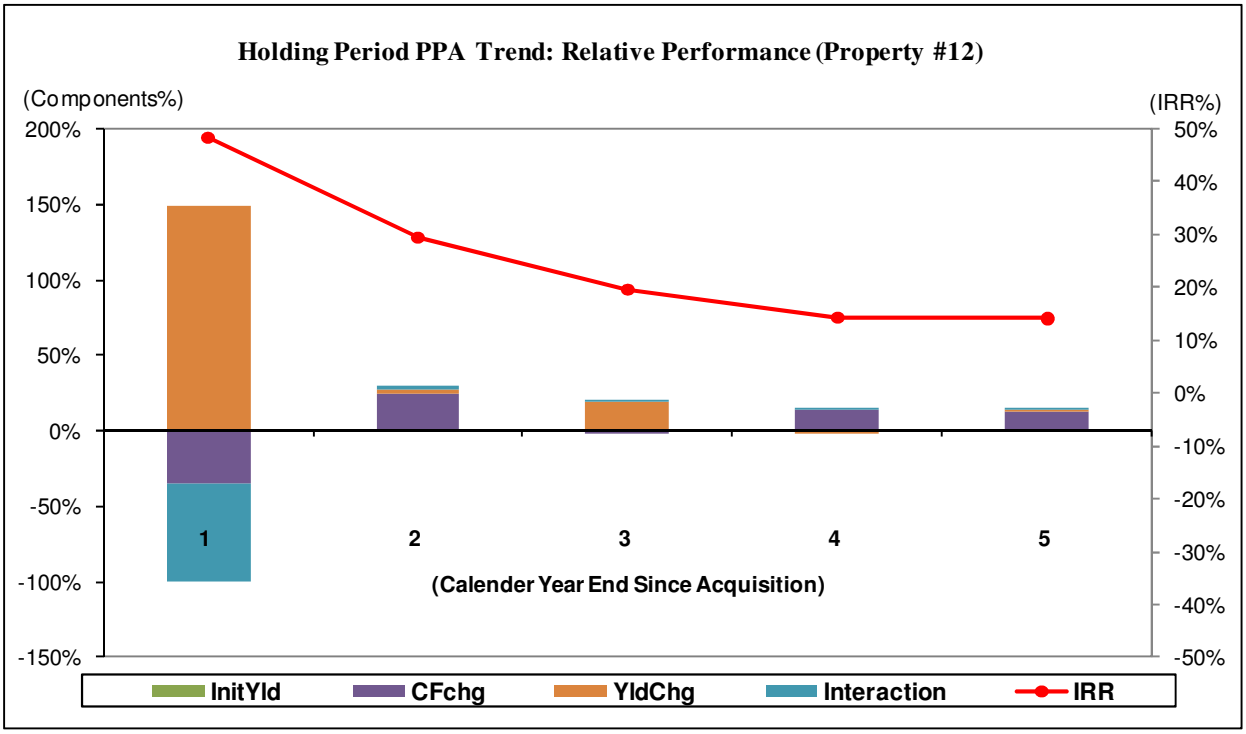
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #12

Property #12	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	29.08%	7.58%	16.35%	4.77%	0.38%
NPI Cohort (Retail - Pacific)	14.95%	7.52%	3.35%	4.13%	-0.05%
Relative Stat (Retail - Pacific)	14.13%	0.06%	13.00%	0.64%	0.43%
Over (O) / Under (U) Performance	O	O	O	O	O







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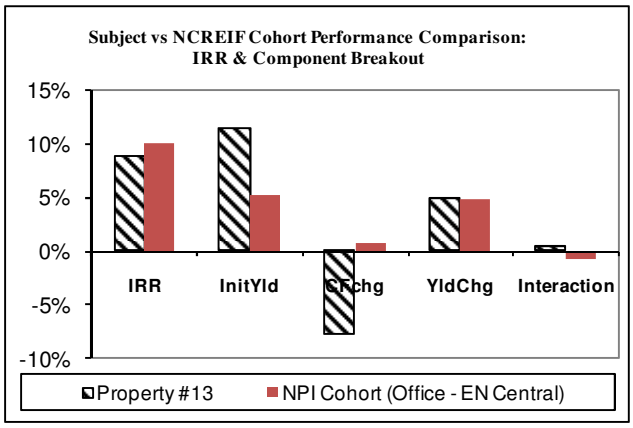
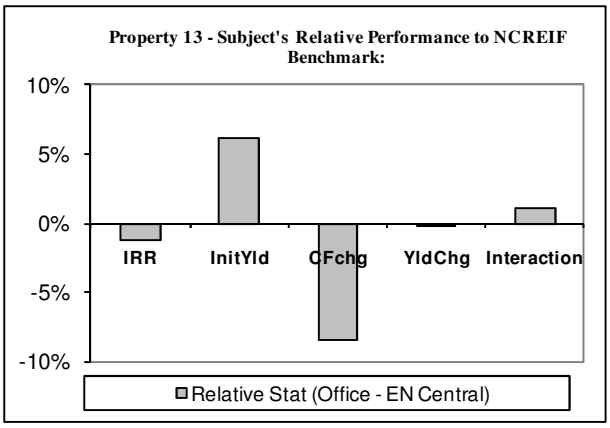
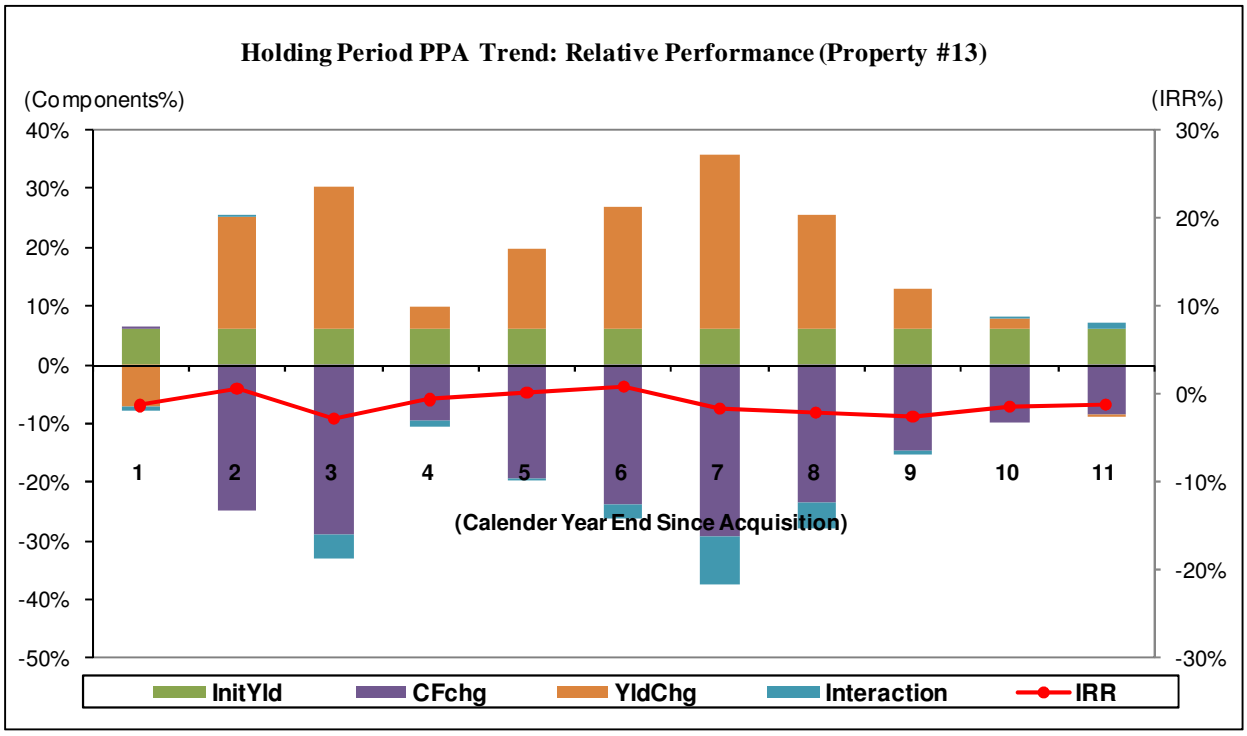
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #13

Property #13	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	8.85%	11.33%	-7.79%	4.86%	0.46%
NPI Cohort (Office - EN Central)	10.11%	5.22%	0.68%	4.86%	-0.65%
Relative Stat (Office - EN Central)	-1.26%	6.10%	-8.48%	0.00%	1.11%
Over (O) / Under (U) Performance	U	O	U	U	O





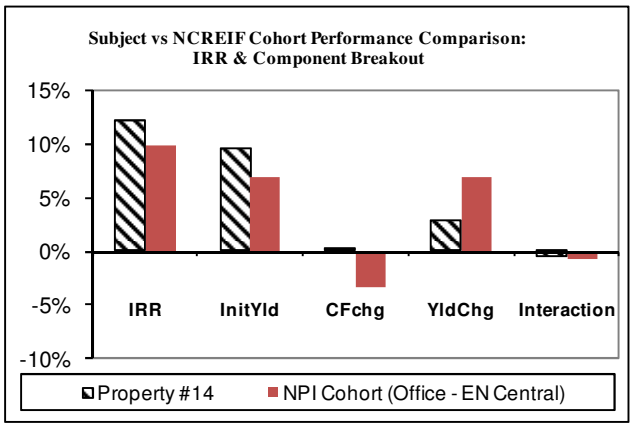


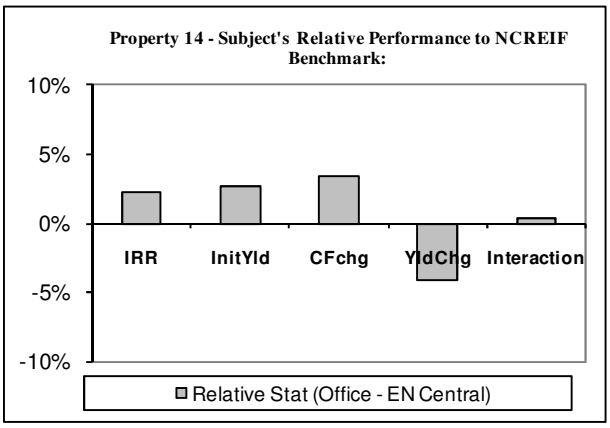
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

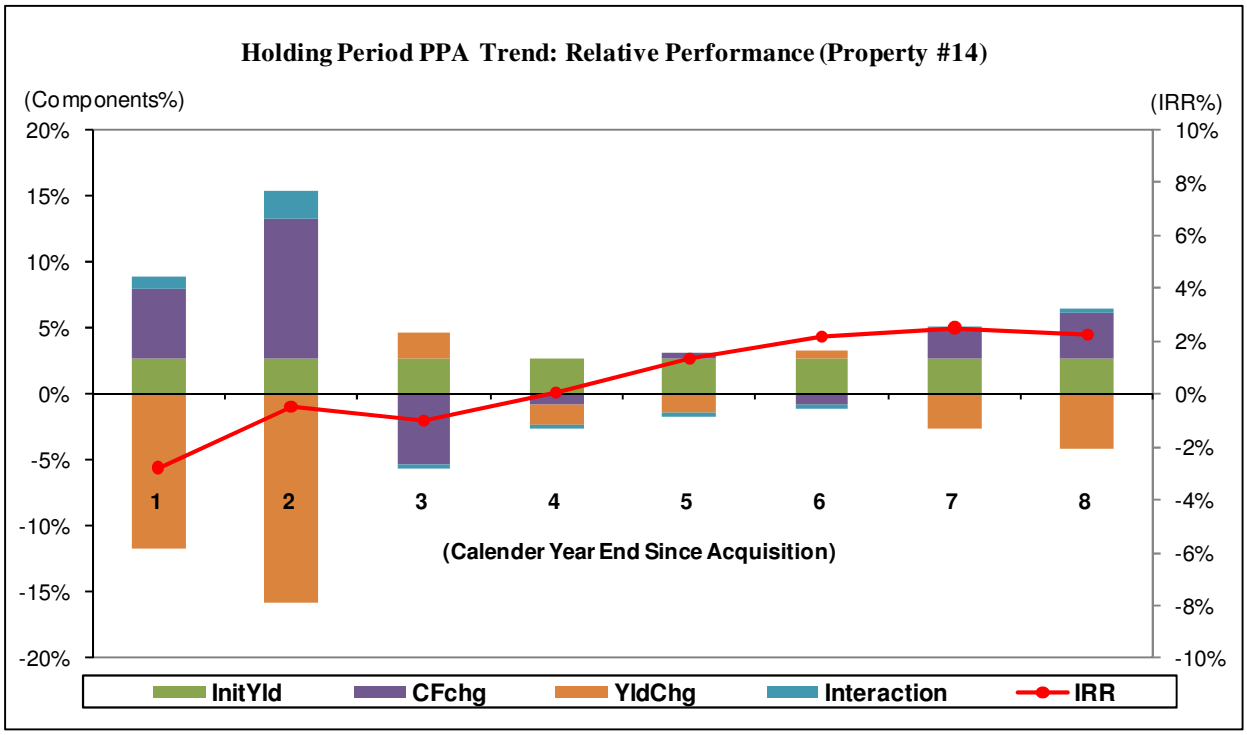
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #14

Property #14	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	12.03%	9.60%	0.14%	2.78%	-0.50%
NPI Cohort (Office - EN Central)	9.77%	6.92%	-3.31%	6.96%	-0.81%
Relative Stat (Office - EN Central)	2.26%	2.68%	3.46%	-4.19%	0.31%
Over (O) / Under (U) Performance	O	O	O	U	O







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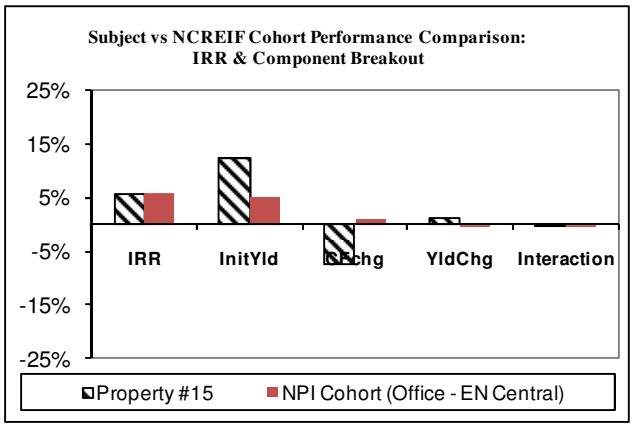
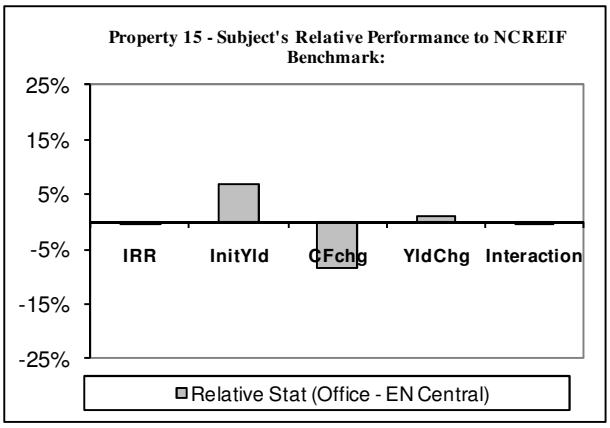
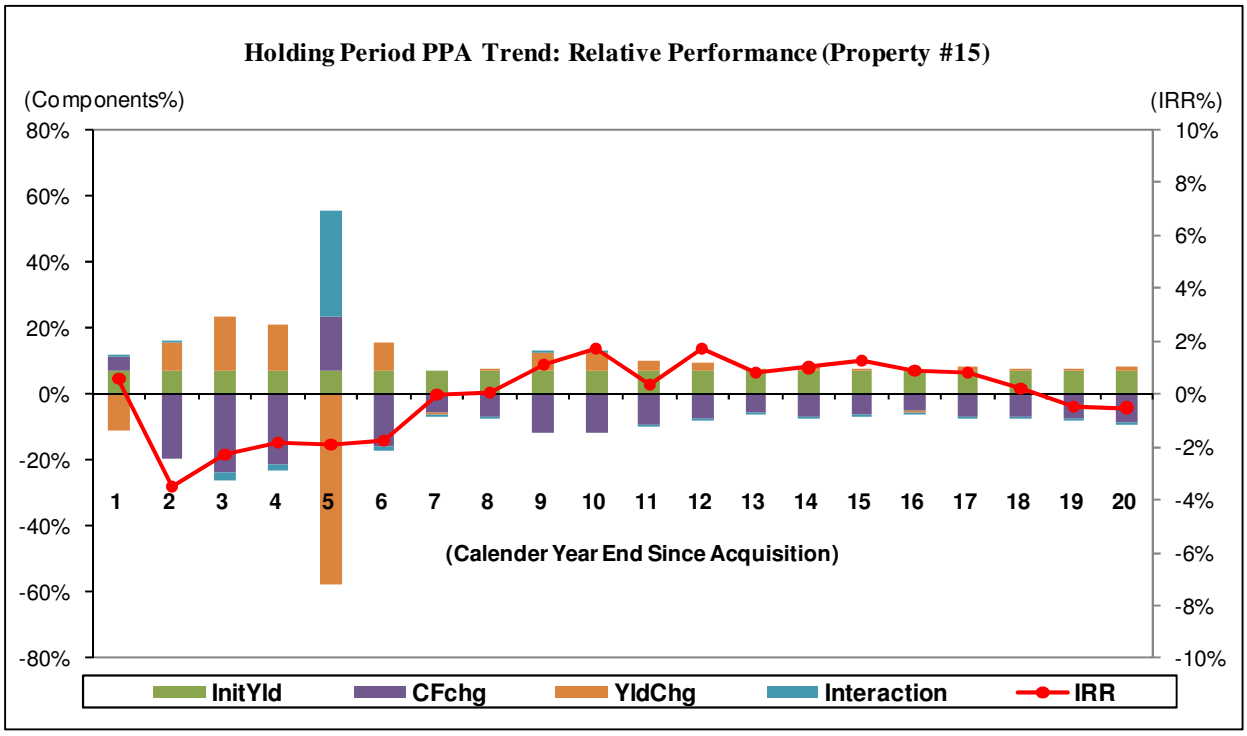
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #15

Property #15	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	5.35%	12.13%	-7.49%	0.94%	-0.24%
NPI Cohort (Office - EN Central)	5.87%	5.25%	0.96%	-0.23%	-0.11%
Relative Stat (Office - EN Central)	-0.52%	6.88%	-8.45%	1.17%	-0.13%
Over (O) / Under (U) Performance	U	O	U	O	U





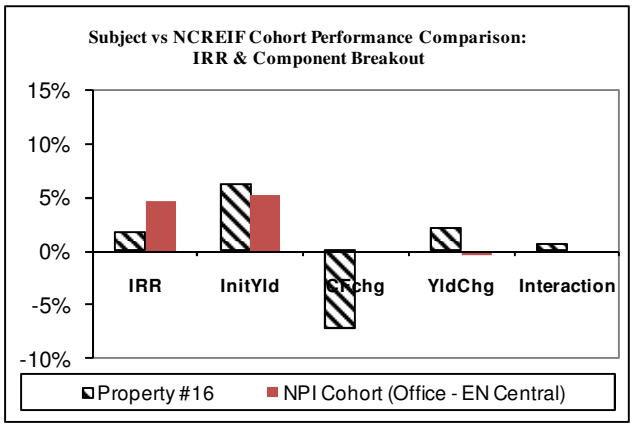


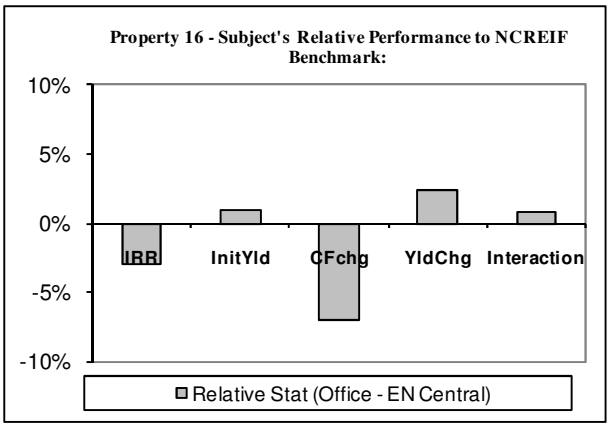
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

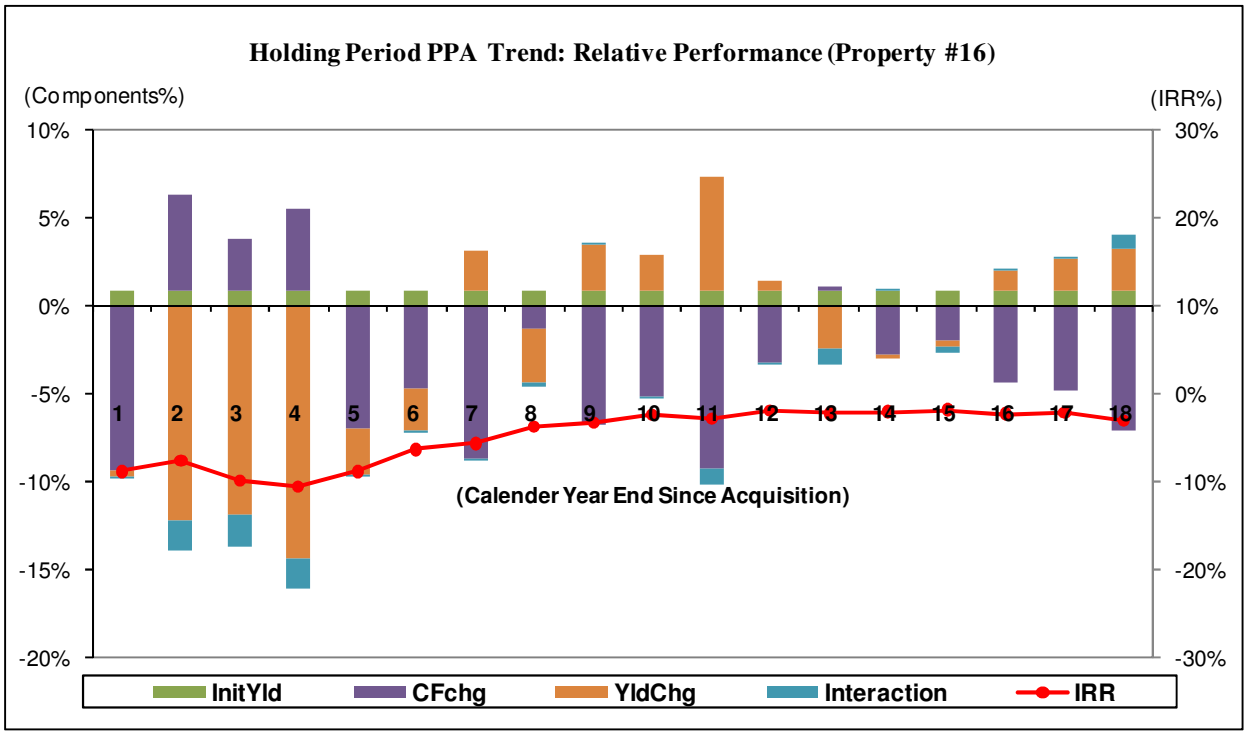
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #16

Property #16	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	1.65%	6.14%	-7.19%	2.05%	0.64%
NPI Cohort (Office - EN Central)	4.68%	5.22%	-0.10%	-0.31%	-0.12%
Relative Stat (Office - EN Central)	-3.03%	0.92%	-7.09%	2.37%	0.76%
Over (O) / Under (U) Performance	U	O	U	O	O







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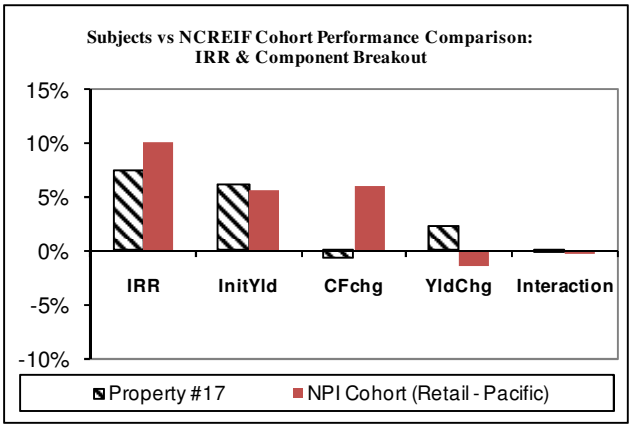
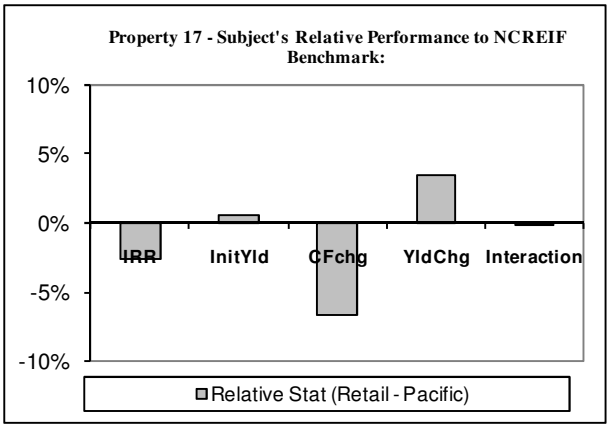
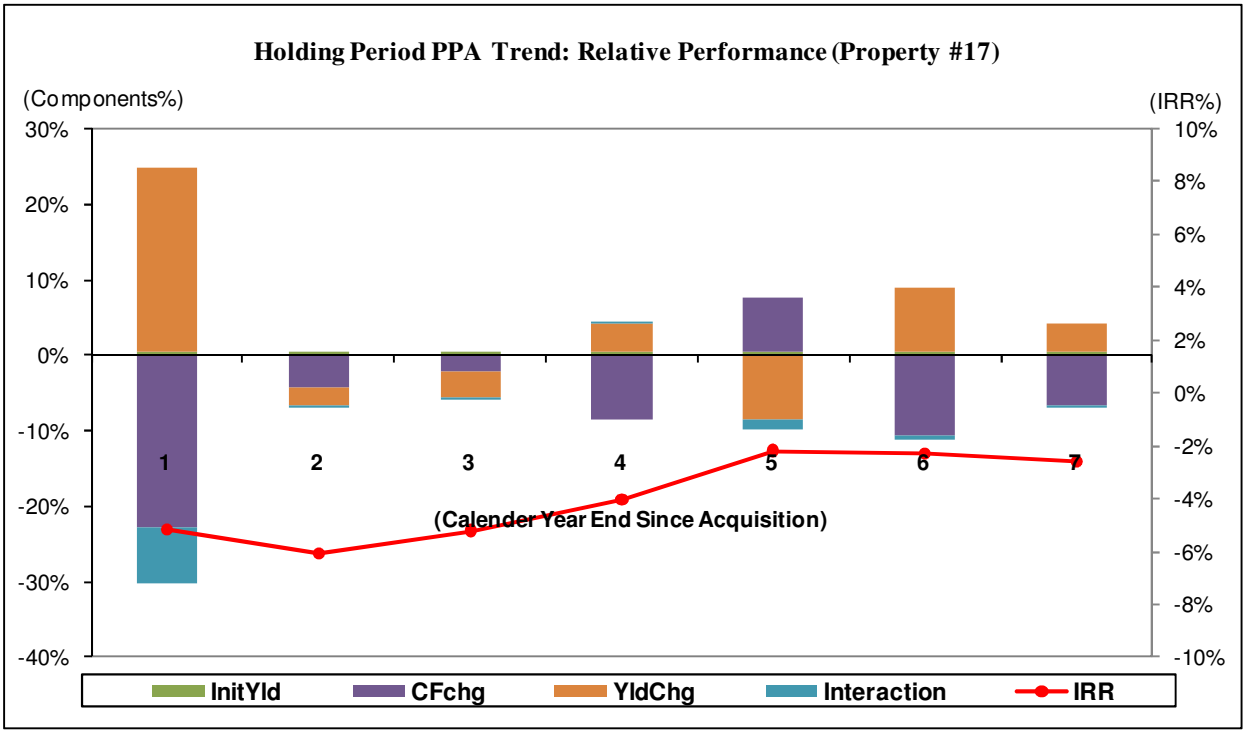
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #17

Property #17	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	7.52%	6.22%	-0.65%	2.18%	-0.24%
NPI Cohort (Retail - Pacific)	10.10%	5.64%	6.02%	-1.35%	-0.21%
Relative Stat (Retail - Pacific)	-2.58%	0.58%	-6.67%	3.53%	-0.03%
Over (O) / Under (U) Performance	U	O	U	O	U





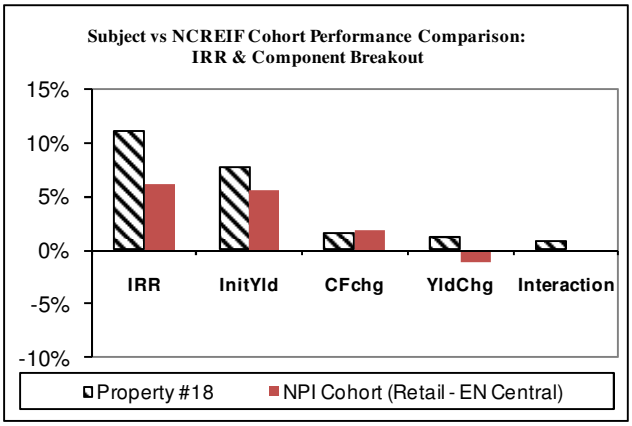


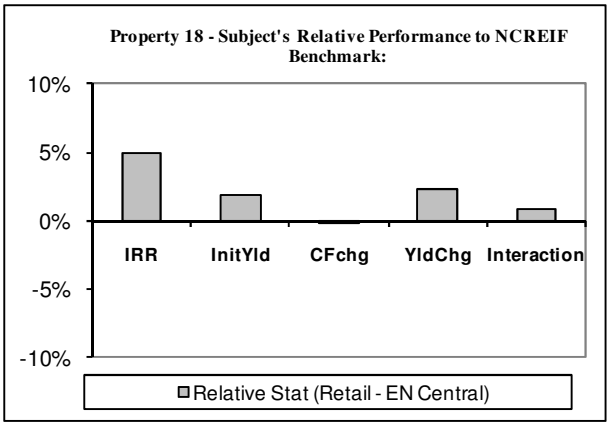
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

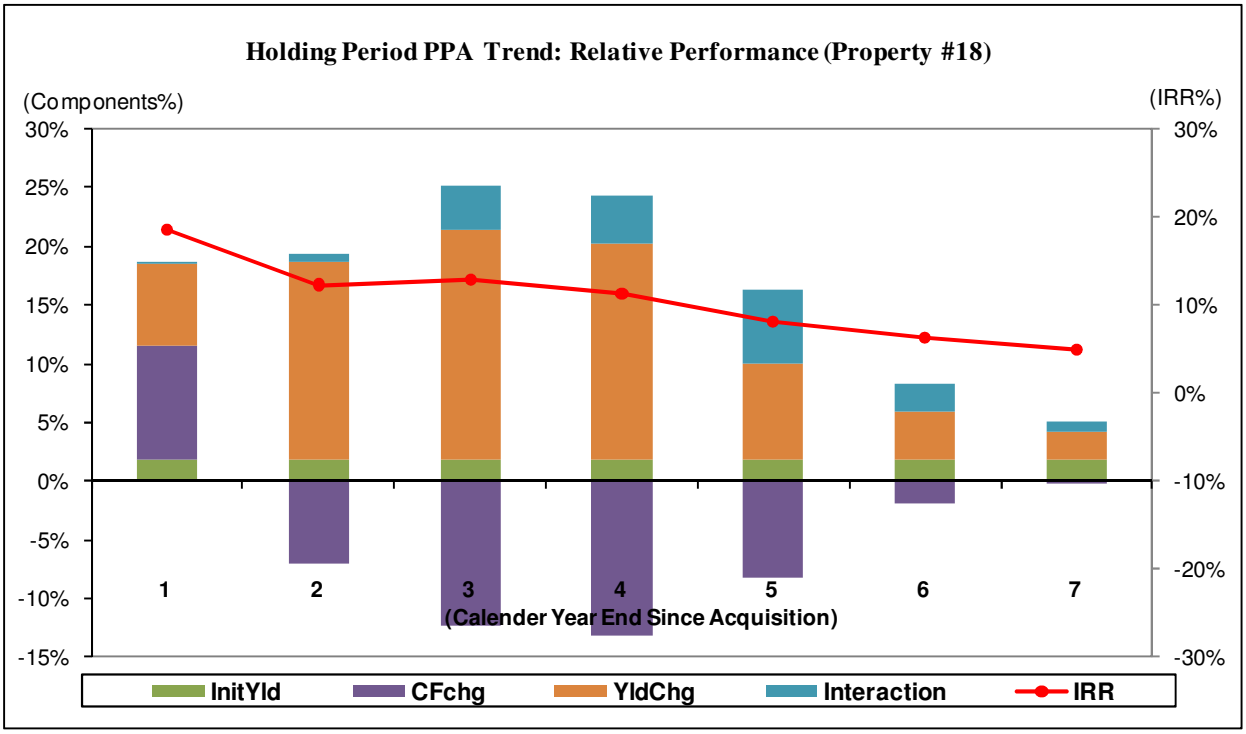
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #18

Property #18	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	11.05%	7.58%	1.60%	1.10%	0.77%
NPI Cohort (Retail - EN Central)	6.17%	5.67%	1.78%	-1.17%	-0.11%
Relative Stat (Retail - EN Central)	4.88%	1.92%	-0.18%	2.26%	0.88%
Over (O) / Under (U) Performance	O	O	U	O	O





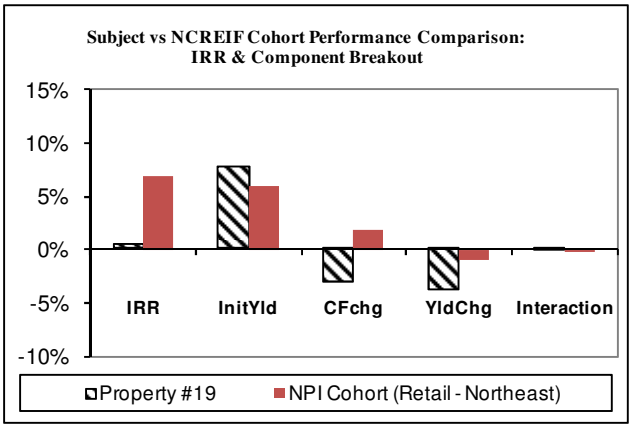


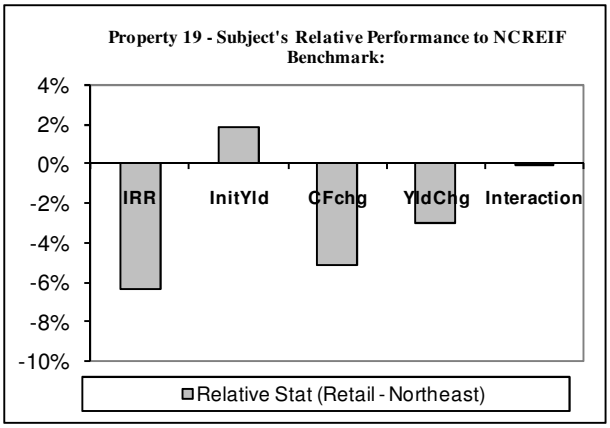
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

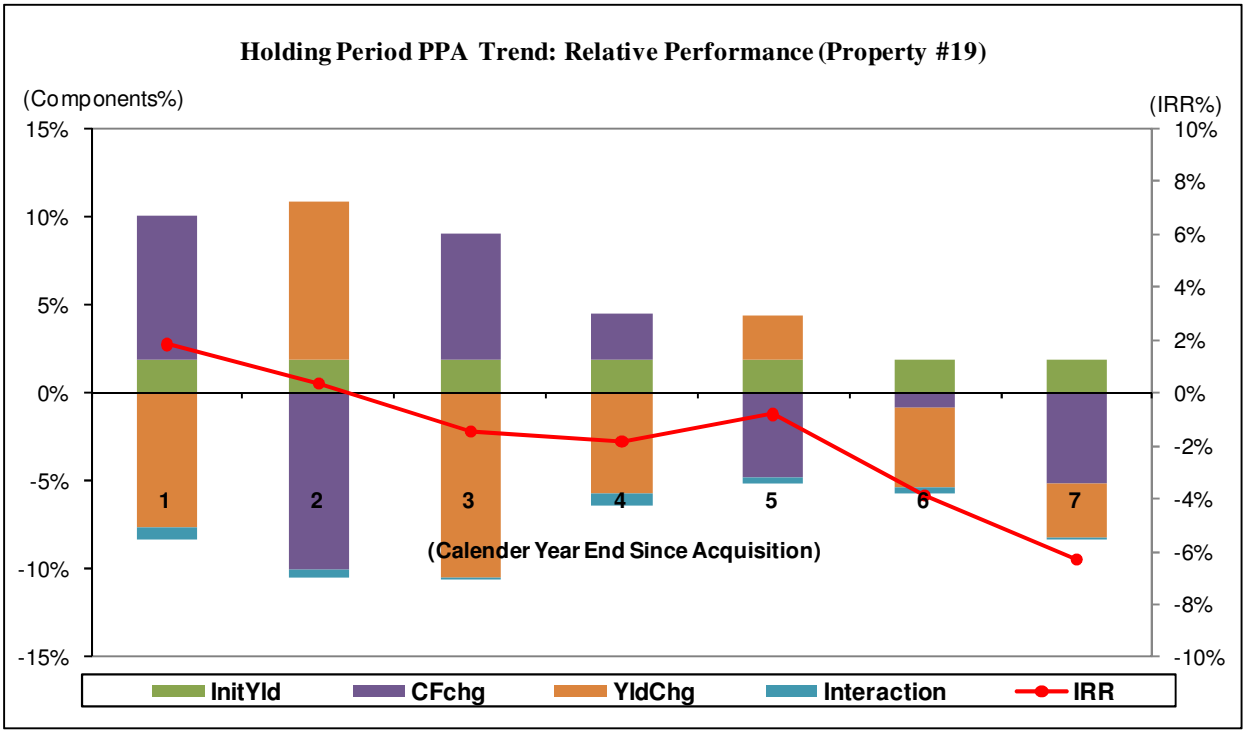
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #19

Property #19	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	0.54%	7.84%	-3.21%	-3.93%	-0.16%
NPI Cohort (Retail - Northeast)	6.85%	6.00%	1.91%	-0.90%	-0.16%
Relative Stat (Retail - Northeast)	-6.31%	1.85%	-5.12%	-3.04%	0.00%
Over (O) / Under (U) Performance	U	O	U	U	U





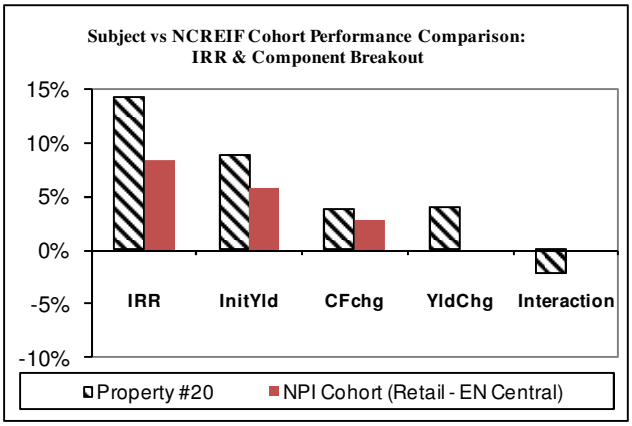


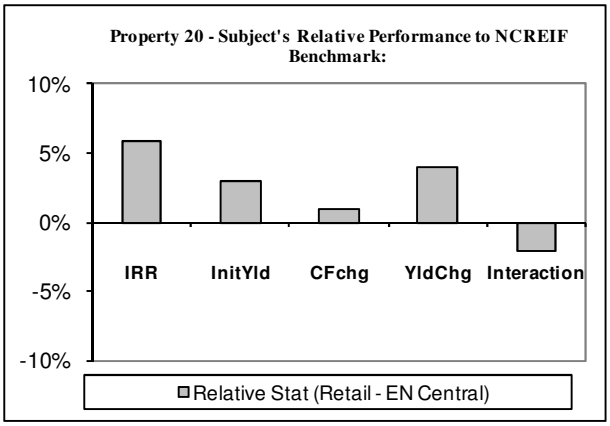
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

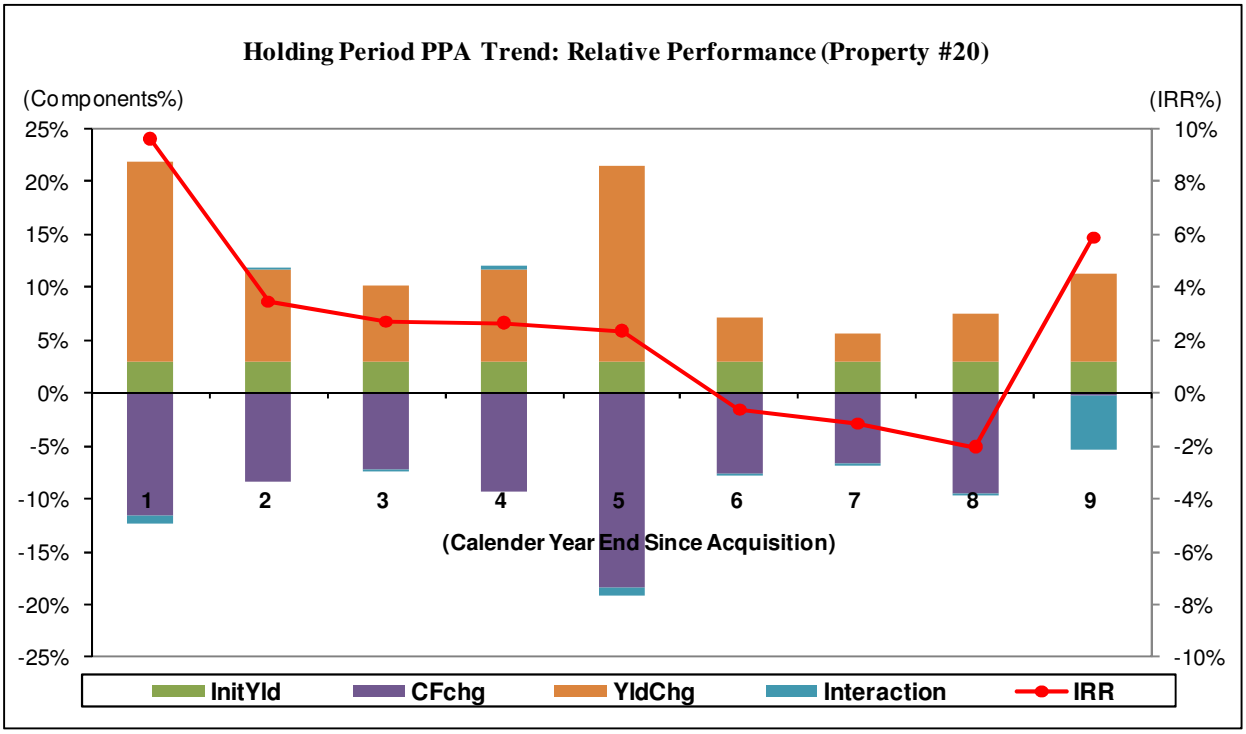
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #20

Property #20	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	14.17%	8.72%	3.69%	3.94%	-2.18%
NPI Cohort (Retail - EN Central)	8.30%	5.78%	2.73%	-0.08%	-0.13%
Relative Stat (Retail - EN Central)	5.87%	2.94%	0.96%	4.01%	-2.05%
Over (O) / Under (U) Performance	O	O	O	O	U





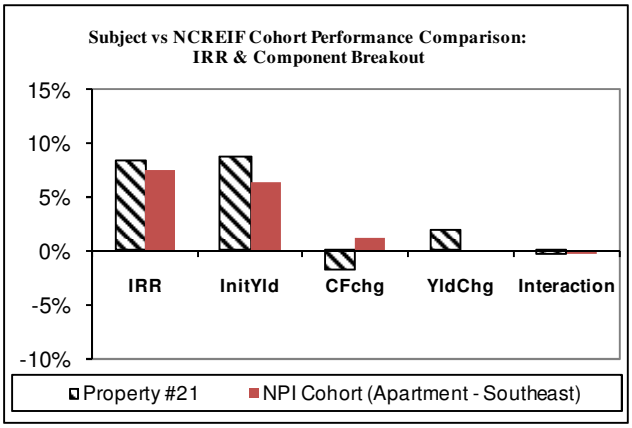


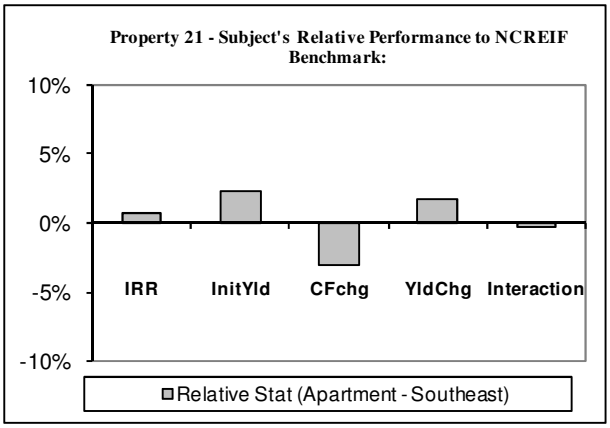
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

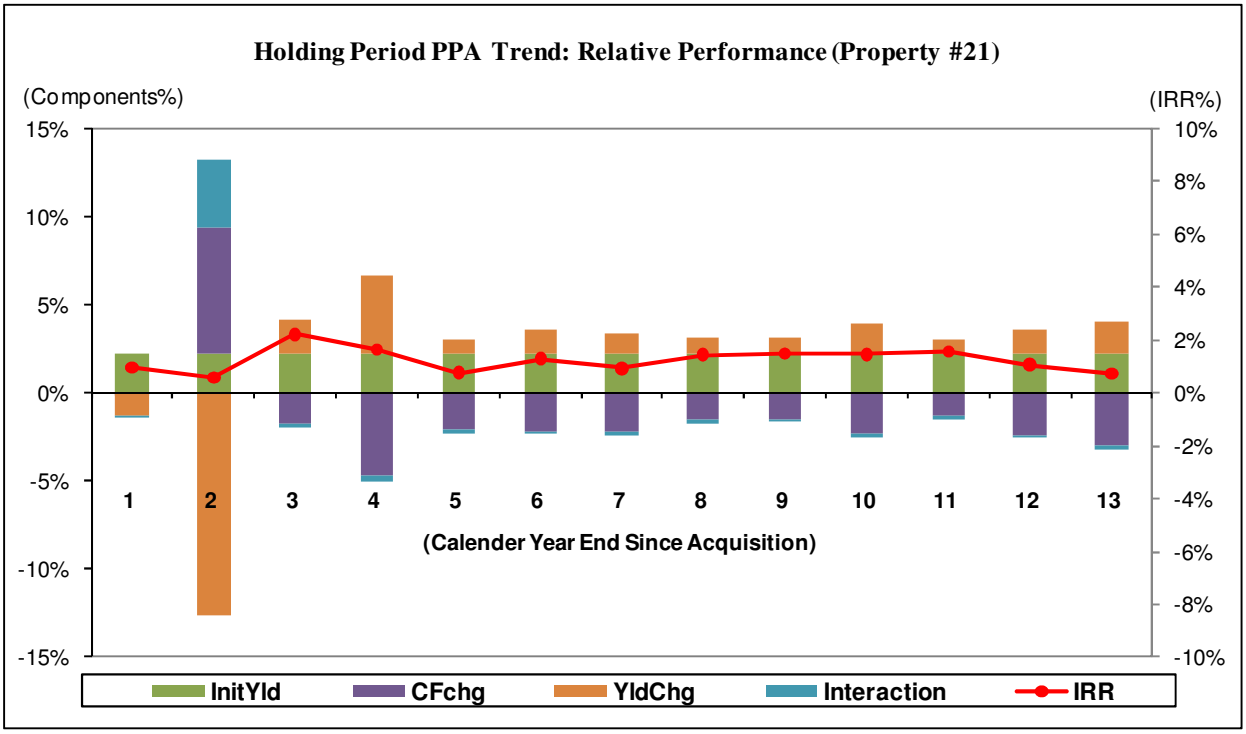
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #21

Property #21	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	8.34%	8.70%	-1.89%	1.92%	-0.39%
NPI Cohort (Apartment - Southeast)	7.60%	6.42%	1.14%	0.19%	-0.16%
Relative Stat (Apartment - Southeast)	0.74%	2.27%	-3.03%	1.73%	-0.23%
Over (O) / Under (U) Performance	O	O	U	O	U





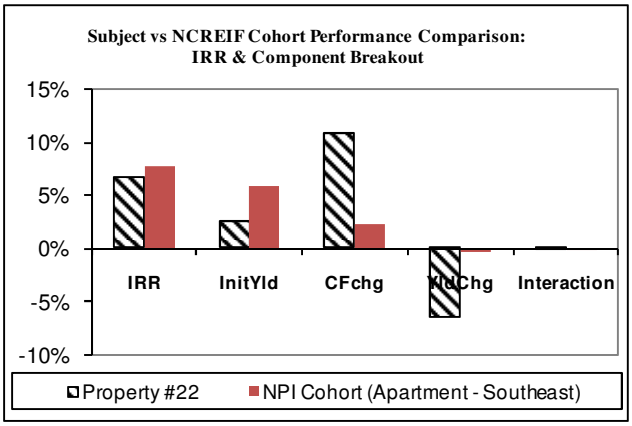


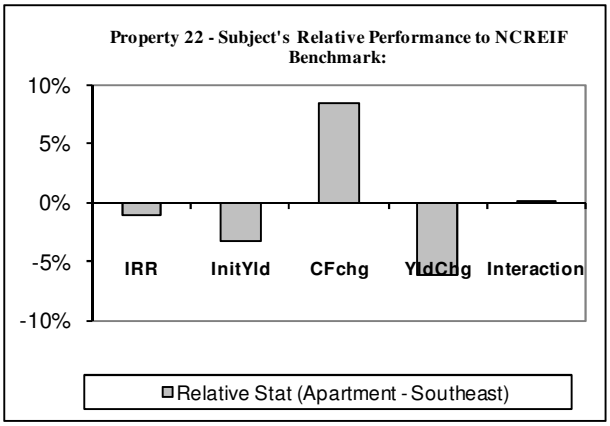
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

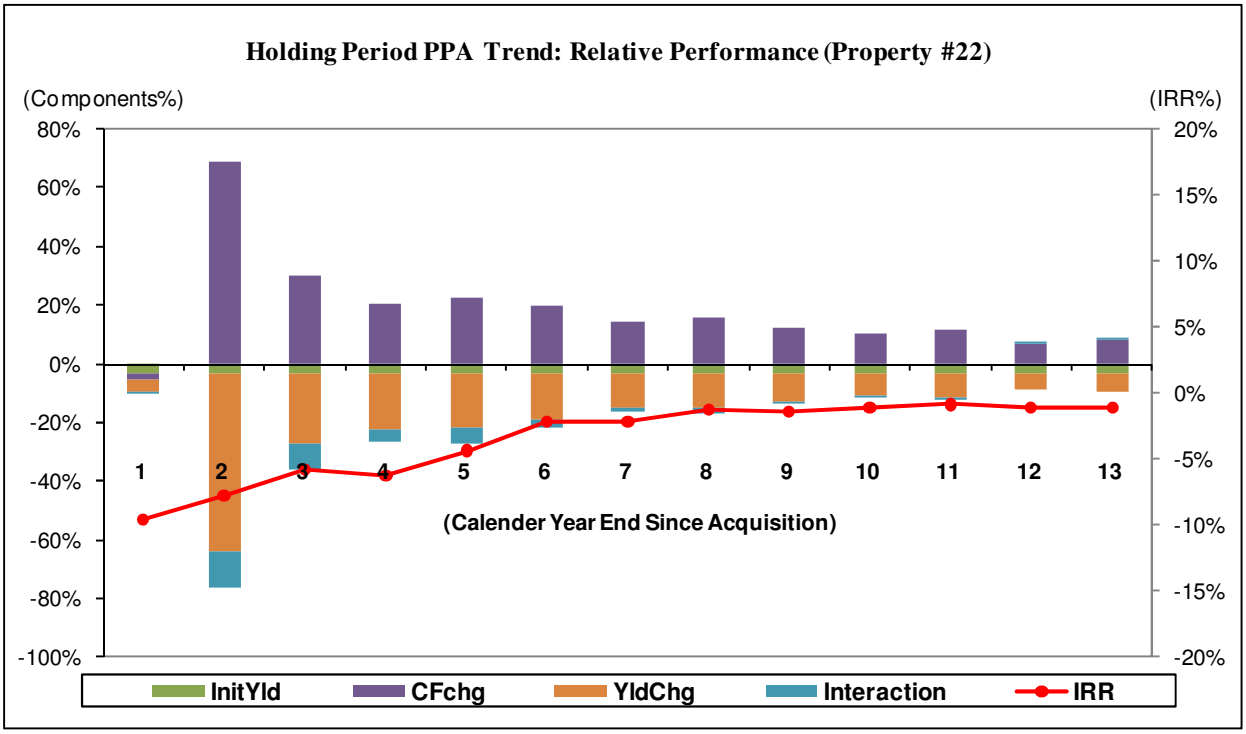
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #22

Property #22	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	6.57%	2.56%	10.71%	-6.57%	-0.13%
NPI Cohort (Apartment - Southeast)	7.67%	5.91%	2.31%	-0.40%	-0.15%
Relative Stat (Apartment - Southeast)	-1.11%	-3.35%	8.40%	-6.17%	0.01%
Over (O) / Under (U) Performance	U	U	O	U	O





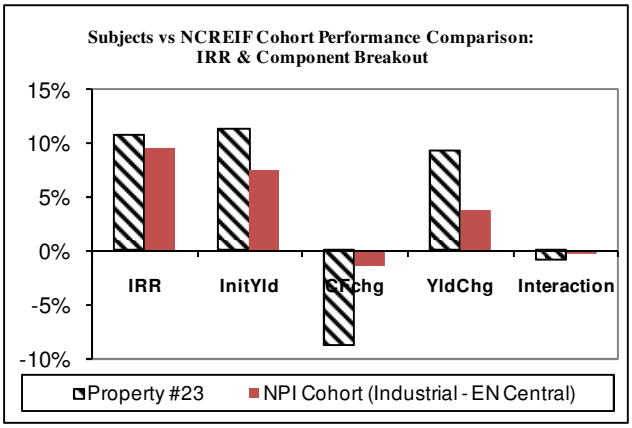


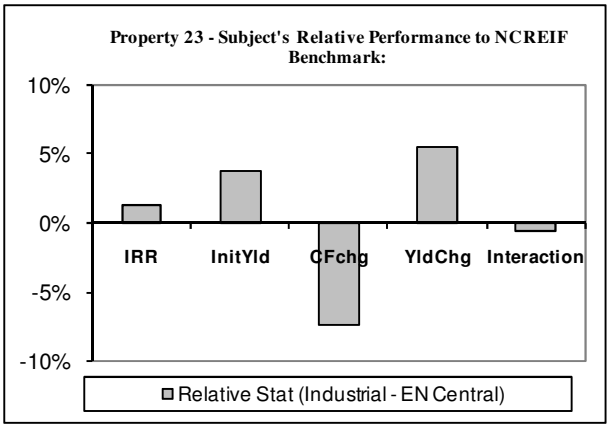
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

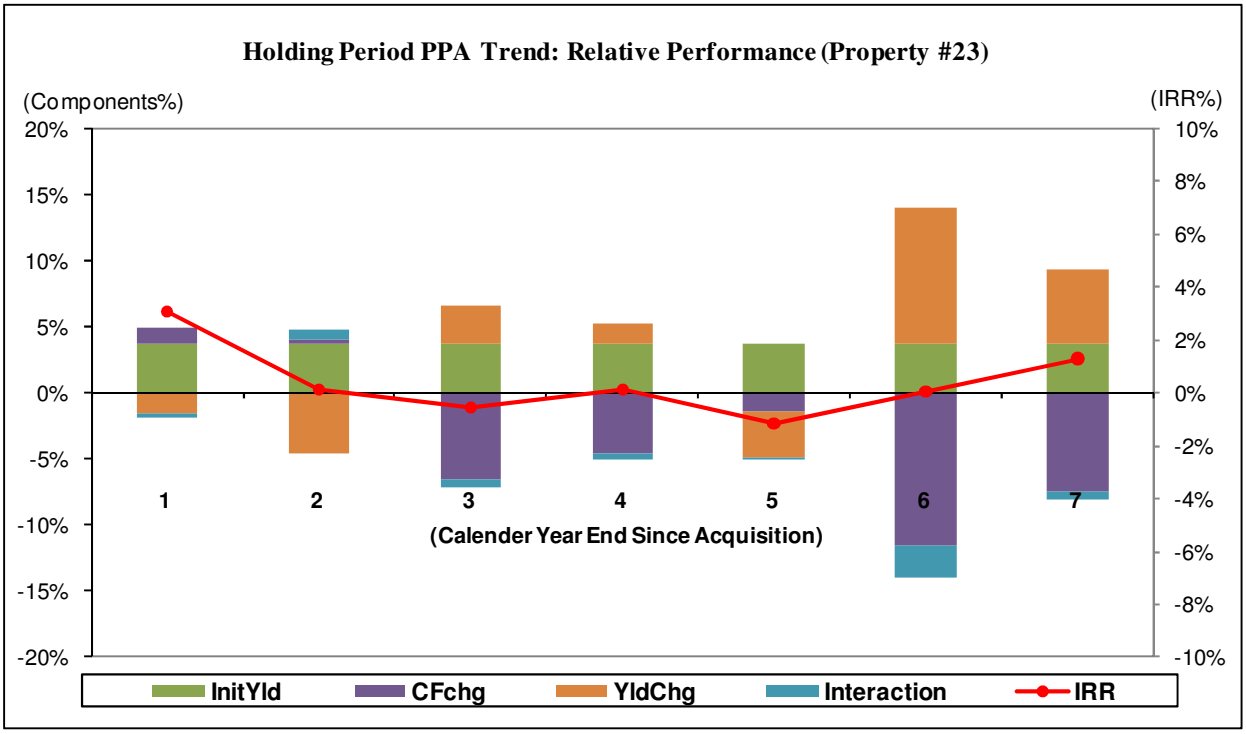
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #23

Property #23	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	10.88%	11.29%	-8.87%	9.30%	-0.84%
NPI Cohort (Industrial - EN Central)	9.58%	7.52%	-1.46%	3.76%	-0.23%
Relative Stat (Industrial - EN Central)	1.30%	3.78%	-7.41%	5.54%	-0.60%
Over (O) / Under (U) Performance	O	O	U	O	U







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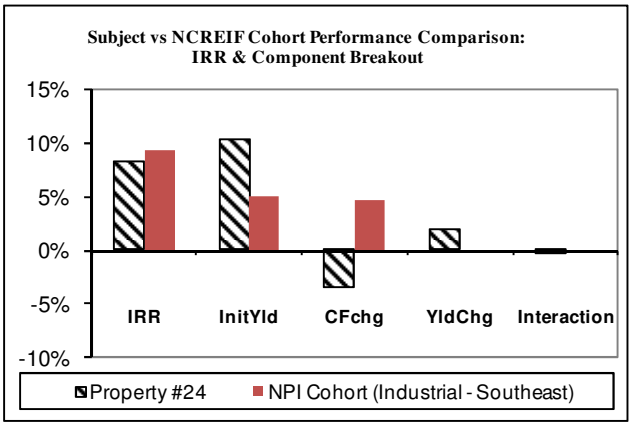
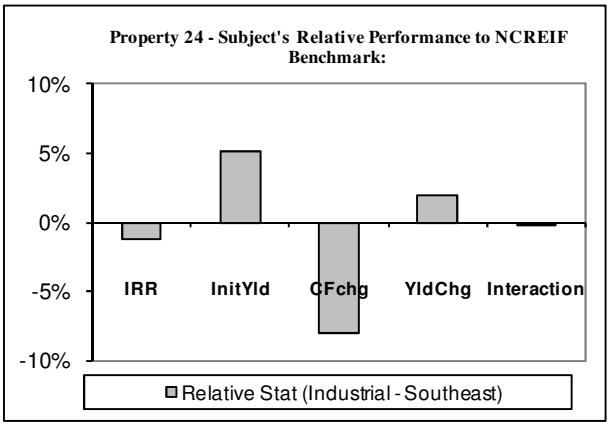
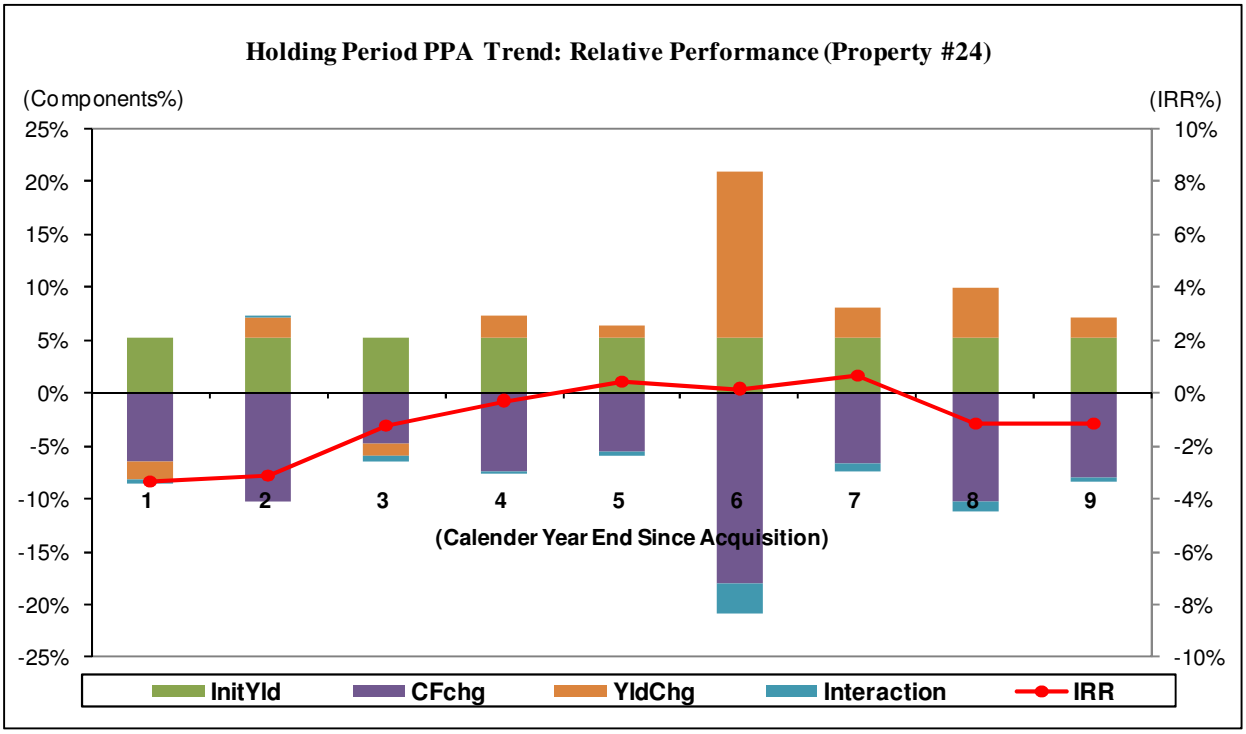
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #24

Property #24	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	8.20%	10.21%	-3.45%	1.80%	-0.36%
NPI Cohort (Industrial - Southeast)	9.38%	5.00%	4.63%	-0.16%	-0.10%
Relative Stat (Industrial - Southeast)	-1.18%	5.20%	-8.09%	1.96%	-0.26%
Over (O) / Under (U) Performance	U	O	U	O	U





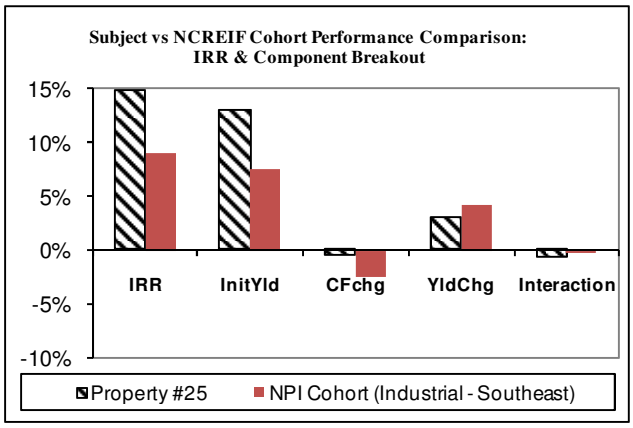


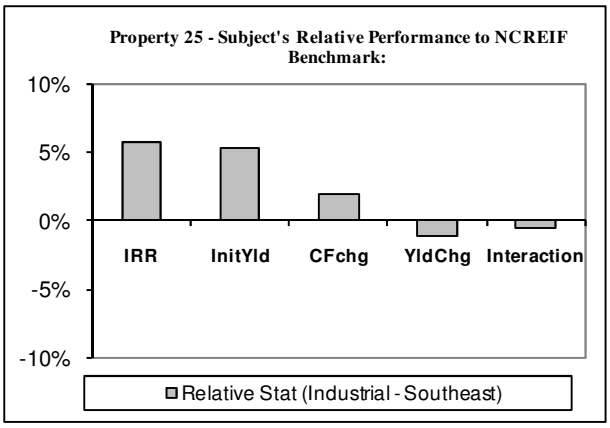
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

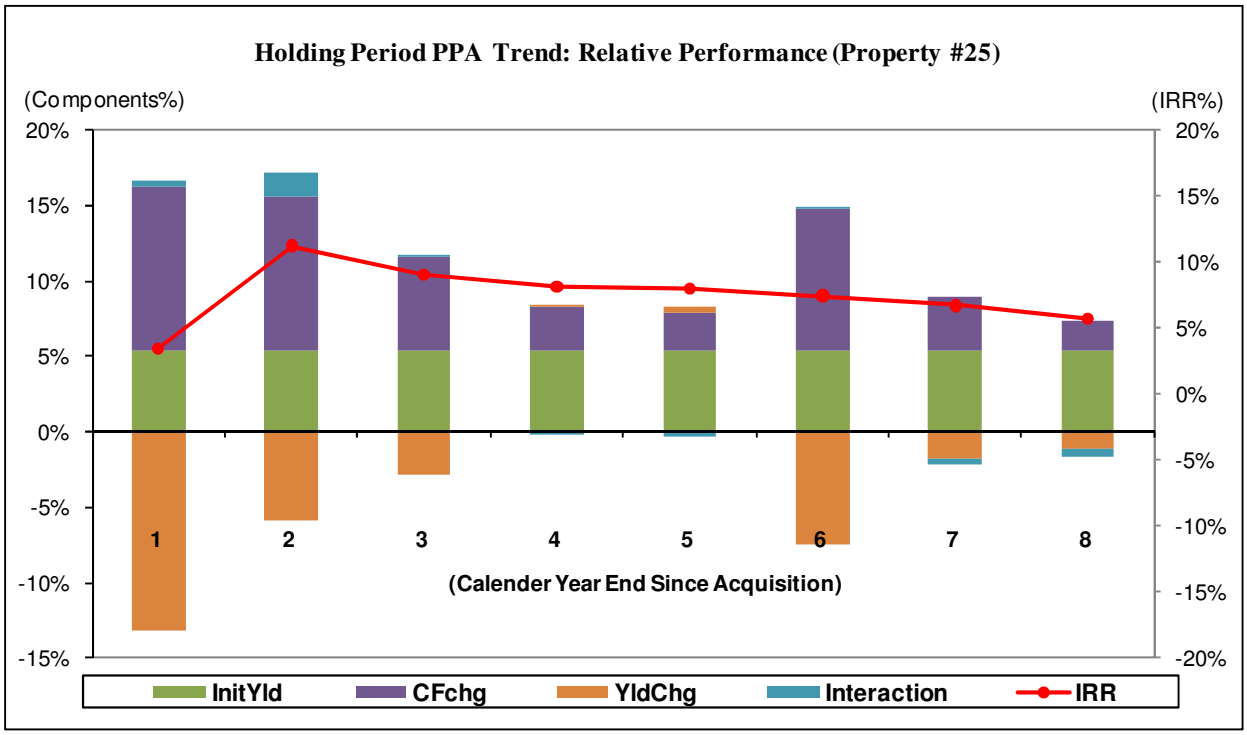
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #25

Property #25	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	14.85%	12.96%	-0.50%	3.09%	-0.69%
NPI Cohort (Industrial - Southeast)	9.11%	7.57%	-2.46%	4.22%	-0.23%
Relative Stat (Industrial - Southeast)	5.74%	5.38%	1.95%	-1.13%	-0.46%
Over (O) / Under (U) Performance	O	O	O	U	U







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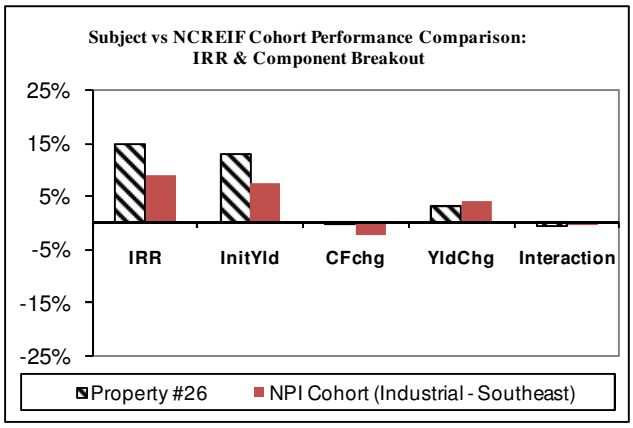
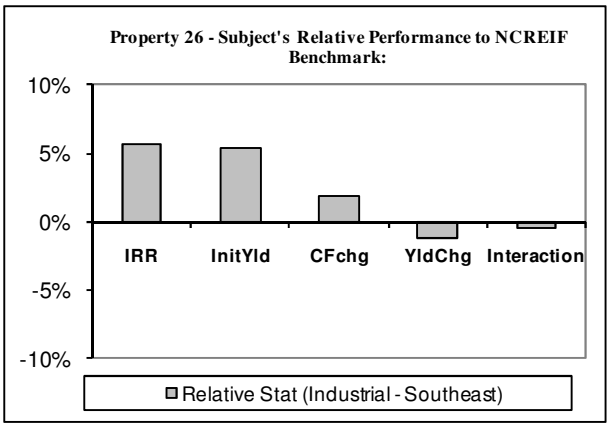
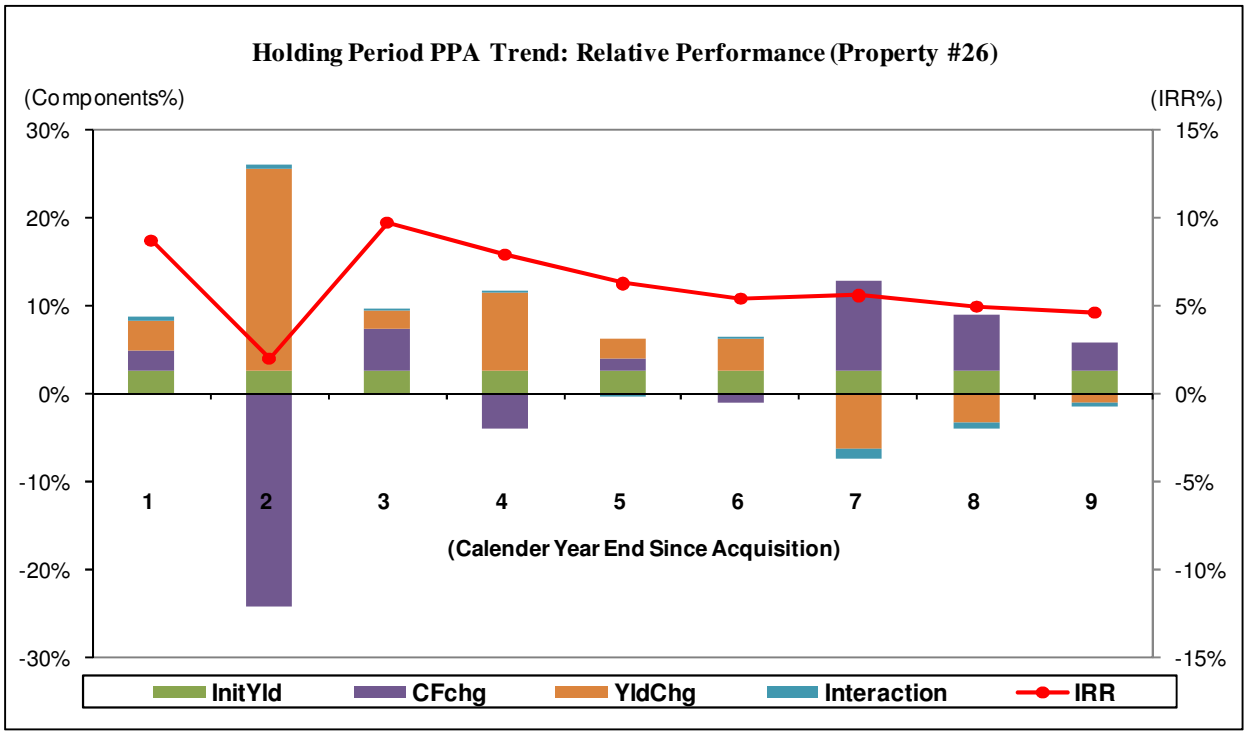
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #26

Property #26	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	14.85%	12.96%	-0.50%	3.09%	-0.69%
NPI Cohort (Industrial - Southeast)	9.11%	7.57%	-2.46%	4.22%	-0.23%
Relative Stat (Industrial - Southeast)	5.74%	5.38%	1.95%	-1.13%	-0.46%
Over (O) / Under (U) Performance	O	O	O	U	U







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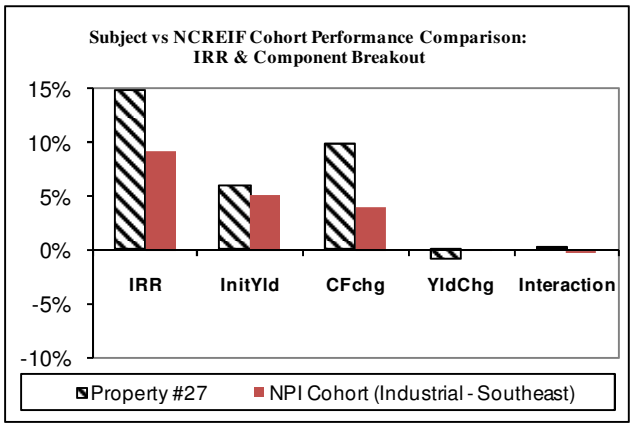
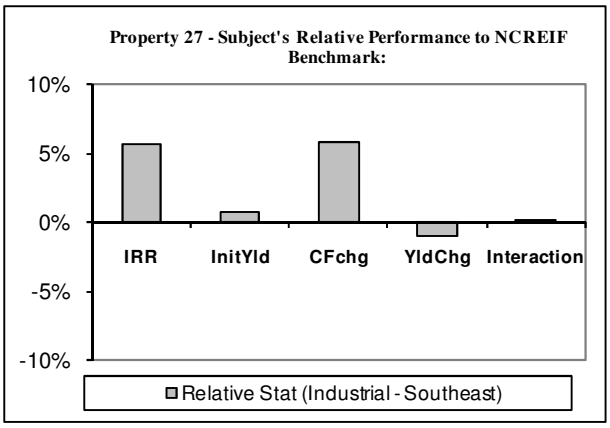
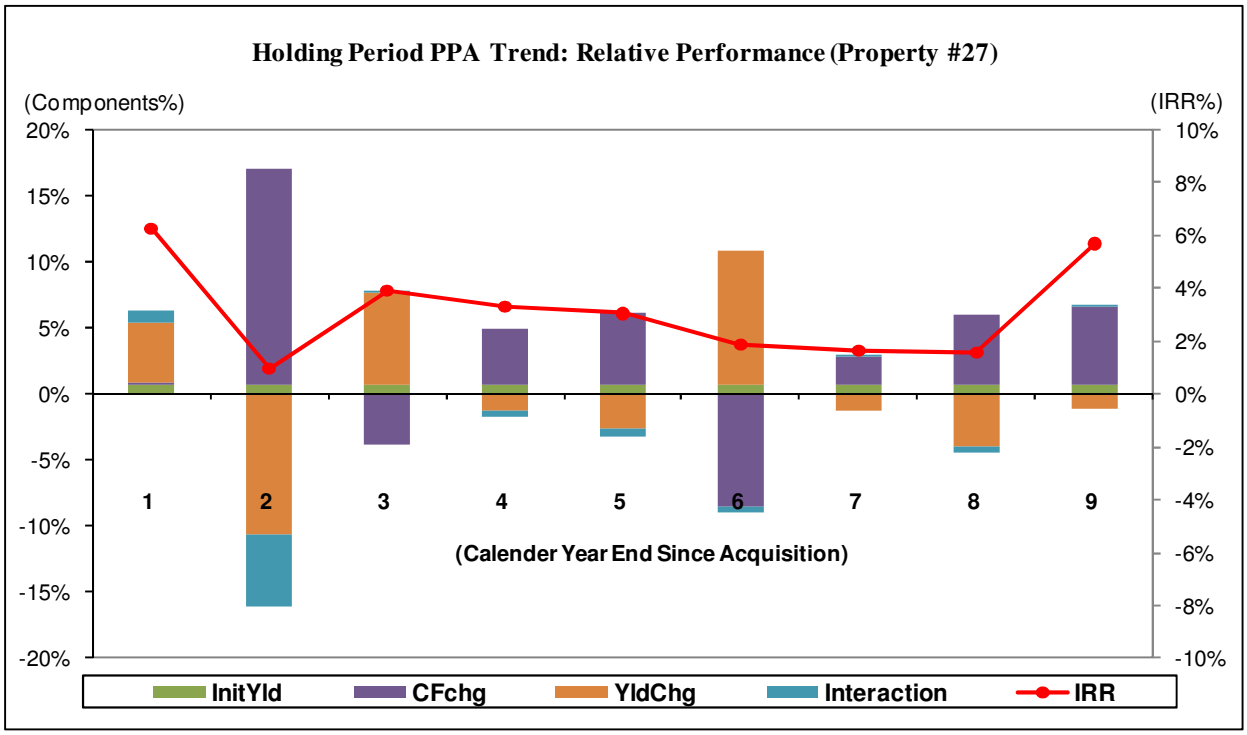
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #27

Property #27	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	14.95%	5.90%	9.86%	-0.86%	0.05%
NPI Cohort (Industrial - Southeast)	9.27%	5.17%	4.04%	0.17%	-0.10%
Relative Stat (Industrial - Southeast)	5.68%	0.73%	5.83%	-1.03%	0.15%
Over (O) / Under (U) Performance	O	O	O	U	O





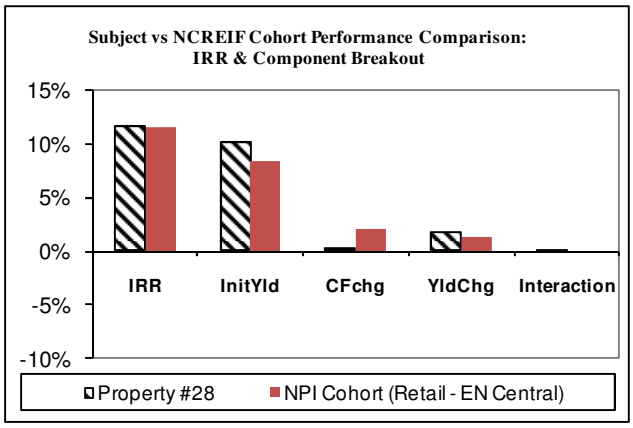


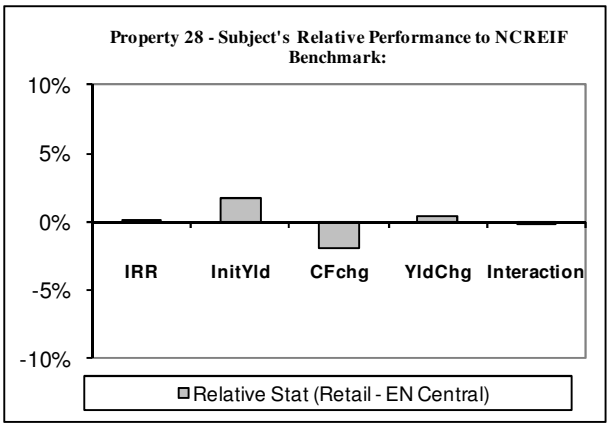
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

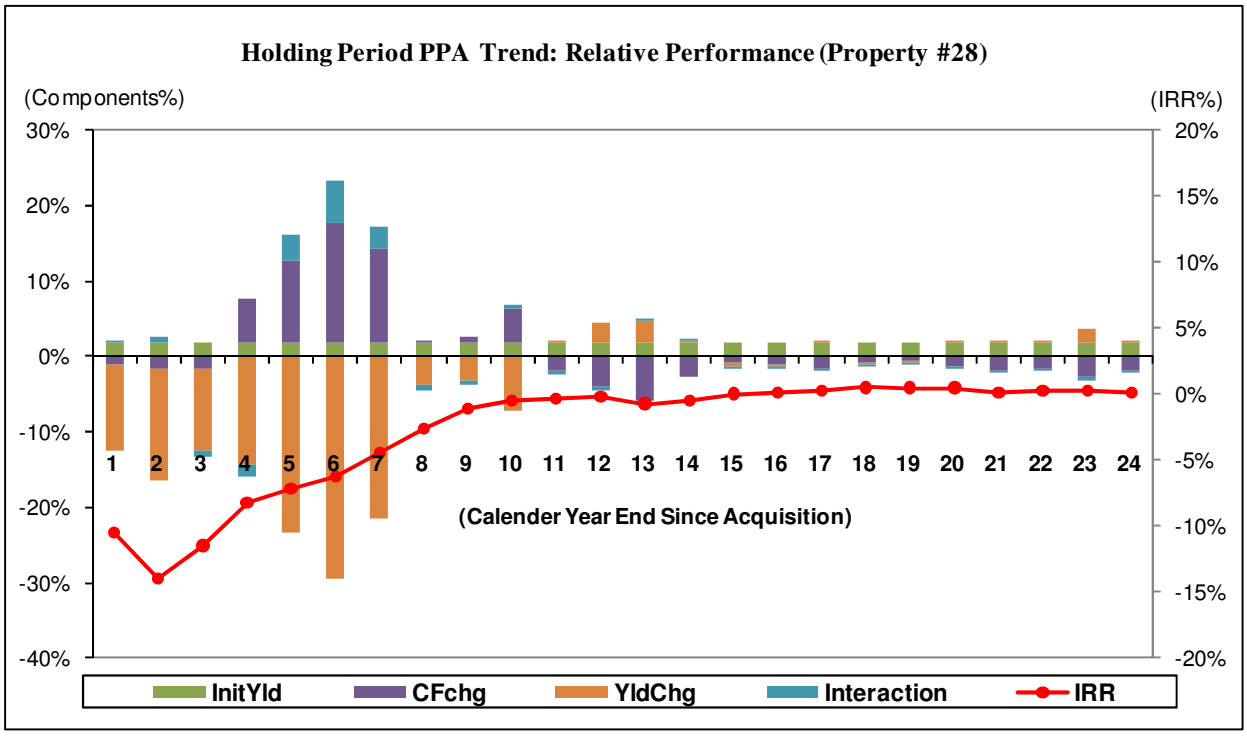
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #28

Property #28	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	11.63%	10.09%	0.15%	1.64%	-0.24%
NPI Cohort (Retail - EN Central)	11.49%	8.40%	2.04%	1.23%	-0.17%
Relative Stat (Retail - EN Central)	0.14%	1.69%	-1.90%	0.41%	-0.07%
Relative Stat (Retail - EN Central)	O	O	U	O	U





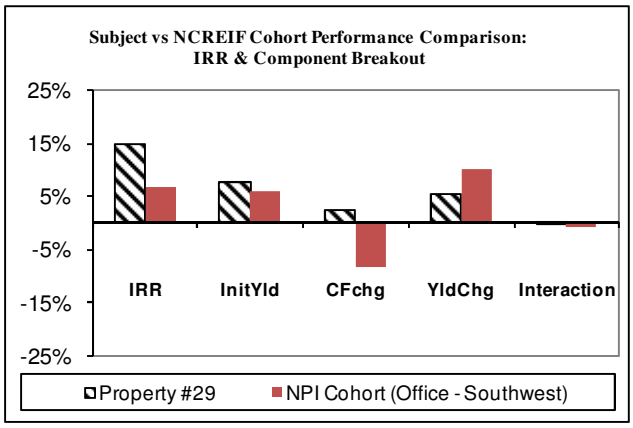


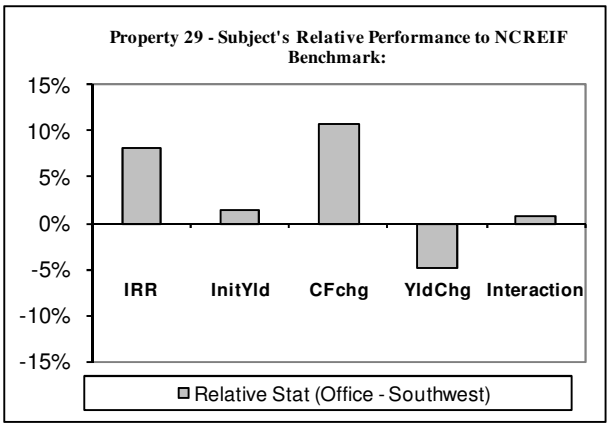
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

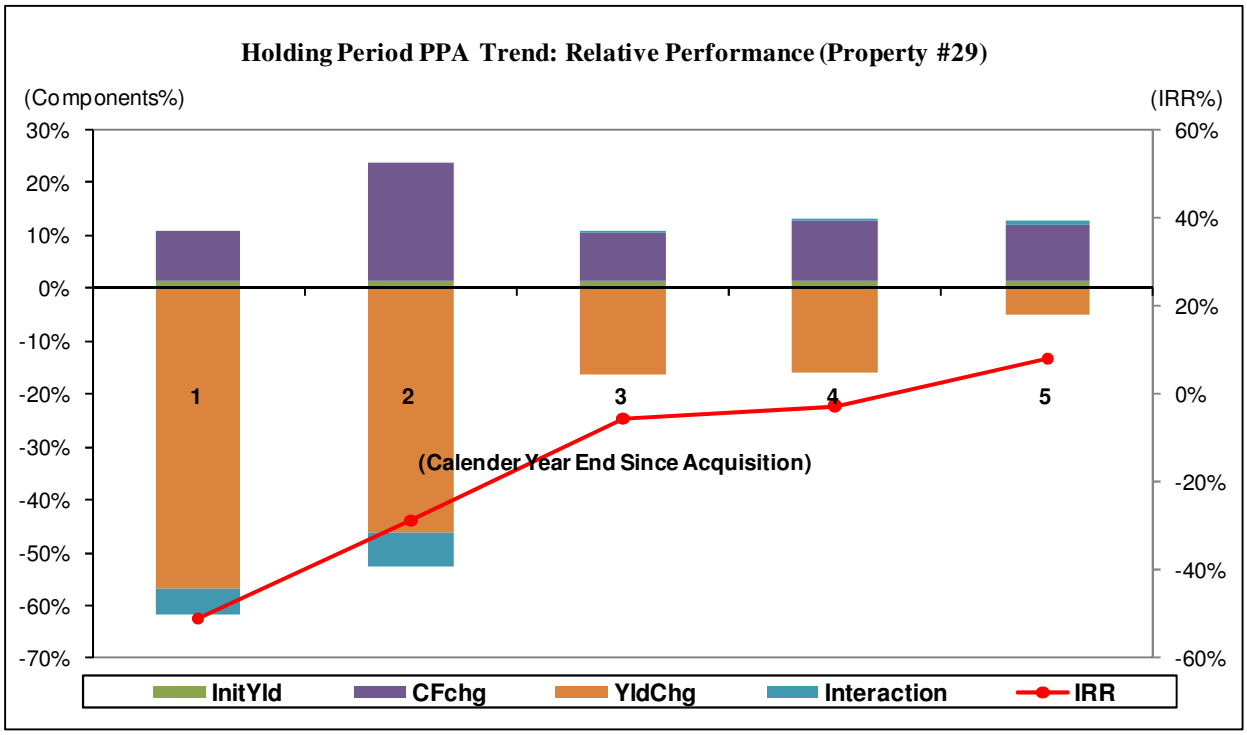
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #29

Property #29	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	14.82%	7.35%	2.33%	5.32%	-0.17%
NPI Cohort (Office - Southwest)	6.75%	5.85%	-8.39%	10.21%	-0.92%
Relative Stat (Office - Southwest)	8.07%	1.51%	10.71%	-4.89%	0.74%
Over (O) / Under (U) Performance	O	O	O	U	O







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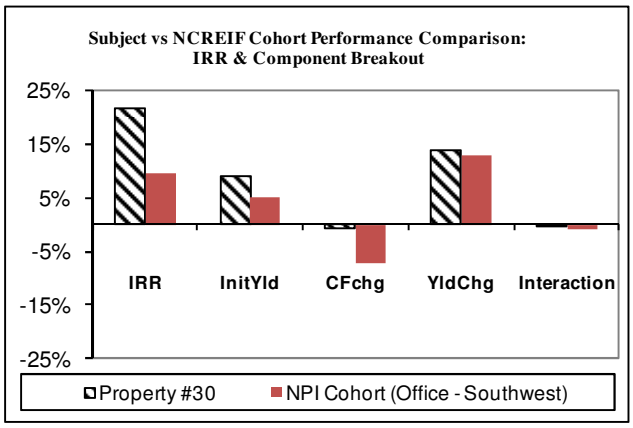
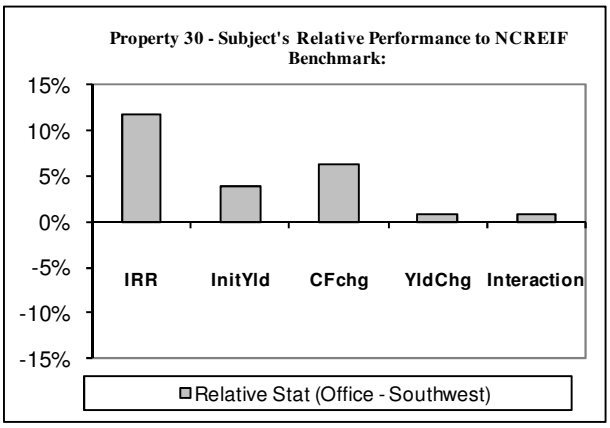
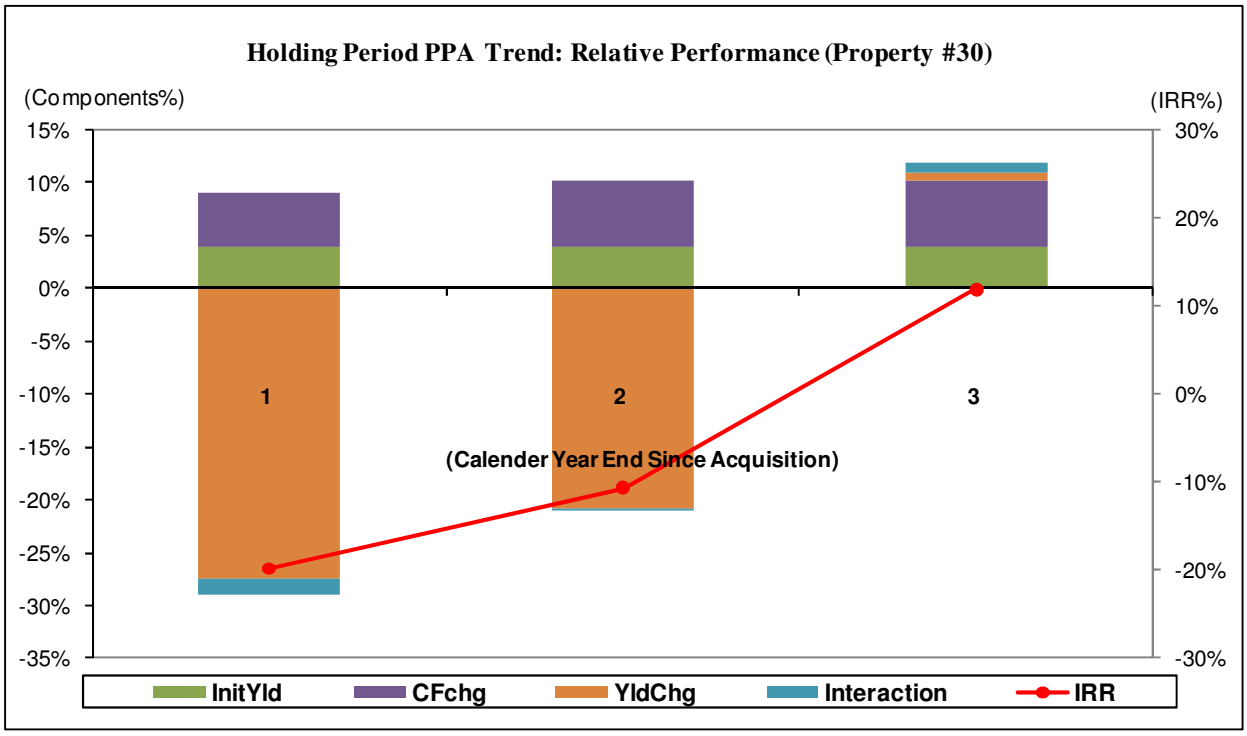
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #30

Property #30	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	21.49%	8.83%	-0.86%	13.60%	-0.08%
NPI Cohort (Office - Southwest)	9.62%	4.98%	-7.18%	12.78%	-0.96%
Relative Stat (Office - Southwest)	11.86%	3.85%	6.31%	0.81%	0.88%
Over (O) / Under (U) Performance	O	O	O	O	O





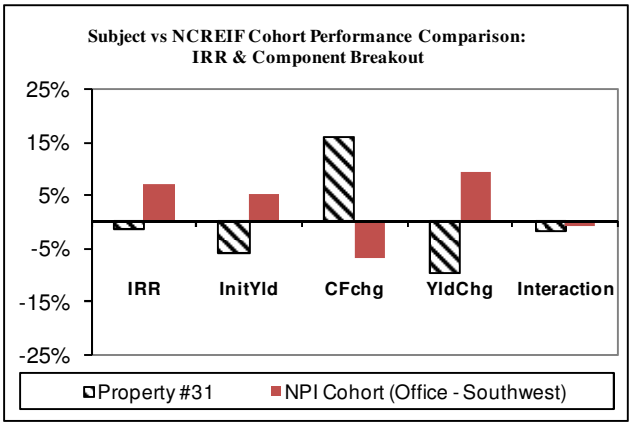


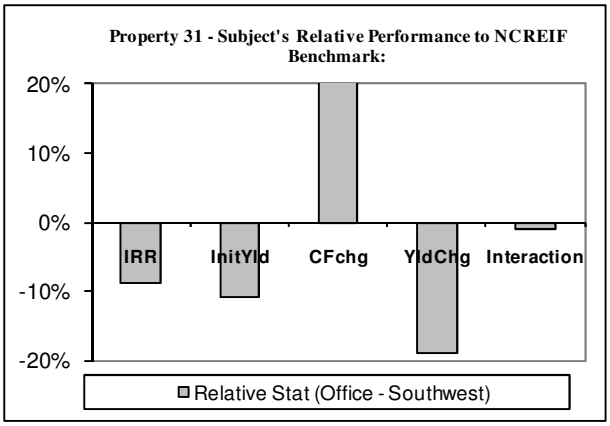
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

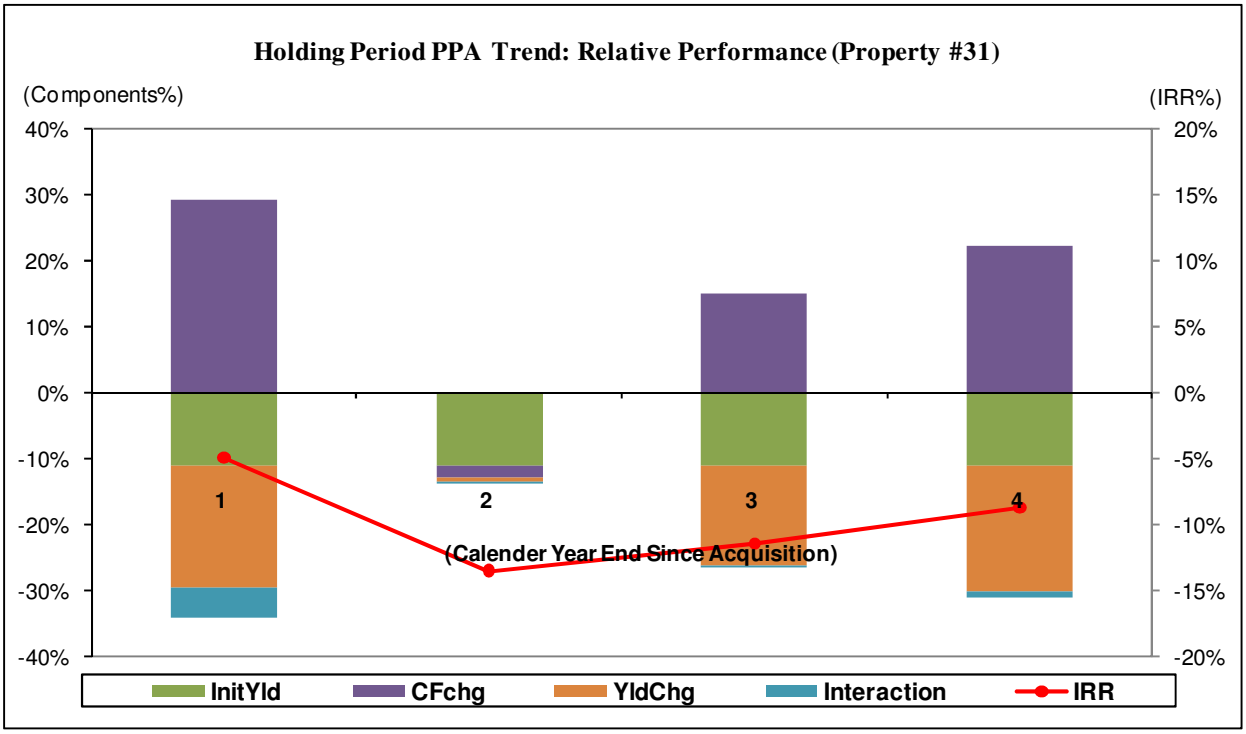
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #31

Property #31	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	-1.65%	-5.84%	15.77%	-9.85%	-1.73%
NPI Cohort (Office - Southwest)	7.06%	5.14%	-6.60%	9.22%	-0.69%
Relative Stat (Office - Southwest)	-8.71%	-10.98%	22.38%	-19.07%	-1.04%
Over (O) / Under (U) Performance	U	U	O	U	U





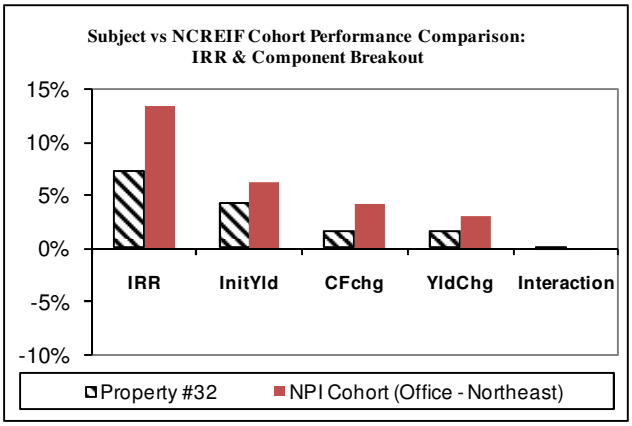


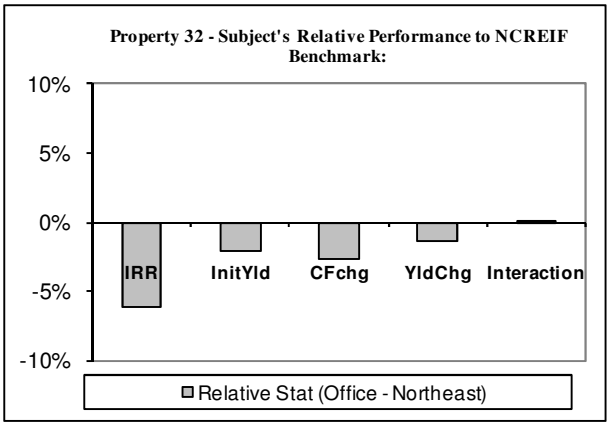
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

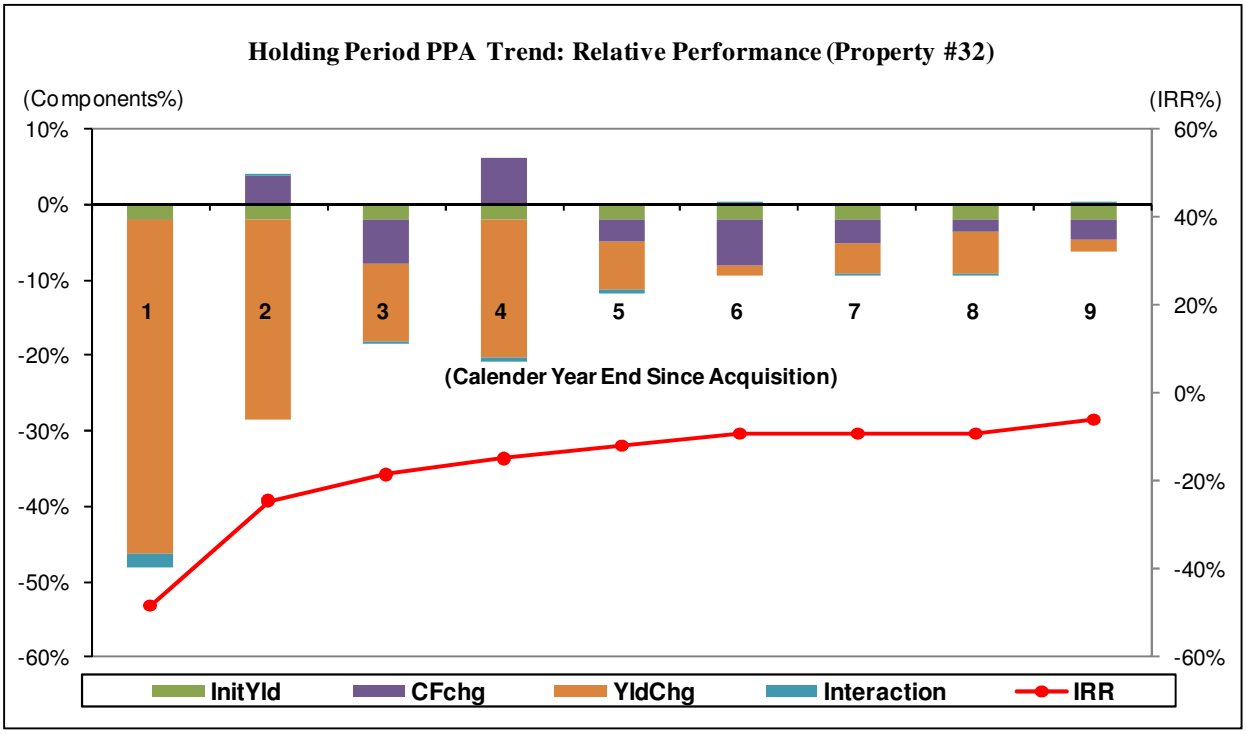
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #32

Property #32	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	7.28%	4.26%	1.51%	1.60%	-0.10%
NPI Cohort (Office - Northeast)	13.38%	6.29%	4.25%	3.02%	-0.17%
Relative Stat (Office - Northeast)	-6.11%	-2.03%	-2.73%	-1.41%	0.07%
Over (O) / Under (U) Performance	U	U	U	U	O





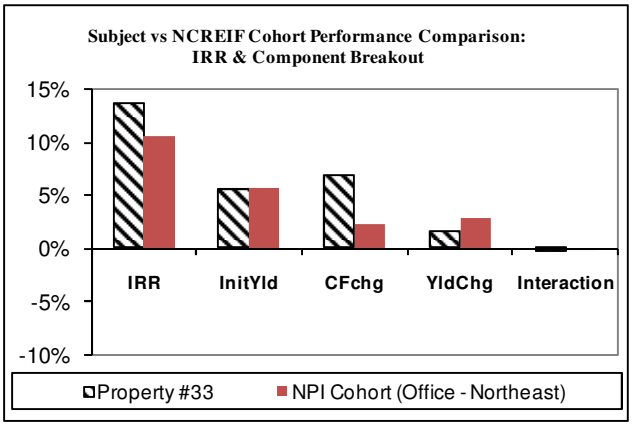


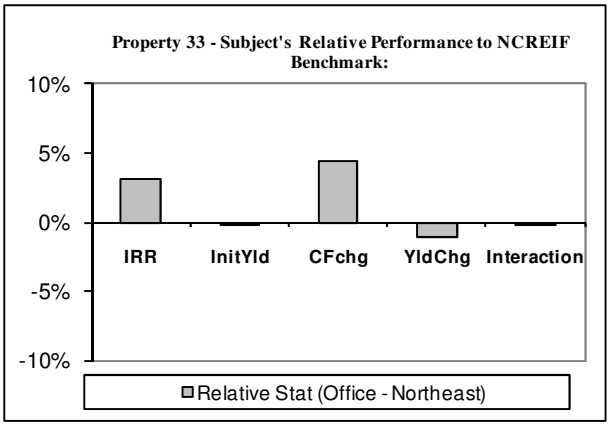
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

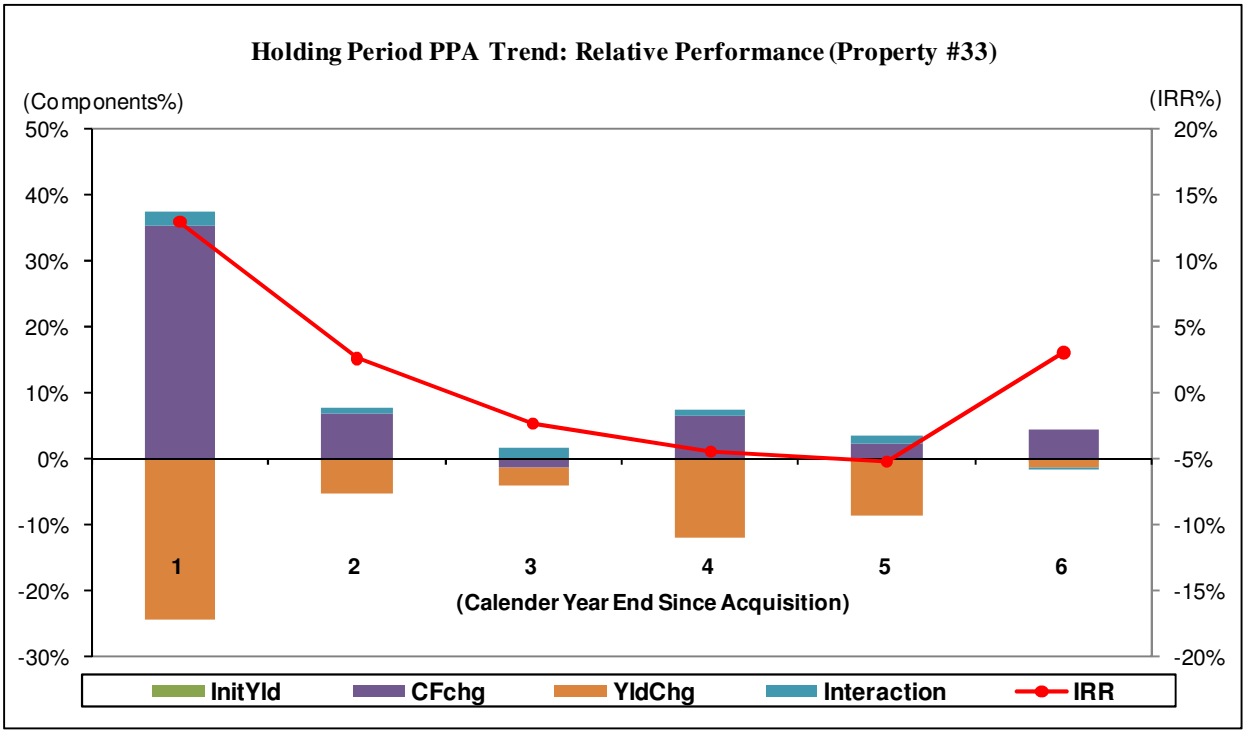
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #33

Property #33	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	13.67%	5.58%	6.75%	1.67%	-0.33%
NPI Cohort (Office - Northeast)	10.61%	5.67%	2.29%	2.80%	-0.15%
Relative Stat (Office - Northeast)	3.06%	-0.09%	4.46%	-1.13%	-0.18%
Over (O) / Under (U) Performance	O	U	O	U	U





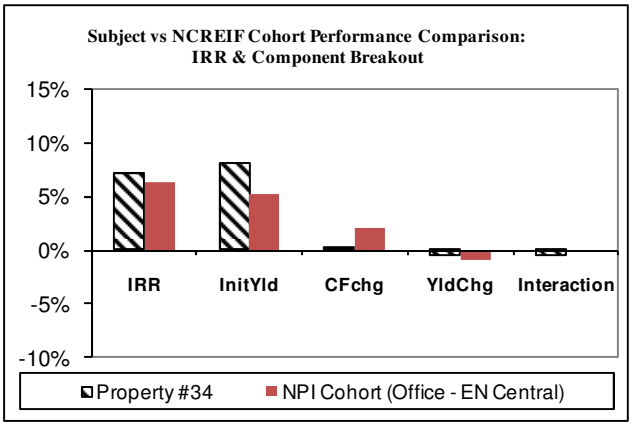


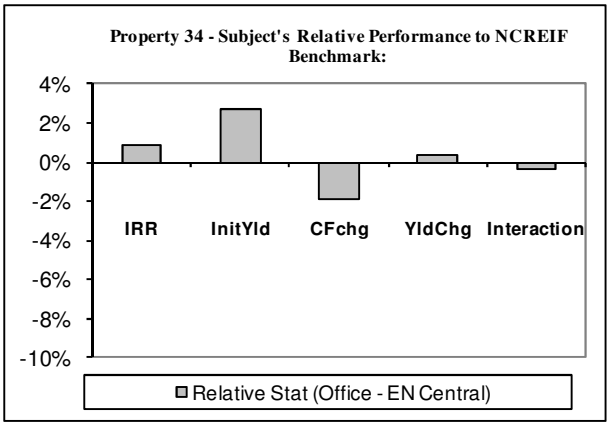
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

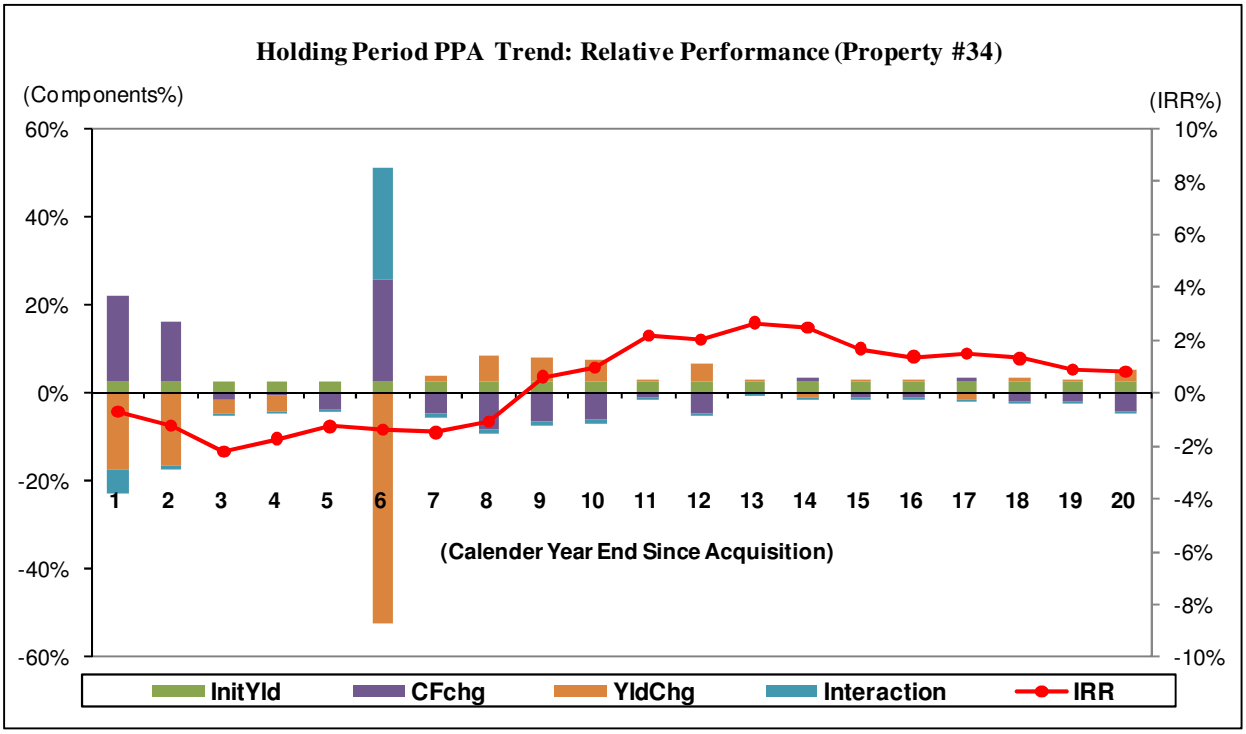
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #34

Property #34	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	7.07%	8.00%	0.17%	-0.51%	-0.60%
NPI Cohort (Office - EN Central)	6.24%	5.28%	2.02%	-0.83%	-0.23%
Relative Stat (Office - EN Central)	0.82%	2.72%	-1.85%	0.32%	-0.37%
Over (O) / Under (U) Performance	O	O	U	O	U





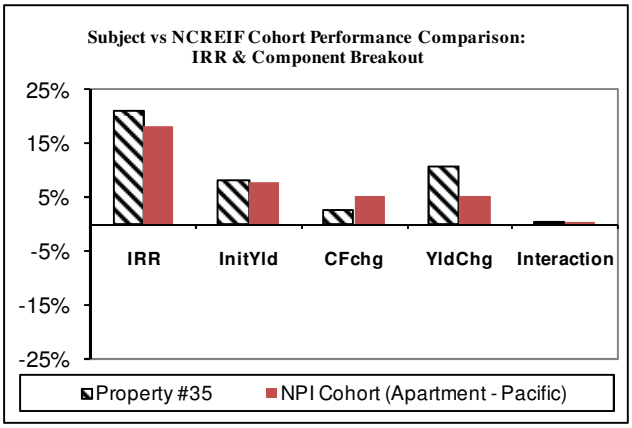


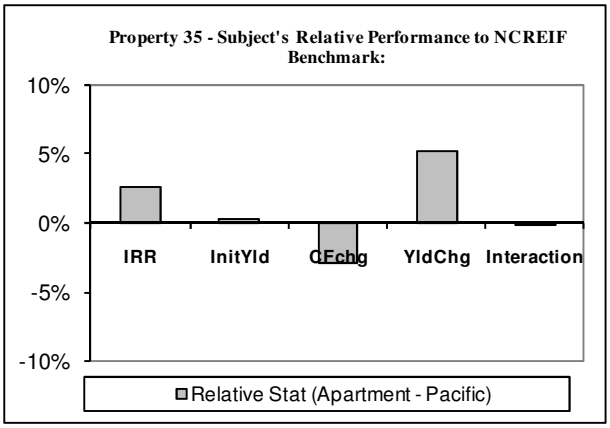
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

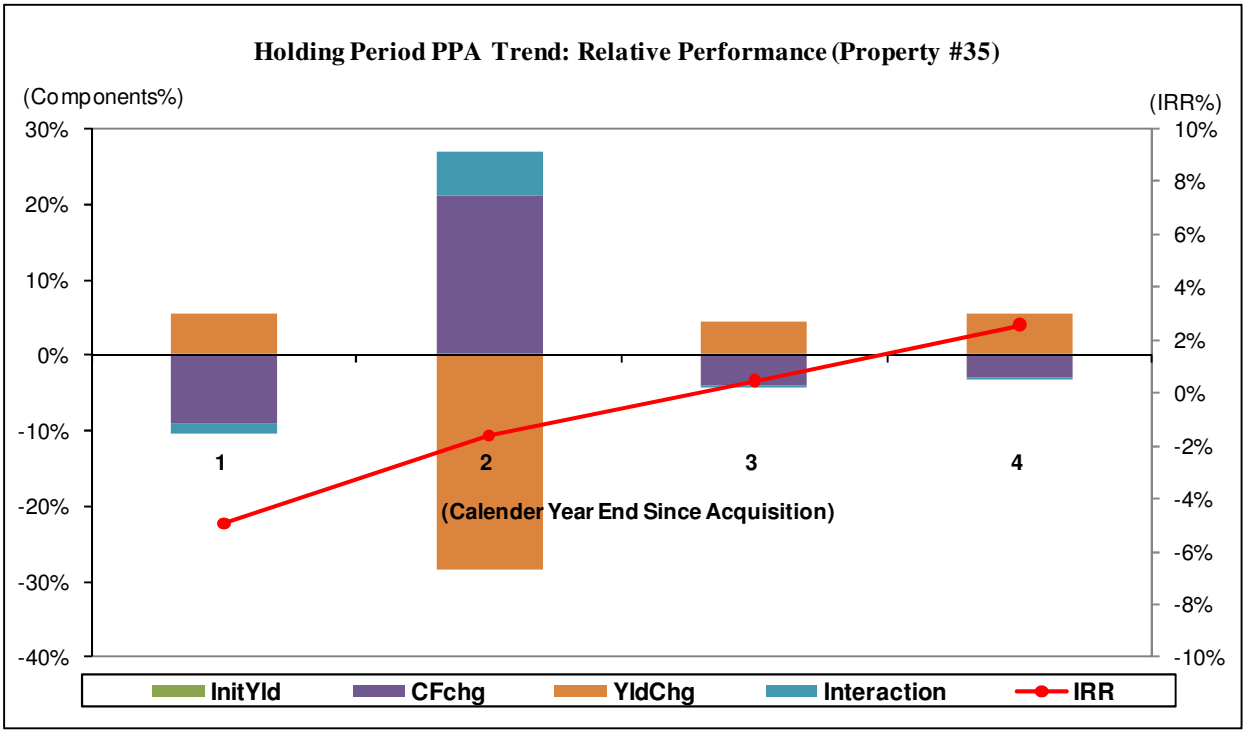
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #35

Property #35	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	20.93%	7.95%	2.41%	10.52%	0.06%
NPI Cohort (Apartment - Pacific)	18.35%	7.70%	5.30%	5.26%	0.09%
Relative Stat (Apartment - Pacific)	2.58%	0.25%	-2.89%	5.25%	-0.03%
Over (O) / Under (U) Performance	O	O	U	O	U





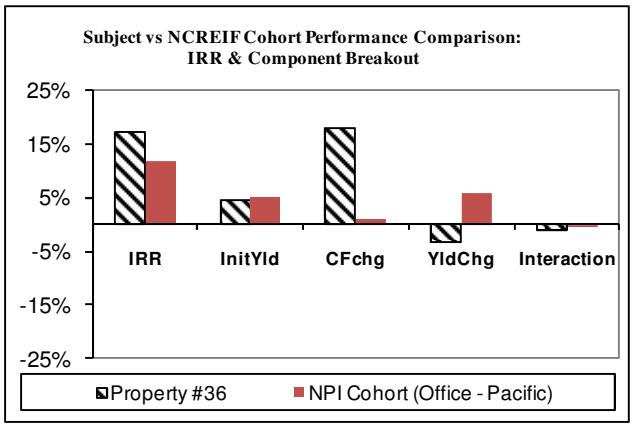


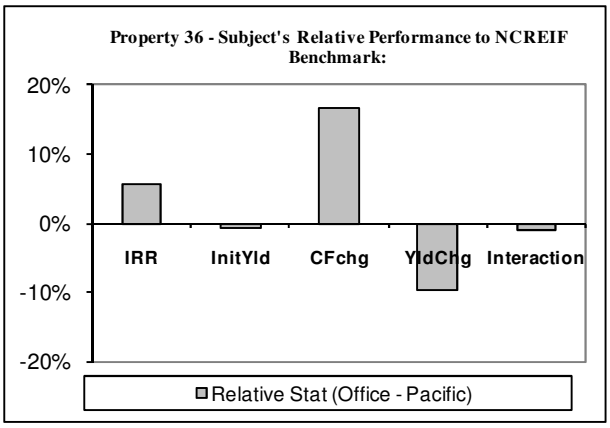
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

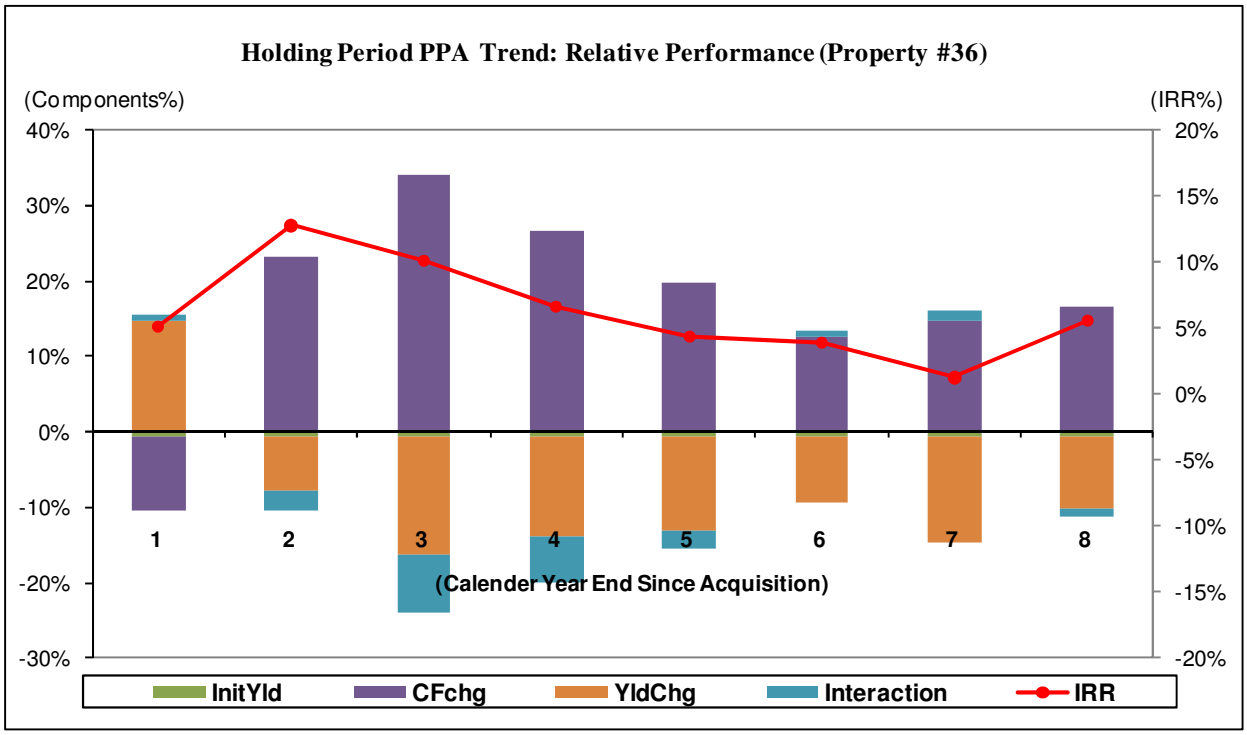
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #36

Property #36	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	17.18%	4.21%	17.80%	-3.62%	-1.20%
NPI Cohort (Office - Pacific)	11.66%	4.91%	1.11%	5.94%	-0.29%
Relative Stat (Office - Pacific)	5.52%	-0.70%	16.69%	-9.56%	-0.91%
Over (O) / Under (U) Performance	O	U	O	U	U





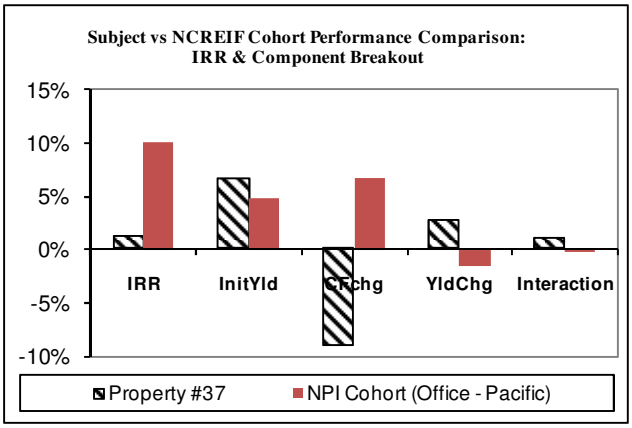


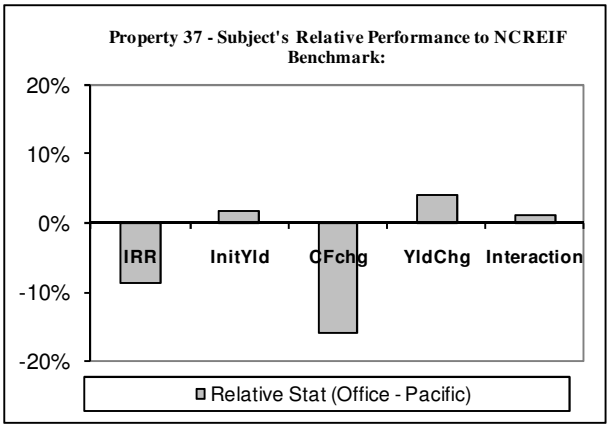
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

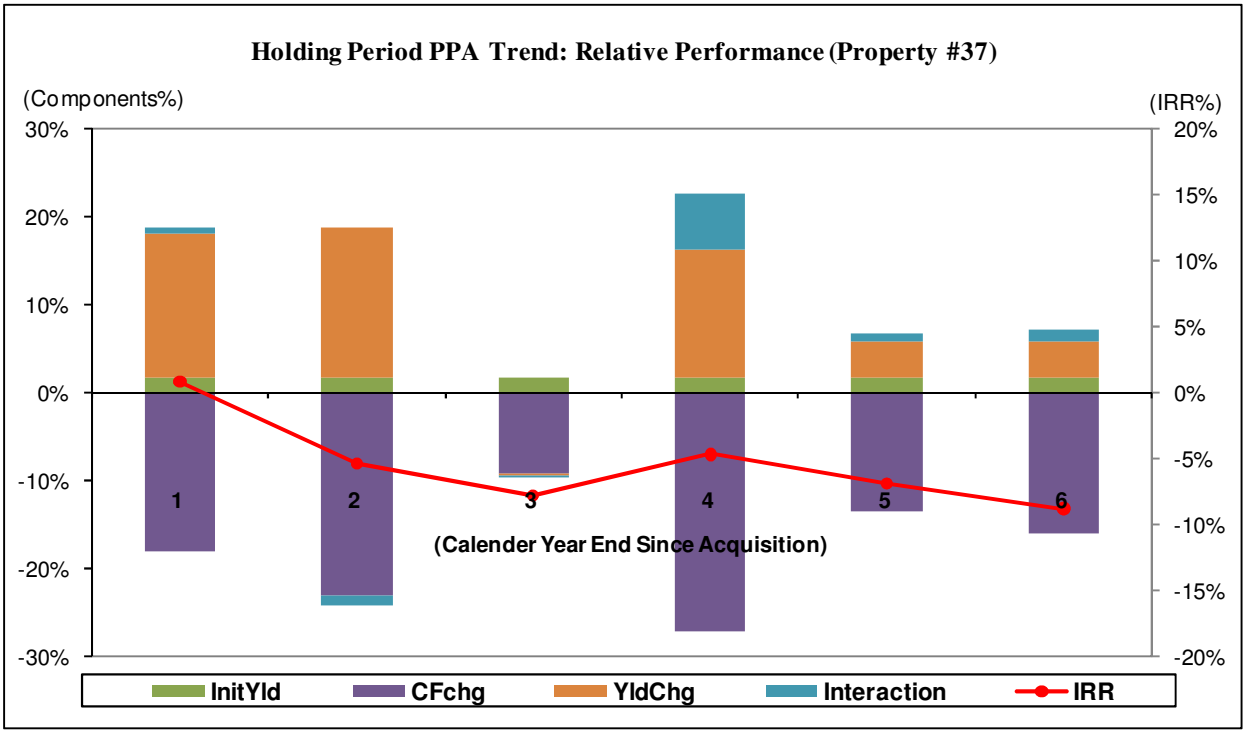
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #37

Property #37	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	1.25%	6.66%	-9.13%	2.63%	1.10%
NPI Cohort (Office - Pacific)	10.01%	4.91%	6.74%	-1.49%	-0.14%
Relative Stat (Office - Pacific)	-8.76%	1.75%	-15.87%	4.12%	1.24%
Over (O) / Under (U) Performance	U	O	U	O	O





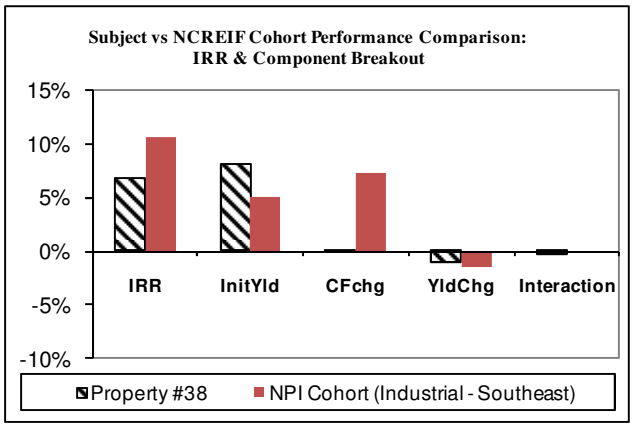


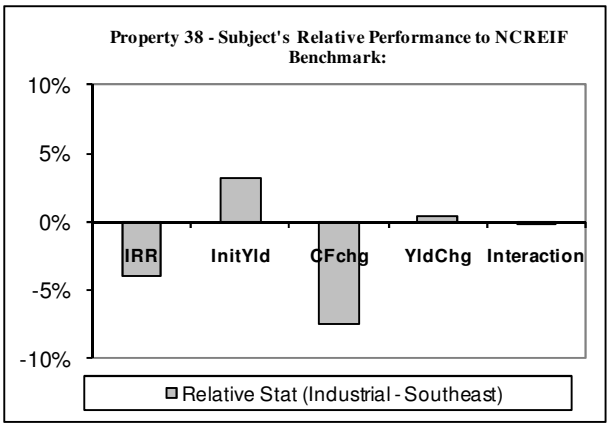
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

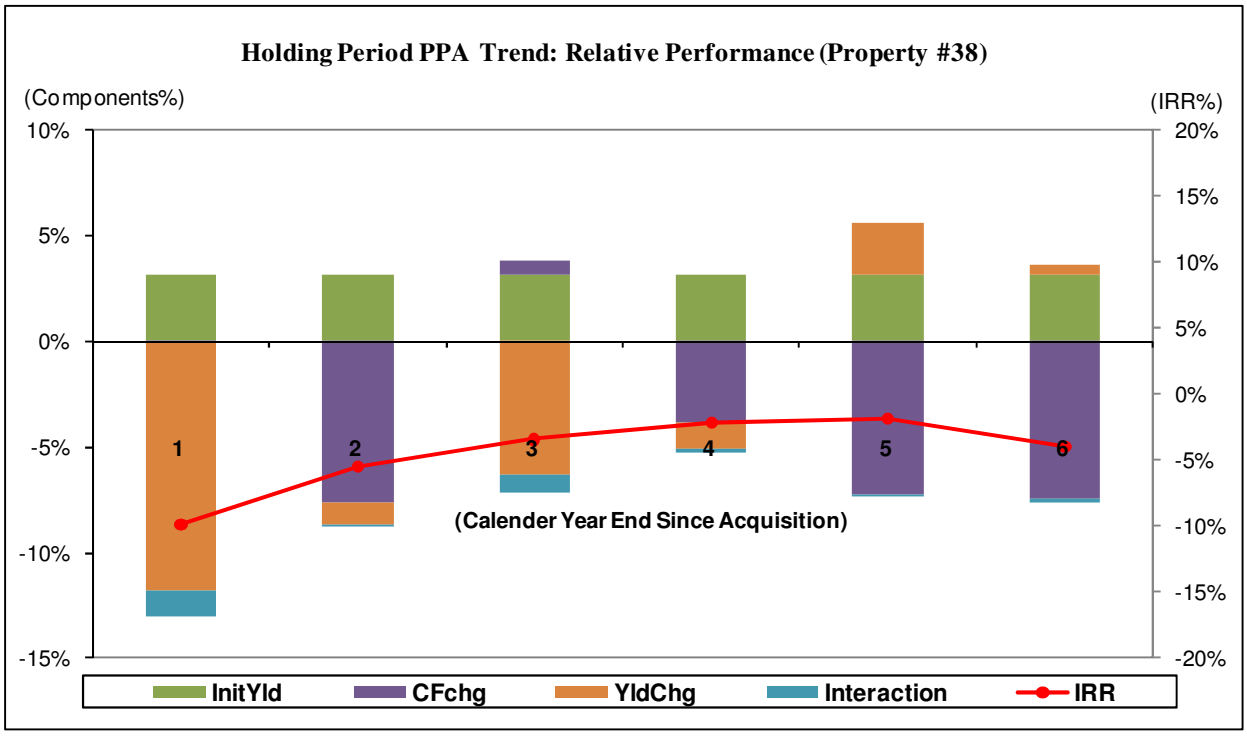
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #38

Property #38	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	6.65%	8.12%	-0.15%	-1.05%	-0.28%
NPI Cohort (Industrial - Southeast)	10.64%	4.96%	7.33%	-1.48%	-0.17%
Relative Stat (Industrial - Southeast)	-3.99%	3.16%	-7.48%	0.43%	-0.11%
Over (O) / Under (U) Performance	U	O	U	O	U





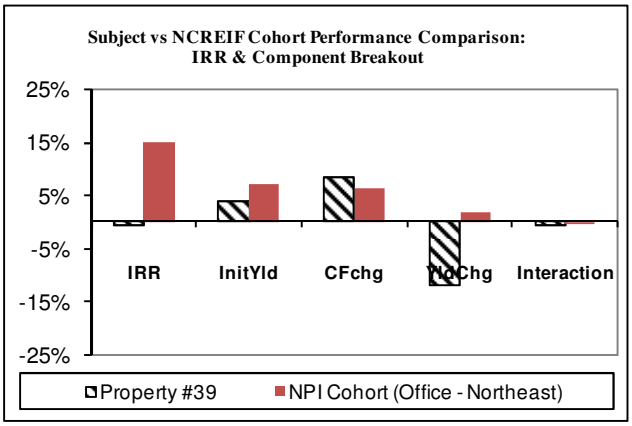


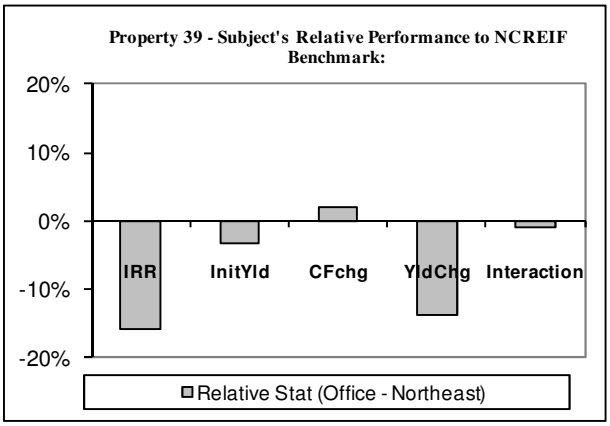
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

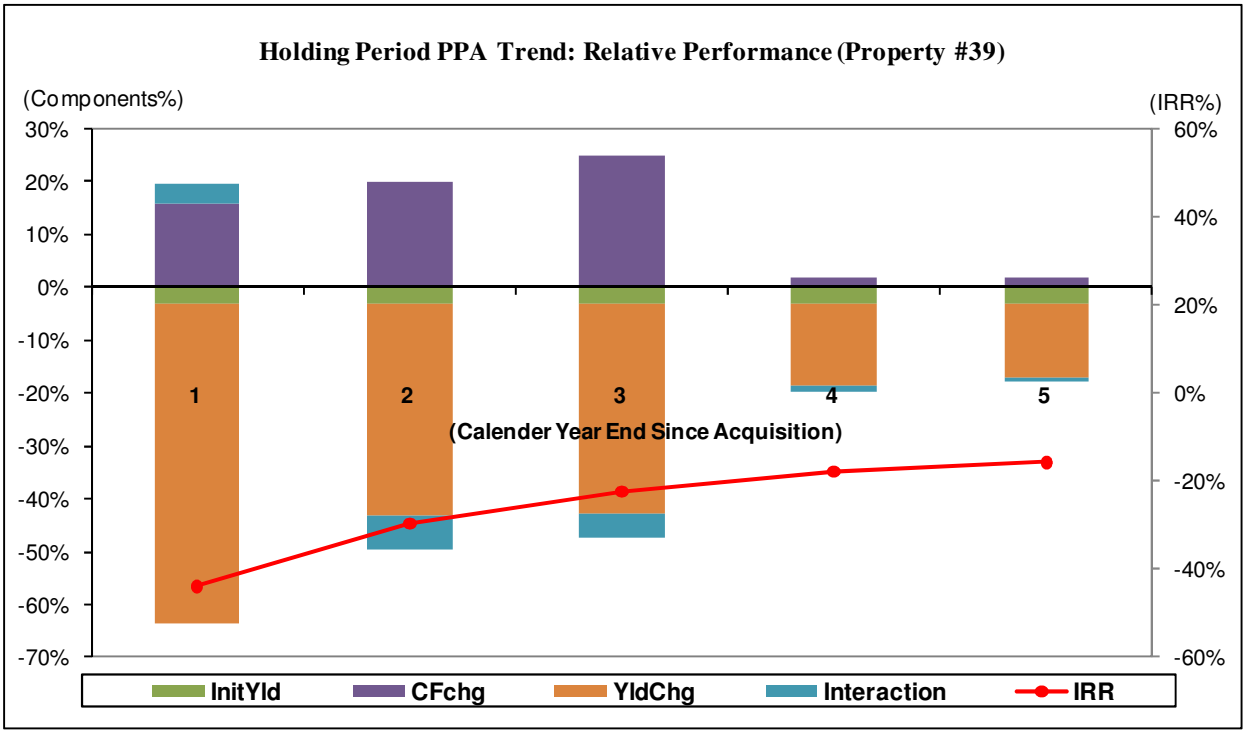
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #39

Property #39	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	-0.78%	3.89%	8.39%	-12.16%	-0.90%
NPI Cohort (Office - Northeast)	15.00%	6.99%	6.38%	1.70%	-0.07%
Relative Stat (Office - Northeast)	-15.78%	-3.10%	2.01%	-13.85%	-0.83%
Over (O) / Under (U) Performance	U	U	O	U	U





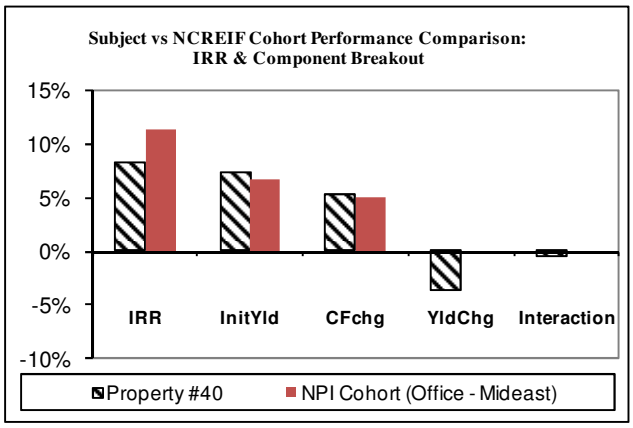


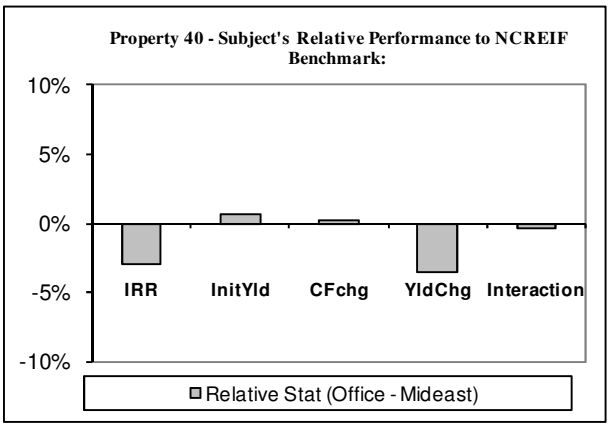
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

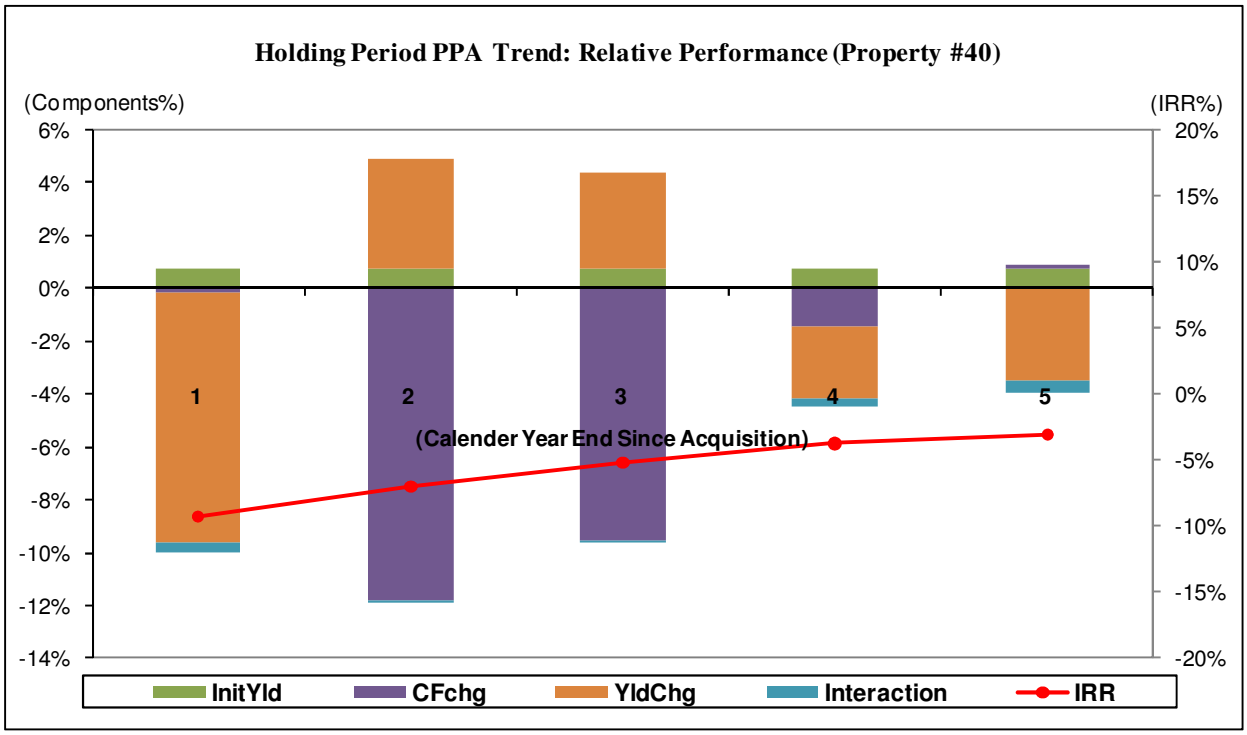
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #40

Property #40	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	8.25%	7.36%	5.15%	-3.66%	-0.60%
NPI Cohort (Office - Mideast)	11.28%	6.65%	4.97%	-0.16%	-0.18%
Relative Stat (Office - Mideast)	-3.03%	0.72%	0.18%	-3.50%	-0.42%
Over (O) / Under (U) Performance	U	O	O	U	U





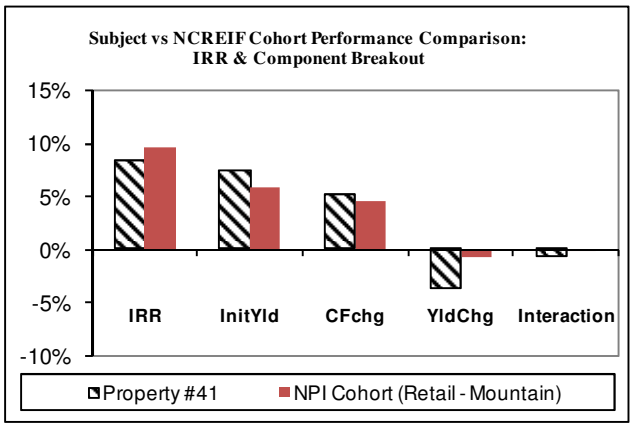


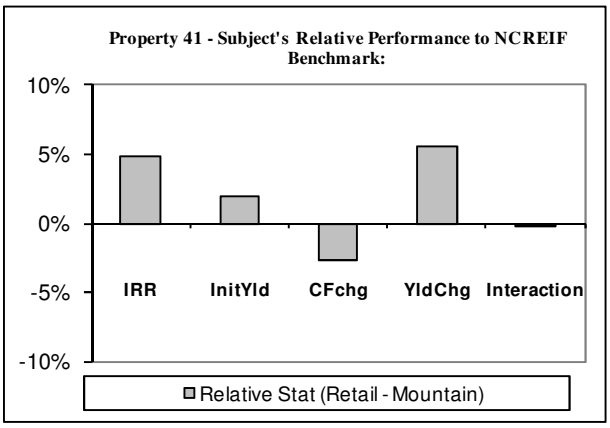
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

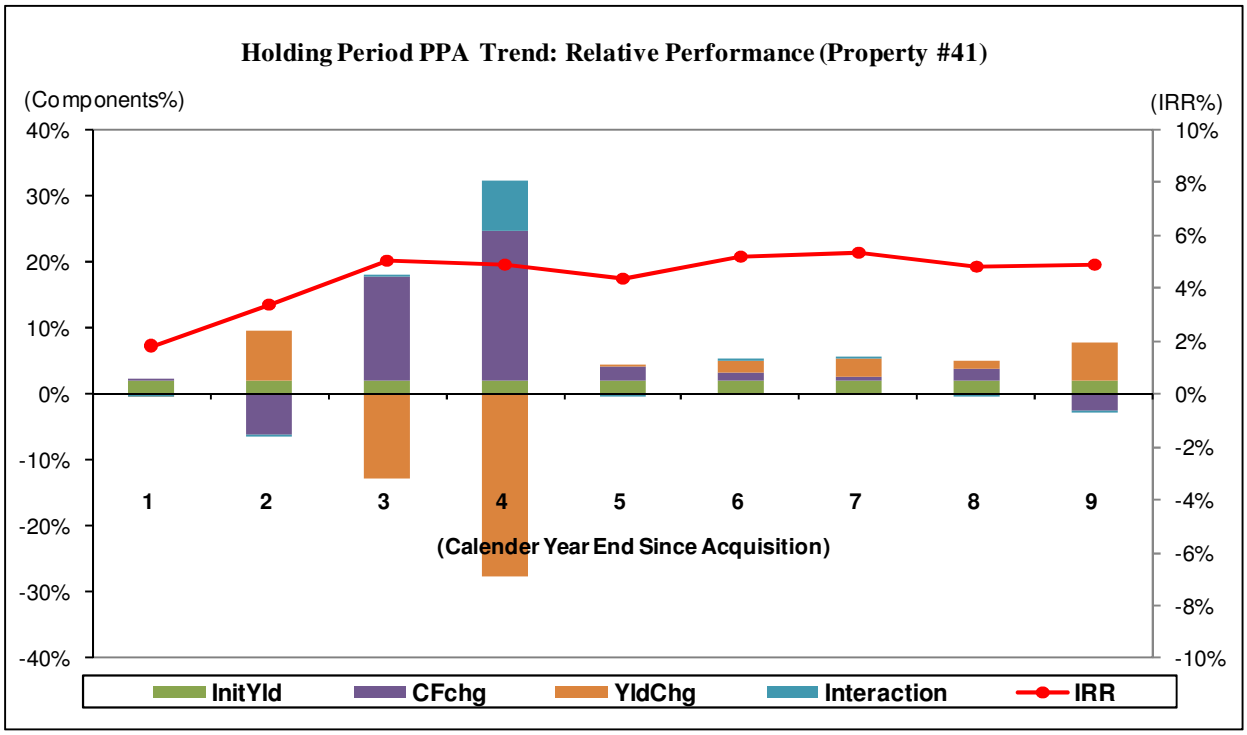
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #41

Property #41	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	14.50%	7.93%	2.00%	4.89%	-0.33%
NPI Cohort (Retail - Mountain)	9.58%	5.90%	4.61%	-0.73%	-0.19%
Relative Stat (Retail - Mountain)	4.91%	2.03%	-2.60%	5.62%	-0.13%
Over (O) / Under (U) Performance	O	O	U	O	U





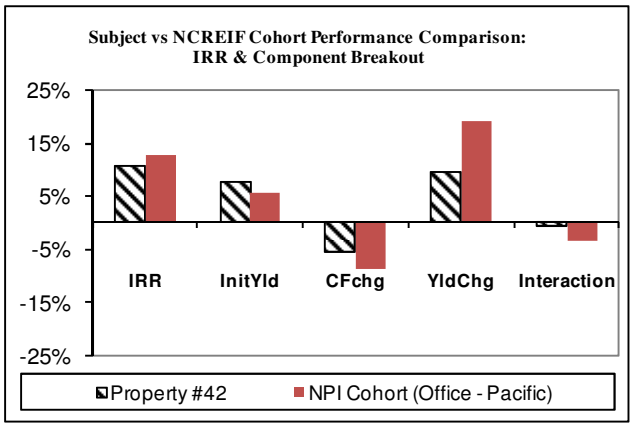


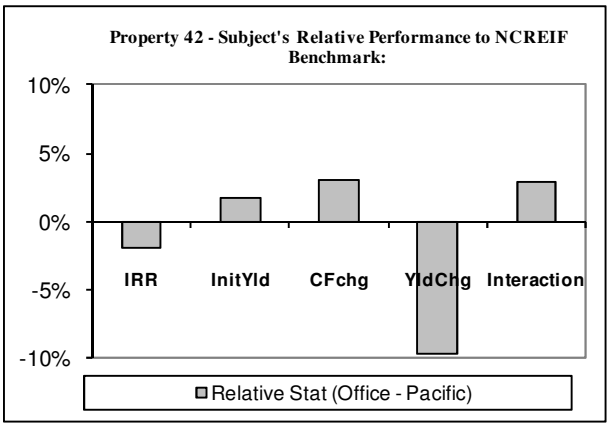
(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

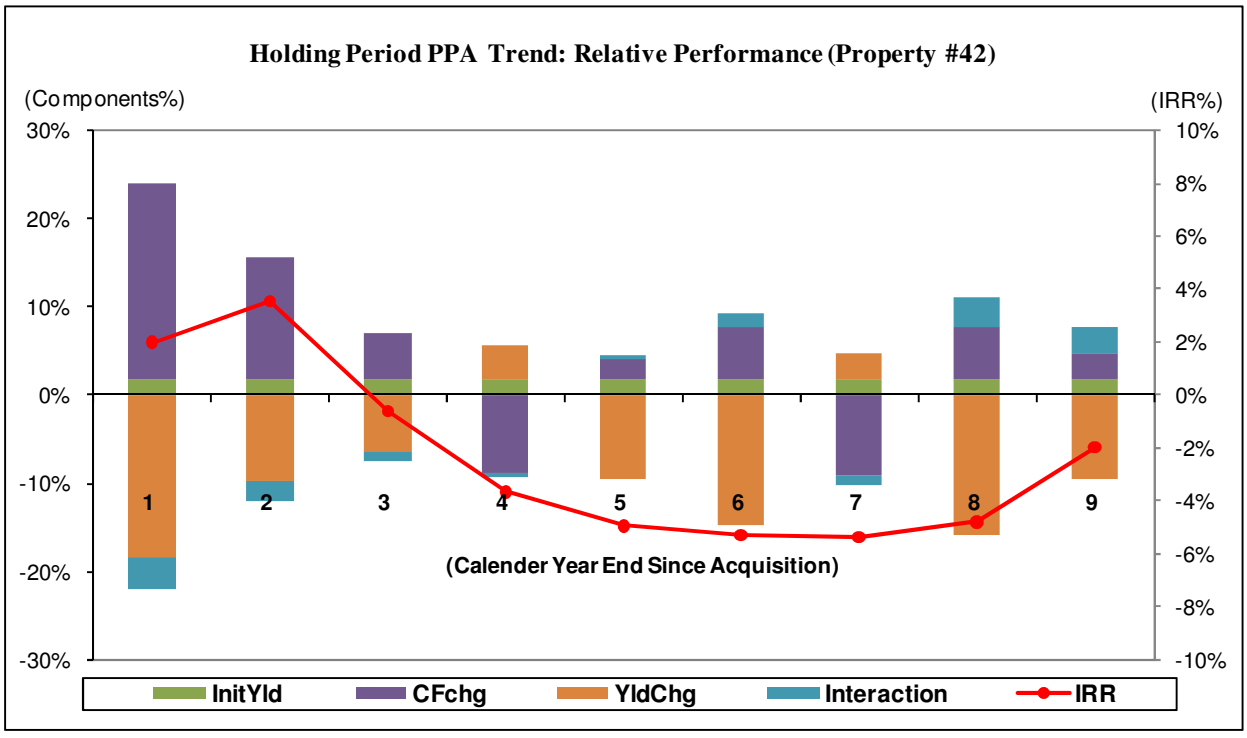
APPENDIX B: PROPERTY PERFORMANCE ATTRIBUTION RESULTS BY PROPERTY

Property #42

Property #42	IRR	InitYld	CFchg	YldChg	Interaction
Subject Property	10.67%	7.37%	-5.66%	9.60%	-0.64%
NPI Cohort (Office - Pacific)	12.63%	5.58%	-8.66%	19.20%	-3.48%
Relative Stat (Office - Pacific)	-1.96%	1.80%	3.00%	-9.60%	2.84%
Over (O) / Under (U) Performance	U	O	O	U	O







(Holding Period PPA calculated for each year is based on appraised values, except for the terminal year, which is based on the actual disposition price.)

APPENDIX C: EQUITY AND PROPERTY-LEVEL CASH FLOW PPA COMPARISON

(Performance Relative to Benchmark)

Property Number	NCREIF Bechmark	Stylized Acq Date	Stylized Hldg Pd (Yrs)	IRR	InitYld	CFchg	YldChg
2	Industrial - EN Central	May-88	16.6	6.75%	O	O	O
3	Office - Pacific	May-98	7.1	-4.89%	O	U	U
4	Industrial - Pacific	Jul-99	4.9	-4.34%	O	U	O
5	Office - Pacific	Jul-99	5.1	4.68%	O	U	O
6	Office - Pacific	Apr-01	3.3	5.36%	O	U	O
7	Office - Southwest	Dec-99	3.8	0.02%	O	U	O
8	Office - Southwest	Mar-00	3.5	-1.47%	O	U	O
9	Apartment - Southwest	Mar-95	10.3	0.13%	O	U	O
10	Apartment - Southwest	Mar-95	10.3	-0.35%	O	U	O
11	Apartment - Southwest	Mar-95	10.3	0.29%	O	U	U
13	Office - EN Central	Dec-95	10.8	-1.26%	O	U	U
15	Office - EN Central	May-83	20.5	-0.52%	O	U	O
16	Office - EN Central	Jul-85	18.3	-3.03%	O	U	O
17	Retail - Pacific	Jan-95	7.6	-2.58%	O	U	O
18	Retail - EN Central	Mar-95	7.4	4.88%	O	U	O
21	Apartment - Southeast	Jun-88	13.4	0.74%	O	U	O
22	Apartment - Southeast	Nov-88	13.0	-1.11%	U	O	U
23	Industrial - EN Central	Nov-96	6.8	1.30%	O	U	O
24	Industrial - Southeast	Aug-95	8.6	-1.18%	O	U	O
25	Industrial - Southeast	Feb-96	8.0	5.74%	O	O	U
26	Industrial - Southeast	Aug-95	8.5	5.74%	O	O	U
27	Industrial - Southeast	Dec-95	8.2	5.68%	O	O	U
28	Retail - EN Central	Jun-83	24.5	0.14%	O	U	O
29	Office - Southwest	Jun-01	4.8	8.07%	O	O	U
30	Office - Southwest	Apr-03	2.9	11.86%	O	O	O
31	Office - Southwest	Feb-02	4.1	-8.71%	U	O	U
34	Office - EN Central	Jun-82	20.2	0.82%	O	U	O
35	Apartment - Pacific	Jan-97	4.9	2.58%	O	U	O
37	Office - Pacific	Apr-98	5.8	-8.76%	O	U	O
38	Industrial - Southeast	Apr-95	6.3	-3.99%	O	U	O
39	Office - Northeast	Apr-97	5.1	-15.78%	U	O	U
40	Office - Mideast	Nov-98	4.2	-3.03%	O	O	U
41	Retail - Mountain	Dec-94	9.0	4.91%	O	U	O
42	Office - Pacific	May-99	8.8	-1.96%	O	O	U
Total # Outperformed				18	31	11	22
Total % Outperformed				53%	91%	32%	65%
Total # Underperformed				16	3	23	12
Total % Underperformed				47%	9%	68%	35%

Outrperform vs. Benchmark =	O
Underperform vs. Benchmark =	U

Color-Coded Relative PPA Results for Properties with Property-Level Cash Flow Information Only

APPENDIX C: EQUITY AND PROPERTY-LEVEL CASH FLOW PPA COMPARISON

(Performance Relative to Benchmark)

Property Number	NCREIF Bechmark	Stylized Acq Date	Stylized Hldg Pd (Yrs)	IRR	InitYld	CFchg	YldChg
1	Office - Southeast	Jul-87	16.9	3.73%	O	U	O
12	Retail - Pacific	Jun-99	4.8	14.13%	O	O	O
14	Office - EN Central	Jan-97	8.9	2.26%	O	O	U
19	Retail - Northeast	Aug-95	7.0	-6.31%	O	U	U
20	Retail - EN Central	Jan-95	9.9	5.87%	O	O	O
32	Office - Northeast	Dec-96	8.3	-6.11%	U	U	U
33	Office - Northeast	Jan-99	6.0	3.06%	U	O	U
36	Office - Pacific	Apr-98	7.8	5.52%	U	O	U
Total # Outperformed				6	5	5	3
Total % Outperformed				75%	63%	63%	38%
Total # Underperformed				2	3	3	5
Total % Underperformed				25%	38%	38%	63%

Outrperform vs. Benchmark =	O
Underperform vs. Benchmark =	U

Color-Coded Relative PPA Results for Properties with Equity Level Cash Flow Information Only

APPENDIX C: EQUITY AND PROPERTY-LEVEL CASH FLOW PPA COMPARISON

(Performance Relative to Benchmark)

Property #	IRR	InitYld	CFchg	YldChg	Interaction
2	6.65%	6.31%	-0.31%	0.79%	-0.15%
3	10.90%	4.91%	-2.82%	9.99%	-1.17%
4	11.69%	5.46%	6.63%	-0.26%	-0.14%
5	8.67%	5.63%	-2.90%	6.43%	-0.49%
6	1.89%	5.89%	-6.65%	2.97%	-0.32%
7	4.56%	2.62%	20.97%	-16.01%	-3.01%
8	4.35%	2.40%	25.43%	-19.10%	-4.38%
9	8.76%	4.94%	3.01%	0.95%	-0.14%
10	8.76%	4.94%	3.01%	0.95%	-0.14%
11	8.76%	4.94%	3.01%	0.95%	-0.14%
13	10.11%	5.22%	0.68%	4.86%	-0.65%
15	5.87%	5.25%	0.96%	-0.23%	-0.11%
16	4.68%	5.22%	-0.10%	-0.31%	-0.12%
17	10.10%	5.64%	6.02%	-1.35%	-0.21%
18	6.17%	5.67%	1.78%	-1.17%	-0.11%
21	7.60%	6.42%	1.14%	0.19%	-0.16%
22	7.67%	5.91%	2.31%	-0.40%	-0.15%
23	9.58%	7.52%	-1.46%	3.76%	-0.23%
24	9.38%	5.00%	4.63%	-0.16%	-0.10%
25	9.11%	7.57%	-2.46%	4.22%	-0.23%
26	9.11%	7.57%	-2.46%	4.22%	-0.23%
27	9.27%	5.17%	4.04%	0.17%	-0.10%
28	11.49%	8.40%	2.04%	1.23%	-0.17%
29	6.75%	5.85%	-8.39%	10.21%	-0.92%
30	9.62%	4.98%	-7.18%	12.78%	-0.96%
31	7.06%	5.14%	-6.60%	9.22%	-0.69%
34	6.24%	5.28%	2.02%	-0.83%	-0.23%
35	18.35%	7.70%	5.30%	5.26%	0.09%
37	10.01%	4.91%	6.74%	-1.49%	-0.14%
38	10.64%	4.96%	7.33%	-1.48%	-0.17%
39	15.00%	6.99%	6.38%	1.70%	-0.07%
40	11.28%	6.65%	4.97%	-0.16%	-0.18%
41	9.58%	5.90%	4.61%	-0.73%	-0.19%
42	12.63%	5.58%	-8.66%	19.20%	-3.48%

Relative Stats (Property Type & Division):					
Min	1.89%	2.40%	-8.39%	-19.10%	-4.38%
Max	18.35%	8.40%	25.43%	12.78%	0.09%
Average	8.78%	5.66%	2.48%	1.13%	-0.49%
Range	16.46%	6.00%	33.81%	31.88%	4.47%

Relative PPA Results of Full Cash Flows Sorted by Property Number
(for Properties with Property-Level Cash Flow Information Only)

APPENDIX C: EQUITY AND PROPERTY-LEVEL CASH FLOW PPA COMPARISON

(Performance Relative to Benchmark)

Property #	IRR	InitYld	CFchg	YldChg	Interaction
1	3.04%	4.53%	-0.24%	-1.06%	-0.19%
12	14.95%	7.52%	3.35%	4.13%	-0.05%
14	9.77%	6.92%	-3.31%	6.96%	-0.81%
19	6.85%	6.00%	1.91%	-0.90%	-0.16%
20	8.30%	5.78%	2.73%	-0.08%	-0.13%
32	13.38%	6.29%	4.25%	3.02%	-0.17%
33	10.61%	5.67%	2.29%	2.80%	-0.15%
36	11.66%	4.91%	1.11%	5.94%	-0.29%

Relative Stats (Property Type & Division):					
Min	-90.91%	2.40%	-8.66%	-19.10%	-4.38%
Max	46.10%	8.40%	33.81%	31.88%	4.47%
Average	-2.36%	5.50%	7.00%	6.30%	-0.60%
Range	137.00%	6.00%	42.48%	50.97%	8.85%

Relative PPA Results of Full Cash Flows Sorted by Property Number (for Properties with Equity Level Cash Flow Information Only)

APPENDIX D: EX-POST ANALYSIS OF FULL CASH FLOW: ABBREVIATED PPA METHOD

An Abbreviated PPA Method that is mathematically equivalent to the procedure outlined in the *Ex-Post Analysis of Full Cash Flow: Full PPA Method* section is also possible (and this method was used in the empirical analysis presented in Chapter 5). The concept of the Abbreviated PPA Method is identical to the Full PPA Method previously described, however the mechanics and formulas used for the computations are slightly different.

The following table provides the actual investment cash flows described in the *Ex-Post Analysis of Full Cash Flow: Full PPA Method* section of this thesis, but shown on a monthly cash flow frequency. For simplicity, the annual cash flows described in the prior example are divided into equal monthly cash flows in the following example.

Different from the prior example, the projected cash flow for the year following the terminal year (2006), which was used in the prior example for calculating the terminal yield (projected cash flow for the year following the terminal year / sales price = terminal yield), will now be assumed to be unknown (as in fact is the case in the empirical analysis in the next chapter). The cash flow data compiled for the investment portfolio used for the PPA analysis described in this thesis represent only the actual cash flows incurred by the Investment Fund, without any cash flow projections for the year after the terminal year. Since the cash flow projections are unavailable, in order to compute the terminal yields, actual cash flows exhibited by the investment properties twelve months prior to each property's sale can be used as an alternative cash flow metric (but this forces us to use a backward-looking terminal yield (together with the forward-looking acquisition yield). The actual monthly cash flows of the simple example are as follows:

DATE	OPERATING CASH FLOW	PRINCIPAL CHANGE	TOTAL CASH FLOW DETAIL
Dec-00		(150,000,000)	(150,000,000)
Jan-01	906,250	-	906,250
Feb-01	906,250	-	906,250
Mar-01	906,250	-	906,250
Apr-01	906,250	-	906,250
May-01	906,250	-	906,250
Jun-01	906,250	-	906,250
Jul-01	906,250	-	906,250
Aug-01	906,250	-	906,250
Sep-01	906,250	-	906,250
Oct-01	906,250	-	906,250
Nov-01	906,250	-	906,250
Dec-01	906,250	-	906,250
Jan-02	924,375	-	924,375
Feb-02	924,375	-	924,375
Mar-02	924,375	-	924,375
Apr-02	924,375	-	924,375
May-02	924,375	-	924,375
Jun-02	924,375	-	924,375
Jul-02	924,375	-	924,375
Aug-02	924,375	-	924,375
Sep-02	924,375	-	924,375
Oct-02	924,375	-	924,375
Nov-02	924,375	-	924,375
Dec-02	924,375	-	924,375
Jan-03	942,863	-	942,863
Feb-03	942,863	-	942,863
Mar-03	942,863	-	942,863
Apr-03	942,863	-	942,863
May-03	942,863	-	942,863
Jun-03	942,863	-	942,863
Jul-03	942,863	-	942,863
Aug-03	942,863	-	942,863
Sep-03	942,863	-	942,863
Oct-03	942,863	-	942,863
Nov-03	942,863	-	942,863
Dec-03	942,863	-	942,863
Jan-04	961,720	-	961,720
Feb-04	961,720	-	961,720
Mar-04	961,720	-	961,720
Apr-04	961,720	-	961,720
May-04	961,720	-	961,720
Jun-04	961,720	-	961,720
Jul-04	961,720	-	961,720
Aug-04	961,720	-	961,720
Sep-04	961,720	-	961,720
Oct-04	961,720	-	961,720
Nov-04	961,720	-	961,720
Dec-04	961,720	-	961,720
Jan-05	980,954	-	980,954
Feb-05	980,954	-	980,954
Mar-05	980,954	-	980,954
Apr-05	980,954	-	980,954
May-05	980,954	-	980,954
Jun-05	980,954	-	980,954
Jul-05	980,954	-	980,954
Aug-05	980,954	-	980,954
Sep-05	980,954	-	980,954
Oct-05	980,954	-	980,954
Nov-05	980,954	-	980,954
Dec-05	980,954	200,000,000	200,980,954

Figure 27 - Actual Monthly Cash Flows of Abbreviated PPA Example

Based on the actual monthly cash flows shown in the prior table, the following computations can be made:

SUBJECT PROPERTY CASH FLOW			
IRR		13.08%	9.20%
Month-Year	**(1) Operating CFs**	**(2) IRR CFs**	**(3) IRR CF@InitYld**
Dec-00		-$150,000,000	-150,000,000
Jan-01	$906,250	$906,250	906,250
Feb-01	$906,250	$906,250	906,250
Mar-01	$906,250	$906,250	906,250
Apr-01	$906,250	$906,250	906,250
May-01	$906,250	$906,250	906,250
Jun-01	$906,250	$906,250	906,250
Jul-01	$906,250	$906,250	906,250
Aug-01	$906,250	$906,250	906,250
Sep-01	$906,250	$906,250	906,250
Oct-01	$906,250	$906,250	906,250
Nov-01	$906,250	$906,250	906,250
Dec-01	$906,250	$906,250	906,250
Jan-02	$924,375	$924,375	924,375
Feb-02	$924,375	$924,375	924,375
Mar-02	$924,375	$924,375	924,375
Apr-02	$924,375	$924,375	924,375
May-02	$924,375	$924,375	924,375
Jun-02	$924,375	$924,375	924,375
Jul-02	$924,375	$924,375	924,375
Aug-02	$924,375	$924,375	924,375
Sep-02	$924,375	$924,375	924,375
Oct-02	$924,375	$924,375	924,375
Nov-02	$924,375	$924,375	924,375
Dec-02	$924,375	$924,375	924,375
Jan-03	$942,863	$942,863	942,863
Feb-03	$942,863	$942,863	942,863
Mar-03	$942,863	$942,863	942,863
Apr-03	$942,863	$942,863	942,863
May-03	$942,863	$942,863	942,863
Jun-03	$942,863	$942,863	942,863
Jul-03	$942,863	$942,863	942,863
Aug-03	$942,863	$942,863	942,863
Sep-03	$942,863	$942,863	942,863
Oct-03	$942,863	$942,863	942,863
Nov-03	$942,863	$942,863	942,863
Dec-03	$942,863	$942,863	942,863
Jan-04	$961,720	$961,720	961,720
Feb-04	$961,720	$961,720	961,720
Mar-04	$961,720	$961,720	961,720
Apr-04	$961,720	$961,720	961,720
May-04	$961,720	$961,720	961,720
Jun-04	$961,720	$961,720	961,720
Jul-04	$961,720	$961,720	961,720
Aug-04	$961,720	$961,720	961,720
Sep-04	$961,720	$961,720	961,720
Oct-04	$961,720	$961,720	961,720
Nov-04	$961,720	$961,720	961,720
Dec-04	$961,720	$961,720	961,720
Jan-05	$980,954	$980,954	980,954
Feb-05	$980,954	$980,954	980,954
Mar-05	$980,954	$980,954	980,954
Apr-05	$980,954	$980,954	980,954
May-05	$980,954	$980,954	980,954
Jun-05	$980,954	$980,954	980,954
Jul-05	$980,954	$980,954	980,954
Aug-05	$980,954	$980,954	980,954
Sep-05	$980,954	$980,954	980,954
Oct-05	$980,954	$980,954	980,954
Nov-05	$980,954	$980,954	980,954
Dec-05	$980,954	$200,980,954	163,345,778

IRR Components:	
InitYld	7.25%
CFchg	1.95%
YldChg	4.07%
Interaction	-0.19%
Total IRR	13.08%
TermYld	5.89%

Figure 28 - IRR-Based Property-Level Performance Attribution - Example Computation Based on Abbreviated PPA Method

Column (1) shows the actual operating cash flows. Column (2) shows the total cash flows including both the actual operating cash flows and the capital flows factoring in the acquisition capital outflow and the capital inflow from the reversion/disposition. Column (3) shows the actual initial capital outflow for the acquisition, the actual operating cash flows during the holding period, while substituting the actual terminal value with a hypothetical terminal value derived by dividing the actual operating cash flows in the final year by the initial yield rather than the actual terminal yield. The initial yield of 7.25% computed for this example is derived by dividing the initial year cash flows by the initial investment/acquisitions price ($10,875,000/$150,000,000 = 7.25%), the same way the initial yield was calculated in the Full PPA Method described in the prior section. The hypothetical final month cash flow computed in column (3) is derived by applying the initial yield of 7.25% on the final year cash flow of $11,771,450, which results in a hypothetical terminal value of $162,364,824, or $163,345,778 in total cash flows after adding the operating cash flow in the final month of $980,954.

The actual total realized IRR for this example can be computed on the actual total cash flows in column (2), which indicates an IRR of 13.08%. The difference in the actual total realized IRR computed in this example of 13.08%, compared to the total IRR of 12.69% computed in the last example is due to the difference in frequency of the cash flows and the monthly compounding effect (in effect, receiving the cash flows monthly throughout each year instead of the same cash flows entirely in arrears at the end of each year). To compute the CFC component, similar to the way it is was computed in the Full PPA Method, can be derived by subtracting the IY from the IRR computed for column (3), or 1.95% (9.20% - 7.25% = 1.95%). The 9.20% IRR computed for column (3) is based on a monthly IRR computed on the hypothetical cash flows in column (3), which is then compounded up to an annualized rate. The terminal yield of 5.89% can be computed by dividing the final year operating cash flow by the actual terminal value or sale price ($11,771,450/$200,000,000 = 5.89%).

A shortcut is used in the Abbreviated PPA Method in computing the YC component by first solving for a hypothetical IRR based on the following equation:

$$F_0 + \frac{F_1}{1+IRR} + \frac{F_2}{(1+IRR)^2} + \frac{F_3}{(1+IRR)^3} \ldots + \frac{F_x}{(1+IRR)^x} = 0$$

Where in the case of this example,

X	= number of periods = 5*12 = 60 months
F_0	= -1
F_1 to F_{59}	= IY/12 = 7.25%/12 = 0.604%
F_{60}	= 0.604% + terminal value = 0.604% + (IY/Terminal Yield) = 0.604% + (7.25%/5.89%) = 1.238

Therefore,

$IRR_{monthly}$	= 0.897%
IRR_{annual}	= ($IRR_{monthly}$ +1)^12-1 = 11.32%

The formula computes the IRR on a hypothetical cash flow stream consisting of hypothetical constant payments per period equal to the initial cash flows (in this case monthly), the actual initial capital outflow for the acquisition, and the actual terminal yield, which results in an annualized IRR of 11.31%. The IY can then be subtracted from the annualized IRR computed from the hypothetical cash flow stream to derive the YC component (11.32% - 7.25% = 4.07%). The difference between the total realized IRR and the sum of the three components of IY, CFC, and YC, results in a value of -0.19% attributable to the interaction effect (13.08% - 7.25% - 1.95% - 4.07% = -0.19%).

The Abbreviated PPA Method described herein is used for analyzing the investment data set and providing the analytical results described in the next chapter.

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APPENDIX E: STYLIZATIONS AND ADJUSTMENTS FOR COMPUTING THE PPA

In order to perform the PPA analysis for each of the investments within the data set, some adjustments to the actual monthly comptroller-reported (accounting based) investment cash flow streams and yield computations were necessary to derive apple-to-apple IRR components for comparative purposes (e.g., with a benchmark). These adjustments include the stylization of the investment holding periods, the inflation of the initial investment by a reasonable yield rate to offset the effect of stylizing the holding period, and the selection of more stabilized annual cash flow for computing the terminal yields when necessary.

Stylization of Investment Holding Periods

As mentioned at the beginning of this section, although the data set represent investments made by various core investment funds, many of the investments involved some level of capital improvements and repositioning of the asset, or require a significant level of lease up after their acquisition, with a few representing development deals. These unstabilized factors may contribute to artificially lower (or higher) initial yield when the PPA analysis is performed, which would then have an effect on the cash flow change and yield change components. In order to compare the relative performance of one investment versus another and against a core investment benchmark on an apple-to-apple basis, the cash flows of each investment have been reviewed and stylized to represent cash flows of stabilized investments since acquisition. The stylization is intended to reduce the effects that the unstabilized factors have on the three IRR components.

The first step taken to stylize the unstabilized investment's holding period to reflect stabilized core investments is to review the property's actual monthly cash flows and investment history to identify the point in time when the property may have reached stabilization. The identification of the month of stabilization for each of the investments within the data set involved a relatively subjective process in which a property is deemed to have reached stabilization when: 1) all initial capital improvements have been completed (indicated by significant capital outflows in the earlier months of the holding period); and 2) when the property

generates a reasonable level of positive net cash flow that can be maintained over a 12 month period. The month in which the property is deemed to have reached stabilization is chosen as the first month immediately following the stylized acquisition date, or the start of the stylized holding period. The end of the stylized holding period reflects the actual month when the property is sold.

The stylized stabilization period is defined as the difference in time between the start of the stylized holding period and the start of the actual cash flow. The following table provides a summary of the stylized stabilization periods applied to each of the properties within the Investment Portfolio.

Property Number	Stylized Stabilization Period (Months)	Property Number	Stylized Stabilization Period (Months)	Property Number	Stylized Stabilization Period (Months)	Property Number	Stylized Stabilization Period (Months)
1	8	12	34	23	12	34	17
2	10	13	2	24	5	35	4
3	4	14	2	25	11	36	30
4	12	15	20	26	3	37	2
5	4	16	32	27	2	38	3
6	25	17	1	28	13	39	97
7	2	18	16	29	39	40	5
8	8	19	7	30	35	41	47
9	1	20	12	31	21	42	3
10	1	21	0	32	84		
11	1	22	5	33	40		

Min	0
Max	97
Average	16

Figure 29 - Summary of the Stylized Stabilization Periods Applied to the Data Set

All but one of the properties required some level of stylization of the holding period by incorporating stylized stabilization periods ranging from 1 to 97 months. Of the 42 properties, 19 required stylized stabilization periods of less than 6 months, 8 required less than one year, 5 required less than two years, while the remaining 10 required stylized stabilization periods of more than two years. For the majority of the properties that required less than 6 months of stylized stabilization period, the adjustments made to push back the start of the holding period is for eliminating periods immediately prior to the actual closing of the property that included minor cash flows associated with the acquisitions underwriting, due diligence, and other miscellaneous fees and expenses.

The adjustment to the property's actual cash flow that is necessary to compensate for the push back of the start of the holding period is to treat all of the actual cash flows prior to the stylized acquisition date as a single lump sum cash flow that is incurred on the stylized acquisition date. For example, say if a property was acquired in May 2000 and is not stabilized until June 2002 due to a six month rehabilitation of the property and its subsequent lease-up, a stylized acquisition date of May 2002 would have been chosen for the property, which would also represent the start of the stylized holding period. In this example, all of the actual total cash flows between May 2000 and May 2002 would be summed into a single cash flow to represent the stylized initial investment on May 2002.

After applying the stylized stabilization periods, the actual average holding period of 10.3 years for the investment data set is reduced to an average stylized holding period of 9 years. A summary table providing the stylized acquisition date and holding periods for each of the properties within the Investment Portfolio can be found in *Appendix A*.

Inflating the Initial Investment Cash Flow

As mentioned in the prior section, the initial investment at the start of the holding period for each investment has also been stylized to include the sum of the actual property cash flows that had occurred prior to the stylized acquisition date as a single cash flow. In order to factor in the time value of money to bring the various cash flows forward to the stylized acquisition date, an estimated annual inflation rate of 10.5% per annum was chosen to represent the Investment Firm's unlevered return requirement. A simplified adjustment of growing the sum of all of the actual property cash flows prior to the stylized acquisition date by the 10.5% annualized yield, for a period of half of the stylized stabilization period was applied to determine the stylized initial investments for each property (inflating the cash flows by only half of the stylized stabilization period assumes that cash flows during the period are smoothed or generally occur around the midpoint of the period).

The goal of this adjustment is: 1) minimize the effect that the stylized holding period have on the initial yield component, and 2) bring the stylized total IRRs of each investment closer in line with the actual total IRRs realized by the investments. Since the cash flows for the initial year of the stylized holding period is generally higher due to the identification of stylized

acquisition dates based on stabilized cash flows, which would represent generally higher numerator that is divided into the initial investment or acquisitions price to determine the IY component, an upward adjustment to the initial investment based on reasonable return requirements would result in more reasonable initial yields. The upward adjustment to the initial investment would also bring the stylized total IRRs computed from the cash flows during the stylized holding periods closer in line with the actual total realized IRRs of each investment.

For most of the investments, inflating the initial investment by the 10.5% yield chosen resulted in the narrowing of the variance between the stylized IRR and the actual IRR to under 250 basis points on an absolute basis. For 4 of the 42 properties, an annual yield as low as 0% and as high as 65% was necessary to bring the IRR variance to under 250 basis points on an absolute basis. The net result from the inflationary adjustment to the initial investment is IRR variance (stylized total IRR minus actual total IRR) ranging from -1.04% to 2.35%, and averaging 0.14% for all of the investments within the portfolio.

A summary table providing the actual total IRR, stylized total IRR, and the IRR variance for each property is provided in *Appendix A*.

Terminal Yield Computations Using Stabilized Annual Cash Flows

As mentioned previously, due to the lack of cash flow projections for the year following the terminal year, actual historical cash flows for the twelve month period immediately prior to the sale of the property can be used to determine an "in-place" terminal yield by dividing the cash flows by the actual sale price. Based on a review of the cash flows provided for each of the investments within the Investment Portfolio, the actual cash flow in the final month of the holding period, or the month in which the property is sold, generally included accounting adjustments associated with investment gains and/or losses, therefore, the sum of the actual historical cash flows for the twelve month period immediately prior to the month of sale is used as the default annual cash flow divided into the sale price to determine the property's terminal yield.

This method for computing the terminal yield generally works fine when the cash flows during the twelve months immediately prior to its sale represent cash flows from stabilized

operations, however, some times the cash flows during this period does not accurately reflect stabilized operations due to the inclusion of non-recurring cash outflows such as any major capital improvements, or the property may be sold because it is suffering from high vacancy and poor leasing prospects, with the cash flows representing below stabilized occupancy levels. In any case, when the twelve month historical cash flow prior to the sale is well below stabilized levels or in some cases negative, a reasonable terminal yield cannot be computed and can also skew the results of the CFC and YC components. In order to estimate more reasonable terminal yields, cash flows that represent stabilized operations from one or two years ago can be used to compute the terminal yield.

The cash flows of each investment were reviewed to subjectively determine the occurrence of such events. For the ex-post analysis of full cash flows for each investment property from their acquisition to disposition, 8 of the 42 required an adjustment to the terminal yield computation where more stabilized historical cash flows from one or two years ago were divided into the sales price to determine the terminal yield. For the holding period PPA analysis described in the following section, where the PPA analysis is performed each year throughout the stylized holding period for each property, 29 of the 373 terminal yield computations required an adjustment.

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APPENDIX F: CREATING A SYTHETIC BENCHMARK FROM NPI

To further illustrate the method in which synthetic benchmarks are created based on the NPI sub-index for analyzing the Investment Portfolio, a walkthrough of the creation of a benchmark for the investment example described in the *Ex-Post Analysis of Full Cash Flow: Abbreviated PPA Method* section is provided as follows.

The first step is to obtain the NCREIF market segment sub-index data through their NCREIF Custom Query Screen service. The NPI Cash Flow Returns database provides the desirable cash flow information providing the total net operating income, capital expenditure, market value, and property sales prices of the portfolio of properties within the sub-index selection. The NPI market segment sub-index can be narrowed to match the investment's property type, location in terms of region, division and MSA, among other parameters. Due to the data limitations in the approximately 6,000 institutional real estate investments currently tracked by the NPI, a market segment sub-index that controls for property type and division was determined to be the most suitable benchmark for comparative analysis to the investments within the data set, as it allows the sub-indices to include enough properties to represent an adequate benchmark. Based on the property types and locations of properties within the Investment Portfolio in terms of their region and division, the following table provides a summary of the NCREIF database that is available:

			Current Property	Initial Data Start Date	
Property Type	**Region**	**Division**	**Count**	**Year**	**Quarter**
Office	**All**	**All**	**1,436**	**1978**	**1**
Office	Midwest	EN Central	107	1979	4
Office	East	Northeast	220	1978	1
Office	West	Pacific	454	1978	1
Office	East	Mideast	454	1978	3
Office	South	Southeast	142	1980	1
Office	South	Southwest	140	1980	1
Industrial	**All**	**All**	**2,167**	**1978**	**1**
Industrial	Midwest	EN Central	294	1978	1
Industrial	West	Pacific	648	1978	1
Industrial	South	Southeast	357	1978	1
Retail	**All**	**All**	**964**	**1978**	**1**
Retail	Midwest	EN Central	135	1978	1
Retail	East	Northeast	108	1978	3
Retail	West	Pacific	175	1978	1
Retail	West	Mountain	58	1978	1
Apartment	**All**	**All**	**1,424**	**1978**	**1**
Apartment	West	Pacific	278	1984	4
Apartment	South	Southeast	285	1983	3
Apartment	East	Northeast	210	1983	4
Apartment	South	Southwest	240	1984	4

Figure 30 - NCREIF Market Segment Sub-Index Summary (As of 1st Quarter of 2010)

Once the suitable sub-index has been chosen, only the sub-index cash flows during the period that coincides with the stylized holding period of the investment should be used in order to control for the market condition (time span) for computing the IRR components through PPA (Since the investment level cash flow data are on monthly frequencies while the NPI data are published on quarterly frequencies, the NPI period used for creating the benchmark for the investments varied slightly between zero to less than three months from the investment's stylized holding period). The cash flows of the portfolio of properties within the sub-index are treated as if they were a single property for purpose of computing the synthetic benchmark values. Considering the prior investment example was an office property located in the Boston CBD acquired at the end of 2000 and sold at the end of 2005, the following table provides the Northeast Office NPI sub-index raw data chosen for creating the synthetic benchmark:

NCREIF MARKET SEGMENT SUB-INDEX RAW DATA (OFFICE - NORTHEAST)					
(1) YYYYQ	(2) MV	(3) MVLag1	(3) NOI	(4) CapEx	(5) PSales
20004	8,238,302,958	7,940,863,871	159,555,744	39,904,625	59,494,022
20011	8,715,034,928	8,696,495,531	173,230,505	33,052,779	56,619,585
20012	9,572,888,127	9,460,846,063	201,627,206	27,429,383	0
20013	9,309,741,494	9,295,465,908	192,128,345	70,758,099	2,366,589
20014	10,005,131,697	10,115,979,305	210,580,363	56,876,879	0
20021	11,211,087,136	11,258,937,410	241,880,345	42,758,240	4,490,180
20022	12,229,587,993	12,182,031,527	271,643,975	51,140,765	0
20023	12,223,545,666	12,297,557,704	263,074,205	43,060,180	21,497,430
20024	12,097,451,886	12,164,745,307	266,371,836	46,927,293	0
20031	12,100,583,763	12,481,794,609	245,088,048	25,285,036	344,588,643
20032	12,230,360,452	12,305,503,090	264,908,708	45,377,606	45,731,390
20033	12,238,724,417	12,678,157,507	235,415,463	46,734,470	416,185,017
20034	13,145,507,955	13,225,304,903	269,996,474	73,810,204	176,416,543
20041	13,145,156,235	14,129,904,672	258,633,352	58,067,989	1,241,329,627
20042	13,489,754,179	13,511,651,187	265,885,197	48,381,022	154,717,702
20043	13,710,981,934	13,909,217,013	248,149,760	92,087,620	408,306,730
20044	14,049,690,248	14,291,109,799	248,335,101	95,275,269	567,738,017
20051	13,687,852,544	14,433,434,079	238,435,479	64,633,308	1,115,350,189
20052	15,270,311,625	14,770,192,474	255,242,949	86,453,938	71,043,042
20053	16,032,164,178	15,660,407,265	243,093,511	77,343,462	273,112,143
20054	16,008,852,268	16,043,023,598	251,078,252	113,121,422	714,895,428

Figure 31 - NCREIF Sub-Index Raw Data for Benchmarking Example

In Figure 31, column (1) indicates the date of the data, with the first four numbers indicating the year, followed by the last digit indicating the quarter. Column (2) provides the total market value of the properties within the sub-index at the end of the quarter, based on the sum of individual property values provided to NCREIF by institutional investors. Column (3) provides last period's total market value for the properties within the sub-index during the given period (property counts within the sub-index vary from quarter to quarter as properties are acquired or sold). Column (4) provides the capital expenditures, while column (5) provides the value of properties sold (or partially sold).

The following table provides computations that can be made from the NPI sub-index raw data:

NCREIF BENCHMARK SYNTHETIC CASH FLOW						
IRR	10.22%	1.20%				
(1) YYYYQ	(2) IRR CFs	(3) IRR CF@InitYld	(4) CF	(5) Price Index	(6) I Return (Modified)	(7) A Return (Modified)
20004	-1.04495	-1.04495		1.04495	0.01507	1.04495
20011	0.01684	0.01684	0.01684	1.05398	0.01612	1.00864
20012	0.01941	0.01941	0.01941	1.06646	0.01841	1.01184
20013	0.01392	0.01392	0.01392	1.06837	0.01306	1.00179
20014	0.01623	0.01623	0.01623	1.05666	0.01519	0.98904
20021	0.01869	0.01869	0.01869	1.05259	0.01769	0.99615
20022	0.01905	0.01905	0.01905	1.05670	0.01810	1.00390
20023	0.01891	0.01891	0.01891	1.05219	0.01789	0.99573
20024	0.01898	0.01898	0.01898	1.04637	0.01804	0.99447
20031	0.01843	0.01843	0.01843	1.04330	0.01761	0.99707
20032	0.01861	0.01861	0.01861	1.04081	0.01784	0.99761
20033	0.01549	0.01549	0.01549	1.03890	0.01488	0.99817
20034	0.01541	0.01541	0.01541	1.04649	0.01483	1.00731
20041	0.01485	0.01485	0.01485	1.06549	0.01419	1.01816
20042	0.01715	0.01715	0.01715	1.07597	0.01610	1.00983
20043	0.01207	0.01207	0.01207	1.09222	0.01122	1.01510
20044	0.01170	0.01170	0.01170	1.11716	0.01071	1.02283
20051	0.01345	0.01345	0.01345	1.14578	0.01204	1.02562
20052	0.01309	0.01309	0.01309	1.19008	0.01143	1.03867
20053	0.01260	0.01260	0.01260	1.23909	0.01058	1.04118
20054	1.30232	0.79423	0.01066	1.29166	0.00860	1.04243

Figure 32 - NCREIF Synthetic Benchmark Example Computations

In Figure 32, column (1) indicates the date. Columns (6) and (7) need to be first computed to derive the other values. Column (6) shows the benchmark's income return, which is computed by subtracting the capital expenditure from the NOI, then dividing the total by the property's market value in the prior period (based on figures shown in Figure 31 for the 4th period of 2000: [$159,555,744 - $39,904,625]/$7,940,863,871 = 0.01507). Column (7) shows the benchmark's asset return, which is computed by comparing the growth between the sum of the current period market value, after adding back the market values of properties that have sold in the current period, to the market value of the prior period (based on figures shown in Figure 31 for the 4th quarter of 2000: [$8,238,302,958 + $59,494,022 - $7,940,863,871]/ $7,940,863,871 = 1.04495).

The income and asset returns computed in these two columns are used to first derive the price index found in column (5), and the operating cash flows found in column (4). Column (5) shows the benchmark's price index, or its market value (for estimating either the acquisitions or dispositions prices). The initial value in column (5), the start of the price index, can be set equal to the asset return value in column (7) from any arbitrary starting period, which in this case is

established as the fourth quarter of 2000 to match the investment's end of 2000 acquisition date. Following the initial period, the price index values are computed by multiplying the asset return in the current period by the value of the price index in the prior period (for the first quarter of 2001: 1.00864*1.04495 = 1.05398).

Column (4) shows the benchmark's operating cash flows. Since the first period in the benchmark's synthetic cash flow represents the period in which the property is acquired, the operating cash flow is zero. For the periods following the initial period, the operating cash flows for the benchmark as computed by multiplying the current period income return by the prior period price index (for the first quarter of 2001: 0.01612*1.04495 = 0.01684).

Once the operating cash flows and the price index is established, column (2) represents the total investment cash flow for the synthetic property, where the initial period total cash flow represents an outflow for the initial investment (acquisition), which is equal to the initial price index value times negative one. For the periods after the initial period, column (2) is equivalent to the operating cash flows computed in column (4), while the final period cash flow in column (2) is the sum of the current period operating cash flow and the price index to account for the property's terminal value. The total investment cash flows in column (2) are used to compute the synthetic benchmark's total realized IRR of 10.22%. The initial yield of 6.36% for the benchmark is computed by dividing the first annual cash flow in column (2) by the initial investment ([0.01684 + 0.01941 + 0.01392 + 0.01623]/1.04495 = 6.36%).

Column (3) represents the hypothetical cash flow computed with the actual initial investment, actual holding period cash flows, and a terminal value computed by applying the initial yield on the actual operating cash flows in the final year of the holding period. Subtracting the 6.36% IY from the IRR computed from the column (3) cash flow stream of 1.20% results in the CFC component of -5.16%. The YC component of 9.78%, as well as the interaction effect of -0.75%, can then be computed based on the same method described in the *Ex-Post Analysis of Full Cash Flow: Abbreviated PPA Method* section, using the values computed for the IY and terminal yield, and the holding period.

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APPENDIX G: PROPERTY-LEVEL VS. EQUITY LEVEL CASH FLOW RESULTS

As noted previously, although the majority of the assets within the data set represent wholly owned properties without any debt or leverage, therefore, the cash flows of these investments represent property-level cash flows, eight of the 42 investments within the data set were identified as having significant leverage, and the cash flow history provided for those investments were effectively like "entity-level" equity cash flows. The cash flow history for the eight properties were considered entity-level equity cash flows due to the involvement of leverage or joint venture partnership agreements with distributions that were not on a pari passu basis between the parties. (These include Properties #1, 12, 14, 19, 20, 32, 33 and 36 of the data set).

In order to assess the possible contribution of the deal structure benefits and leverage effects on the PPA results for the properties with equity cash flows, an analysis of the PPA results for investments with property-level cash flows and a separate analysis of the PPA results for investments with equity level cash flows were made for comparative purposes. A summary of the PPA results can be found in *Appendix C*.

Relative total IRR returns for the properties with equity level cash flows averaged 75% outperformance frequency (6 of 8), which is significantly higher than the 53% outperformance frequency indicated by the properties with property-level cash flows (18 of 34). The properties with equity level cash flows exhibited IY and YC outperformance frequencies that are lower relative to those with property-level cash flows (IY is 63% versus 91%, while YC is 38% versus 65%), while exhibiting an outperformance frequency that is significantly higher in the CFC component (63% versus 32%). However, these comparisons are based on the investment's performance relative to an unleveraged benchmark that has lower risk.[1]

[1] This is in principle quite a large caveat, as the historical period covered is generally one of nominally rising real estate values. Clearly leverage increases risk, and clearly it also increases ex post total return performance during upswings in the market. These effects would exist in both the subject properties and the benchmark, but we are unable to adjust the benchmark to reflect the leverage effect.

The eight properties with equity level cash flows exhibited subject property total IRR returns ranging from 0.54% to 29.08%, with seven of the eight properties exhibiting total IRR of above 6.76%. Assuming average cost of debt of say 6% to 7%, approximately six or seven of the eight properties appears to have enjoyed the benefit of positive leverage. Considering the subject's performance relative to the benchmark includes positive leverage effects, the investments' actual performance to an apples-to-apples benchmark that has been adjusted for leverage may result in the underperformance of both the total IRR and CFC components. If the benchmarks of each investment were adjusted for leverage, the net effect would be a lower relative total IRR performance and lower CFC and YC relative performances.

Due to the lack of specific details necessary for the accurate adjustment of the synthetic benchmarks for the properties with equity level cash flows, the comparison of PPA results between the properties with equity level and property-level cash flows was deemed inconclusive.

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