

High Net-Worth Individuals' Portfolios: Private Real Estate Assets

by

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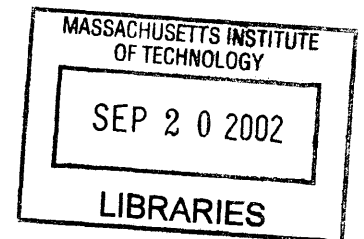
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Abstract

The asset allocations of private real estate in the investment portfolios of High Net Worth Individuals (HNWIs) indicate that HNWIs' portfolio returns are not at optimum levels on a risk-adjusted basis. More specifically, utilizing Modern Portfolio Theory, existing allocations to private real estate should, arguably be increased by as much as twice its present allocation. This deficiency is due to insufficient conduits and products available at financial institutions for HNWIs. This mismatch has created a supply and demand problem of HNWI demand for and financial institutions' supply of private real estate assets.

The current HNWIs allocations were examined using the "Survey of Consumer Finances" (Federal Reserve, 1998). HNWIs capable of private real estate investment were investors whose net worth was \$25 million and above. The HNWI allocations and more than twenty years of historical investment returns and volatilities for financial assets and real estate, were the foundation for analyzing the variance between actual and optimum portfolio allocations of private real estate. This comparison highlighted how the entire HNWI segment could double its current real estate allocation to meet the optimal portfolio level.

Along with this real estate allocation deficiency, the HNWI segment has grown substantially over the last 10 years. Since this is a growing segment and a potential source of capital for the real estate industry, this thesis specifically identifies the real estate asset allocation inefficiencies, recommends optimum real estate asset allocations, and lists the alternatives and characteristics of investment conduits and products for increased investment in private real estate by HNWIs.

Thesis Advisor: W. Tod McGrath

Title: Lecturer, Department of Urban Studies and Planning

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Introduction

Overview

Over the past two years with increasing stock market volatility, investors began to look for alternate investments. In this context, real estate has become a popular vehicle for alternate investments. Private real estate assets require large amounts of investment. Typical investors are pension funds, REITs and opportunity funds. High Net Worth Individuals (HNWIs) whose net worth meets minimum investment requirements are an increasing source of capital for private real estate assets. As a result, financial institutions have begun to aggressively market both private and public real estate products to HNWIs. Institutions are having success marketing these products due to investors' desires to migrate out of volatile assets into an investment that provides both fixed income and growth opportunities. More importantly, HNWIs' interests have been peaked due to their currently low allocations to real estate assets.

In order to evaluate portfolios of HNWIs, a database was required. The 1998 Survey of Consumer Finances (SCF) contains a database of 4,305 respondents describing all respondents' financial profiles. Within this survey, details from asset allocations to investment preferences are provided and facilitated the identification of current asset allocations of HNWIs.

In addition, the research includes a practical application of Modern Portfolio Theory, developed by Harry Markowitz in 1952.¹ According to Markowitz, "Modern Portfolio Theory explores how risk averse investors construct portfolios in order to optimize market risk against expected returns. The theory quantifies the benefits of diversification. Out of a universe of risky assets, an efficient frontier of optimal portfolios can be constructed. Each portfolio on the efficient frontier offers the maximum possible expected return for a given level of risk."²

Therefore combining the SCF data set and the principles of Modern Portfolio theory, current versus optimal portfolios is analyzed. Specifically, four SCF assets are analyzed: Stocks, Bonds, Cash, and Real Estate. These four assets are analyzed from the perspective of comparing the

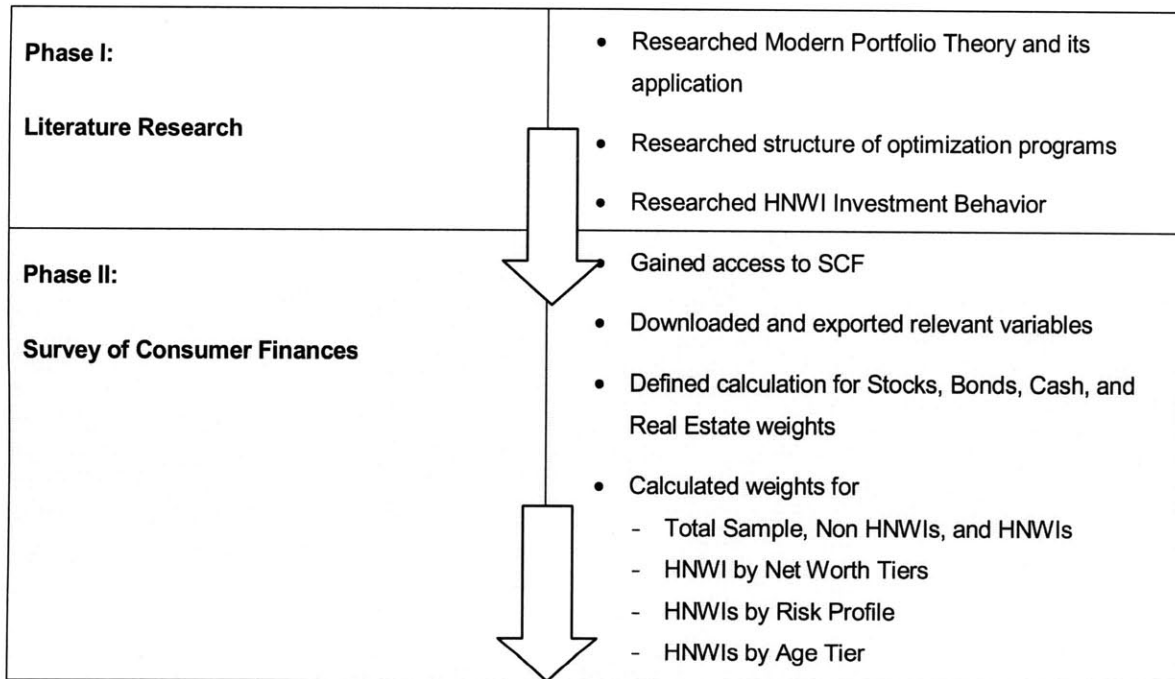
¹ Modern Portfolio Theory (MPT) was introduced by Harry Markowitz with his paper "Portfolio Selection" which appeared in the 1952 Journal of Finance. Thirty-eight years later, he shared a Nobel Prize with Merton Miller and William Sharpe for what has become a broad theory for portfolio selection and corporate finance.

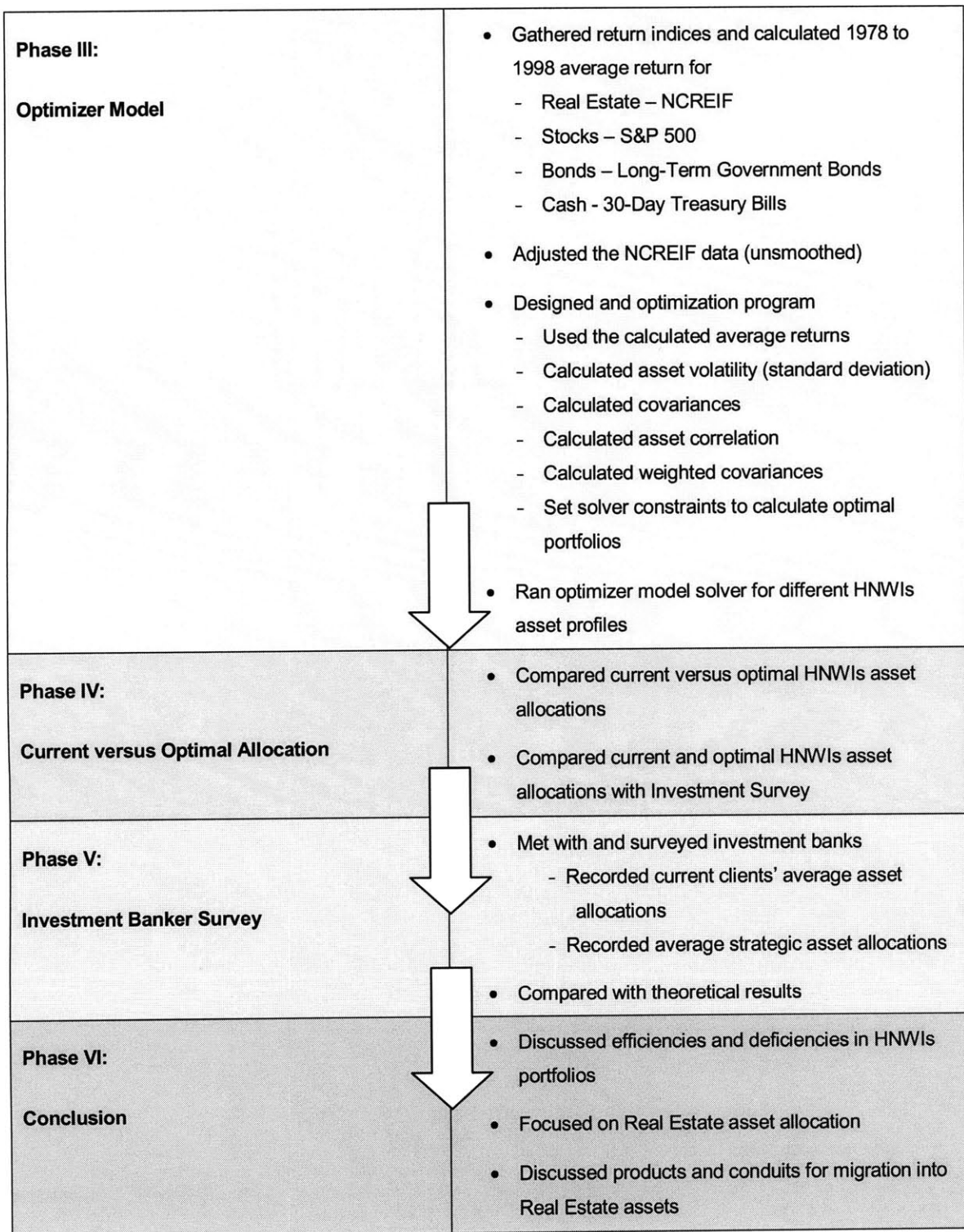
² [www.contingencyanalysis.com. "Modern Portfolio Theory."](http://www.contingencyanalysis.com/glossarymodernportfoliotheory.htm) August 5, 2002 <http://www.contingencyanalysis.com/glossarymodernportfoliotheory.htm>.

current portfolio allocations of HNWIs to optimum allocations based on historical investment returns and volatilities (as measured by market indices for each asset).

As a result of this research, current versus optimum asset allocations highlight efficiencies and deficiencies of HNWIs' portfolios. The focus of this research is on HNWIs' portfolio allocations to Private Real Estate investment. Interviews with financial institutions indicate that there is a supply and demand problem: not enough real estate conduits and products available to alleviate HNWIs real estate allocation demands. Over the years increased availability of real estate products and conduits, as investment vehicles will help HNWIs migrate into real estate assets. This migration will help correct identified real estate asset allocation deficiencies in HNWIs portfolios.

Methodology



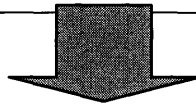


Chapter Summaries

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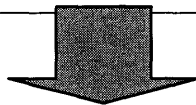
According to Merrill Lynch and Gemini Consulting in the 2001 World Wealth Report, "In 2001, HNWI's over \$1 million in net worth constituted a \$26.2 trillion market." Not only does this segment control a considerable amount of total dollars in the US economy, this segment is growing at a strong pace. In order to analyze the HNWI segment, the Survey of Consumer Finances was utilized. The Survey's 204 HNWI's out of the 4,305 respondents were compared to the overall data set and isolated for segment analysis. Total HNWI net worth out of the SCF sample is calculated. Additionally, HNWI's are analyzed by Net Worth Tiers, by Risk Tolerance, and by Age Tier.

Chapter 2



HNWI's investment patterns are analyzed through the Survey of Consumer Finances. The SCF defines net worth as the total of 19 assets and their corresponding liabilities. These assets are reorganized to calculate net worth with only 13 assets and their corresponding liabilities. Out of these 13 assets, Businesses constitute the largest allocation for HNWI's. Stocks, Bonds, Other Managed Assets, Residential Real Estate, and Non Residential Real Estate are the next largest segments of HNWI's. This 13-asset allocation helps identify the most appropriate assets for a HNWI liquid asset investment portfolio.

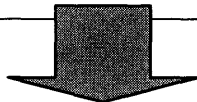
Chapter 3



According to surveyed investment banks, HNWI's typically invest in stocks, bonds, and alternative investments. Additionally, investors will have some amount of their portfolio in cash. From the preceding 13-asset allocation, these four assets were selected since they are representative of managed liquid asset portfolios. Stocks, Bonds and Cash were utilized from the SCF and for alternative investments the SCF's Non Residential Real Estate was used. The Non Residential Real Estate is only a portion of typical alternative investments. Since the focus of this analysis is private real estate investment and due to lack of detailed data within the SCF, other alternative investments were not used.

Chapter 4

After listing the final four asset allocations, indices were required to generate risk and returns for each HNWI asset allocation. In order to reflect accurately a “typical” investment portfolio, assets that have standardized and accurate investment performance indices were chosen. As a result, for private Real Estate the NCREIF Index was used; for Stocks the S&P 500 Index was applied; for Bonds the “Long Term Government Bonds” Index was utilized; and lastly for Cash the “30-Day Treasury Bills” Index was used. The Stocks, Bonds, and Cash indices were obtained from one source - Ibbotson Associates in order to standardize the information.



Chapter 5

The principles of Modern Portfolio Theory developed by Harry Markowitz in an article in 1952 helped shape the optimization program developed to assess the HNWI's portfolio allocations. The research herein is a practical application of the main concepts and fundamentals accepted by academics and portfolio managers. It includes an application of the framework developed by Markowitz of how the risk can be reduced by choosing stocks that do not move in the same direction, combined with the application of the “Separation Theorem” (first noted by J. Tobin), and lastly, an empirical measure of the “risk reward ratio” known as the Sharpe Ratio. The optimization program combines asset returns, volatility, and correlation to establish the best possible combination of assets within an investment portfolio. It also is used to analyze HNWI's current portfolios risk and return levels.

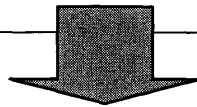


Chapter 6

The optimization program identifies opportunities for diversification. The program combines the return, return volatility, and correlation of the four assets (Real Estate, Stocks, Bonds, and Cash) in order to determine the optimum allocation among the selected assets. After incorporating these elements and general constraints three scenarios are evaluated: Cash is considered a risky asset and its maximum allocation in the portfolio is not constrained; Cash is considered a risky asset and its maximum allocation in the portfolio is constrained to a limit of 10%; and Cash is not considered a risky asset and it is not included in the portfolio. These scenarios outline optimal portfolios for different types of HNWI's.

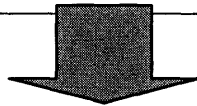
Chapter 7

Current allocations of the HNWI in the SCF survey are processed through the optimization program. The program utilizes the same assumptions of Chapters 5 and 6. However the program does not calculate optimum portfolios but rather utilizes the weights of the current allocations to establish the risk and returns of the portfolios. The calculation of risk and returns of HNWI portfolios allows a basis of comparison to the optimal allocations generated in Chapter 6. Current HNWI portfolios are examined at a General level, By Net Worth Level, By Risk Tolerance, and By Age. All of the current allocations are based solely on the SCF sample.



Chapter 8

The Gap is the difference between the current portfolio asset allocation (described in Chapter 7) with the optimum asset allocation (described in Chapter 6). The optimum allocation used in this comparison is Scenario B (maximum cash allocation of 10%). It is considered the most applicable due to the similarities with the current SCF average HNWI allocations. Although, Scenario B has some flaws at low target return levels, it is the most appropriate considering the average returns obtained from HNWI portfolios in Chapter 7 (moderate to high). Current versus optimal allocations are compared at a General level, By Net Worth Tier, By Risk Tolerance, and By Age Tier. Each case identifies if real estate assets are over invested or under invested.



Chapter 9

As a comparison to the current HNWI asset allocations provided by the SCF and the optimal portfolios generated by the optimization model, a selection of investment banks were surveyed on their HNWI clientele. These institutions provided current average HNWI asset allocations along with strategic HNWI asset allocations. Strategic allocations refer to the investment banks' recommendations in asset allocations. The investment banks chiefly had four asset allocations: stocks, bonds, cash, and alternative investments. Real Estate was an asset under Alternative Investments along with Hedge Funds, Private Equity, and Other. The current average HNWI asset allocations are compared with the SCF HNWI's asset allocations. Additionally, the strategic allocations are compared with the optimal allocations generated by the optimization model.

Chapter 10

The market of HNWI and Ultra HNWI is growing rapidly. Traditionally, HNWI net worth made their fortunes through inheritance. Instead, the newer high net worth individual is often younger, more aggressive, looking for performance, social activities and philanthropy to become part of their plan. Their investment behavior may be compared to institutional investors' behavior. Institutions have been a dominant force in real estate investment and as a result adequate conduits and products have been created for this segment. However, HNWI do not have a comparable infrastructure. The real estate fund is the predominant product marketed to HNWI. The majority of HNWI commercial real estate is directly owned by the investor. The self-sourcing of real estate helps explain the low HNWI allocation in real estate. With the growth in this HNWI segment, the supply and demand function will eventually solve the real estate allocation deficiency as new products enter the market to absorb the HNWI real estate demand.

1) High Net Worth Individuals

According to Merrill Lynch and Gemini Consulting in the 2001 World Wealth Report, “In 2001, HNWI’s over \$1 million in net worth constituted a \$26.2 trillion market.” Not only does this segment control a considerable amount of total dollars in the US economy, this segment is growing at a strong pace. In order to analyze the HNWI segment, the Survey of Consumer Finances was utilized. The Survey’s 204 HNWI’s out of the 4,305 respondents were compared to the overall data set and isolated for segment analysis. Total HNWI net worth out of the SCF sample is calculated. Additionally, HNWI’s are analyzed by Net Worth Tiers, by Risk Tolerance, and by Age Tier.

1.1) Minimum Threshold

There are three sources of wealth for HNWI’s: entrepreneurial wealth, earned wealth, and inherited wealth.³ HNWI’s accumulate wealth either through one or more of these sources. Together these sources are the platform for HNWI’s’ net worth.

Exhibit 1.1.1: Sources of Wealth

| Sources of Wealth | Description |
|------------------------|--|
| Entrepreneurial Wealth | <ul style="list-style-type: none">• Wealth is from a private business |
| Earned Wealth | <ul style="list-style-type: none">• Wealth is from a continued salary and income and may include stock options |
| Inherited Wealth | <ul style="list-style-type: none">• Wealth has been inherited |

Source: Data Monitor. Future Focus: The Evolving High Net Worth Customer. 29 Jun 2000. 4

This net worth is generally defined as total assets minus liabilities.⁴ Varying levels of net worth essentially help define the tiers of HNWI’s. Private wealth management institutions’ thresholds are based on the total amount of liquid assets versus total net worth. Liquid assets are assets that can be converted into cash quickly and without any price discount.⁵ Liquid assets represent a portion of total net worth. These liquid assets include a variety of assets from private real estate

³ Data Monitor. Future Focus: The Evolving High Net Worth Customer [29 Jun 2000] 4

⁴ Investorwords.com. <http://www.investorwords.com/cgi-bin/getword.cgi?3267> August 2000

⁵ Investorwords.com. <http://www.investorwords.com/cgi-bin/getword.cgi?2837&liquidity> August 2000

to mutual funds. Institutional minimum liquid asset thresholds range from as low as \$100,000 to as high as \$25 million.⁶

Private real estate investment requires a higher amount of liquid assets due to the magnitude of the investment. As a result, real estate divisions of institutions target HNWI with liquid assets in excess of \$10 million. From the data analysis of the SCF, the four liquid assets examined within the current asset allocations generally represent between 30% to 40% of total net worth. Therefore, a \$10 million liquid asset threshold implies approximately a \$25 to \$33 million HNWI. Throughout this analysis the HNWI Tiers begin at a \$25 million net worth.

The following table outlines these assumptions:

Exhibit 1.1.2: Liquid Assets versus Net Worth

| | |
|---|--|
| Liquid Asset Minimum Threshold | \$10,000,000 |
| Liquid Assets/Net Worth (from SCF Four Asset Allocation) | 30% to 40% |
| HNWI Minimum Net Worth Threshold | \$10,000,000 / (30% to 40%) =\$25 to \$33 million Net Worth Threshold set at \$25 million and above |

1.2) Current Trends

During the late 1990s, original sources of wealth expanded from entrepreneurial, income, and inherited wealth to include stock option wealth. However, due to the dot.com boom and bust and recent stock market volatility, stock options lost their instant wealth reputation. With the recent number of HNWI made and lost in the late 1990s, HNWI have been a popular topic. Included are facts and trends of HNWI over the past few years:

- According to the World Wealth Report 2002, "In 2001 world wealth from HNWI (those that have at least \$1 million in net worth) grew slightly to \$26.2 trillion, up 3% from the year before and the number of HNWI also grew 3% to 7.1 million."⁷

⁶ Ramiro Juliá and Rachel Matthai Investment Banker Survey 2002

⁷ Merrill Lynch and Gemini Consulting. 2002 World Wealth Report 2001

- Additionally the 2002 Report stated that in North America HNWI's average age was between 55-57 and wealth sources include entrepreneurial businesses and technology and finance income. Also HNWI's favor domestic equities.⁸
- By 2000, there were 596,000 U.S. households with a net worth of \$5 million or more. These households include baby boomers cashing in stock options, seniors with hefty 401(k)s, Gen-X computer entrepreneurs, and lottery winners.⁹
- HNWI's as defined herein have been described as the Ultra-Affluent or the upper echelon of the HNWI market. According to Russ Alan Prince's article in National Underwriter Life & Health, "The Ultra-Affluent is a family unit with a net worth of \$25 million or more. The wealth the Ultra-Affluent commands is \$11.9 trillion. The low-end estimate puts the combined net worth of the Ultra-Affluent at \$8.4 trillion, while the high-end estimate is \$13.8 trillion."

Exhibit 1.2.1: The Wealth of the Ultra-Affluent

| Low-End Estimate | Best Estimate | High-End Estimate |
|------------------|-----------------|-------------------|
| \$8.4 Trillion | \$11.9 Trillion | \$13.8 Trillion |

Source: Prince, Russ Alan. "Core Characteristics Of The Ultra-Affluent That Advisors Should Know" National Underwriter Life & Health June 11, 2001 105 (24): 37

- According to the 2000 World Wealth Report by Merrill Lynch and Gemini Consulting, "The recent proliferation of dot.com billionaires and other similar entrepreneurs have generated the 'ultra high net worth individuals' (U- HNWI's). To graduate to the lofty heights of such a select band, an individual needs \$30 million worth of liquid financial assets. The study estimates that U-HNWI's totaled 55,000 in 1999, up by 18 percent on 1998. These 55,000 super-rich individuals hold financial assets worth a massive \$7.9 trillion last year, representing nearly one-third of the world's total HNWI financial wealth."¹⁰

These trends help understand that not only are there HNWI's but also ultra HNWI's. The HNWI's analyzed within this research include the ultra HNWI's due to their private real estate investment capabilities.

⁸ Merrill Lynch and Gemini Consulting. 2001

⁹ Mandell, Nancy R. "Where does wealth end and ultra-wealth begin?" On Wall Street December 2000

¹⁰ Merrill Lynch and Gemini Consulting. 2000 World Wealth Report 2000

1.3) Survey of Consumer Finances

The Survey of Consumer Finances published by the Federal Reserve was utilized to analyze the investment portfolios of the \$25 million and above HNWI's. The Federal Reserve states:

"The Survey of Consumer Finances is a triennial survey of the balance sheet, pension, income, and other demographic characteristics of U.S. families. The survey also gathers information on the use of financial institutions. The Survey of Consumer Finances is conducted every three years to provide detailed information on the finances of U.S. families. No other study for the country collects comparable information. Data from the SCF are widely used, from analysis at the Federal Reserve and other branches of government to scholarly work at the major economic research centers."¹¹

"The study is sponsored by the Federal Reserve Board in cooperation with the Department of the Treasury. Since 1992, data have been collected by the National Opinion Research Center at the University of Chicago (NORC)."

"To ensure the representativeness of the study, respondents are selected randomly and a strong attempt is made to select families from all economic strata."

"Most of the data in the survey are intended to represent the financial characteristics of a subset of the household unit referred to as the "primary economic unit" (PEU). In brief, the PEU consists of an economically dominant single individual or couple (married or living as partners) in a household and all other individuals in the household who are financially dependent on that individual or couple."

In the 1998 survey there were 4,309 respondents. The public dataset available included 4,305 out of the 4,309 respondents. For each respondent the SCF generated five imputed responses. This imputation expanded the data set to 21,525 entries. The Federal Reserve states:

"Most of the variables that originally contained a missing value code have been imputed. The overwhelming majority of variables that originally contained missing values have been imputed five times by drawing repeatedly from an estimate of the conditional distribution of the data."

¹¹ Federal Reserve. Survey of Consumer Finances. 1998

“These imputations are stored as five successive replicates (“implicates”) of each data record. Thus, the number of observations in the full dataset (21,525) is five times the actual number of respondents (4,305).”

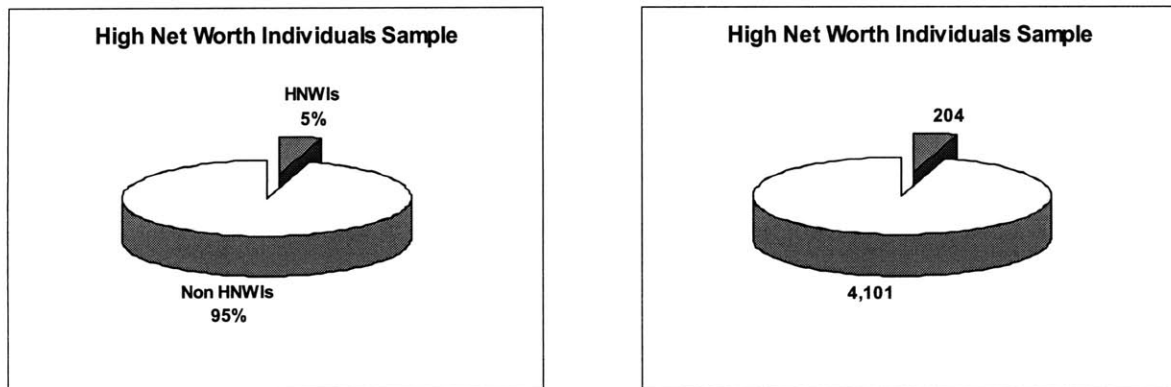
“Multiple imputation offers two distinct advantages compared with singly-imputed data. First, because multiple imputation yields multiple outcomes from a random process, it supports more efficient estimation than singly-imputed data. Second, multiple imputation allows users to make straightforward estimates of the degree of uncertainty associated with the missing information.”

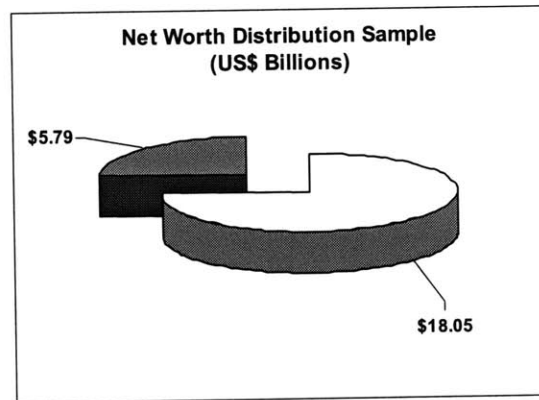
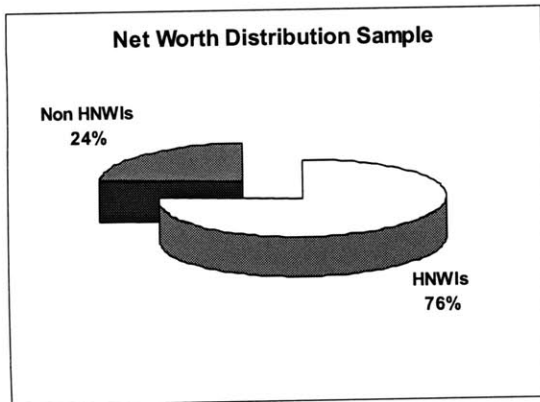
“For users who want to estimate only simple statistics such as means and medians ignoring the effects of imputation error on the standard errors of these estimates, it will probably be sufficient to divide the weights by 5.”

1.4) Survey of Consumer Finances (SCF) Sample

The HNWI portion of the SCF comprises 204 out of the 4,305 responses. This represents 5% of the entire data set. While the HNWI segment is only 5% of the data segment, it constitutes 76% of the sample’s net worth. The HNWI segments’ net worth represented by the survey is \$18.04 billion. The entire sample’s net worth is \$23.84 billion. Therefore, although the total number of HNWIs is small its portion of the sample’s net worth is significant.

Exhibit 1.4.1: SCF Data Set



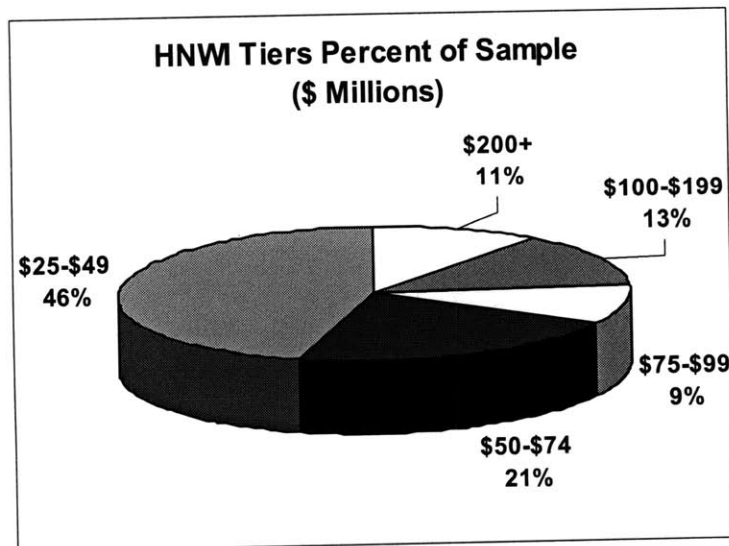


Note: Based on original SCF data set of 21,525.
 Source: Federal Reserve. Survey of Consumer Finances 1998

By Net Worth Tier

Five HNWI thresholds were examined. These five thresholds included \$25 to \$49 million, \$50 to \$74 million, \$75 to \$99 million, \$100 to \$199 million and \$200 million and up. The \$25 to \$49 million tier is the largest comprising 46% of the entire HNWI sample. Together, the \$100 to \$199 million and \$200 million and above tiers total approximately 24%. The smallest segment is the \$75 to \$99 million tier. Additionally, this chart indicates that the greatest portion of HNWIs have a net worth of less than \$75 million.

Exhibit 1.4.2: HNWI Net Worth Tiers

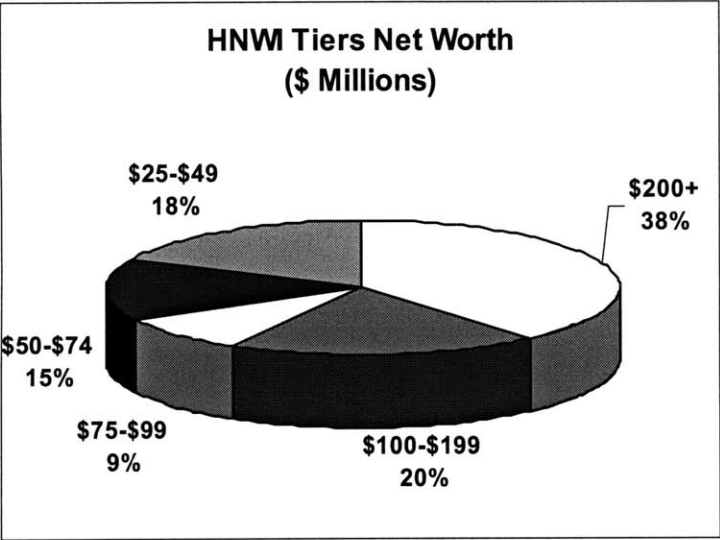


Note: Based on the HNWI sample of 1012 cases out of the original 1018 due to removal of negative asset allocations.

Source: Federal Reserve. Survey of Consumer Finances 1998

In contrast to the preceding chart, the \$200 million and over tier controls approximately 38% of the HNWI's total net worth. The \$100 to \$199 million tier comprises approximately 20% of net worth of the sample. The \$25 to \$49 million tier due to the number of individuals within this segment control 18% of the overall HNWI net worth. Therefore, although the higher HNWI tiers constitute fewer people their impact on total net worth is significant.

Exhibit 1.4.3: HNWI Net Worth Tiers



Note: Based on the HNWI sample of 1012 cases out of the original 1018 due to removal of negative asset allocations.

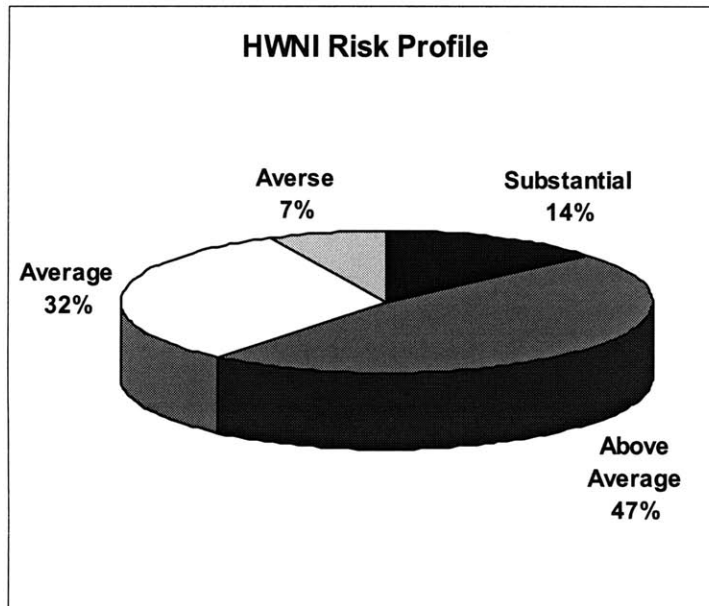
Source: Federal Reserve. Survey of Consumer Finances 1998

By Risk Tolerance

The SCF has risk and return preferences for the entire data set. Respondents were asked if they preferred to take substantial risks for substantial returns, above average risks for above average returns, average risks for average returns, or no risks.

Approximately 47% of HNWI's indicated they prefer to see above average returns for above average risks. The second largest category was average returns for average risk, at 32%. Approximately 7% of the HNWI's are risk averse, while 14% will take substantial risks for substantial returns. This risk profile shows that HNWI's prefer moderate to aggressive portfolios.

Exhibit 1.4.4: HNWI Risk Tolerance



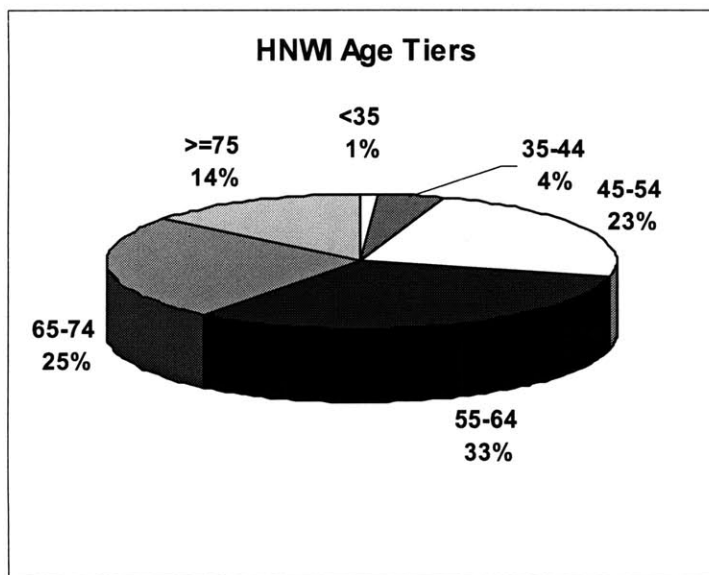
Note: Based on the HNWI sample of 1012 cases out of the original 1018 due to removal of negative asset allocations.

Source: Federal Reserve. Survey of Consumer Finances 1998

By Age Tier

The age distribution of the SCF HNWI segment is categorized into six segments: less than 35, 35-44, 45-54, 55-64, 65-74, and greater than 75. The 55-64 tier comprises the largest segment of HNWI and constitutes approximately 33% of the sample of HNWI. The less-than-35 segment is only 1% of the data set. Approximately 81% of the HNWI are between the ages of 45 and 74. This stratification indicates that HNWI of \$25 million and above predominantly include established individuals that have typically had over 20 years of work experience.

Exhibit 1.4.5: HNWI Age Tiers



Note: Based on the HNWI sample of 1012 cases out of the original 1018 due to removal of negative asset allocations.

Source: Federal Reserve. Survey of Consumer Finances 1998

2) Market Assets

HNWIs' investment patterns are analyzed through the Survey of Consumer Finances. The SCF defines net worth as the total of 19 assets and their corresponding liabilities. These assets are reorganized to calculate net worth with only 13 assets and their corresponding liabilities. Out of these 13 assets, Businesses constitute the largest allocation for HNWIs. Stocks, Bonds, Other Managed Assets, Residential Real Estate, and Non Residential Real Estate are the next largest segments of HNWIs. This 13-asset allocation helps identify the most appropriate assets for a HNWI liquid asset investment portfolio.

2.1) Assets and Liabilities

HNWIs invest in a variety of assets that range from private businesses to bonds. The SCF's financial asset questions provide substantial information on asset allocations for the entire sample. The SCF calculates net worth with the sum of 19 assets and their corresponding liabilities. Each asset and liability consists of several financial variables that have been asked within the SCF. The following table includes the assets and liabilities and their SCF definitions.

Exhibit 2.1.1: SCF Assets and Liabilities

| Asset | Definition |
|---|--|
| Bonds Code: BOND | <ul style="list-style-type: none"> Total amount in bonds, not including bond funds or savings bonds |
| Call Account Code: CALL | <ul style="list-style-type: none"> Total amount in call (margin) accounts at brokerage firms |
| Cash Value of Life Insurance Code: CASHLI | <ul style="list-style-type: none"> Cash value of whole life insurance |
| Certificate of Deposits Code: CDS | <ul style="list-style-type: none"> Total amount of certificate of deposits |
| Checking Account Code: CHECKING | <ul style="list-style-type: none"> Total of checking accounts other than money market |
| Money Market Accounts Code: MMA | <ul style="list-style-type: none"> Total amount of all types of money market accounts |

| | |
|--|---|
| Non-Financial Assets Code: NFIN | <ul style="list-style-type: none"> Total non-financial assets which includes the following assets: |
| Businesses Code: BUS | <ul style="list-style-type: none"> For businesses where the household has an active interest, value is equity (sales price minus outstanding business loans) if business were sold today, plus loans from household to business, minus loans from business to household not previously reported plus value of personal assets used as collateral for business loans that were reported earlier |
| Houses Code: HOUSES | <ul style="list-style-type: none"> Value of primary residence |
| Non Residential Real Estate Code: NNRESRE | <ul style="list-style-type: none"> Total net equity in nonresidential real estate: real estate other than the principal residence, properties coded as 1-4 family residences, time shares, and vacation homes net of mortgaged other loans taken out for investment real estate |
| Other Residential Real Estate Code: OTHRES | <ul style="list-style-type: none"> Total amount of other residential real estate includes: land contracts/notes household has made, properties other than the principal residence that are codes as 1-4 family residences, timeshare, and vacation homes |
| Other Non-Financial Assets Code: OTHNFIN | <ul style="list-style-type: none"> Total amount of other non-financial assets defined as total value of miscellaneous assets minus other financial assets |
| Vehicles Code: VEHIC | <ul style="list-style-type: none"> Value of all vehicles (includes autos, motor homes, RVs, airplanes, boats) |
| Non Money Market Funds Code: NMMF | <ul style="list-style-type: none"> Total directly held mutual funds, excluding money market mutual funds |
| Other Financial Assets Code: OTHFIN | <ul style="list-style-type: none"> Total amount of other financial assets (includes loans from the household to someone else, future proceeds, royalties, futures, non-public stock, deferred compensation) |
| Other Managed Assets Code: OTHMA | <ul style="list-style-type: none"> Total amount in other managed assets (trusts, annuities, and managed investment accounts in which household has equity interest) |
| Retirement Funds Code: RETQLIQ | <ul style="list-style-type: none"> Total quasi-liquid retirement funds: sum of IRAs, thrift accounts, and future pensions |
| Savings Bonds Code: SAVBOND | <ul style="list-style-type: none"> Total amount in savings bonds |

| | |
|---|---|
| Savings Accounts Code: SAVING | <ul style="list-style-type: none"> Total amount in savings account |
| Stocks Code: STOCKS | <ul style="list-style-type: none"> Total amount in stocks |
| Liability | Definition |
| PLoan 1 Code: PLOAN1 | <ul style="list-style-type: none"> Loans for home purchase, cottage, vacation property, and time share |
| PLoan 2 Code: PLOAN2 | <ul style="list-style-type: none"> Home improvement loans |
| PLoan 3 Code: PLOAN3 | <ul style="list-style-type: none"> Vehicle loans |
| PLoan 4 Code: PLOAN4 | <ul style="list-style-type: none"> Loan for purchase of goods and services |
| PLoan 5 Code: PLOAN5 | <ul style="list-style-type: none"> Loans for investments and mortgage loans for other real estate |
| PLoan 6 Code: PLOAN6 | <ul style="list-style-type: none"> Loans for education and loans for professional expenses |
| PLoan 7 Code: PLOAN7 | <ul style="list-style-type: none"> Unclassified borrowing against pension plans |
| PLoan 8 Code: PLOAN8 | <ul style="list-style-type: none"> Other unclassifiable loans |

Source: Federal Reserve. Survey of Consumer Finances 1998

The SCF net worth is the sum of equity investment in all assets. The following formula highlights the components of the SCF's net worth.

| |
|--|
| <p>NETWORTH</p> <p>=BOND+CALL+CASHLI+CDS+CHECKING+MMA+ NNRESRE+HOUSES+OTHRES+OTHNFIN+VEHIC</p> <p>+NMMF+OTHFIN+OTHMA+RETQLIQ+SAVBOND+SAVING+STOCKS</p> <p>-PLOAN1-PLOAN2-PLOAN3-PLOAN4-PLOAN5-PLOAN6-PLOAN7-PLOAN8</p> |
|--|

Source: Federal Reserve. Survey of Consumer Finances 1998

2.2) Reclassification of Assets and Liabilities

After synthesizing the SCF dataset, the financial assets were collapsed into 13 assets less their corresponding liabilities. The number of assets decreased due to the grouping of similar assets such as Savings Bonds and Bonds. Also all cash assets were grouped under Cash. This reclassification simplified the SCF net worth formula. The following table highlights these 13 assets:

Exhibit 2.2.1: Reclassification of Assets and Liabilities

| Asset | Components |
|--|--|
| <p>Bonds Code: BOND</p> | <p>Sum of Bonds and Savings Bonds Formula: BOND+SAVBOND</p> |
| <p>Cash Value of Life Insurance Code: CASHLI</p> | <p>Cash Value of Life Insurance Formula: CASHLI</p> |
| <p>Cash Code: CASH</p> | <p>Sum of Call Accounts, Certificate of Deposits, Checking Accounts, Money Market Accounts, and Savings Accounts less PLoan 4, PLoan 6, and PLoan 8 Formula: CALL+CDS+CHECKING+MMA+SAVING-PLOAN4-PLOAN6-PLOAN8</p> |
| <p>Businesses Code: BUS</p> | <p>Businesses Formula: BUS</p> |
| <p>Non Residential Real Estate Code: NNRESRE</p> | <p>Non Residential Real Estate less PLoan 5 Formula: NNRESRE-PLOAN5</p> |
| <p>Other Residential Real Estate and Houses Code: RESRE</p> | <p>Sum of Other Residential Real Estate and Houses less PLoan 1 and PLoan 2 Formula: OTHRES+HOUSES-PLOAN1-PLOAN2</p> |
| <p>Other Non-Financial Assets Code: OTHNFIN</p> | <p>Other Non-Financial Assets Formula: OTHNFIN</p> |

| | |
|---|--|
| Vehicles Code: VEHIC | Vehicles less PLoan 3 Formula: VEHIC-PLOAN3 |
| Non Money Market Funds Code: NMMF | Money Market Funds Formula: NMMF |
| Other Financial Assets Code: OTHFIN | Other Financial Assets Formula: OTHFIN |
| Other Managed Assets Code: OTHMA | Other Managed Assets Code: OTHMA |
| Retirement Funds Code: RETQLIQ | Retirement Funds less PLoan 7 Formula: RETQLIQ-PLOAN7 |
| Stocks Codes: STOCKS | Stocks Formula: STOCKS |

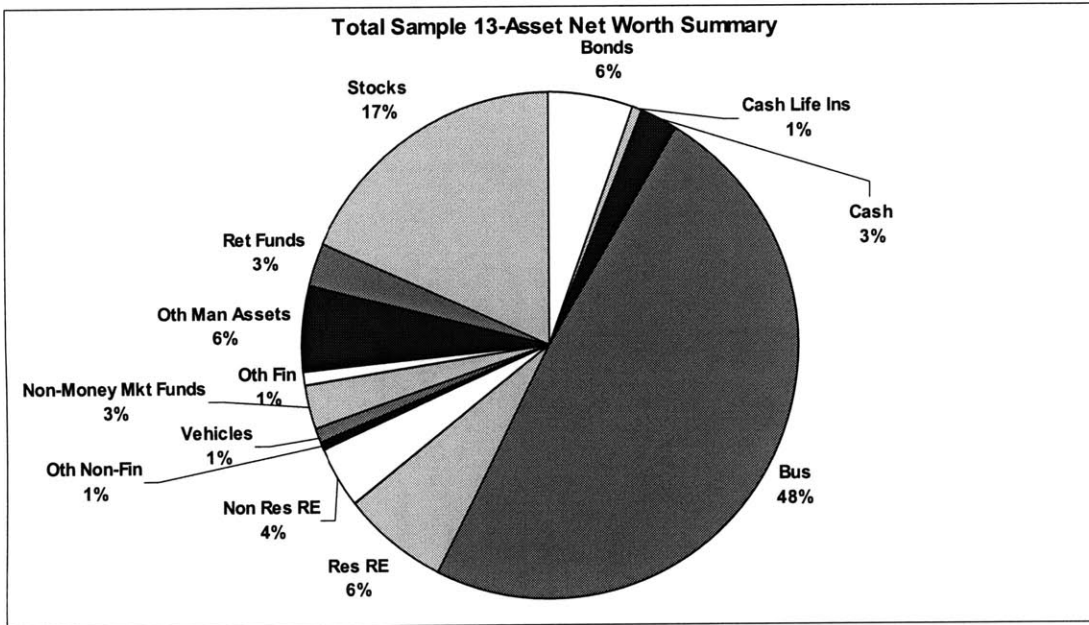
Source: Federal Reserve. Survey of Consumer Finances 1998

These realigned assets and liabilities yield the same total equity investment or net worth of each respondent. The revised net worth formula is:

| |
|---|
| <p>NETWORTH RECLASSIFIED</p> <p>=BOND+CASHLI+CASH+BUS+NNRESRE+RESRE+OTHNFN+VEHIC+NMMF+OTHFIN+OTHMA</p> <p>+RETQLIQ+STOCKS-PLOAN1-PLOAN2-PLOAN3-PLOAN4-PLOAN5-PLOAN6-PLOAN7-</p> <p>PLOAN8</p> |
|---|

The following three pie charts show the 13-asset net worth allocation for the entire dataset, HNWI, and Non HNWI. As explained previously the HNWI segment has the majority of all assets even though it represents a smaller portion of the dataset. As a result, the overall dataset has a similar 13-asset distribution as the HNWI segment due to the relative proportion of the HNWI's assets. In contrast, Non HNWI have a smaller Business and Stocks allocation while they have a larger Retirement Funds allocation. Businesses constitute the largest asset in all three scenarios: 48% for the total sample, 54% for HNWI, and 31% for Non HNWI. Note that Non Residential Real Estate represented between 4% to 5% of the 13-asset summary.

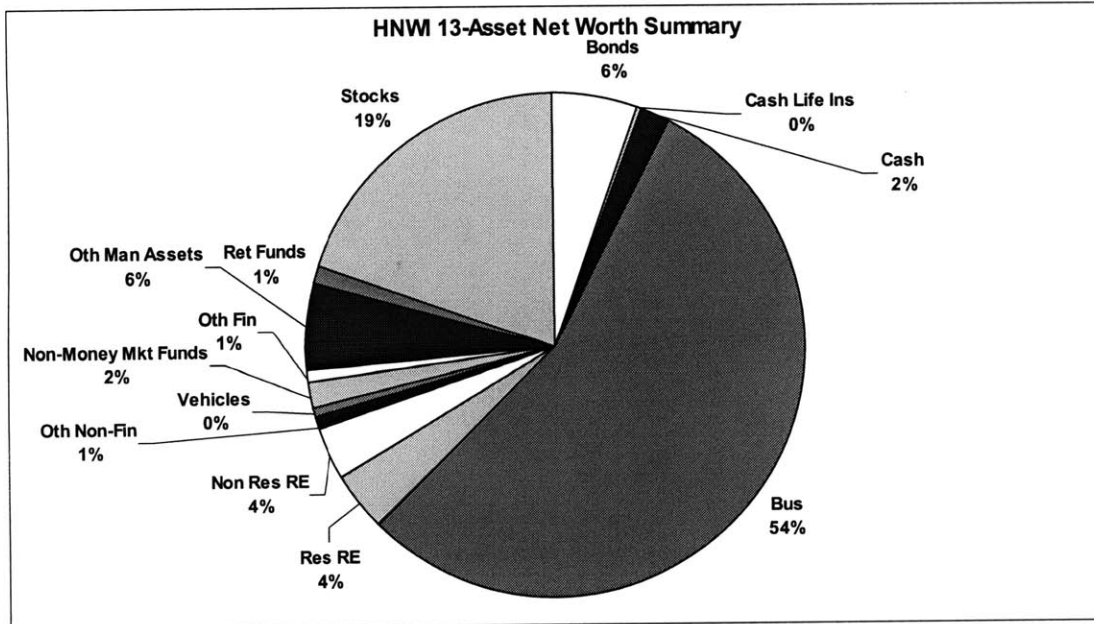
Exhibit 2.2.2: Total Sample 13-Asset Net Worth Summary



Note: 13-Asset Allocation is based on the entire dataset of 21,525 entries.

Source: Federal Reserve. Survey of Consumer Finances 1998

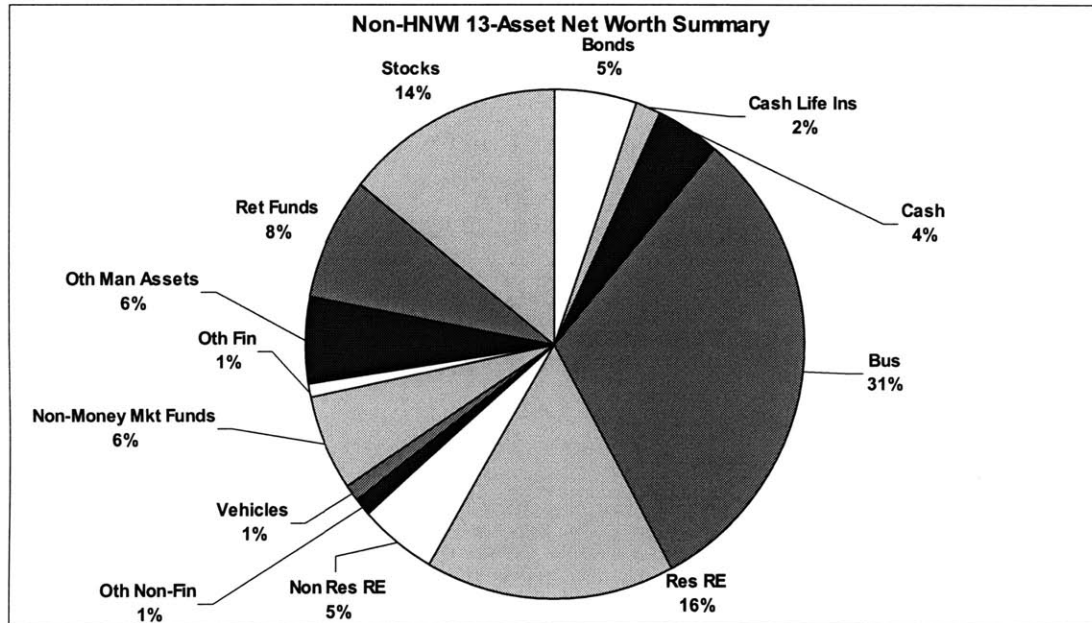
Exhibit 2.2.3: HNWI 13-Asset Net Worth Summary



Note: 13-Asset Allocation is based on the entire dataset of 21,525 entries.

Source: Federal Reserve. Survey of Consumer Finances 1998

Exhibit 2.2.4: Non HNWI 13-Asset Net Worth Summary



Note: 13-Asset Allocation is based on the entire dataset of 21,525 entries.

Source: Federal Reserve. Survey of Consumer Finances 1998

3) High Net Worth Individuals' Portfolio Allocations

According to surveyed investment banks, HNWI typically invest in stocks, bonds, and alternative investments. Additionally, investors will have some amount of their portfolio in cash. From the preceding 13-asset allocation, these four assets were selected since they are representative of managed liquid asset portfolios. Stocks, Bonds and Cash were utilized from the SCF and for alternative investments the SCF's Non Residential Real Estate was used. The Non Residential Real Estate is only a portion of typical alternative investments. Since the focus of this analysis is private real estate investment and due to lack of detailed data within the SCF, other alternative investments were not used. After specifically analyzing the real estate allocation, HNWI have a 6% allocation in real estate. The HNWI segments analyzed have a real estate allocation that ranges from 0% to 18%. The majority of the HNWI segments center between a 5% and 8% real estate allocation.

The following table summarizes the overall HNWI's four-asset allocations.

Exhibit 3.0.1: Overall HNWI Four-Asset Allocation

| Category | Real Estate | Stocks | Bonds | Cash |
|--------------|-------------|--------|-------|------|
| Total Sample | 8% | 64% | 20% | 9% |
| HNWI | 6% | 67% | 20% | 7% |
| Non HNWI | 11% | 54% | 21% | 14% |

Source: Federal Reserve. Survey of Consumer Finances 1998

The following table highlights the asset allocations by HNWI segments.

Exhibit 3.0.2: HNWI Segment Four-Asset Allocations

| Tiers | Real Estate | Stocks | Bonds | Cash |
|---------------|-------------|--------|-------|------|
| \$200+ | 4% | 78% | 17% | 1% |
| \$100-\$199 | 2% | 68% | 23% | 8% |
| \$75-\$99 | 11% | 57% | 24% | 7% |
| \$50-\$74 | 8% | 64% | 17% | 11% |
| \$25-\$49 | 13% | 53% | 22% | 12% |
| Risk Tiers | Real Estate | Stocks | Bonds | Cash |
| Substantial | 5% | 86% | 9% | 5% |
| Above Average | 8% | 76% | 15% | 9% |
| Average | 5% | 66% | 28% | 6% |
| Averse | 18% | 31% | 56% | 13% |
| Age Tiers | Real Estate | Stocks | Bonds | Cash |
| <35 | 0% | 80% | 18% | 2% |
| 35-44 | 2% | 87% | 8% | 4% |
| 45-54 | 7% | 73% | 12% | 8% |
| 55-64 | 7% | 70% | 19% | 5% |
| 65-74 | 6% | 64% | 23% | 6% |
| >=75 | 8% | 53% | 28% | 11% |

Source: Federal Reserve. Survey of Consumer Finances 1998

3.1) Four Asset Selection

In summary, the final four assets were selected due to market standards, the limitations on the level of detail of the SCF data, available market returns indices, and optimum portfolio theory. The following table highlights the reasons for the selection of each asset.

Exhibit 3.1.1: Four Asset Selection Criteria

| Asset | Comments |
|--------|--|
| Stocks | <ul style="list-style-type: none"> • Market standard • SCF has the asset title stock • S&P 500 available as market index |
| Bonds | <ul style="list-style-type: none"> • Market standard • SCF has the asset title stock • Long-term government bonds available as market index |

| | |
|--------------------|--|
| Cash | <ul style="list-style-type: none"> • Market standard • SCF has the asset title stock • 30-Day Short Term Treasury Bills available as market index |
| Real Estate | <ul style="list-style-type: none"> • Part of alternative investments • Focus of analysis is private real estate asset allocations • SCF has the asset title stock • NCREIF available as market index |

From the SCF data, together these four assets represent just over 30% of net worth for the total data set, HNWI, and Non HNWI. This 30% is the amount that the sample has available for personal investment. The remaining 70% is within the 13-asset allocation described previously, the majority of which comprises private business wealth and personal residences.

Exhibit 3.1.2: Four Asset Portfolio Percentage of Total Net worth

| Category | Total Four Asset Portfolio | Total Networth | Percent |
|---------------------|-----------------------------------|-----------------------|----------------|
| Total Sample | \$ 7,605,426,392 | \$ 23,760,211,572 | 32.0% |
| HNWI | \$ 5,668,067,156 | \$ 17,978,042,643 | 31.5% |
| Non HNWI | \$ 1,937,359,237 | \$ 5,782,168,928 | 33.5% |

Note: Based on SCF Sample

Source: Federal Reserve. Survey of Consumer Finances 1998

3.2) Assumptions of SCF's Four Assets

While processing the weight allocations for all four assets there were several assumptions made for the entire data set. The following table highlights these assumptions.

Exhibit 3.2.1: Assumptions

| Assumptions |
|---|
| 1. All assets were reported on an unlevered basis. As described previously each loan associated with each asset was subtracted. |
| 2. Mutual Funds were reallocated to the either stocks or bonds based on the SCF category. |

| |
|--|
| <p>3. Since one of the assumptions within the optimizer model is that there is no short selling of an asset, no assets were allowed to have negative balances.</p> <ul style="list-style-type: none"> • After unlevering Cash, all negative positions were set to 0. • NNRESRE contained some negative positions prior to unlevering. These were deleted and reduced the HNWI data set to 1,012 from 1,018 entries. • After unlevering NNRESRE, all negative positions were set to 0. |
| <p>4. Retirement funds were not reallocated to stocks and bonds due to the limitations on amounts invested per year and the tax regulations.</p> |
| <p>5. Total amount in other managed assets (trusts, annuities, and managed investment accounts in which household has equity interest) were not reallocated due to tax regulations. Specifically trusts and managed investment accounts were in the same category and could not be separated.</p> |

3.3) Real Estate Allocation

Real Estate has been analyzed as private real estate. Real estate assets are part of a larger capital market.¹² The real estate four quadrant model outlines the real estate investment products and capital markets.

Exhibit 3.3.1: Four Quadrant Model

| | Public Markets | Private Markets |
|---------------|--|---|
| Equity Assets | <ul style="list-style-type: none"> • Stocks • REITs • Mutual Funds | <ul style="list-style-type: none"> • Real Property (Private Real Estate) • Private Firms • Oil and Gas Partnerships |
| Debt Assets | <ul style="list-style-type: none"> • Bonds • MBS (Mortgage Backed Securities) • Money Instruments | <ul style="list-style-type: none"> • Bank Loans • Whole Mortgages • Venture Debt |

Source: David Geltner and Norman G Miller. Commercial Real Estate Analysis and Investments (New Jersey: Prentice Hall, 2001) 13

As indicated in the four-quadrant model, this analysis examines real property equity assets in private markets. Equity or debt assets in public markets such as REITs or MBS are assumed to be within the SCF's Stocks and Bonds assets. The SCF does not break down the type of REIT and MBS investments and therefore real estate could not be examined at a public market level.

Assumptions for Real Estate Allocation

¹² David Geltner and Norman G Miller. Commercial Real Estate Analysis and Investments (New Jersey: Prentice Hall, 2001) 13

Within the SCF data there were three categories of real estate: Houses, Other Residential Real Estate, and Non Residential Real Estate. As described previously, Houses and Other Residential Real Estate consisted of primary and secondary homes and were not considered as part of private real property investments since the primary occupant was the respondent.

Additionally, as a primary occupant there is no rental income and therefore only appreciation will constitute the return. Private real estate property that is examined includes both an income and appreciation return.

In addition to these three categories the SCF documented which Businesses were real estate businesses. From further detailed data an account of which real estate business owned property was tabulated to exclude businesses that were brokerage firms or third party real estate firms.

Therefore there were three Non Residential Real Estate Allocations (NNRESRE) that were examined:

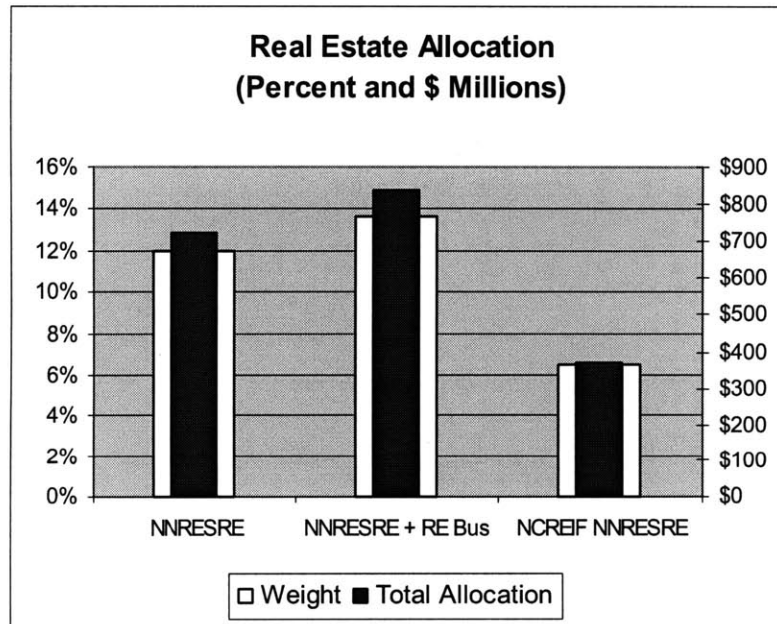
Exhibit 3.3.2: Real Estate Allocations Procedure

| Real Estate Allocation | Description |
|---|--|
| Total NNRESRE | <p>Step 1</p> <ul style="list-style-type: none"> • Includes all Non Residential Real Estate from SCF survey. <p>Step 2</p> <ul style="list-style-type: none"> • Respondents with negative NNRESRE allocations were deleted (6 entries reducing total to 1,012 from 1,018). <p>Step 3</p> <ul style="list-style-type: none"> • Allocations after unlevering were set to 0 |
| NNRESRE and Real Estate Businesses | <p>Step 1</p> <ul style="list-style-type: none"> • Includes all Non Residential Real Estate from SCF survey and Real Estate Businesses. <ul style="list-style-type: none"> - Only included Real Estate Businesses that owned property. <p>Step 2</p> <ul style="list-style-type: none"> • Respondents with negative NNRESRE allocations were deleted (6 entries reducing total to 1,012 from 1,018). <p>Step 3</p> <ul style="list-style-type: none"> • Allocations after unlevering were set to 0 |

| | |
|----------------------------------|--|
| COMPARABLE NCREIF NNRESRE | <p>Step 1</p> <ul style="list-style-type: none"> Includes only NCREIF comparable real estate products for purposes of comparison with the NCREIF index. <ul style="list-style-type: none"> Real estate products included were: 5 or more unit residence, apartment house, other commercial property, business and residential combination, condominium, and residential. Those excluded are listed in Appendix A <p>Step 2</p> <ul style="list-style-type: none"> Respondents with negative NNRESRE allocations were deleted (6 entries reducing total to 1,012 from 1,018). <p>Step 3</p> <ul style="list-style-type: none"> Allocations after unlevering were set to 0 |
|----------------------------------|--|

The following chart shows the Real Estate Allocations for all three classifications of Real Estate:

Exhibit 3.3.3: Real Estate Allocations



| Category | Weight | Total Allocation (\$ Millions) |
|-------------------------|--------|--------------------------------|
| NNRESRE | 12% | \$ 724.45 |
| NNRESRE + RE Bus | 14% | \$ 839.24 |
| NCREIF NNRESRE | 6% | \$ 367.65 |

Note: Based on SCF Sample

Source: Federal Reserve. Survey of Consumer Finances 1998

Comparing these three categories of SCF Real Estate, NNRESRE and RE Bus has the highest Real Estate allocation of 14% and comprises \$839.24 million of real estate. NNRESRE on its own has a real estate allocation of 12% at \$724.45 million. The NCREIF NNRESRE is half that of the entire NNRESRE allocation. Its allocation is only 6% at \$367.65 million. This low NCREIF comparable real estate allocation indicates that half of real estate investment is not commercial investment grade property.

The final Real Estate asset allocation that was utilized for the current versus optimum portfolio analysis was the NCREIF NNRESRE. This allocation was used to keep the analysis consistent with the NCREIF index utilized and this allocation represents investment grade real estate that provides a return that may be tracked at an industry level.

3.4) Asset Allocations

The following chart highlights the formulas used to calculate each of the final four assets. These formulas resulted in the asset totals. The sum of all of these assets was the total portfolio allocation. To cancel out the five imputations, all total dollar amounts were divided by five, which generated the original total dollar amounts. The weights of each asset were calculated as a percent of the portfolio total.

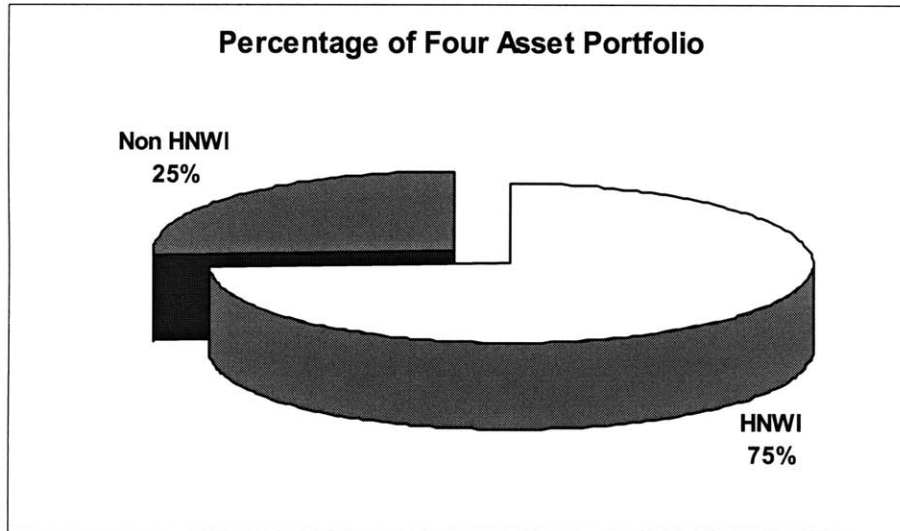
Exhibit 3.4.1: Four Asset Allocations Formula

| Asset | Comments |
|---|---|
| Stocks Codes: STOCKS | Stocks Formula: STOCKS |
| Bonds Code: BOND | Sum of Bonds and Savings Bonds Formula: BOND+SAVBOND |
| Cash Code: CASH | Sum of Call Accounts, Certificate of Deposits, Checking Accounts, Money Market Accounts, and Savings Accounts less PLoan 4, PLoan 6, and PLoan8 Formula: CALL+CDS+CHECKING+MMA+SAVING-PLOAN4-PLOAN6-PLOAN8 |
| Non Residential Real Estate Code: NNRESRE | NCREIF comparable Non Residential Real Estate less PLoan 5 Formula: ((NNRESRE (Category 45, 46, 47, 48, 49, and 50)) * Equity Share) – (Equity Share*NNRESRE Loans associated with each entry) |

Overall Asset Allocations

From the following chart, HNWI control 75% of the data set's four-asset allocation. Non HNWIs only control 25% of the data set's four-asset allocation.

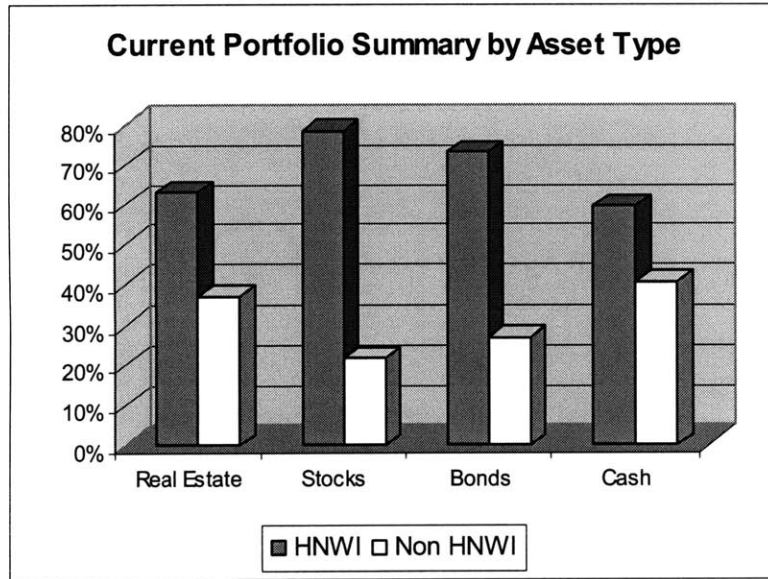
Exhibit 3.4.2: Percentage of Four Asset Portfolio



Source: Federal Reserve. Survey of Consumer Finances 1998

The following exhibit indicates that HNWI control the majority of each of the four assets. Specifically, HNWI control over 60% in all four assets.

Exhibit 3.4.3: Four Asset Summary by Asset Type

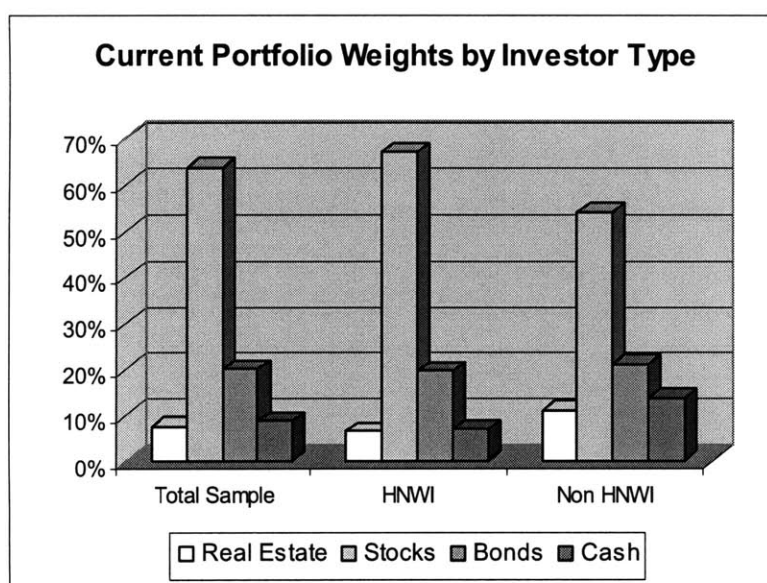


| Category | Real Estate | Stocks | Bonds | Cash | Total Allocation |
|----------|-------------|--------|-------|------|------------------|
| HNWI | 63% | 78% | 73% | 60% | 75% |
| Non HNWI | 37% | 22% | 27% | 40% | 25% |

Source: Federal Reserve. Survey of Consumer Finances 1998

From the following graph, although HNWI's typically have a majority in the total dollar amount of all four assets, their allocations at times are smaller than Non HNWI's. Non HNWI's have a larger Real Estate and Cash allocation while a smaller Stocks allocation. Even though Non HNWI's have a lower total dollar amount in Real Estate and Cash, their size of investment is a greater portion of their overall allocation. Non HNWI's are inclined to invest less in Stocks due to the lower amounts of disposable income. Total HNWI's weights are relatively on par with the Total Sample's weights. As a result, this indicates how HNWI's control the majority of the asset allocation of the sample.

Exhibit 3.4.4: Current Portfolio Weights by Investor Type



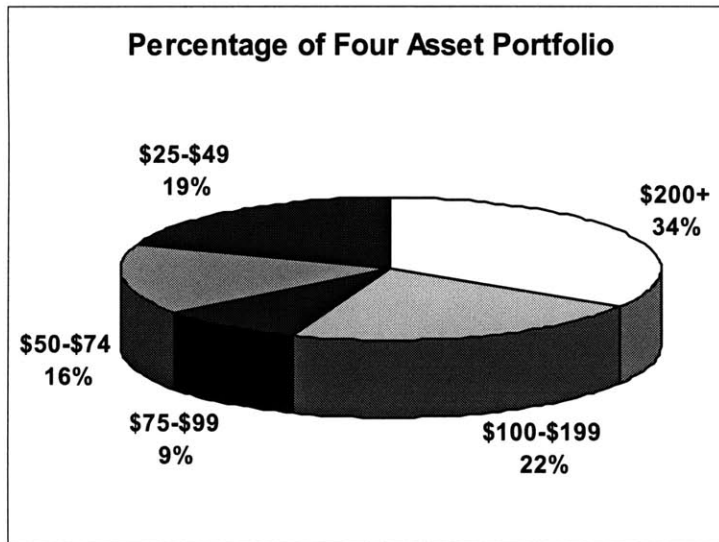
| Category | Real Estate | Stocks | Bonds | Cash |
|---------------------|-------------|--------|-------|------|
| Total Sample | 8% | 64% | 20% | 9% |
| HNWI | 6% | 67% | 20% | 7% |
| Non HNWI | 11% | 54% | 21% | 14% |

Source: Federal Reserve. Survey of Consumer Finances 1998

Asset Allocations by Net Worth Tier

From the following chart, the \$200 million and over HNWI Tier controls approximately 34% of the four-asset portfolio. The \$100-\$199 million Tier controls 22% of the four asset portfolio followed by the \$25-\$49 million Tier with 19%. The \$75-\$99 million controls the smallest portion of the four asset portfolio.

Exhibit 3.4.5: Percentage of Four Asset Portfolio by Net Worth Tier

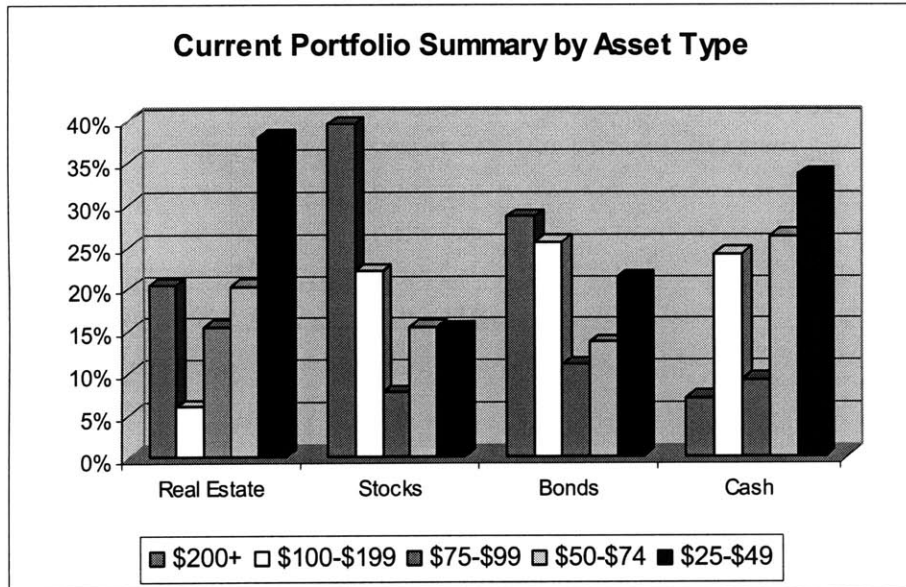


Note: Tier Range is in \$ Millions

Source: Federal Reserve. Survey of Consumer Finances 1998

The following graph shows that the \$200 million and over Tier controls the majority portion of Stocks and Bonds. The \$25-\$49 million Tier has the highest share of Real Estate and Cash.

Exhibit 3.4.6: Four Asset Summary by Net Worth Tier



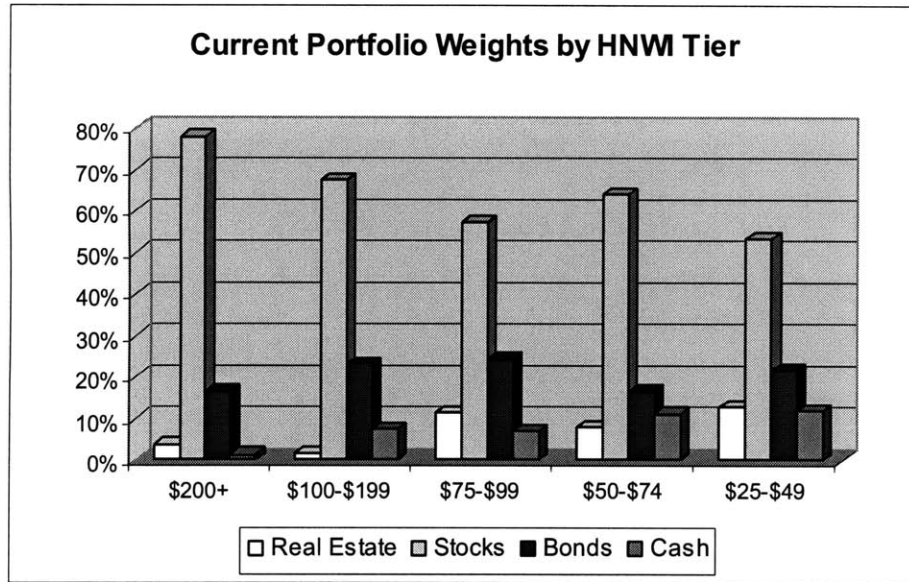
| Tiers | Real Estate | Stocks | Bonds | Cash | Total Allocation |
|--------------------|-------------|--------|-------|------|------------------|
| \$200+ | 20% | 40% | 29% | 7% | 34% |
| \$100-\$199 | 6% | 22% | 26% | 24% | 22% |
| \$75-\$99 | 15% | 8% | 11% | 9% | 9% |
| \$50-\$74 | 20% | 15% | 14% | 26% | 16% |
| \$25-\$49 | 38% | 15% | 21% | 34% | 19% |

Note: Tier Range is in \$ Millions

Source: Federal Reserve. Survey of Consumer Finances 1998

The following chart indicates, the \$25-\$49 million Tier has the highest Real Estate allocation of 13%. The Stocks allocation tends to increase with each higher HNWI Tier (apart from the \$75-\$99 HNWI Tier). The Cash allocation generally decreases with each higher HNWI Tier.

Exhibit 3.4.7: Current Portfolio Weights by Net Worth Tier



| Tiers | Real Estate | Stocks | Bonds | Cash |
|--------------------|-------------|--------|-------|------|
| \$200+ | 4% | 78% | 17% | 1% |
| \$100-\$199 | 2% | 68% | 23% | 8% |
| \$75-\$99 | 11% | 57% | 24% | 7% |
| \$50-\$74 | 8% | 64% | 17% | 11% |
| \$25-\$49 | 13% | 53% | 22% | 12% |

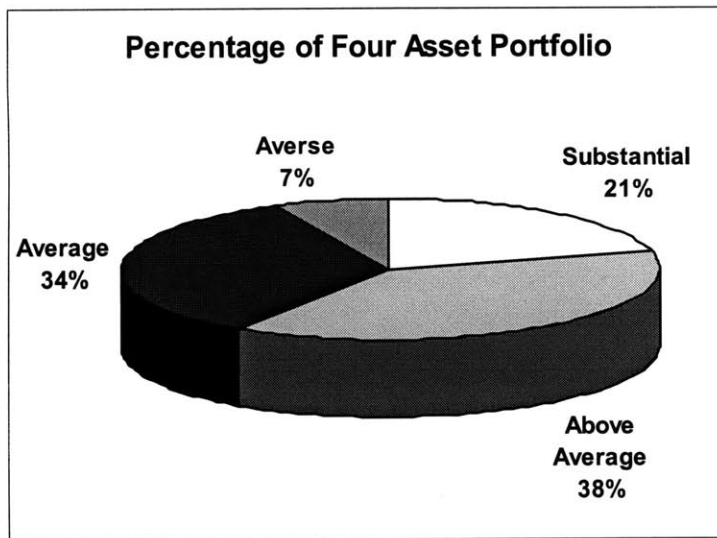
Note: Tier Range is in \$ Millions

Source: Federal Reserve. Survey of Consumer Finances 1998

HNWI Asset Allocations by Risk Tolerance

From the following chart, the Above Average risk profile controls 38% of the four-asset portfolio. The Average risk profile controls approximately 34% of the four-asset portfolio. The third largest profile is Substantial risk. This profile controls 21% of the four-asset portfolio. The risk Averse profile has the smallest control of the four asset portfolio.

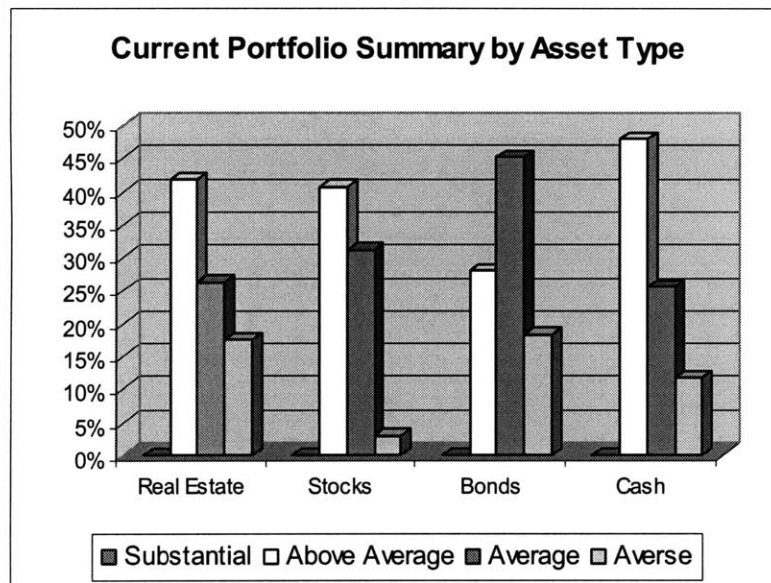
Exhibit 3.4.8: Percentage of Four Asset Portfolio by Risk Tolerance



Source: Federal Reserve. Survey of Consumer Finances 1998

From the following graph, apart from Bonds the Above Average risk profile controls the majority of all assets. The Average risk profile controls the next largest percentage of all four assets. The Average risk profile has the largest percentage of Bonds. HNWI's that are Risk Averse have the smallest portion of the four-asset portfolio.

Exhibit 3.4.9: Four Asset Summary by Risk Tolerance

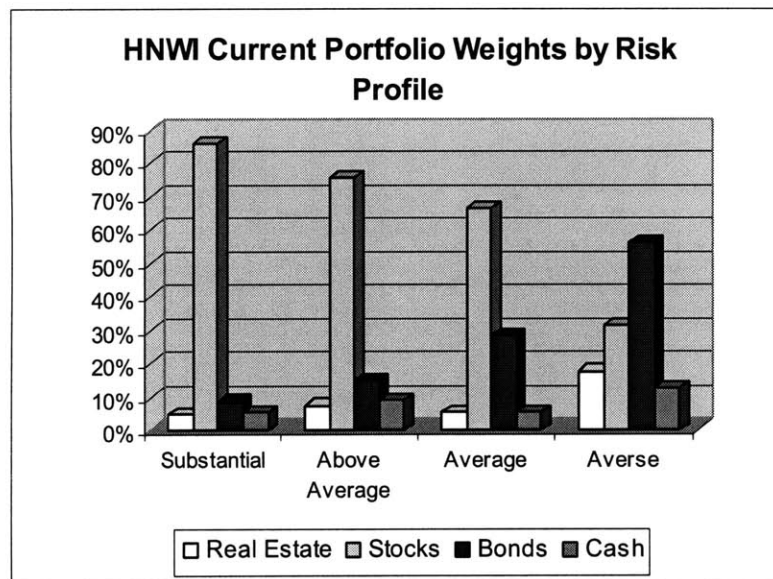


| Risk Tiers | Real Estate | Stocks | Bonds | Cash | Total Allocation |
|----------------------|-------------|--------|-------|------|------------------|
| Substantial | 14% | 25% | 9% | 15% | 21% |
| Above Average | 42% | 41% | 28% | 48% | 38% |
| Average | 26% | 31% | 45% | 25% | 34% |
| Averse | 18% | 3% | 18% | 12% | 7% |

Source: Federal Reserve. Survey of Consumer Finances 1998

The following chart highlights the weight allocations of the different risk segments. Risk Averse HNWI have the highest Real Estate, Bonds, and Cash allocations. These allocations indicate that Risk Averse HNWI view Real Estate, Cash, and Bonds as conservative investments. Substantial risk, Above Average risk, and Average risk HNWI have significant Stocks allocations.

Exhibit 3.4.10: Current Portfolio Weights by Risk Tolerance



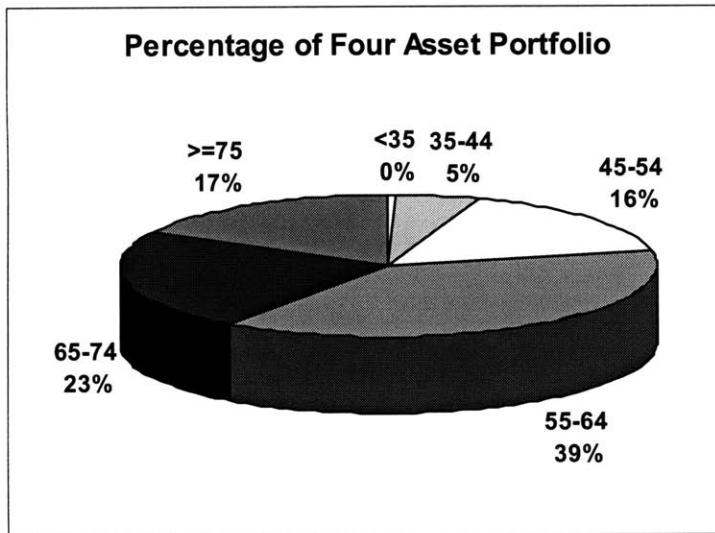
| Risk Tiers | Real Estate | Stocks | Bonds | Cash |
|----------------------|-------------|--------|-------|------|
| Substantial | 5% | 86% | 9% | 5% |
| Above Average | 8% | 76% | 15% | 9% |
| Average | 5% | 66% | 28% | 6% |
| Averse | 18% | 31% | 56% | 13% |

Source: Federal Reserve. Survey of Consumer Finances 1998

Asset Allocations by Age Tier

From the following graph, the age bracket 55-64 controls the largest portion (39%) of the four-asset portfolio. From the age of 55 to 74, 62% of the four assets are accounted for. Greater than or equal to 75 and 45-54 jointly control approximately 33% of the four-asset portfolio. This age distribution indicates that there are very few HNWI's less than 44 years of age.

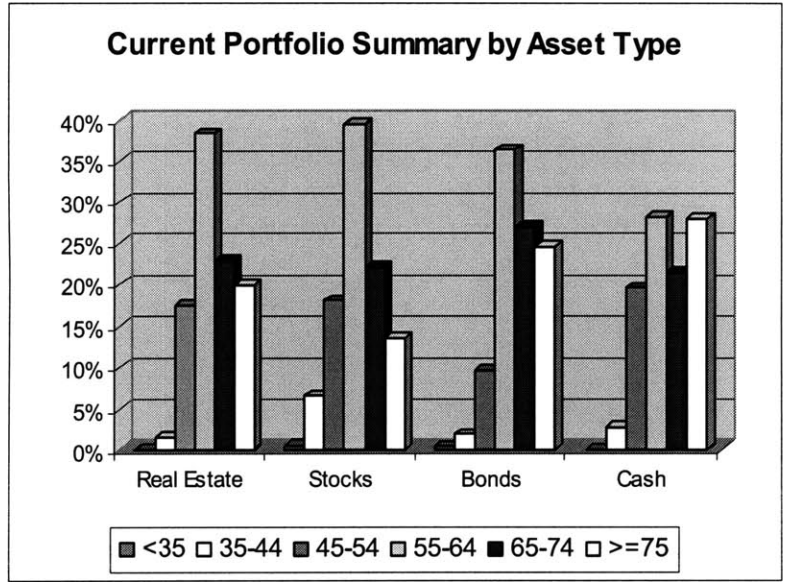
Exhibit 3.4.11: Percentage of Four Asset Portfolio by Age Tier



Source: Federal Reserve. Survey of Consumer Finances 1998

From the following exhibits, the age group 55-64 controls the majority of all four assets. The 65-74 age group is the next leading segment followed by the greater than or equal to 75 segment. HNWI's less than 44 years old control approximately 5% of the total four-asset allocation.

Exhibit 3.4.12: Four Asset Summary by Age Tier

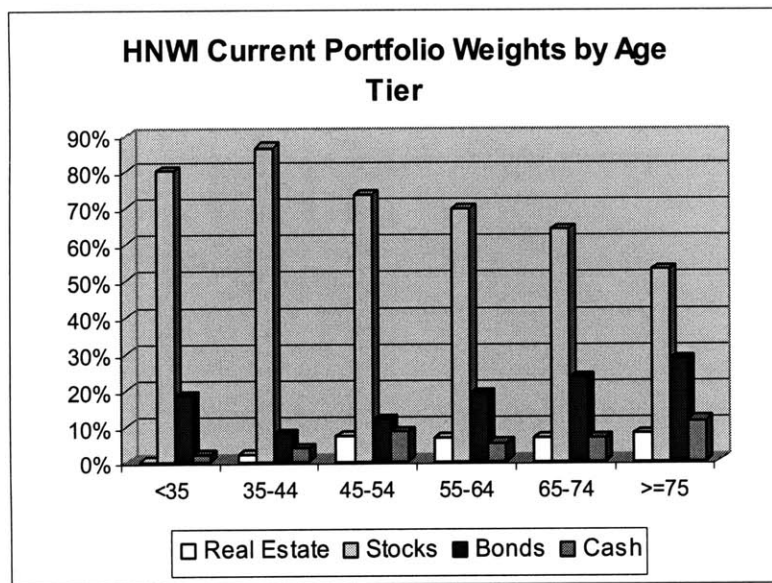


| Age Tiers | Real Estate | Stocks | Bonds | Cash | Total Allocation |
|-----------|-------------|--------|-------|------|------------------|
| <35 | 0% | 1% | 0% | 0% | 0% |
| 35-44 | 2% | 7% | 2% | 3% | 5% |
| 45-54 | 17% | 18% | 10% | 20% | 16% |
| 55-64 | 38% | 39% | 36% | 28% | 38% |
| 65-74 | 23% | 22% | 27% | 21% | 23% |
| >=75 | 20% | 13% | 25% | 28% | 17% |

Source: Federal Reserve. Survey of Consumer Finances 1998

The following graph highlights the weight allocation for the Age Tiers. HNWI's less than 44 years old have the highest Stocks allocation and the lowest Real Estate allocation. HNWI's over 64 years of age have the highest allocation in Bonds. HNWI's greater than 44 years old have higher Cash allocations. These allocations indicate the level of risk that each tier is willing to take. Therefore, at a preliminary level, the younger tiers are willing to take on more risk with higher Stocks allocations and the older tiers are willing to take on less risk with a higher allocation in Bonds.

Exhibit 3.4.13: Current Portfolio Weights by Age Tier



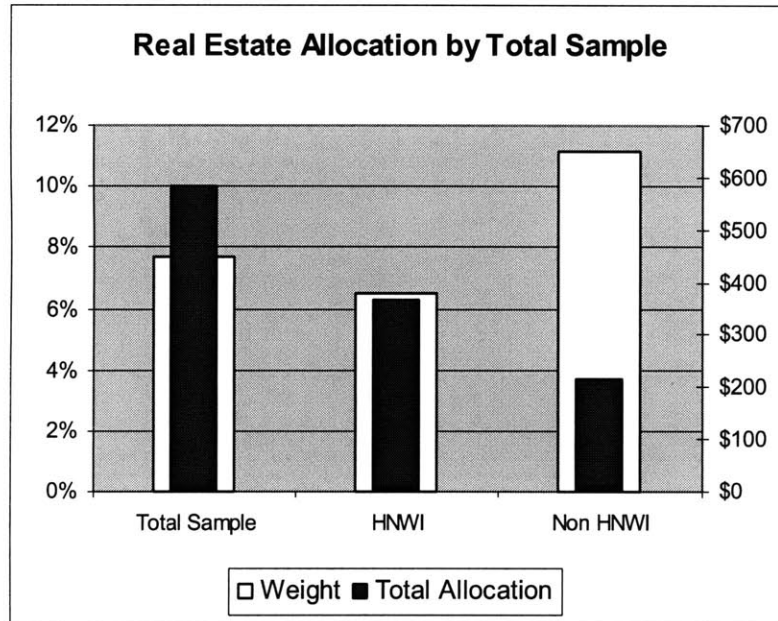
| Age Tiers | Real Estate | Stocks | Bonds | Cash |
|-----------|-------------|--------|-------|------|
| <35 | 0% | 80% | 18% | 2% |
| 35-44 | 2% | 87% | 8% | 4% |
| 45-54 | 7% | 73% | 12% | 8% |
| 55-64 | 7% | 70% | 19% | 5% |
| 65-74 | 6% | 64% | 23% | 6% |
| >=75 | 8% | 53% | 28% | 11% |

Source: Federal Reserve. Survey of Consumer Finances 1998

Real Estate Allocations

Compared to Non HNWIs, HNWIs have a smaller allocation in Real Estate. However, HNWIs total amount in Real Estate surpasses Non HNWIs. The overall sample has a slightly higher Real Estate allocation than HNWIs.

Exhibit 3.4.14: Real Estate Allocation by Total Sample

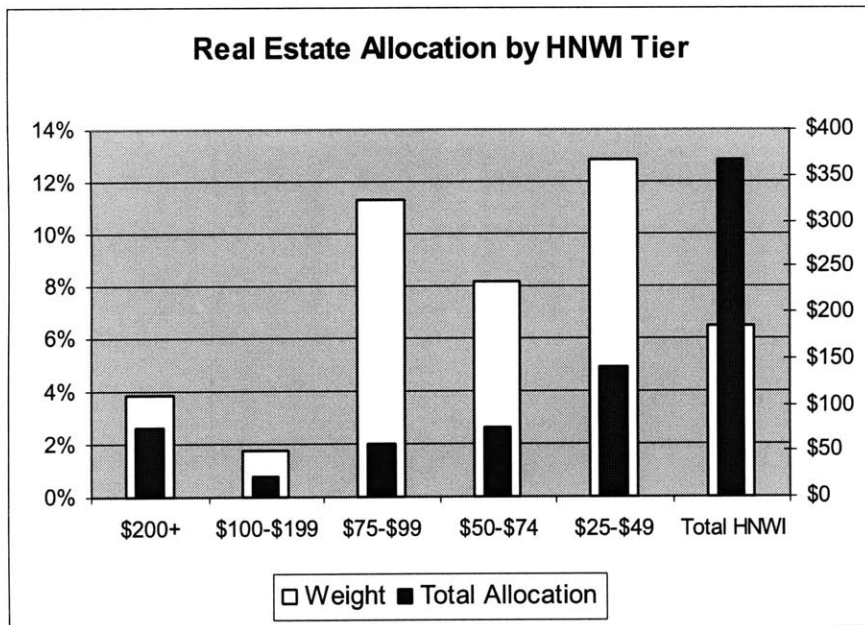


| Category | Weight | Total Allocation |
|---------------------|--------|------------------|
| Total Sample | 8% | \$ 583.28 |
| HNWI | 6% | \$ 367.65 |
| Non HNWI | 11% | \$ 215.62 |

Source: Federal Reserve. Survey of Consumer Finances 1998

The \$25-\$49 million Tier has the highest Real Estate allocation of 13% and also the highest amount of Real Estate at \$140.08 million. The \$75-\$99 million Tier has the next highest Real Estate allocation of 11%. HNWI's above \$99 million have the lowest Real Estate percentage allocations.

Exhibit 3.4.15: Real Estate Allocation by Net Worth Tier

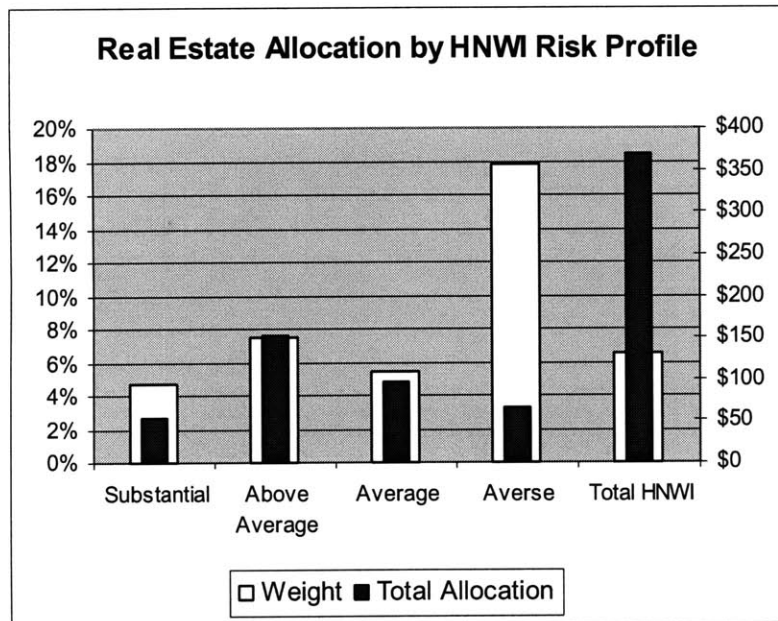


| Tiers | Weight | Total Allocation |
|--------------------|--------|------------------|
| \$200+ | 4% | \$ 74.70 |
| \$100-\$199 | 2% | \$ 21.68 |
| \$75-\$99 | 11% | \$ 56.67 |
| \$50-\$74 | 8% | \$ 74.51 |
| \$25-\$49 | 13% | \$ 140.08 |
| Total HNWI | 6% | \$ 367.65 |

Source: Federal Reserve. Survey of Consumer Finances 1998

Risk Averse HNWI's have the highest allocation to Real Estate at 15%. Although Risk Averse HNWI's have the highest Real Estate allocation percentage, the Above Average risk HNWI's own the largest amount of Real Estate. The Average risk HNWI's have the second highest dollar amount of Real Estate investment.

Exhibit 3.4.16: Real Estate Allocation by Risk Tolerance

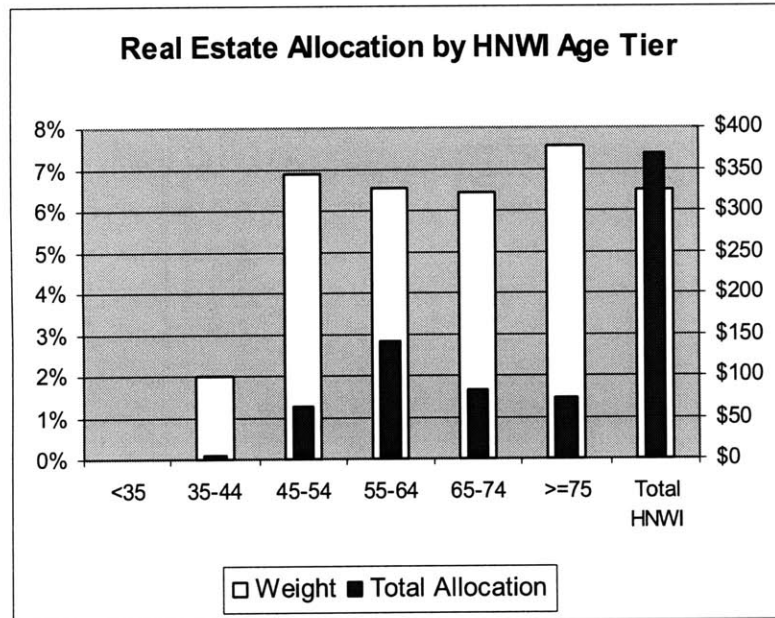


| Risk Tiers | Weight | Total Allocation |
|---------------|--------|------------------|
| Substantial | 5% | \$ 53.01 |
| Above Average | 7% | \$ 153.57 |
| Average | 5% | \$ 96.71 |
| Averse | 15% | \$ 64.36 |
| Total HNWI | 6% | \$ 367.65 |

Source: Federal Reserve. Survey of Consumer Finances 1998

Generally, Real Estate allocations increase with age. HNWI's less than 35 do not have a Real Estate allocation. The age group 55-64 has the highest amount of Real Estate.

Exhibit 3.4.17: Real Estate Allocation by Age Tier



| Age Tiers | Weight | Total Allocation |
|-------------------|-----------|------------------|
| <35 | 0% | \$ - |
| 35-44 | 2% | \$ 5.65 |
| 45-54 | 7% | \$ 63.86 |
| 55-64 | 7% | \$ 141.07 |
| 65-74 | 6% | \$ 84.01 |
| >=75 | 8% | \$ 73.07 |
| Total HNWI | 6% | \$ 367.65 |

Source: Federal Reserve. Survey of Consumer Finances 1998

4) Risk and Return Indices

After listing the final four asset allocations, indices were required to generate risk and returns for each HNWI asset allocation. In order to reflect accurately a “typical” investment portfolio, assets that have standardized and accurate investment performance indices were chosen. As a result, for private Real Estate the NCREIF Index was used; for Stocks the S&P 500 Index was applied; for Bonds the “Long Term Government Bonds” Index was utilized; and lastly for Cash the “30-Day Treasury Bills” Index was used. The Stocks, Bonds, and Cash indices were obtained from one source - Ibbotson Associates in order to standardize the information. The NCREIF index¹³ returns were adjusted to fix the time lag generated by the appraisal based method. Additionally, all the returns are yearly compound returns.

4.1) Indices Used: S&P 500, Long-Term Government Bonds, T-Bills, and NCREIF

Stocks: S&P 500

The S&P 500 Index reflects the return and volatility of stocks. According to Standard and Poors, “The S&P 500 Index is calculated using a base-weighted aggregate methodology. This means that the weight of each stock in the index is proportionate to each stock’s market capitalization. The total market value of a company is determined by multiplying the price of its stock by the number of shares outstanding. The index includes 500 of the larger stocks in United States (prior to 1957 it consisted of 90 of the larger stocks). Statisticians call an index of a set of combined variables (such as price and number of shares) a composite index.”¹⁴

The Index is calculated by adding the market values of its 500 components and dividing that sum by the latest Index Divisor.¹⁵ The same procedure is used to calculate indices for the four S&P 500 major industry sectors (Industrial, Financial, Transportation, and Utilities) and indices for the individual industry groups.¹⁶

¹³ NPI, Official Index produced by NCREIF

¹⁴ Standard and Poor’s. www.standardandpoors.com. August 2002

¹⁵ According to Standard and Poor’s the Index Divisor is a “value used to ensure that the numerical value of an index does not change despite developments that alter its composition. The raw value of the index is divided by the divisor in order to calculate the normalized value. The divisor changes when the makeup of the index changes and neutralizes the change.”

¹⁶ Ibbotson and Associates. Stock, Bonds, Bills and Inflation 2002 Yearbook. June 2002.

Bonds: Long Term Government Bonds

The total returns of long-term government bonds are constructed by Ibbotson Associates using data from the Wall Street Journal (1977-1999) and the Center for Research in Security Prices at the University of Chicago. According to Ibbotson Associates, "Total returns for the period covered by this research are calculated as the change in the flat interest price. The flat price is the averages of the bond's bid and asks prices plus the accrued coupon."

Ibbotson states, "The reported return includes both, capital appreciation and yield based on 20 years to maturity. Capital appreciation is defined as total return minus the income return (in excess of yield). Yield is the internal rate of return that equates the bond price which represents the average of bid and ask plus the accrued interest."¹⁷

Cash: Treasury-Bills

According to Ibbotson Associates, "The Treasury-Bill Index is based on the results of auctions that the U.S. Treasury holds for its Treasury bills, notes and bonds." The U.S. government issues Treasury bills with different terms to maturity as a source of income for national debt and other expenses.¹⁸ The Treasury Bill Index used within this analysis is the Ibbotson Associates Treasury Bill Index with an approximate maturity of 30 days. (Ibbotson Associates. 2002)

Treasury securities are considered a safe and secure investment due to the full faith and credit of the United States government guarantee on the timely interest and principal payments. Additionally, most Treasury securities are liquid, which means they can easily be sold for cash. (Ibbotson Associates. 2002)

Real Estate: NCREIF Index

The NCREIF index is the most controversial index utilized within this analysis. It is controversial since it is an appraisal-based index. However, the NCREIF Index is the only available index that tracks the performance of privately held commercial real estate and academics have developed several methods to adjust this index. NCREIF states, "The index was born after 14 investment managers agreed in principle to form a not-for-profit entity to foster research on the commercial real estate asset class. This led to the development of a database consisting of property

¹⁷ Ibbotson Associates. Stocks, Bonds, Bills and Inflation 2002 Yearbook. 2002: 58.

¹⁸ Ibbotson Associates. 2002

operating information, which used to be known as the Russell/NCREIF Property Index (the Frank Russell Company used to publish the Index). On January 1, 1995, thirteen years after its inception, NCREIF assumed full responsibility for the Index, including its publication and distribution.”¹⁹

The NCREIF Property Index consists of both unlevered and levered properties, but investment returns associated with leveraged properties are reported on an unleveraged basis.²⁰ This is consistent with the unleveraged asset weights described in Chapter 3.

The value of the Index is set at 100 at the fourth quarter of 1977. Calculations are based on quarterly returns of individual properties before deduction of asset management fees. Each property’s return is weighted by its market value. The return is calculated by adding the Income and Capital Appreciation of the property. The Index reflects changes in both components. (NCREIF. 2002)

The current quarter’s return is considered preliminary and subject to adjustment in the subsequent quarter, and previous quarter returns may be slightly adjusted annually as data submission errors are corrected. All properties have been acquired on behalf of tax-exempt institutions and held in a fiduciary environment. This is perhaps one of the reasons why the index cannot be applied extensively to all private real estate. (NCREIF. 2002)

The property types included in the Index are Apartment, Industrial, Office, and Retail (existing properties only - no development projects).²¹ Accordingly, the data obtained from the Consumer Survey of Finances was adjusted to match the type of properties included by the index.

According to NCREIF, “Sold properties are removed from the Index in the quarter the sale takes place but the historical information remains in the database.”

All property market values are determined by real estate appraisal methodology.²² This appraisal valuation is one of the most criticized issues of the Index.

¹⁹ NCREIF (National Council of Real Estate Investments Fiduciaries). www.ncreif.com August 2002

²⁰ NCREIF August 2002

²¹ NCREIF August 2002

²² NCREIF August 2002

4.2) Adjusting the NCREIF Index

The Total Return of the NCREIF Index includes estimates of appreciation (or depreciation) in value, realized capital gain (or loss) of properties that have been sold, and income. This return is calculated by adding the Income and Capital Appreciation return on a quarterly basis. (NCREIF. 2002)

In general, real estate private valuations have two types of errors: random noise and temporal lag. Transaction based indices have random noise, which decreases with larger sample sizes. Appraisal-based indices have both errors. Additionally, in the NCREIF appraisal based index not all the properties are reappraised at the same point in time. The properties that are not reappraised are entered in the index at their last appraised value. (Geltner and Miller. 2001)

In order to minimize the temporal lag, the NCREIF investment return index has been adjusted. The adjustment method is the reverse-engineering model developed by David Geltner (1993). This adjustment process is the “unsmoothing model” or “reverse filter”. Using this method the reverse-engineered calendar year “t” appreciation component of the return equals 2.5 times the difference between the NPI return (NCREIF) for that year minus 60% of the previous year’s NPI return.²³ A simple or one step formula is applied to the normal returns produced by the NCREIF index:

$$g_t = (g NPI_t - (0.6) g NPI_{t-1}) / (0.4)^{24}$$

Source: Geltner and Miller. 684

The following graph illustrates the effect that the “unsmoothing model” has on the returns and volatility of the index:

²³ Geltner and Miller 684

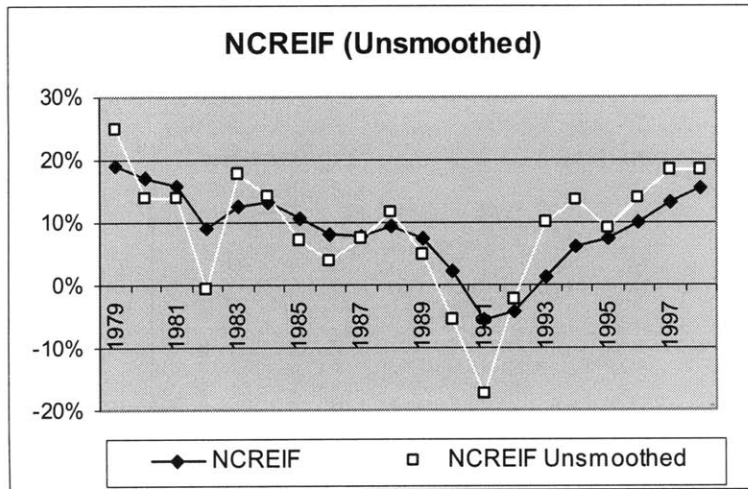
²⁴ t = Year

g_t = Reverse Engineered Appreciation Return

$g NPI_t$ = NCREIF Appreciation Return of year t

$g NPI_{t-1}$ = NCREIF Appreciation Return of year t-1

Exhibit 4.2.1: NCREIF Unsmoothed Data (1979-1998)



Source: NCREIF (2002)

Over a twenty-year period (1979-1998), the reported return²⁵ observed is **8.80%** and the volatility of the return is **6.53%**. After unsmoothing the data, the return remains approximately the same at **8.81%**, but the volatility increases substantially and reaches **9.76%**. The peaks and the valleys in Exhibit 4.1.1 of the unsmoothed return line are more pronounced representing higher volatility.

For the reasons previously discussed all further analysis is based on the adjusted “unsmoothed” NCREIF index. This method can only be applied to yearly returns. Although there are more detailed alternate methods to unsmooth the NCREIF Index, the elegant “reverse filter” method was utilized due its reliability and simplicity.

4.3) Index Table

The indices used to calculate mean returns are included in the following exhibit. The returns are not inflation adjusted. However, they are compared with the inflation (last column) for reference purposes:

²⁵ Total Return includes asset appreciation (or depreciation) in value, capital gains in properties that have been sold and income.

Exhibit 4.3.1: Index Table (1979-1998)

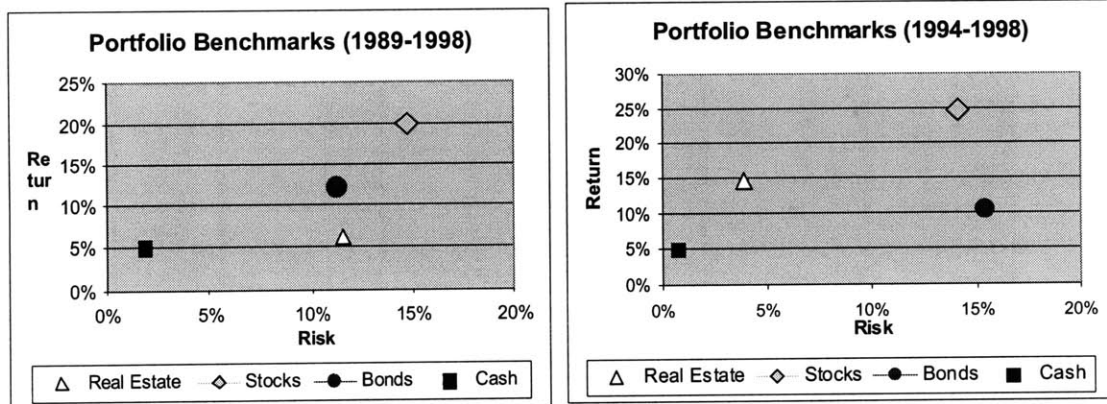
| | Selected Assets | | | | Inflation |
|------|-----------------|--------|-------|-------|-----------|
| | Real Estate | Stocks | Bonds | Cash | CPI |
| 1979 | 24.8% | 18.4% | -1.2% | 10.4% | 13.3% |
| 1980 | 13.9% | 32.4% | -4.0% | 11.2% | 12.5% |
| 1981 | 13.7% | -9.4% | 1.9% | 14.7% | 8.9% |
| 1982 | -0.7% | 21.4% | 40.4% | 10.5% | 3.8% |
| 1983 | 17.7% | 22.5% | 0.7% | 8.8% | 3.8% |
| 1984 | 14.1% | 6.3% | 15.5% | 9.9% | 3.9% |
| 1985 | 7.2% | 32.2% | 31.0% | 7.7% | 3.8% |
| 1986 | 4.0% | 18.5% | 24.5% | 6.2% | 1.1% |
| 1987 | 7.4% | 5.2% | -2.7% | 5.5% | 4.4% |
| 1988 | 11.6% | 16.8% | 9.7% | 6.4% | 4.4% |
| 1989 | 4.9% | 31.5% | 18.1% | 8.4% | 4.6% |
| 1990 | -5.6% | -3.2% | 6.2% | 7.8% | 6.1% |
| 1991 | -17.5% | 30.6% | 19.3% | 5.6% | 3.1% |
| 1992 | -2.4% | 7.7% | 8.1% | 3.5% | 2.9% |
| 1993 | 9.9% | 10.0% | 18.2% | 2.9% | 2.7% |
| 1994 | 13.5% | 1.3% | -7.8% | 3.9% | 2.7% |
| 1995 | 9.0% | 37.4% | 31.7% | 5.6% | 2.5% |
| 1996 | 13.8% | 23.1% | -0.9% | 5.2% | 3.3% |
| 1997 | 18.2% | 33.4% | 15.9% | 5.3% | 1.7% |
| 1998 | 18.5% | 28.6% | 13.1% | 4.9% | 1.6% |

Source: NCREIF (2002) and Ibbotson Associates (2002)

4.4) Average Risk and Returns

The mean returns of the four assets vary according with the period of analysis. For example, comparing the timeframes 1989-1998 (10 years) and 1994-1998 (5 years), the 10-year period has a **6.25%** return and **11.56%** volatility for real estate assets, while the 5-year period has a **14.61%** return and a **3.92%** volatility.

Exhibit 4.4.1: Comparing Portfolio Benchmarks



Source: NCREIF (2002) and Ibbotson Associates (2002)

The returns and volatilities of the four different asset classes during three timeframes are shown below:

Exhibit 4.4 2: Three Alternative Time Frames

| | Real Estate | Stocks | Bonds | Cash |
|--------------------|--------------------|---------------|---------------|--------------|
| 1979 - 1998 | | | | |
| Return | 8.81% | 18.23% | 11.87% | 7.21% |
| Volatility | 9.76% | 13.54% | 13.29% | 3.01% |
| 1989 - 1998 | | | | |
| Return | 6.25% | 20.03% | 12.18% | 5.30% |
| Volatility | 11.56% | 14.71% | 11.25% | 1.73% |
| 1994 - 1998 | | | | |
| Return | 14.61% | 24.75% | 10.38% | 4.97% |
| Volatility | 3.92% | 14.16% | 15.39% | 0.65% |

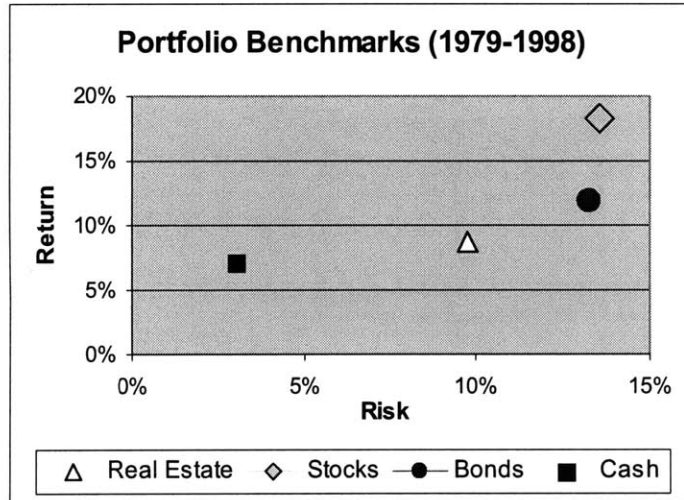
Source: NCREIF (2002) and Ibbotson Associates (2002)

As William F. Sharpe states, "While results vary from asset class to asset class, and from time period to time period, experience suggests that for predicting future values, historic data appears to be quite useful with respect to standard deviations, reasonably useful for correlations, and virtually useless for expected returns."²⁶ Based on this statement, this research prioritizes the standard deviation and the correlation of the selected assets. The asset returns are merely benchmarks for investor preferences.

²⁶ William F Sharpe, Gordon J Alexander, and Jeffrey V Bailey. *Investments* (New Jersey: Prentice Hall). 1999.

Since the research analyzes long-term portfolio strategies and patterns, the 20-year period (1979-1998) was considered the most appropriate time frame for this analysis. The following chart highlights the 20-year volatilities and returns of the four assets.

Exhibit 4.4.3: Portfolio Benchmarks, 1979-1998



Source: NCREIF (2002) and Ibbotson Associates (2002)

5) Modern Portfolio Theory Application

The principles of Modern Portfolio Theory developed by Harry Markowitz in an article in 1952²⁷ helped shape the optimization program developed to assess the HNWI's portfolio allocations. According to the definition of ContingencyAnalysis.com, "Modern Portfolio Theory explores how risk averse investors construct portfolios in order to optimize market risk against expected returns. The theory quantifies the benefits of diversification. Out of a universe of risky assets, an efficient frontier of optimal portfolios can be constructed. Each portfolio on the efficient frontier offers the maximum possible expected return for a given level of risk."

The research herein is a practical application of the main concepts and fundamentals accepted by academics and portfolio managers. It includes an application of the framework developed by Markowitz of how the risk can be reduced by choosing stocks that do not move in the same direction, combined with the application of the "Separation Theorem" (first noted by J. Tobin²⁸), and lastly, an empirical measure of the "risk reward ratio" known as the Sharpe Ratio.²⁹ The optimization program combines asset returns, volatility, and correlation to establish the best possible combination of assets within an investment portfolio.

In this regard, portfolio optimization can be very complex with more than 300 hundred assets or very simple with just two assets.³⁰ This research seeks only to delineate and to establish major investment performance patterns; which is why, it is estimated, that a simple model in this case is enough. This model is also used analyze HNWI's current portfolios risk and return levels.

5.1) Introduction

Minimization of portfolio return volatility at any given level of expected investment return

The diversification of assets in a portfolio will generally lower the risk³¹ and optimize the returns.³² Investors are always asked, "Why accept take more risk when you can take less, or why accept lower returns when you can achieve greater returns with the same level of risk?" The idea behind portfolio diversification is simple, "Don't put all your eggs in the same basket."

²⁷ Harry Markowitz. "Portfolio Selection" *Journal of Finance* 7 March 1952

²⁸ J. Tobin "Liquidity Preference as Behavior toward Risk" *Review of Economic Studies* (February 1958)

²⁹ Sharpe, Alexander, and Bailey *Investments* (New Jersey: Prentice Hall, 1999) 844

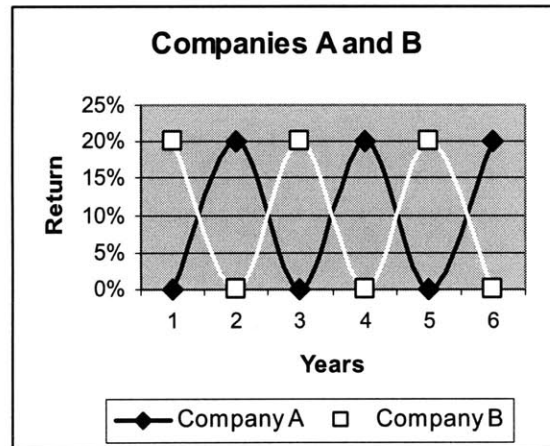
³⁰ Portfolio Managers and Portfolio Analysts usually work with highly complex programs.

³¹ Also referred to in this chapter as volatility, return volatility, and standard deviation.

³² Average returns.

A simple example will help illustrate this idea. Let's assume that an investor is expecting a 10% return and he has two options: Company A and Company B. Both individually offer a 10% return with a volatility (or standard deviation) of 10%. How can an investor improve his investment performance? Let's assume that company A is an "umbrella" manufacturer and company B is a "sun glasses" manufacturer.³³ When the first one is successful the second one is not.

Exhibit 5.1.1: Current Portfolio by Net-Worth Level



If the investor holds 50% of the shares in each company he will receive the same expected return but with virtually no risk (0% volatility). How Company A's expected return varies with Company B's expected return is called correlation. Certain combinations of assets are more valuable than others. The correlation is critical in determining the diversification power of both companies and the decision of investing in both businesses. This simple example may be utilized for a combination of different assets. (Cichetti. 2002)

Return

Return is the expected gain that an investor anticipates receiving from a portfolio over a holding period. At any given level of investment risk (return volatility) a higher expected return is preferred over a lower expected return. (Geltner and Miller. 2001)

³³ Acknowledgement to Brian Cichetti, Director of the Real Estate Program at the Kenan-Flager School of Business at the University of North Carolina at Chapel Hill for his illustrations and clear concepts over the Professional Development Courses at MIT in August 2002.

The formula for expected returns is the average of the asset's returns over a given time period:³⁴

$$E_r = \left(\frac{1}{T} \right) \sum_{t=1}^T r_t$$

According to the four assets selected the investment returns for each asset are:

Exhibit 5.1.2: Average Return (1979-1998)

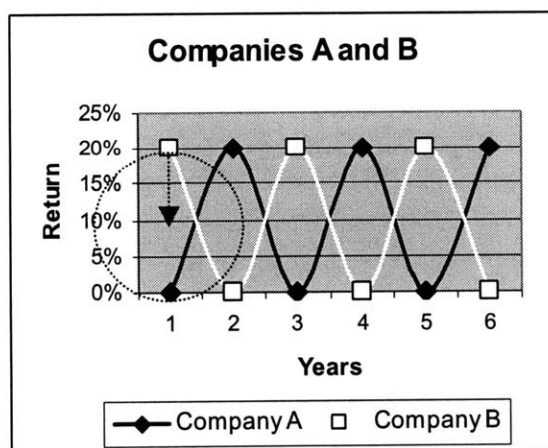
| | Real Estate | Stocks | Bonds | Cash |
|-------------|-------------|--------|--------|-------|
| 1979 - 1998 | | | | |
| Return | 8.81% | 18.23% | 11.87% | 7.21% |

Source: NCREIF (2002) and Ibbotson Associates (2002)

Risk

There are many definitions of risk. For this research, Sharpe's definitions of risk were used, "Risk is the uncertainty associated with the end-of-period value of an investment. Risk is also a measure of dispersion of possible outcomes around the expected value of a random variable." In simple terms, risk is a measure of the variability of the returns with respect to the average return. The higher the distance of investment periodic returns with respect to the mean return, the higher the risk (return volatility). (Sharpe, Alexander, and Bailey. 1999)

Exhibit 5.1.3: Diversification Simple Example



The formula for risk (standard deviation) is:³⁵

³⁴ Geltner and Miller. 550

$$\text{STD} = \sqrt{\frac{\sum_{t=1}^T (r_t - E_r)^2}{T - 1}}$$

For describing risk, this research alternatively uses the words volatility and standard deviation. At any given level of investment return a lower risk is preferred. The return volatility values considered for this analysis are the following:

Exhibit 5.1.4: Volatility (1979-1998)

| | Real Estate | Stocks | Bonds | Cash |
|-------------|-------------|--------|--------|-------|
| 1979 - 1998 | | | | |
| Volatility | 9.76% | 13.54% | 13.29% | 3.01% |

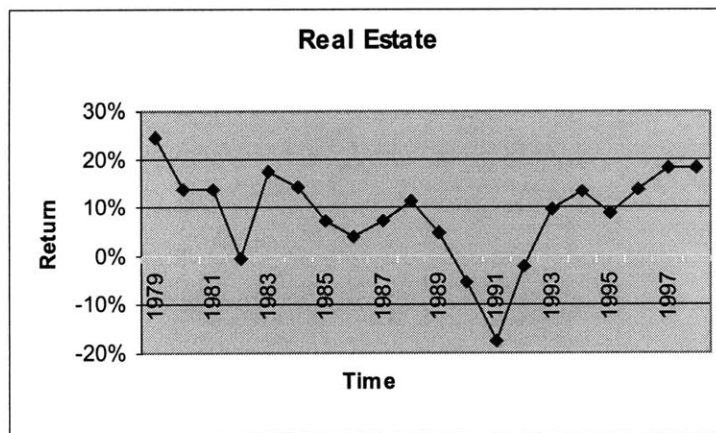
Source: NCREIF (2002) and Ibbotson Associates (2002)

However according to Brealey and Meyers, "Risk is best judged in a portfolio context. The effective risk of any security cannot be judged by any examination of that security alone."³⁶ This concept is very important and is the basis of this research.

5.2) Periodic Return and Risk

From 1979 to 1998, the real estate assets' average return was **8.81%** and its volatility was **9.76%**. The graph shows the cycles of the real estate industry and the downturns at the beginning of the 80's and the 90's.

Exhibit 5.2.1: Real Estate Returns (1979-1998)



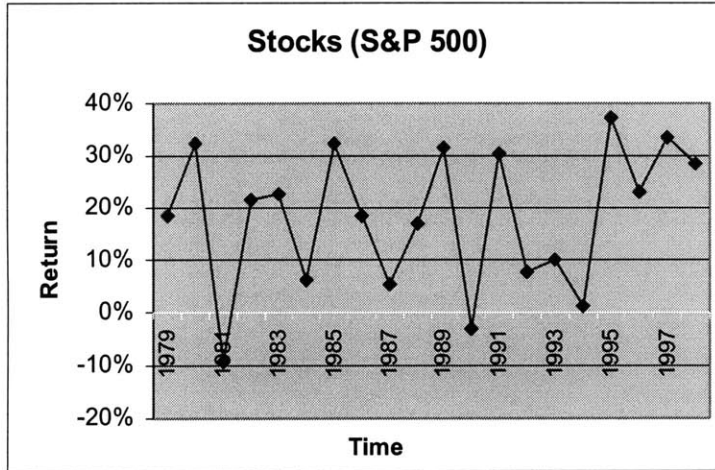
³⁵ Geltner and Miller. 551

³⁶ Richard Brealey and Stewart Myers. *Principles of Corporate Finance*. (Boston: Irwin McGraw Hill) 179

Source: NCREIF (2002)

For the stock market, the average return for the same period was **18.23%** and the volatility was **13.54%**. The graph indicates the higher volatility of the returns typical of the stock market.

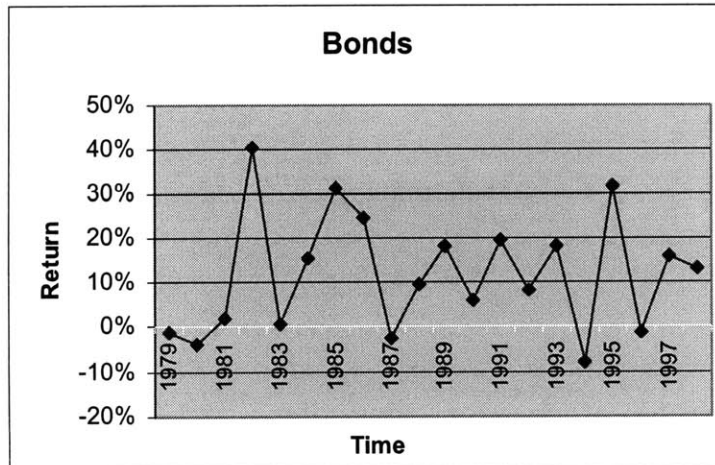
Exhibit 5.2.2: Stock Market Returns (1979-1998)



Source: Ibbotson and Associates (2002)

During the same 20-year period, the bond market average return was **11.27%** and the volatility was **13.29%**. During the 1980s the bond market went through a period of instability. This is why the volatility is remarkably high.

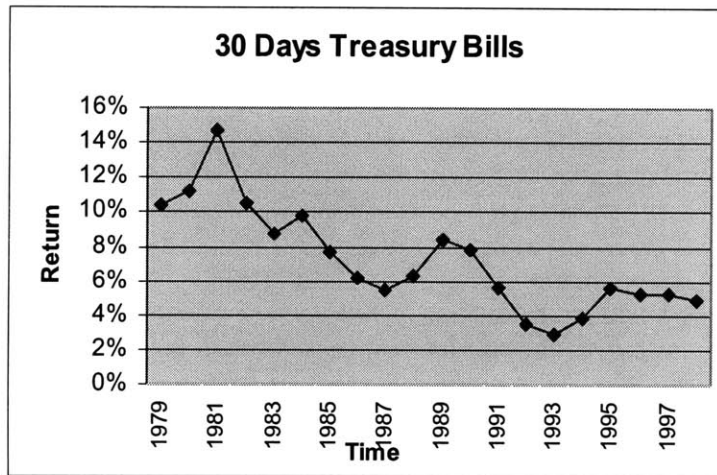
Exhibit 5.2.3: Bond Market Returns (1979-1998)



Source: Ibbotson Associates (2002)

In the case of Treasury Bills, the return observed during the 20-year period was **7.21%** and the volatility was **3.01%**.

Exhibit 5.2.4: Treasury Bills (1979-1998)



Source: Ibbotson Associates (2002)

5.3) Covariance

Covariance is a statistical measure of the relationship between two random variables. It is a measure of the degree to which such variables move together.³⁷

The formula for covariance is the following:³⁸

$$COV_{1,2} = \frac{\sum_{t=1}^T (r_{t1} - Er_1)^2 (r_{t2} - Er_2)^2}{T - 1}$$

The following table summarizes the covariances of the selected assets:

Exhibit 5.3.1: Covariance Matrix

| <i>Covariances</i> | Real Estate | Stocks | Bonds | Cash |
|--------------------|--------------------|---------------|--------------|-------------|
| Real Estate | 0.009041 | | | |
| Stocks | 0.000540 | 0.017407 | | |
| Bonds | -0.004806 | 0.007588 | 0.016779 | |
| Cash | 0.000538 | -0.000570 | -0.000217 | 0.000858 |

³⁷ Geltner and Miller. 552

³⁸ Geltner and Miller. 552

5.4) Correlation Coefficient

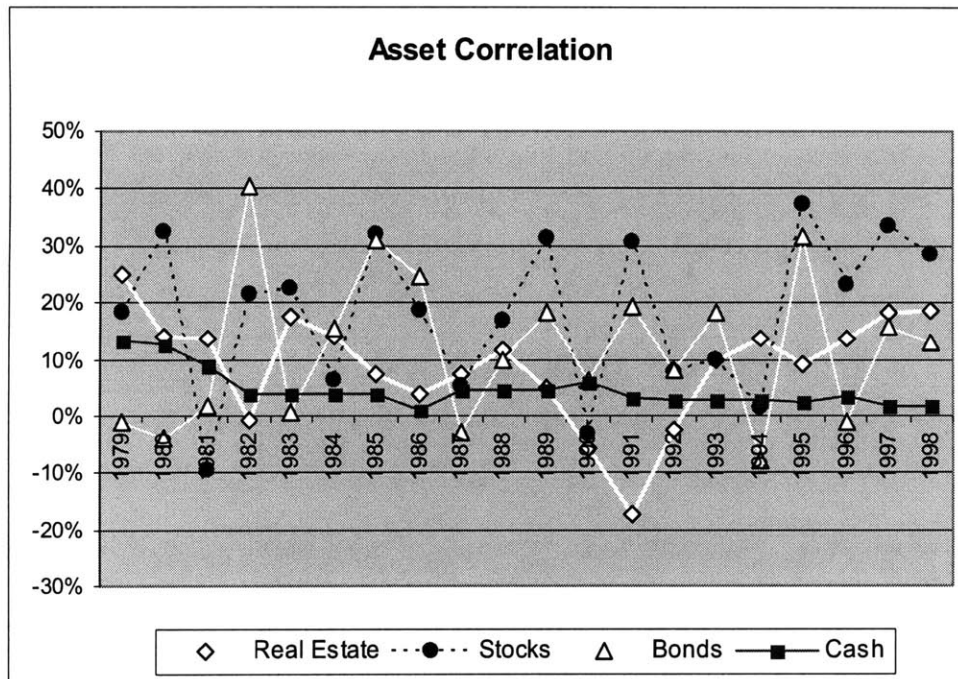
The correlation coefficient is a measure of the mutual variation between two random variables. According to Geltner, "The correlation coefficient rescales the covariance to facilitate comparisons among pairs of random variables." The correlation coefficient is bounded by the values +1 or -1. The correlation coefficient shows how useful a pair of assets is for diversification purposes. If the correlation is between 0 and 1, both assets move in the same direction, if it is 0 the assets are not related at all, and if it is between -1 and 0 the assets move in the opposite direction. For diversification purposes, low or negative correlations are preferred. (Geltner and Miller. 2001)

The formula for correlation between a pair of assets is:³⁹

$$COR_{1,2} = \frac{COV_{1,2}}{STD_1 STD_2}$$

The correlation observed for Real Estate, Stocks, Bonds, and Cash is illustrated in the following chart.

Exhibit 5.4.1: Asset Correlation (1979-1998)



³⁹ Geltner and Miller. 553

The following table summarizes the asset correlations of the selected assets:

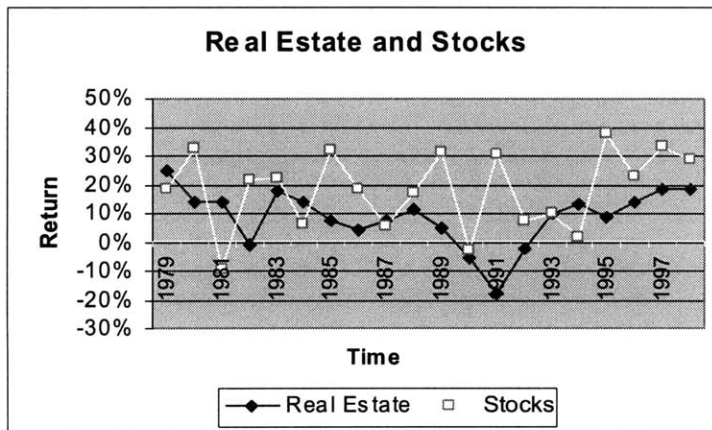
Exhibit 5.4.2: Correlation Matrix

| <i>Correlation</i> | Real Estate | Stocks | Bonds | Cash |
|--------------------|--------------------|---------------|--------------|-------------|
| Real Estate | 1.000000 | | | |
| Stocks | 0.043059 | 1.000000 | | |
| Bonds | -0.390195 | 0.443994 | 1.000000 | |
| Cash | 0.193269 | -0.147525 | -0.057138 | 1.000000 |

5.5) Real Estate: Correlation with Stocks, Bonds, and Cash

The following charts illustrate individually the correlation of Real Estate with Stocks, Bonds and T-Bills. As previously mentioned, a lower or negative correlation is preferred for diversification purposes.

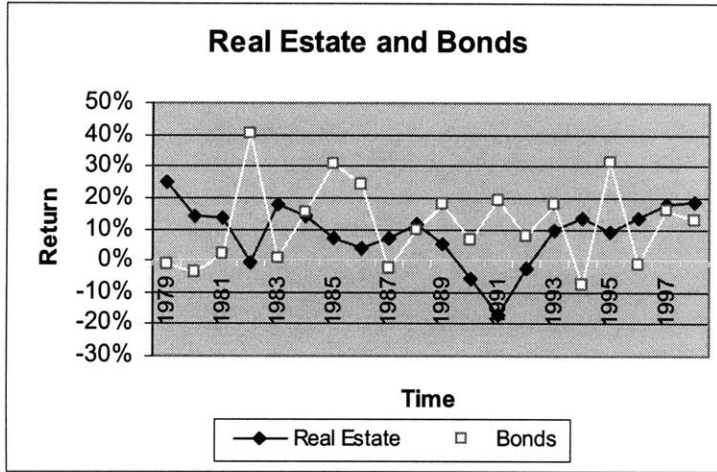
Exhibit 5.5.1: Correlation of Real Estate and Stocks (1979-1998)



Source: NCREIF (2002) and Ibbotson Associates (2002)

In this sense, real estate assets present a correlation of **0.043059** with Stocks. This level of correlation (almost 0) is considered good for diversification purposes.

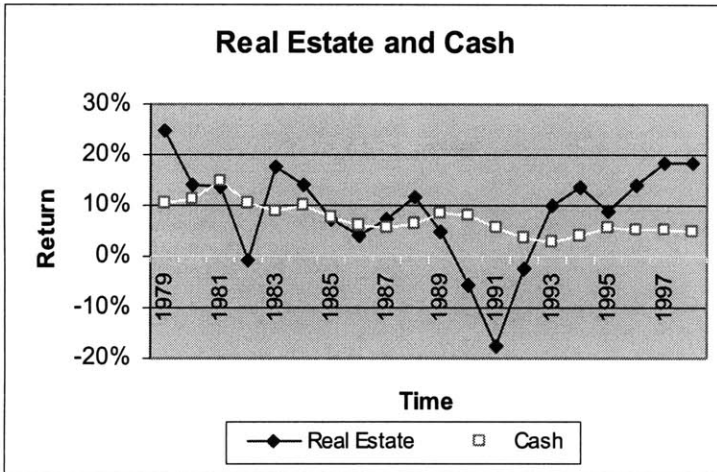
Exhibit 5.5.2: Correlation of Real Estate with Bonds (1979-1998)



Source: NCREIF (2002) and Ibbotson Associates (2002)

The correlation of Real Estate with the Bond Market is still very low, **0.1932269**.

Exhibit 5.5.3: Correlation of Real Estate and Cash - 30-day T-Bills (1979-1998)

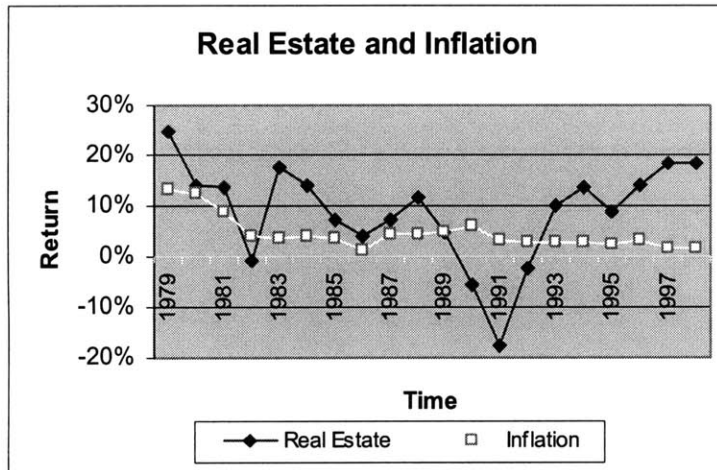


Source: NCREIF (2002) and Ibbotson Associates (2002)

The correlation of Real Estate with Cash is **-0.390195**. It is excellent for diversification purposes.

Although, the correlation between Real Estate and inflation was not measured, it is included in the following chart and shows Real Estate may be considered as an inflation hedge. The correlation coefficient is **0.290828512**.

Exhibit 5.5.4: Real Estate and Inflation – CPI (1979-1998)



Source: NCREIF (2002) and US Treasury Department (2002)

5.6) Optimization Program Basics

As seen with the preceding portfolio analysis return, risk (volatility), covariance, and correlation are the four chief components that help analyze the four-asset portfolio. Specifically these four components help create an optimization program. This program incorporates the assets selected and analyzes them by their asset weights against the risk and return associated with each asset to generate an optimum portfolio. The optimization program is also used to evaluate current asset weights and their portfolio risk and return.

6) Optimum Portfolio

As previously discussed the optimization program identifies opportunities for diversification.⁴⁰ As it was explained through the simple example of Companies A and B in Chapter 5, the program combines the return, return volatility, and correlation of the four assets (Real Estate, Stocks, Bonds, and Cash) in order to determine the optimum allocation among the selected assets.

There are two constraints used within the program. First, short positions are not allowed. This means that none of the assets can have a negative allocation. Second, the minimum allocation per asset is 5%. This means that an investor must invest in all four assets at a minimum of 5%. This minimum requirement automatically creates a maximum allocation of 85%.

After incorporating these elements and general constraints three scenarios are evaluated:

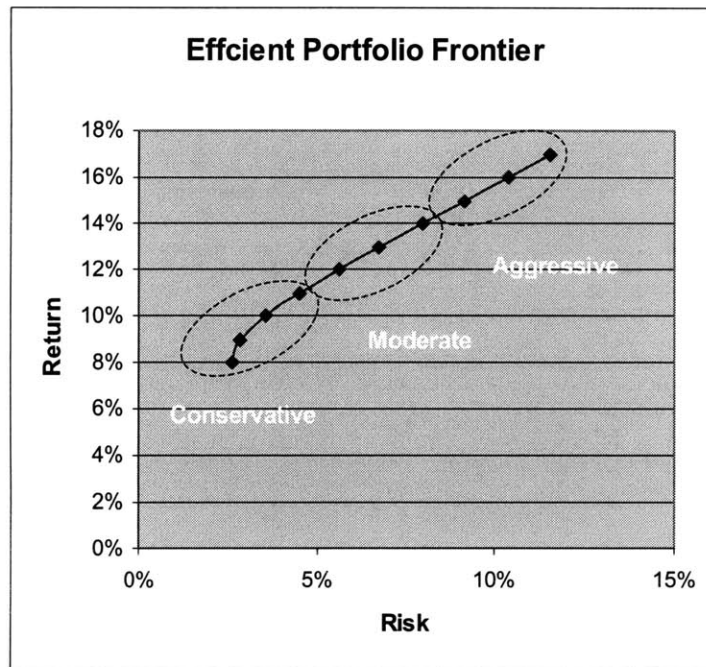
- A) Cash is considered a risky asset and its maximum allocation in the portfolio is not constrained;
- B) Cash is considered a risky asset and its maximum allocation in the portfolio is constrained to a limit of 10%; and
- C) Cash is not considered a risky asset and it is not included in the portfolio.

6.1) No Cash Asset Allocations Constraint

In this scenario cash is considered a risky asset and there is no maximum allocation. With this scenario, the optimizer model yields the following efficient portfolio frontier. The efficient frontier represents all asset combinations that maximize the return and minimize the risk. For any given return volatility the efficient frontier maximizes the expected return, and for any given expected return the efficient frontier minimizes the risk. (Markowitz, 1952)

⁴⁰ The optimization program was constructed on an Excel spreadsheet. The program links weight, return and volatility tables with correlation and covariance matrixes, and applies the solver function to maximize portfolio returns or minimize portfolio volatilities by solving for the best combination of assets in the portfolio. The solver function includes established constraints for each case.

Exhibit 6.1.1: Efficient Portfolio Frontier – No Cash Allocations Constraint



An investor should be indifferent to investing at any point on the frontier. Aggressive investors, willing to take more risk, will prefer asset combinations represented at the upper level of the efficient frontier. Moderate investors will prefer asset combinations represented at the middle level along efficient frontier. Lastly, conservative investors will prefer asset combinations represented at the lower end of the efficient frontier.

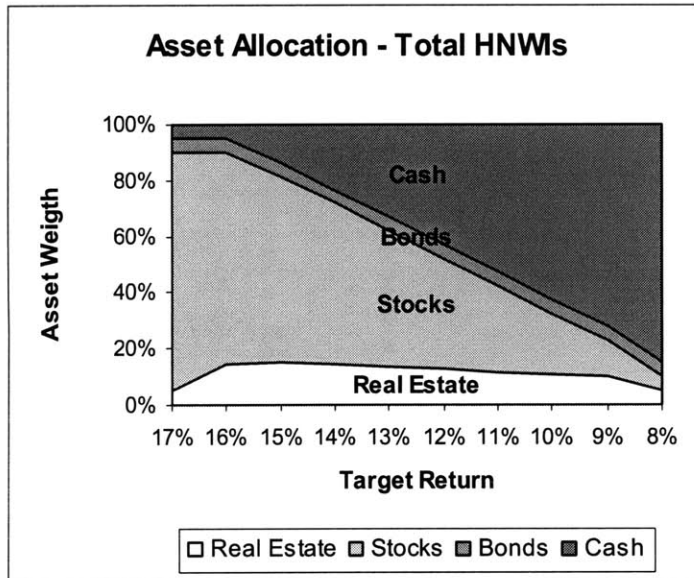
The optimum allocations generated by the optimization program include the following:

Exhibit 6.1.2: Optimum Asset Allocation – No Cash Allocation Constraint

| Return | Volatility | Optimum Asset Allocation | | | |
|--------|------------|--------------------------|--------|-------|-------|
| | | Real Estate | Stocks | Bonds | Cash |
| 17% | 11.52% | 5.0% | 85.0% | 5.0% | 5.0% |
| 16% | 10.37% | 14.4% | 75.6% | 5.0% | 5.0% |
| 15% | 9.15% | 14.9% | 66.4% | 5.0% | 13.6% |
| 14% | 7.95% | 14.2% | 57.4% | 5.0% | 23.4% |
| 13% | 6.77% | 13.4% | 48.5% | 5.0% | 33.1% |
| 12% | 5.62% | 12.6% | 39.5% | 5.0% | 42.9% |
| 11% | 4.54% | 11.8% | 30.6% | 5.0% | 52.6% |
| 10% | 3.57% | 11.0% | 21.6% | 5.0% | 62.4% |
| 9% | 2.84% | 10.4% | 12.5% | 5.4% | 71.8% |
| 8% | 2.61% | 5.0% | 5.0% | 5.0% | 85.0% |

The optimum Real Estate allocation ranges from **5%** (minimum threshold requirement) to **14.9%**. The maximum Real Estate asset allocation occurs at the target return level of **14%** with a volatility of **7.95%**.

Exhibit 6.1.3: Asset Allocation Map – No Cash Asset Allocation Constraint



At low levels of target returns (conservative investors), the optimization program tends to assign higher allocation levels for cash. As a result the maximum allocation is 85%.

High allocations of cash are the result of the low volatility that the 30-Day Treasury Bill Index has and its combination with the other assets with relatively moderate or high volatilities.

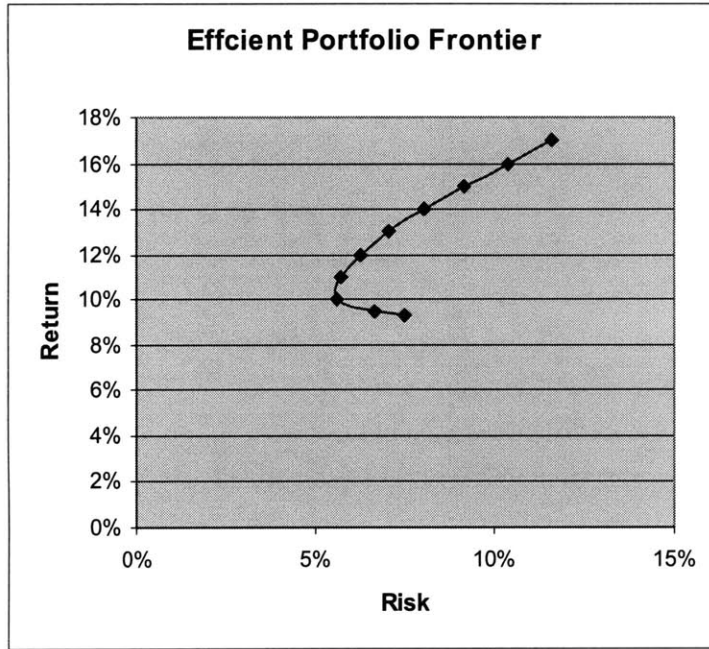
Cash allocations of 85% in a portfolio are unlikely, or at least rare. In fact, the average cash allocation observed in the “Survey of Consumer Finances” ranged from 7.6% to 11.1% (excluding the high and the low).

6.2) Constrained Cash Asset Allocation

In this case, cash is considered a risky asset and its maximum allocation in the portfolio is constrained to a limit of 10%. This limit is consistent with the range of cash allocations observed within the SCF. The objective is to replicate real portfolios observed in the market.

The following exhibit shows the efficient frontier with the 10% Cash constraint.

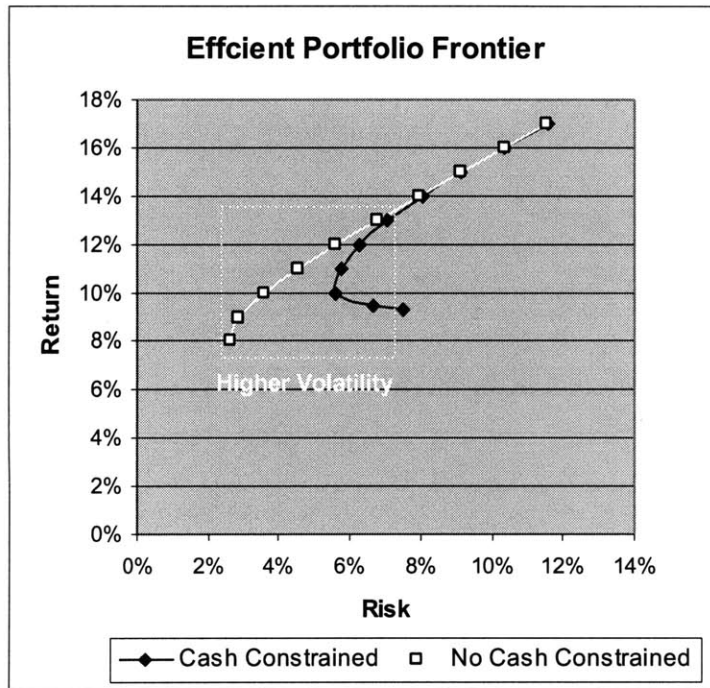
Exhibit 6.2.1: Efficient Portfolio Frontier – Constraint Cash Asset Allocation



As mentioned before, an investor should be indifferent to investing at any point along the frontier.

The following exhibit highlights the difference between the efficient frontiers of portfolios with and without cash constraints.

Exhibit 6.2.2: Comparison - Cash vs. Cash Constrained



As a result of the 10% Cash constraint, all possible outcomes become riskier at the lower level of the curve. However, the new scenario represents more realistic current allocations than the non-constrained Cash allocation.

The suggested allocations after running the optimizer model include the following:

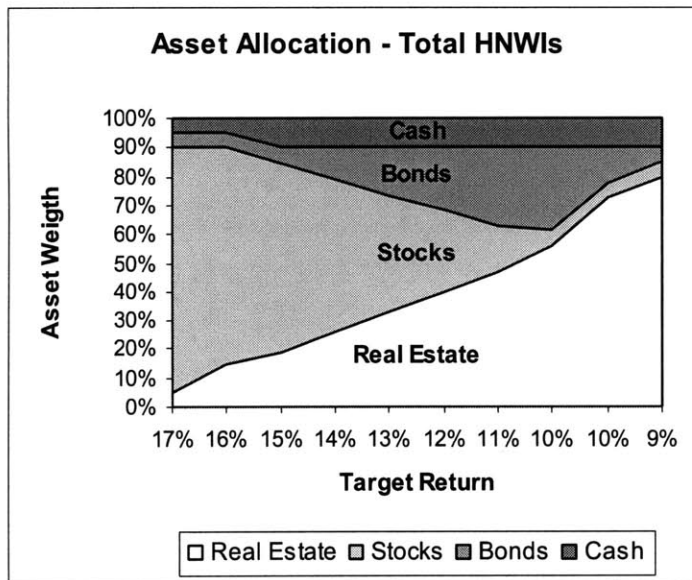
Exhibit 6.2.3: Optimum Asset Allocation – Cash Asset Allocation Constrained

| Optimum Asset Allocation | | | | | | |
|--------------------------|------------|-------------|--------|-------|-------|--|
| Return | Volatility | Real Estate | Stocks | Bonds | Cash | |
| 17.00% | 11.60% | 5.0% | 85.6% | 5.0% | 5.0% | |
| 16.00% | 10.37% | 14.4% | 75.6% | 5.0% | 5.0% | |
| 15.00% | 9.15% | 18.8% | 65.6% | 5.6% | 10.0% | |
| 14.00% | 8.05% | 25.8% | 53.2% | 11.0% | 10.0% | |
| 13.00% | 7.06% | 32.8% | 40.9% | 16.4% | 10.0% | |
| 12.00% | 6.27% | 39.7% | 28.5% | 21.8% | 10.0% | |
| 11.00% | 5.75% | 46.7% | 16.1% | 27.2% | 10.0% | |
| 10.00% | 5.61% | 56.2% | 5.0% | 28.8% | 10.0% | |
| 9.50% | 6.65% | 72.6% | 5.0% | 12.4% | 10.0% | |
| 9.27% | 7.49% | 80.0% | 5.0% | 5.0% | 10.0% | |

Optimum Real Estate allocation ranges from **5%** (minimum constraint) to **80%** (automatic maximum constraint). The maximum Real Estate asset allocation is observed at the lowest target return level of **9.27%**.⁴¹

High allocations of real estate (at low target returns) are the result of the low volatility this asset has in combination with other assets of moderate or high volatilities.

Exhibit 6.2.4: Asset Allocation Map – Cash Asset Allocation Constrained



6.3) Cash is Not a Risky Asset

The last scenario is when Cash is not considered a risky asset and it is not included in the portfolio. The scenarios described before approach the optimum portfolio using the Markowitz framework and including Cash as a risky asset.

Instead, this scenario will apply the Separation Theorem and the Sharpe ratio to identify the optimum portfolio. The Separation Theorem states, “All investors (no matter what their risk preference is) will prefer combinations of a riskless asset and a single asset portfolio.” The investors’ risk preferences can be met by adjusting the position in the riskless asset only, by borrowing more (aggressive investors) or lending more (conservative investors) so as to meet the appropriate expected return. (Brealey and Myers. 2000)

⁴¹ The optimization program produces errors when the target return is lower than 9.27%. The constraints imposed on the optimization program do not allow the solver function for an optimum allocation below such a level.

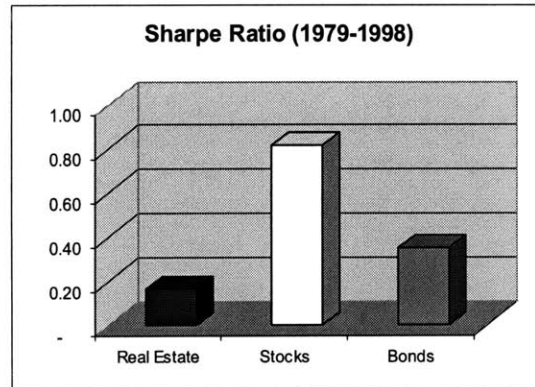
In this case, the optimal combination of assets (optimum portfolio) can be established through the application of the Sharpe Ratio.⁴² The Sharpe Ratio is applied to the results of the optimization program. This ratio is a measure that shows the investment performance of a portfolio. It quantifies the risk premium of a portfolio linked with the compensation that an investor will have over a risk free investment. The formula of the Sharpe Ratio is the following:⁴³

$$\frac{\text{(Return of the Portfolio – Risk Free Asset)} / \text{Standard Deviation of the Portfolio}}$$

As an example, the Sharpe ratio of Real Estate, Stocks and Bonds, as portfolios by themselves is calculated. The portfolio returns of real estate as a single asset portfolio were, on average, **8.21%** and the standard deviation was **9.76%**. Considering Treasury Bills as a riskless investment with a return of **7.21%**,⁴⁴ the Sharpe ratio for Real Estate is **0.1635**.⁴⁵ Repeating the same process for the other two assets the results are: Stocks - **0.8134** and Bonds - **0.3505**.⁴⁶

In the following graph, stocks (as a single portfolio) are the asset with the highest Sharpe ratio.

Exhibit 6.3.1: Sharpe Ratio: Real Estate, Stocks, Bonds



Investment decisions should not be made on single asset Sharpe Ratios since assets are typically invested in portfolios. An investment portfolio is chosen by the asset combination and correlation.

⁴² Alternatively, known as Reward to Variability Ratio. The Sharpe Ratio is ex-post risk-adjusted measure of portfolio performance where risk is defined as the standard deviation of the portfolio's returns. Mathematically, over an evaluation period, it is the excess return of a portfolio divided by the standard deviation of the portfolio's returns. (Sharpe, Alexander, and Bailey. 1999)

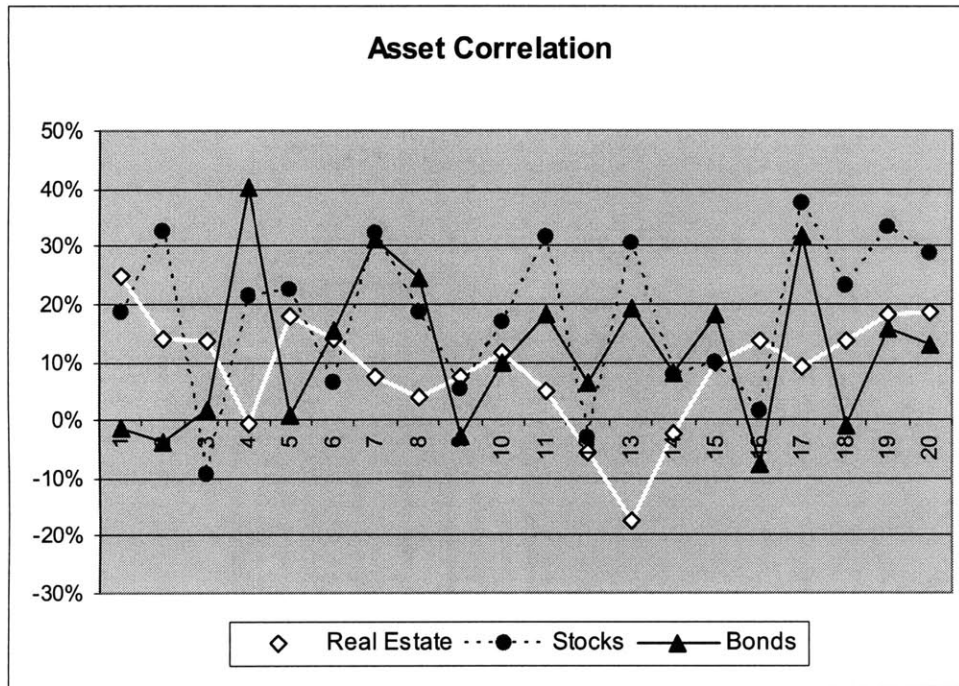
⁴³ Geltner and Miller. 537

⁴⁴ Based on the 30-Day Treasury Bill Index - average of twenty years of history (1979-1998). (Ibbotson and Associates. 2002)

⁴⁵ $(8.21\% - 7.21\%) / 9.76\% = 0.1635$

⁴⁶ Note that Cash is not part of the asset selection any more. Instead it is considered a risk-free asset.

Exhibit 6.3.2: Asset Correlation: Without Cash



Source: NCREIF (2002) and Ibbotson Associates (2002)

The following tables show the values of correlation and covariance that were used in the optimization program:

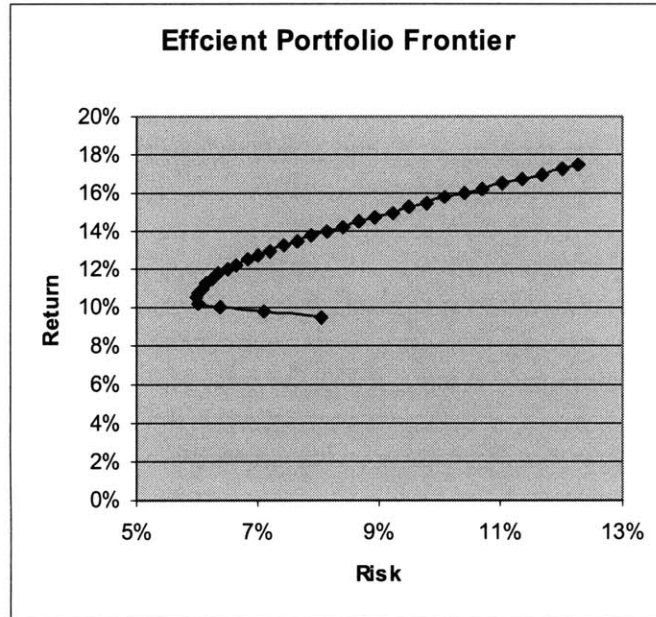
Exhibit 6.3.3: Correlation – Covariance Matrices

| <i>Correlation</i> | Real Estate | Stocks | Bonds |
|--------------------|-------------|----------|----------|
| Real Estate | 1.000000 | | |
| Stocks | 0.043059 | 1.000000 | |
| Bonds | -0.390195 | 0.443994 | 1.000000 |

| <i>Covariances</i> | Real Estate | Stocks | Bonds |
|--------------------|-------------|----------|----------|
| Real Estate | 0.008999 | | |
| Stocks | 0.000014 | 0.017729 | |
| Bonds | -0.005123 | 0.007919 | 0.017654 |

Utilizing the parameters previously described, the optimizer generated the following efficient frontier.

Exhibit 6.3.4: Efficient Portfolio Frontier – Cash is not a Risky Asset



An investor should be indifferent to investing at any point of the frontier. However, the portfolio with a highest Sharpe ratio is desired over the rest. The following table highlights each portfolio and its Sharpe Ratio.

Exhibit 6.3.5: Optimum Asset Allocation – Cash is not a Risky Asset

| Target Return | Volatility | Asset Allocation | | | Sharpe Ratio |
|---------------|------------|------------------|--------|-------|--------------|
| | | Real Estate | Stocks | Bonds | |
| 17.5% | 12.3% | 5.0% | 90.0% | 5.0% | 0.8368 |
| 17.3% | 12.0% | 7.0% | 88.0% | 5.0% | 0.8344 |
| 17.0% | 11.7% | 9.7% | 85.3% | 5.0% | 0.8373 |
| 16.8% | 11.4% | 12.3% | 82.7% | 5.0% | 0.8400 |
| 16.5% | 11.0% | 15.0% | 80.0% | 5.0% | 0.8423 |
| 16.3% | 10.7% | 17.6% | 77.4% | 5.0% | 0.8442 |
| 16.0% | 10.4% | 20.3% | 74.7% | 5.0% | 0.8455 |
| 15.8% | 10.1% | 22.7% | 71.9% | 5.4% | 0.8462 |
| 15.5% | 9.8% | 24.4% | 68.8% | 6.8% | 0.8463 |
| 15.3% | 9.5% | 26.1% | 65.7% | 8.2% | 0.8461 |
| 15.0% | 9.2% | 27.8% | 62.6% | 9.6% | 0.8452 |
| 14.8% | 8.9% | 29.5% | 59.5% | 11.0% | 0.8437 |
| 14.5% | 8.7% | 31.2% | 56.4% | 12.3% | 0.8415 |
| 14.3% | 8.4% | 33.0% | 53.3% | 13.7% | 0.8383 |
| 14.0% | 8.1% | 34.7% | 50.2% | 15.1% | 0.8341 |
| 13.8% | 7.9% | 36.4% | 47.1% | 16.5% | 0.8286 |
| 13.5% | 7.7% | 38.1% | 44.0% | 17.9% | 0.8217 |
| 13.3% | 7.4% | 39.8% | 40.9% | 19.3% | 0.8131 |
| 13.0% | 7.2% | 41.5% | 37.8% | 20.7% | 0.8027 |
| 12.8% | 7.0% | 43.2% | 34.7% | 22.1% | 0.7901 |
| 12.5% | 6.8% | 44.9% | 31.6% | 23.5% | 0.7751 |
| 12.3% | 6.7% | 46.7% | 28.4% | 24.9% | 0.7575 |
| 12.0% | 6.5% | 48.4% | 25.3% | 26.3% | 0.7371 |
| 11.8% | 6.4% | 50.1% | 22.2% | 27.7% | 0.7136 |
| 11.5% | 6.2% | 51.8% | 19.1% | 29.1% | 0.6870 |
| 11.3% | 6.1% | 53.5% | 16.0% | 30.5% | 0.6571 |
| 11.0% | 6.1% | 55.2% | 12.9% | 31.9% | 0.6241 |
| 10.8% | 6.0% | 56.9% | 9.8% | 33.3% | 0.5881 |
| 10.5% | 6.0% | 58.6% | 6.7% | 34.7% | 0.5494 |
| 10.3% | 6.0% | 63.3% | 5.0% | 31.7% | 0.5049 |
| 10.0% | 6.4% | 71.4% | 5.0% | 23.6% | 0.4365 |
| 9.8% | 7.1% | 79.6% | 5.0% | 15.4% | 0.3577 |
| 9.5% | 8.0% | 87.8% | 5.0% | 7.2% | 0.2843 |

The portfolio with the highest Sharpe Ratio includes **24.4%** Real Estate, **68.8%** Stocks, and **6.8%** Bonds. The highest Sharpe Ratio is **0.8463** and the level of return is **15.5%** while the risk is **9.8%**. The following chart outlines the relative location of the “Optimum Portfolio” along the efficient frontier.

Exhibit 6.3.6 Optimum Portfolio: Real Estate, Stocks and Bonds

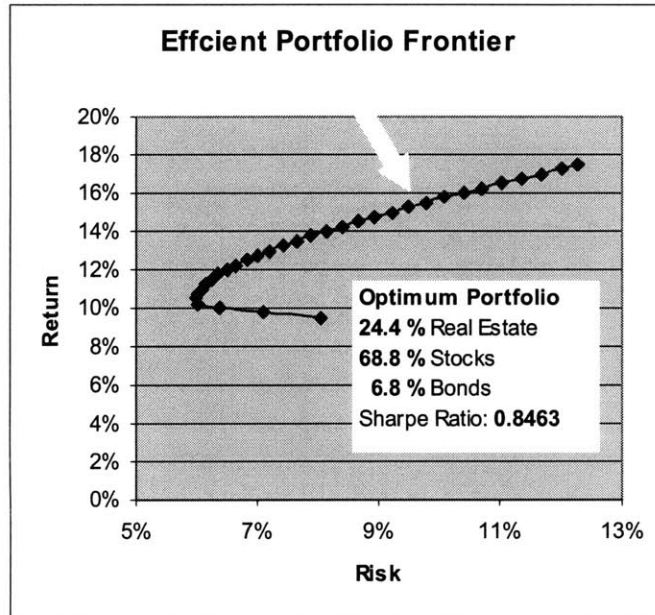
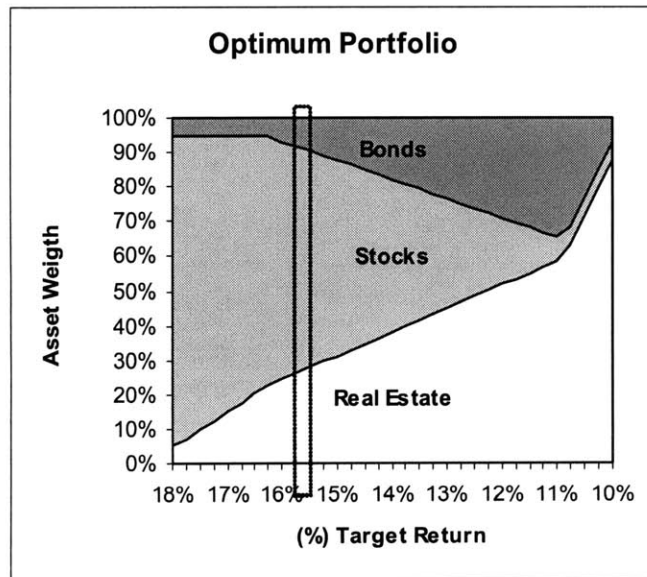


Exhibit 6.3.7: Asset Allocation Map – Cash is not a Risky Asset



According to the Separation Theorem an investor should satisfy his risk preferences by either borrowing or lending at the risk free rate.⁴⁷

⁴⁷ Brealey and Meyers. 194

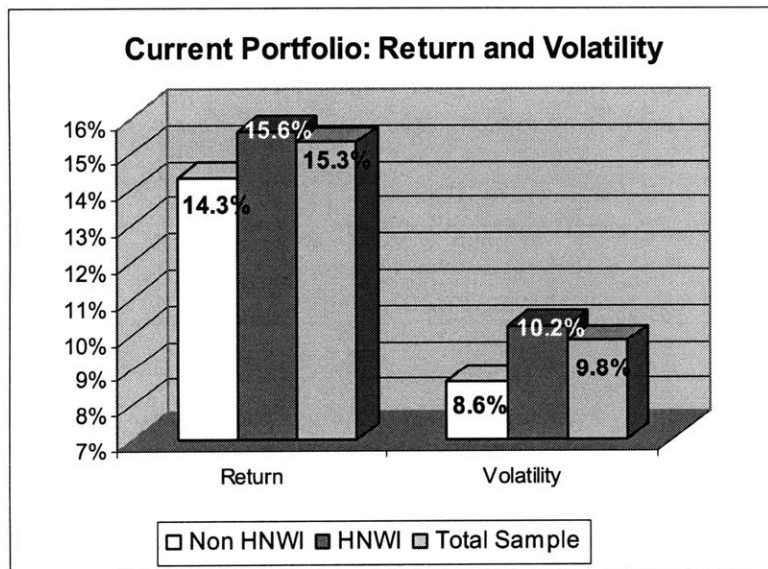
7) HNWI Current Portfolios: Risk and Return Preferences

Current allocations of the HNWIs in the SCF survey are processed through the optimization program. The program utilizes the same assumptions of Chapters 5 and 6. However the program does not calculate optimum portfolios but rather utilizes the weights of the current allocations to establish the risk and returns of the portfolios. The calculation of risk and returns of HNWI portfolios allows a basis of comparison to the optimal allocations generated in Chapter 6. Current HNWI portfolios are examined at a General level, By Net Worth Tier, By Risk Tolerance, and By Age Tier. All of the current allocations are based solely on the SCF sample.

7.1) Overall Sample

The following exhibit indicates the return and risk obtained by the Total Sample, the Non HNWI segment, and the HNWI individual segment. The portfolios of HNWIs are more aggressive than the Non HNWIs. This indicates that the level of risk tolerance increases with the level of net worth.

Exhibit 7.1.1: Current Portfolio - Return and Volatility



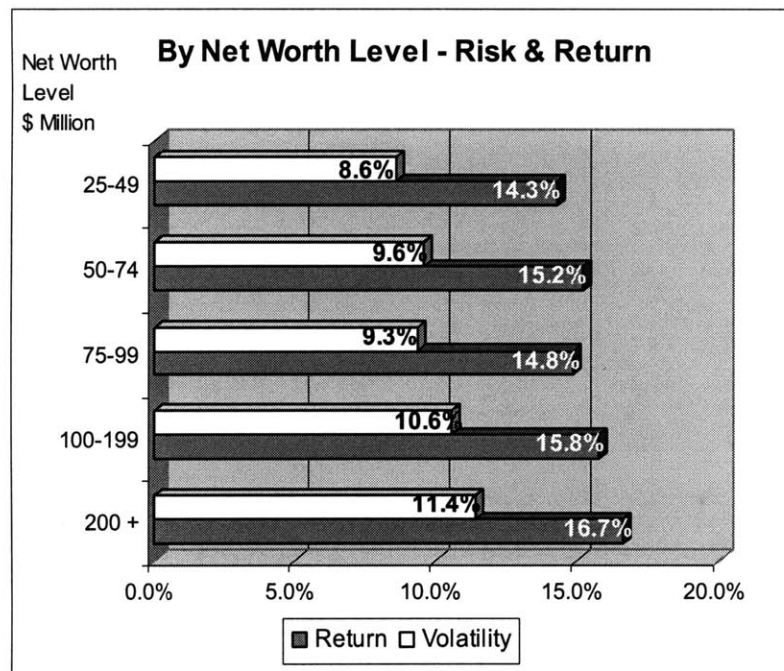
7.2) By Net Worth Tier

Net Worth is classified in five tiers that range from \$25 to \$200 million and above. The Net Worth Tiers include:

- \$25 to \$49 million
- \$50 to \$74 million
- \$75 to \$99 million
- \$100 to \$199 million
- More than \$200 million

As previously mentioned, the target returns and risks levels generally increase as net worth increases. The only exception is the \$50-\$74 million Tier.

Exhibit 7.2.1: Current Portfolio Risk and Return by Net Worth Tier



| Net-Worth (\$M) | Return | Volatility |
|-----------------|--------|------------|
| 200 + | 16.7% | 11.4% |
| 100-199 | 15.8% | 10.6% |
| 75-99 | 14.8% | 9.3% |
| 50-74 | 15.2% | 9.6% |
| 25-49 | 14.3% | 8.6% |

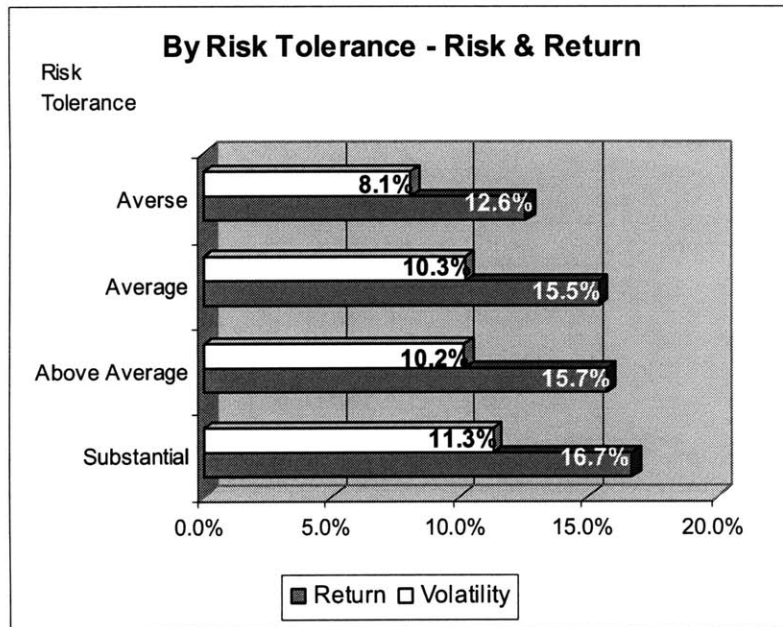
7.3) By Risk Tolerance

The risk tolerance reflects the level of risk that each investor is willing to take in order to obtain expected returns. The higher the net worth the less risk averse the investor is. In order to determine risk and return patterns, the analysis follows the classification for risk aversion established and assessed by the SCF. The risk tolerance is classified in four categories:

- Willing to take substantial risk to make substantial returns
- Willing to take above average risk and to make above average returns
- Willing to take average risk and to make average returns
- Not willing to take any risk

Portfolio returns range from **12.6%** for the most risk averse investors to **16.7%** for the least risk averse investors. The return volatility is consistent with returns and ranges from **8.1%** to **11.3%**.

Exhibit 7.3.1: Current Portfolio Risk and Return by Risk Tolerance



| <i>Risk Tolerance</i> | Return | Volatility |
|-----------------------|---------------|-------------------|
| Substantial | 16.7% | 11.3% |
| Above Average | 15.7% | 10.2% |
| Average | 15.5% | 10.3% |
| Averse | 12.6% | 8.1% |

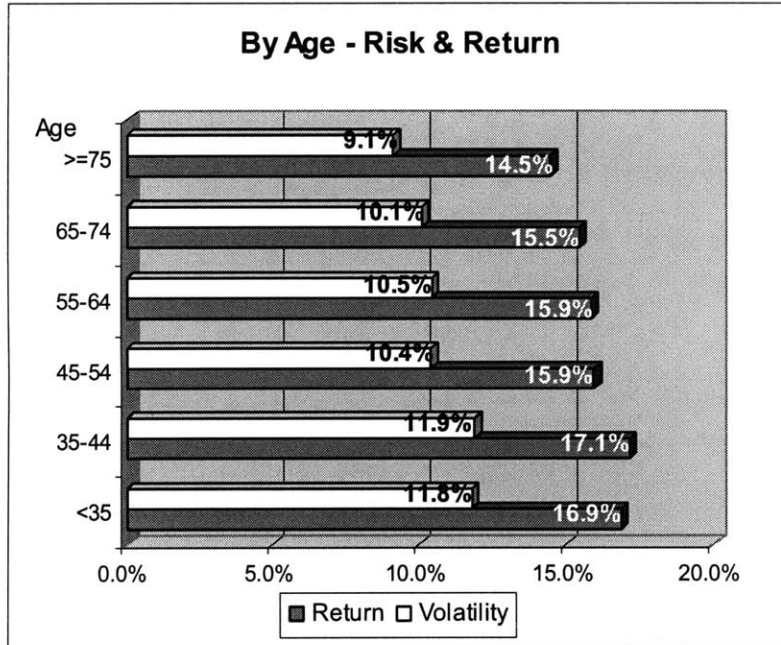
7.4) By Age Tier

The risk tolerance is classified in six categories:

- Less than 35 Years
- Between 35 and 44 Years
- Between 45 and 54 Years
- Between 55 and 64 Years
- Between 65 and 74 Years
- More than 75 Years

Portfolio returns range from **14.5%** for investors of 75 years old or more to **17.1%** for investors between 35-44 years. Risk follows the same pattern.

Exhibit 7.4.1: Current Portfolio Risk and return by Age Tier



| Age | Return | Volatility |
|-------|--------|------------|
| <35 | 16.9% | 11.8% |
| 35-44 | 17.1% | 11.9% |
| 45-54 | 15.9% | 10.4% |
| 55-64 | 15.9% | 10.5% |
| 65-74 | 15.5% | 10.1% |
| >=75 | 14.5% | 9.1% |

8) The Gap: Current versus Optimal Portfolios

The Gap is the difference between the current portfolio asset allocation (described in Chapter 7) with the optimum asset allocation (described in Chapter 6). The optimum allocation used in this comparison is Scenario B (maximum cash allocation of 10%). It is considered the most applicable due to the similarities with the current SCF average HNWI allocations. Although, Scenario B has some flaws at low target return levels, it is the most appropriate considering the average returns obtained from HNWI portfolios in Chapter 7 (moderate to high). Current versus optimal allocations are compared at a General level, By Net Worth Tier, By Risk Tolerance, and By Age Tier. Each case identifies if real estate assets are over invested or under invested.

8.1) Overall Sample

The current portfolio of HNWI has a return of **15.61%** with a volatility of **10.19%**. The asset allocation includes **6.5%** Real Estate, **67.0%** Stocks, **19.7%** Bonds, and **6.9%** Cash. This portfolio differs from that of Non HNWI where the return is **14.33%** with a volatility of **8.64%** and the asset allocation is **11.1%** Real Estate, **54.0%** Stocks, **21.2%** Bonds, and **13.7%** Cash.

Exhibit 8.1.1: Current Portfolio Allocation

| <i>Current Portfolio</i> | Real Estate | Stocks | Bonds | Cash |
|--------------------------|--------------------|---------------|--------------|-------------|
| Total Sample | 7.7% | 63.7% | 20.1% | 8.6% |
| HNWI | 6.5% | 67.0% | 19.7% | 6.9% |
| Non HNWI | 11.1% | 54.0% | 21.2% | 13.7% |

Source: Federal Reserve. Survey of Consumer Finances 1998

After running the optimizer in order to minimize risk of the current portfolio, the resultant allocation for HNWI's portfolios includes 15.4% Real Estate, 71.9% Stocks, 5% Bonds (minimum allowed), and 7.7% Cash. This new allocation represents the same level of target return (15.61%) with a decrease in the volatility of **29 basis points** (from 10.09% to 9.90%).

Exhibit 8.1.2: Same Level of Target Return - Minimum Risk Portfolio

| <i>Minimum Risk</i> | Real Estate | Stocks | Bonds | Cash |
|---------------------|--------------------|---------------|--------------|-------------|
| Total Sample | 16.2% | 68.8% | 5.0% | 10.0% |
| HNWI | 15.4% | 71.9% | 5.0% | 7.7% |
| Non HNWI | 24% | 57.3% | 9.2% | 10.0% |

Instead, if the goal is to maximize the return of the current portfolio, the resultant allocation includes **16%** Real Estate, **74%** Stocks, **5%** Bonds (minimum allowed), and **5%** Cash (minimum

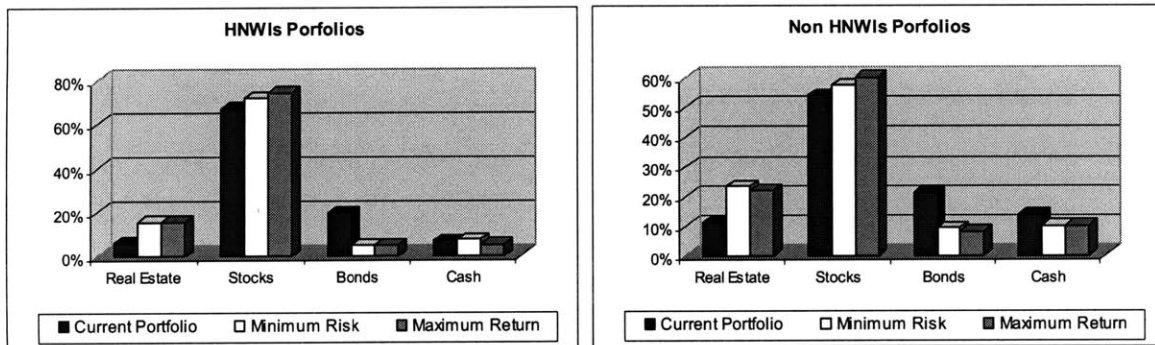
allowed). In this case, the volatility remains at the original level (10.09%) and the return increases **24 basis points**.

Exhibit 8.1.3: Same Level of Risk – Maximum Return Portfolio

| <i>Maximum Return</i> | Real Estate | Stocks | Bonds | Cash |
|-----------------------|--------------------|---------------|--------------|-------------|
| Total Sample | 15% | 71% | 5% | 8% |
| HNWI | 16% | 74% | 5% | 5% |
| Non HNWI | 22% | 60% | 8% | 10% |

The following charts show the difference between HNWIs and Non HNWIs portfolios, the results of minimizing the risk, and maximizing the return.

Exhibit 8.1.4: Asset Allocation Comparison: HNWI's and Non-HNWI's Portfolios



8.2) By Net Worth Tier

The current portfolio returns of HNWIs range from **14.3%** for the \$25-\$49 Million Tier to **16.7%** for the \$200 Million and above Tier. The highest allocation in real estate is **12.9%** for the \$25-\$49 Million Tier and the lowest is **1.8%** for the \$100-\$199 Million Tier. Stock allocations range between **57.3%** and **78.1%**, Bond allocations range between **15.5%** and **24.3%**, and Cash allocations range between **1.4%** and **12.0%**.

Exhibit 8.2.1 Current Portfolio Allocation by Net Worth Tier

| <i>Current Portfolio</i> | Real Estate | Stocks | Bonds | Cash |
|--------------------------|--------------------|---------------|--------------|-------------|
| 200+ | 3.9% | 78.1% | 16.6% | 1.4% |
| 100-199 | 1.8% | 67.6% | 23.1% | 7.6% |
| 75-99 | 11.3% | 57.3% | 24.3% | 7.1% |
| 50-74 | 8.1% | 64.2% | 16.5% | 11.1% |
| 25-49 | 12.9% | 53.4% | 21.8% | 12.0% |

Source: Federal Reserve. Survey of Consumer Finances 1998

The optimum allocation seeks two alternative objectives: 1) Minimize the risk, 2) Maximize the return. Two goals are inserted in the optimization program to identify differences between the current portfolio and the optimum portfolios:

Suggested Portfolio - Risk Minimizer

Suggested Portfolio - Return Maximizer

| Minimum Risk | Real Estate | Stocks | Bonds | Cash |
|--------------|-------------|--------|-------|-------|
| 200+ | 7.5% | 82.5% | 5.0% | 5.0% |
| 100-199 | 15.5% | 73.2% | 5.0% | 6.2% |
| 75-99 | 19.9% | 63.6% | 6.4% | 10.0% |
| 50-74 | 17.3% | 67.7% | 5.0% | 10.0% |
| 25-49 | 23.6% | 57.1% | 9.3% | 10.0% |

| Maximum Return | Real Estate | Stocks | Bonds | Cash |
|----------------|-------------|--------|-------|-------|
| 200+ | 5.8% | 84.2% | 5.0% | 5.0% |
| 100-199 | 12.9% | 77.1% | 5.0% | 5.0% |
| 75-99 | 17.6% | 67.4% | 5.0% | 10.0% |
| 50-74 | 15.5% | 69.5% | 5.0% | 10.0% |
| 25-49 | 22.1% | 59.7% | 8.2% | 10.0% |

Real Estate is over invested or under invested: (see Net Difference)

(+) sign = Under invested : Increase Real Estate Asset Weight by X

(-) sign = Over invested : Lower Real Estate Asset Weight by X

\$200 Million and Above

Current Allocation : 3.9%

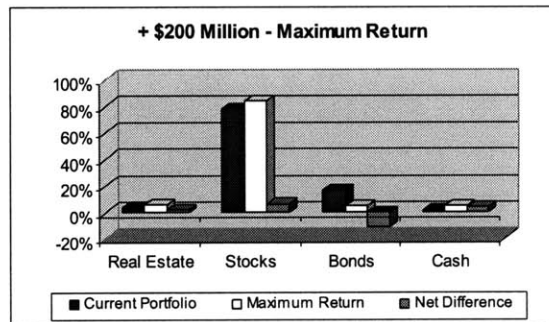
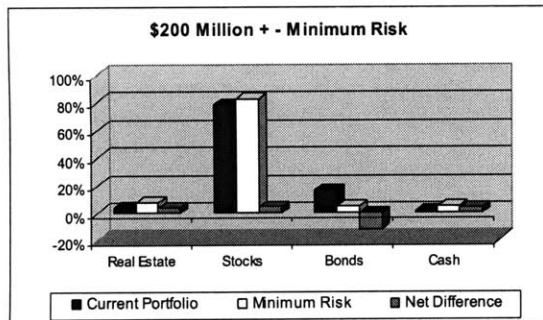
Current Allocation : 3.9%

Optimum Allocation : 7.5%

Optimum Allocation : 5.8%

Net Difference : 3.6%

Net Difference : 1.9%



\$100 – \$199 Million

Current Allocation : 1.8%

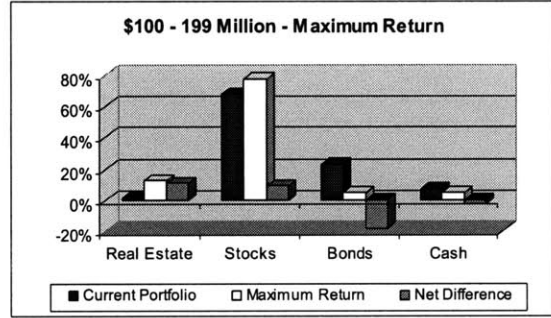
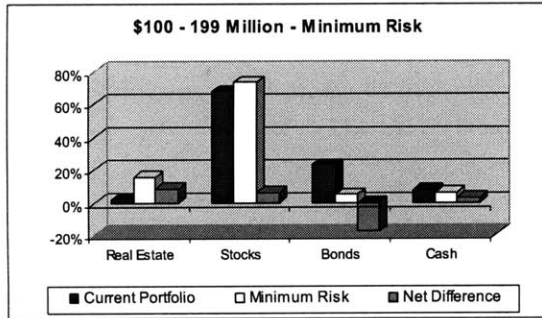
Current Allocation : 1.8%

Optimum Allocation : 15.5%

Optimum Allocation : 12.9%

Net Difference : 13.8%

Net Difference : 11.1%



\$75 – \$99 Million

Current Allocation : 11.3%

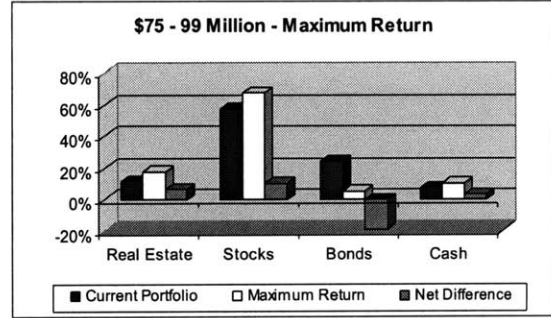
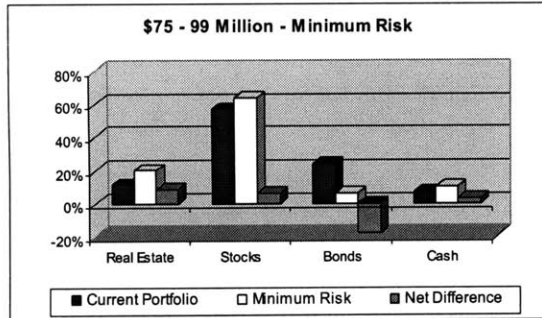
Current Allocation : 11.3%

Optimum Allocation : 19.9%

Optimum Allocation : 17.6%

Net Difference : 9.6%

Net Difference : 6.3%



\$50 – \$74 Million

Current Allocation : 8.1%

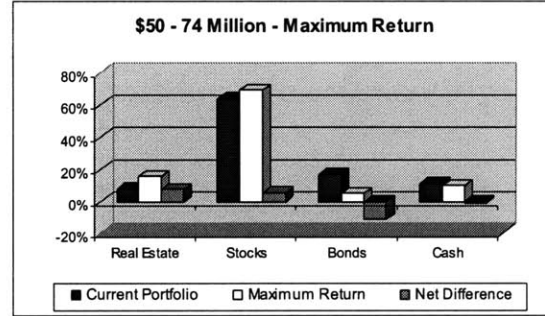
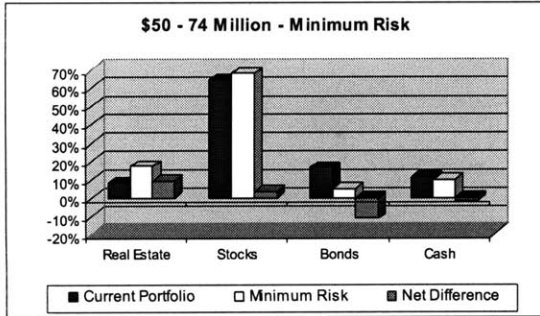
Current Allocation : 8.1%

Optimum Allocation : 17.3%

Optimum Allocation : 15.5%

Net Difference : 9.1%

Net Difference : 7.4%



\$ 25 – \$49 Million

Current Allocation : 12.9%

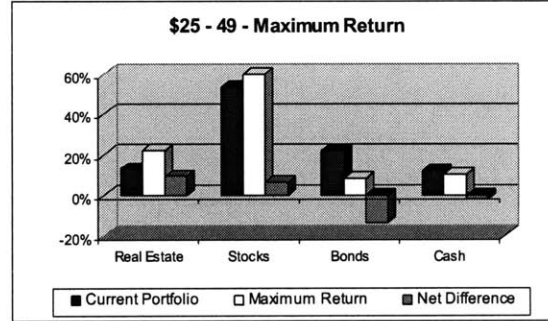
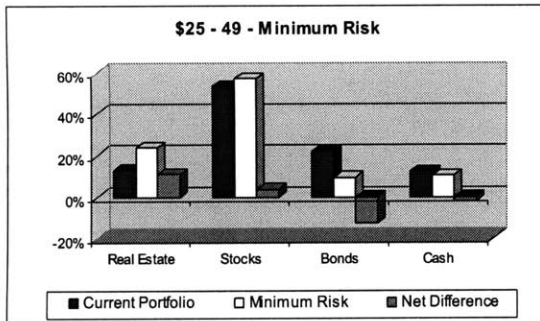
Current Allocation : 12.9%

Optimum Allocation : 23.6%

Optimum Allocation : 22.1%

Net Difference : 10.8%

Net Difference : 9.2%



8.3) By Risk Tolerance

The current portfolio returns of HNWI's range from **12.6%** for conservative investors (Averse) to **16.7%** for aggressive investors (Substantial). The highest allocation in real estate is **15.1%** for risk averse investors and the lowest is **4.5%** for the aggressive investors. Stock allocations range between **26.8%** and **82.1%**, Bond allocations range between **8.4%** and **47.7%**, and Cash allocations range between **5.0%** and **10.6%**.

Exhibit 8.3.1: Current Portfolio Allocation by Risk Tolerance

| <i>Current Portfolio</i> | Real Estate | Stocks | Bonds | Cash |
|--------------------------|--------------------|---------------|--------------|-------------|
| Substantial | 4.5% | 82.1% | 8.4% | 5.0% |
| Above Average | 7.0% | 70.3% | 14.2% | 8.5% |
| Average | 5.1% | 62.8% | 26.8% | 5.3% |
| Averse | 15.1% | 26.6% | 47.7% | 10.6% |

Source: Federal Reserve. Survey of Consumer Finances 1998

The optimum allocation seeks two alternative objectives: 1) Minimize the risk, 2) Maximize the return. Two goals are inserted in the optimization program to identify differences between the current portfolio and the optimum portfolios:

Suggested Portfolio - Risk Minimizer

| <i>Minimum Risk</i> | Real Estate | Stocks | Bonds | Cash |
|----------------------|--------------------|---------------|--------------|-------------|
| Substantial | 6.8% | 83.2% | 5.0% | 5.0% |
| Above Average | 15.5% | 73.0% | 5.0% | 6.5% |
| Average | 15.3% | 70.6% | 5.0% | 9.1% |
| Averse | 35.5% | 35.9% | 18.5% | 10.0% |

Suggested Portfolio - Return Maximizer

| <i>Maximum Return</i> | Real Estate | Stocks | Bonds | Cash |
|-----------------------|--------------------|---------------|--------------|-------------|
| Substantial | 6.4% | 83.6% | 5.0% | 5.0% |
| Above Average | 15.9% | 74.1% | 5.0% | 5.0% |
| Average | 15.7% | 74.3% | 5.0% | 5.0% |
| Averse | 25.4% | 53.8% | 10.8% | 10.0% |

Real Estate is over invested or under invested: (see Net Difference)

(+) sign = Under invested : Increase Real Estate Asset Weight by X

(-) sign = Over invested : Lower Real Estate Asset Weight by X

Substantial

Current Allocation : 4.5%

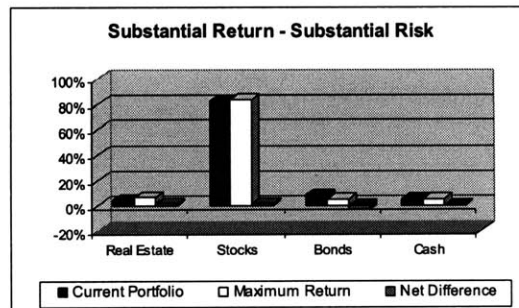
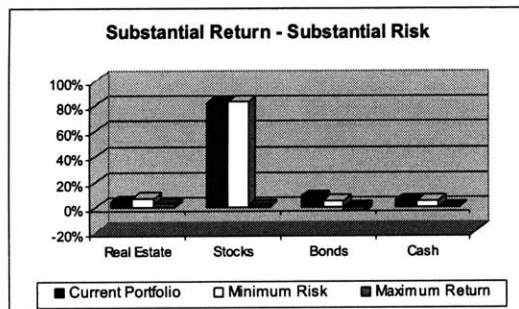
Current Allocation : 5.5%

Optimum Allocation : 6.8%

Optimum Allocation : 6.4%

Net Difference : 2.3%

Net Difference : 1.9%



Above Average Return and Risk

Current Allocation : 7.0%

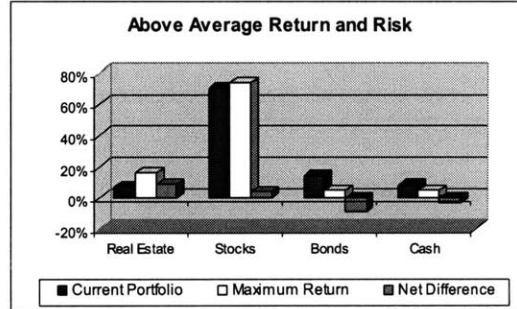
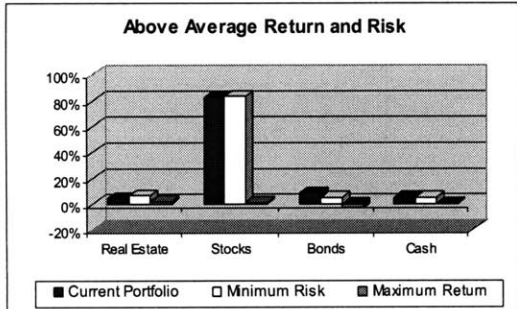
Current Allocation : 7.0%

Optimum Allocation : 15.5%

Optimum Allocation : 15.7%

Net Difference : 8.5%

Net Difference : 10.6%



Average Return and Risk

Current Allocation : 5.1%

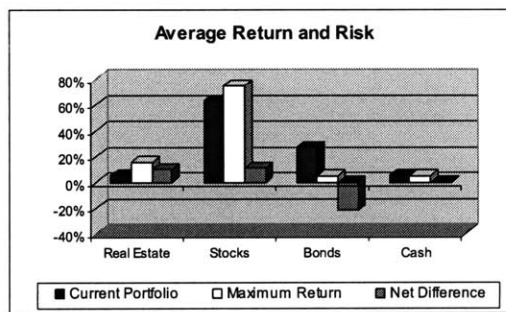
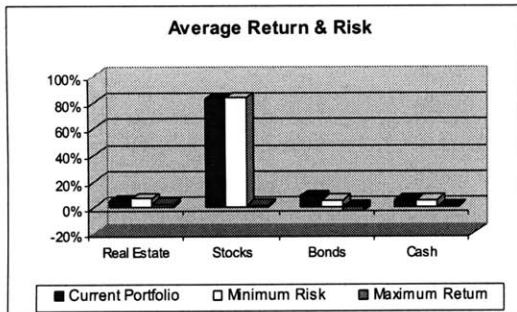
Current Allocation : 5.1%

Optimum Allocation : 15.3%

Optimum Allocation : 15.7%

Net Difference : 10.2%

Net Difference : 10.6%



Risk Averse

Current Allocation : 15.1%

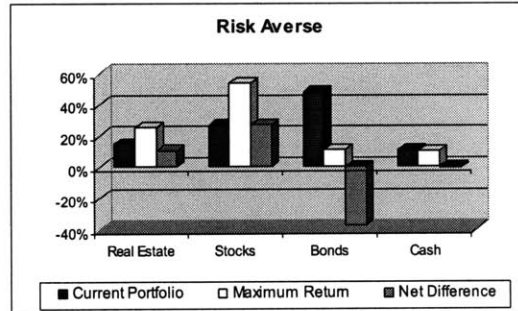
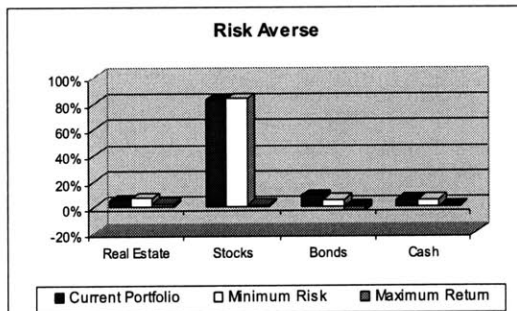
Current Allocation : 15.1%

Optimum Allocation : 35.5%

Optimum Allocation : 25.4%

Net Difference : 20.4%

Net Difference : 10.3%



8.4) By Age Tier

The current portfolio returns of HNWI's range from **14.48%** for the segment of 75 Years and above to **17.14%** for the segment of 35-44 Years. The highest allocation in real estate is **7.6%** for the segment of 75 Years and above and the lowest is **0.0%** for the segment of less than 35 Years. Stock allocations range between **7.6%** and **86.6%**, Bond allocations range between **7.6%** and **28.3%**, and Cash allocations range between **1.9%** and **11.3%**.

Exhibit 8.4.1: Current Portfolio Allocation by Age Tier

| <i>Current Portfolio</i> | Real Estate | Stocks | Bonds | Cash |
|--------------------------|--------------------|---------------|--------------|-------------|
| <35 | 0.0% | 80.0% | 18.1% | 1.9% |
| 35-44 | 2.0% | 86.6% | 7.6% | 3.8% |
| 45-54 | 6.9% | 73.4% | 11.6% | 8.2% |
| 55-64 | 6.6% | 69.5% | 18.9% | 5.1% |
| 65-74 | 6.4% | 64.1% | 23.1% | 6.4% |
| >=75 | 7.6% | 52.9% | 28.3% | 11.3% |

Source: Federal Reserve. Survey of Consumer Finances 1998

The optimum allocation seeks two alternative objectives: 1) Minimize the risk, 2) Maximize the return. Two goals are inserted in the optimization program to identify differences between the current portfolio and the optimum portfolios:

Suggested Portfolio - Risk Minimizer

| <i>Minimum Risk</i> | Real Estate | Stocks | Bonds | Cash |
|---------------------|--------------------|---------------|--------------|-------------|
| <35 | 5.2% | 84.8% | 5.0% | 5.0% |
| 35-44 | 5.0% | 86.4% | 5.0% | 5.0% |
| 45-54 | 15.0% | 75.0% | 5.0% | 5.0% |
| 55-64 | 15.6% | 74.0% | 5.0% | 5.3% |
| 65-74 | 15.3% | 70.5% | 5.0% | 9.2% |
| >=75 | 22.5% | 59.1% | 8.4% | 10.0% |

Suggested Portfolio - Return Maximizer

| <i>Maximum Return</i> | Real Estate | Stocks | Bonds | Cash |
|-----------------------|--------------------|---------------|--------------|-------------|
| <35 | 5.0% | 85.0% | 5.0% | 5.0% |
| 35-44 | 5.0% | 86.4% | 5.0% | 5.0% |
| 45-54 | 14.0% | 76.0% | 5.0% | 5.0% |
| 55-64 | 13.7% | 76.3% | 5.0% | 5.0% |
| 65-74 | 15.8% | 73.4% | 5.0% | 5.9% |
| >=75 | 19.0% | 65.2% | 5.8% | 10.0% |

Real Estate is over invested or under invested: (see Net Difference)

(+) sign = Under invested : Increase Real Estate Asset Weight by X

(-) sign = Over invested : Lower Real Estate Asset Weight by X

Less than 35 Years

Current Allocation : 0.0%

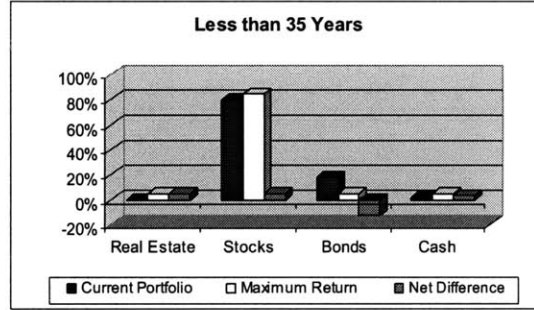
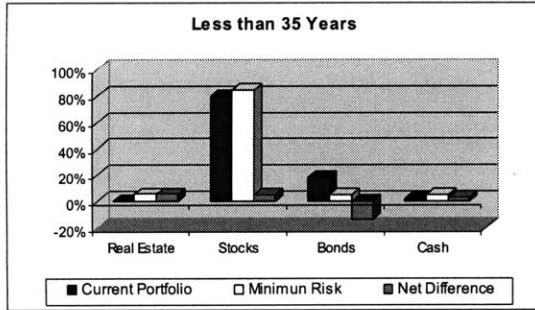
Current Allocation : 0.0%

Optimum Allocation : 5.2%

Optimum Allocation : 5.0%

Net Difference : 5.2%

Net Difference : 5.0%



Between 34 and 44 Years

Current Allocation : 2.0%

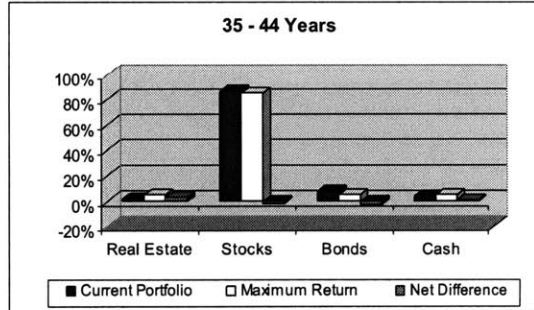
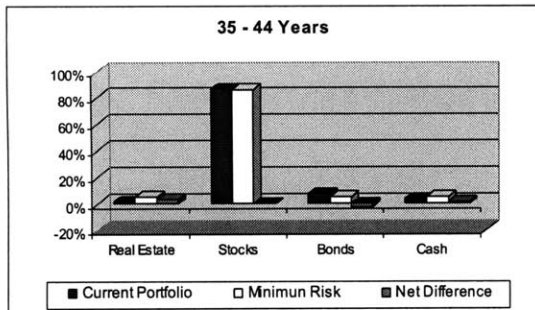
Current Allocation : 2.0%

Optimum Allocation : 5.0%

Optimum Allocation : 5.0%

Net Difference : 3.0%

Net Difference : 3.0%



Between 45 and 54 Years

Current Allocation : 6.9%

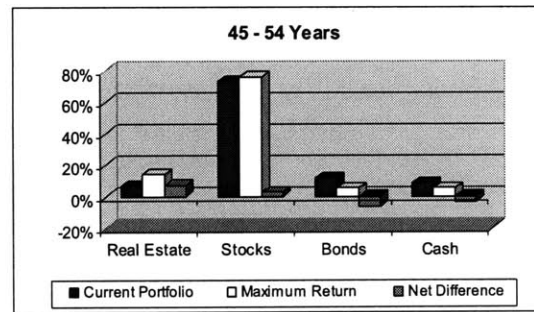
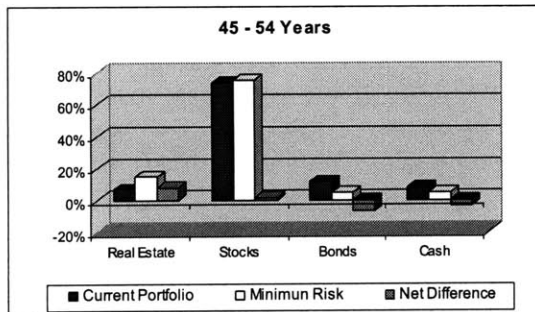
Current Allocation : 6.9%

Optimum Allocation : 15.0%

Optimum Allocation : 14.0%

Net Difference : 8.1%

Net Difference : 7.2%

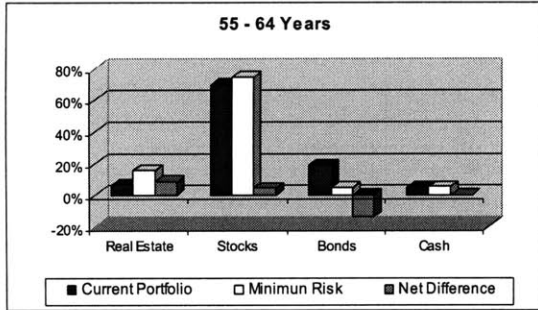


Between 55 and 64 Years

Current Allocation : 6.6%

Optimum Allocation : 15.6%

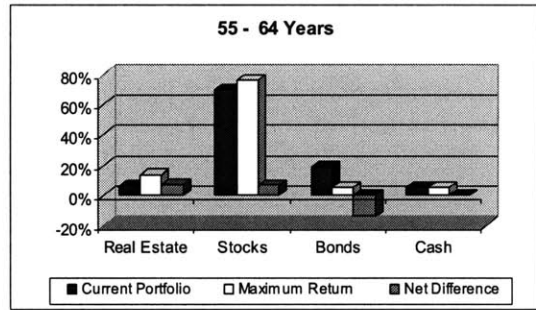
Net Difference : 9.1%



Current Allocation : 6.6%

Optimum Allocation : 13.7%

Net Difference : 7.2%

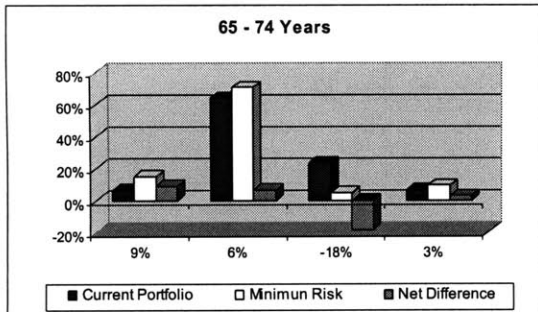


Between 65 and 74 Years

Current Allocation : 6.4%

Optimum Allocation : 22.5%

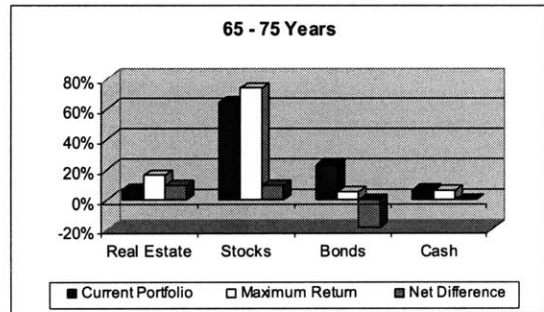
Net Difference : 8.9%



Current Allocation : 6.4%

Optimum Allocation : 15.8%

Net Difference : 9.4%

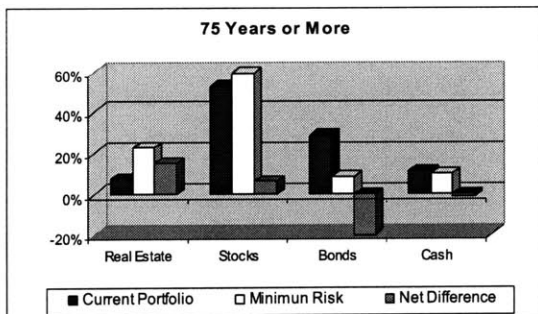


75 Years or more

Current Allocation : 7.6%

Optimum Allocation : 22.5%

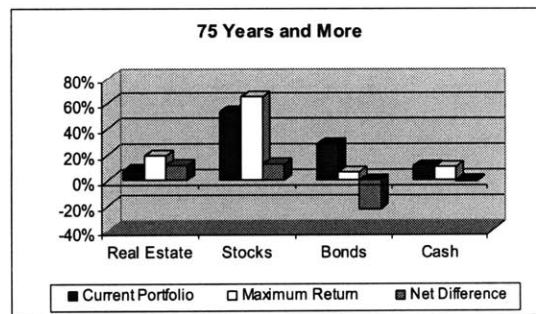
Net Difference : 14.9%



Current Allocation : 7.6%

Optimum Allocation : 19.0%

Net Difference : 11.6%



8.5) Matrix – Summary

The following table presents a summary with the conclusions obtained for the total sample.

Exhibit 8.5.1: Asset Allocation Matrix – General

| Summary | Return | Volatility | Asset Allocation | | | |
|---------------------|---------------|-----------------------|------------------|--------------|--------------|--------------|
| | | | Real Estate | Stocks | Bonds | Cash |
| Total Sample | 15.28% | 9.79% | 7.7% | 63.7% | 20.1% | 8.6% |
| Minimum Risk | 15.28% | 9.50% | 16.2% | 68.8% | 5.0% | 10.0% |
| | | <i>Net Difference</i> | 8.5% | 5.1% | -15.1% | 1.4% |
| Maximum Return | 15.52% | 9.79% | 15.4% | 71.1% | 5.0% | 8.5% |
| | | <i>Net Difference</i> | 7.7% | 7.4% | -15.1% | -0.1% |
| HNWI | 15.61% | 10.19% | 6.5% | 67.0% | 19.7% | 6.9% |
| Minimum Risk | 15.61% | 9.90% | 15.4% | 71.9% | 5.0% | 7.7% |
| | | <i>Net Difference</i> | 8.9% | 4.9% | -14.7% | 0.8% |
| Maximum Return | 15.85% | 10.19% | 15.6% | 74.0% | 5.0% | 5.4% |
| | | <i>Net Difference</i> | 9.1% | 7.1% | -14.7% | -1.5% |
| Non HNWI | 14.33% | 8.64% | 11.1% | 54.0% | 21.2% | 13.7% |
| Minimum Risk | 14.33% | 8.40% | 23.5% | 57.3% | 9.2% | 10.0% |
| | | <i>Net Difference</i> | 12.4% | 3.3% | -12.0% | -3.7% |
| Maximum Return | 14.54% | 8.64% | 21.9% | 59.9% | 8.1% | 10.0% |
| | | <i>Net Difference</i> | 10.8% | 5.9% | -13.1% | -3.7% |

 Current Portfolio. Source: Survey of Consumer Finances, 4,305 Respondents

Exhibit 8.5.2: Asset Allocation Matrix – By Net Worth

| Net Worth | Return | Volatility | Optimum Asset Allocation | | | |
|----------------|---------------|-----------------------|--------------------------|--------------|--------------|--------------|
| | | | Real Estate | Stocks | Bonds | Cash |
| 200+ | 16.65% | 11.42% | 3.9% | 78.1% | 16.6% | 1.4% |
| Minimum Risk | 16.65% | 11.21% | 7.5% | 82.5% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 3.6% | 4.4% | -11.6% | 3.6% |
| Maximum Return | 16.81% | 11.42% | 5.8% | 84.2% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 1.9% | 6.1% | -11.6% | 3.6% |
| 100-199 | 15.76% | 10.55% | 1.8% | 67.6% | 23.1% | 7.6% |
| Minimum Risk | 15.76% | 10.08% | 15.5% | 73.2% | 5.0% | 6.2% |
| | | <i>Net Difference</i> | 13.8% | 5.6% | -18.1% | -1.4% |
| Maximum Return | 16.15% | 10.55% | 12.9% | 77.1% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 11.1% | 9.5% | -18.1% | -2.6% |
| 75-99 | 14.84% | 9.34% | 11.3% | 57.3% | 24.3% | 7.1% |
| Minimum Risk | 14.84% | 8.98% | 19.9% | 63.6% | 6.4% | 10.0% |
| | | <i>Net Difference</i> | 8.6% | 6.3% | -17.9% | 2.9% |
| Maximum Return | 15.15% | 9.34% | 17.6% | 67.4% | 5.0% | 10.0% |
| | | <i>Net Difference</i> | 6.3% | 10.1% | -19.3% | 2.9% |
| 50-74 | 15.18% | 9.57% | 8.1% | 64.2% | 16.5% | 11.1% |
| Minimum Risk | 15.18% | 9.38% | 17.3% | 67.7% | 5.0% | 10.0% |
| | | <i>Net Difference</i> | 9.1% | 3.6% | -11.5% | -1.1% |
| Maximum Return | 15.35% | 9.57% | 15.5% | 69.5% | 5.0% | 10.0% |
| | | <i>Net Difference</i> | 7.4% | 5.3% | -11.5% | -1.1% |
| 25-49 | 14.31% | 8.62% | 12.9% | 53.4% | 21.8% | 12.0% |
| Minimum Risk | 14.31% | 8.38% | 23.6% | 57.1% | 9.3% | 10.0% |
| | | <i>Net Difference</i> | 10.8% | 3.7% | -12.5% | -2.0% |
| Maximum Return | 14.52% | 8.62% | 22.1% | 59.7% | 8.2% | 10.0% |
| | | <i>Net Difference</i> | 9.2% | 6.3% | -13.5% | -2.0% |


 Current Portfolio. Source: Survey of Consumer Finances, 4,305 Respondents

Exhibit 8.5.3: Asset Allocation Matrix – By Risk Tolerance

| Risk Tolerance | Return | Volatility | Optimum Asset Allocation | | | |
|----------------------|---------------|-----------------------|--------------------------|--------------|--------------|--------------|
| | | | Real Estate | Stocks | Bonds | Cash |
| Substantial | 16.72% | 11.34% | 4.5% | 82.1% | 8.4% | 5.0% |
| Minimum Risk | 16.72% | 11.29% | 6.8% | 83.2% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 2.3% | 1.1% | -3.4% | 0.0% |
| Maximum Return | 16.76% | 11.34% | 6.4% | 83.6% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 1.9% | 1.5% | -3.4% | 0.0% |
| Above Average | 15.73% | 10.20% | 7.0% | 70.3% | 14.2% | 8.5% |
| Minimum Risk | 15.86% | 10.04% | 15.5% | 73.0% | 5.0% | 6.5% |
| | | <i>Net Difference</i> | 8.5% | 2.7% | -9.2% | -2.0% |
| Maximum Return | 16.81% | 10.20% | 15.9% | 74.1% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 8.9% | 3.8% | -9.2% | -3.5% |
| Average | 15.46% | 10.26% | 5.1% | 62.8% | 26.8% | 5.3% |
| Minimum Risk | 15.46% | 9.71% | 15.3% | 70.6% | 5.0% | 9.1% |
| | | <i>Net Difference</i> | 10.2% | 7.7% | -21.8% | 3.9% |
| Maximum Return | 15.91% | 10.26% | 15.7% | 74.3% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 10.6% | 11.5% | -21.8% | -0.3% |
| Averse | 12.60% | 8.09% | 15.1% | 26.6% | 47.7% | 10.6% |
| Minimum Risk | 12.60% | 6.72% | 35.5% | 35.9% | 18.5% | 10.0% |
| | | <i>Net Difference</i> | 20.4% | 9.4% | -29.1% | -0.6% |
| Maximum Return | 14.05% | 8.09% | 25.4% | 53.8% | 10.8% | 10.0% |
| | | <i>Net Difference</i> | 10.3% | 27.2% | -36.9% | -0.6% |



 Current Portfolio. Source: Survey of Consumer Finances, 4,305 Respondents

Exhibit 8.5.4: Asset Allocation Matrix – By Age

| Age | Return | Volatility | Optimum Asset Allocation | | | |
|----------------|---------------|-----------------------|--------------------------|--------------|--------------|--------------|
| | | | Real Estate | Stocks | Bonds | Cash |
| <35 | 16.87% | 11.78% | 0.0% | 80.0% | 18.1% | 1.9% |
| Minimum Risk | 16.87% | 11.49% | 5.2% | 84.8% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 5.2% | 4.8% | -13.1% | 3.1% |
| Maximum Return | 16.89% | 11.78% | 5.0% | 85.0% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 5.0% | 5.0% | -13.1% | 3.1% |
| 35-44 | 17.14% | 11.88% | 2.0% | 86.6% | 7.6% | 3.8% |
| Minimum Risk | 17.14% | 11.70% | 5.0% | 86.4% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 3.0% | -0.2% | -2.6% | 1.2% |
| Maximum Return | 16.89% | 11.88% | 5.0% | 85.0% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 3.0% | -1.6% | -2.6% | 1.2% |
| 45-54 | 15.95% | 10.42% | 6.9% | 73.4% | 11.6% | 8.2% |
| Minimum Risk | 15.95% | 10.31% | 15.0% | 75.0% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 8.1% | 1.6% | -6.6% | -3.2% |
| Maximum Return | 16.04% | 10.42% | 14.0% | 76.0% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 7.2% | 2.6% | -6.6% | -3.2% |
| 55-64 | 15.85% | 10.46% | 6.6% | 69.5% | 18.9% | 5.1% |
| Minimum Risk | 15.85% | 10.19% | 15.6% | 74.0% | 5.0% | 5.3% |
| | | <i>Net Difference</i> | 9.1% | 4.5% | -13.9% | 0.2% |
| Maximum Return | 16.07% | 10.46% | 13.7% | 76.3% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 7.2% | 6.8% | -13.9% | -0.1% |
| 65-74 | 15.45% | 10.10% | 6.4% | 64.1% | 23.1% | 6.4% |
| Minimum Risk | 15.45% | 9.70% | 15.3% | 70.5% | 5.0% | 9.2% |
| | | <i>Net Difference</i> | 8.9% | 6.4% | -18.1% | 2.9% |
| Maximum Return | 15.78% | 10.10% | 15.8% | 73.4% | 5.0% | 5.9% |
| | | <i>Net Difference</i> | 9.4% | 9.2% | -18.1% | -0.5% |
| >=75 | 14.48% | 9.12% | 7.6% | 52.9% | 28.3% | 11.3% |
| Minimum Risk | 14.48% | 8.56% | 22.5% | 59.1% | 8.4% | 10.0% |
| | | <i>Net Difference</i> | 14.9% | 6.2% | -19.9% | -1.3% |
| Maximum Return | 14.97% | 9.12% | 19.0% | 65.2% | 5.8% | 10.0% |
| | | <i>Net Difference</i> | 11.5% | 12.3% | -22.5% | -1.3% |

 Current Portfolio. Source: Survey of Consumer Finances, 4,305 Respondents

9) Investment Banker Survey

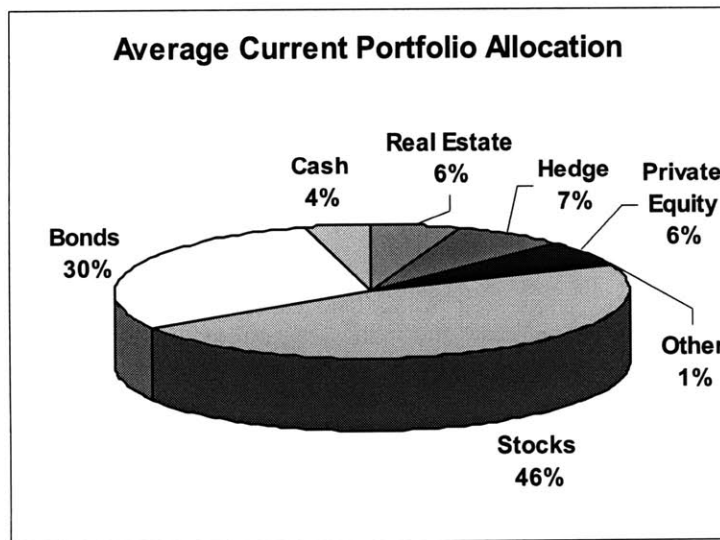
As a comparison to the current HNWI asset allocations provided by the SCF and the optimal portfolios generated by the optimization model, a selection of investment banks were surveyed on their HNWI clientele. These institutions provided current average HNWI asset allocations along with strategic HNWI asset allocations. Strategic allocations refer to the investment banks' recommendations in asset allocations. All information provided by the investment banks was for an average risk HNWI investor.

The Investment Banker Survey is included in **Appendix B**. The investment banks chiefly had four asset allocations: stocks, bonds, cash, and alternative investments. Real Estate was an asset under Alternative Investments along with Hedge Funds, Private Equity and Other. Below the current average HNWI asset allocations are compared with the SCF HNWI's asset allocations. Additionally, the strategic allocations are compared with the optimal allocations generated by the optimization model.

9.1) Current HNWI's Asset Allocations at Investment Banks

The following chart highlights the Investment Banks' average HNWI current asset allocations.

Exhibit 9.1.1: Average Current Portfolio Allocation

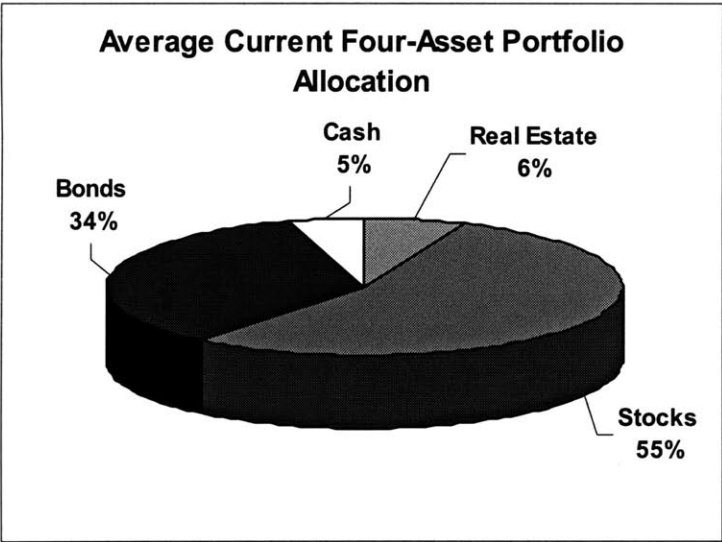


Source: Investment Banker Survey (2002)

The largest asset allocation is Stocks at 46% followed by Bonds at 30%. Real Estate comprises 6% of the HNWI portfolios.

The investment banks' asset allocation was reallocated to the four assets analyzed within this research. The chart below highlights the overall average of the four asset allocations of HNWIs at the institutions surveyed.

Exhibit 9.1.2: Average Current Four-Asset Portfolio Allocation



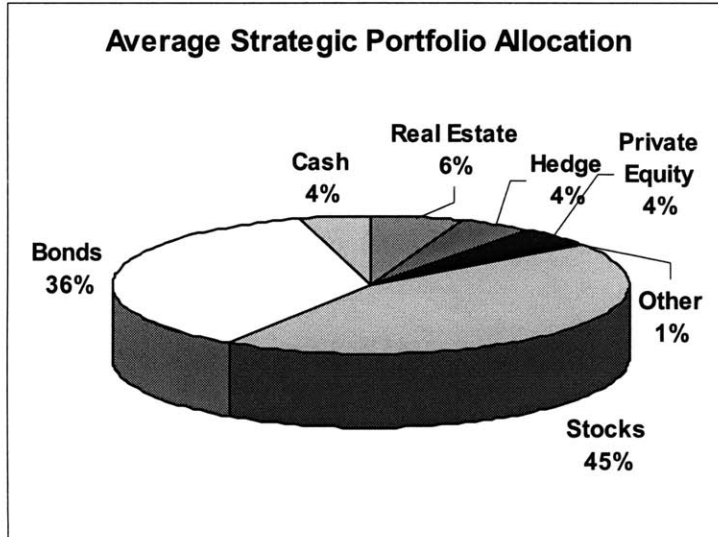
Source: Investment Banker Survey (2002)

The largest asset allocation is Stocks at 55% followed by Bonds at 34%. Real Estate comprises 6% of the HNWI portfolios.

9.2) Strategic HNWI Asset Allocations at Investment Banks

The investment banks have strategic allocations that are generated by optimizer models according to investment profiles of their HNWI clients. The strategic allocation highlighted below is for an average risk HNWI.

Exhibit 9.2.1: Average Strategic Portfolio Allocation

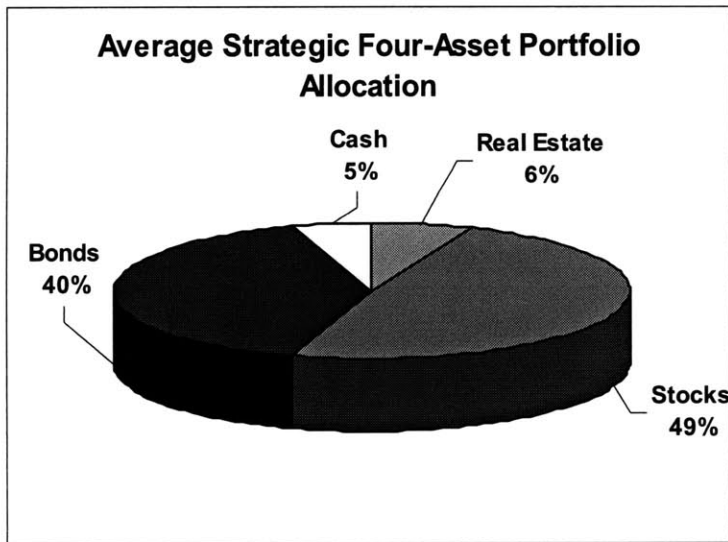


Source: Investment Banker Survey (2002)

The largest asset allocation is Stocks at 45% followed by Bonds at 36%. Real Estate comprises 6% of the HNWI's portfolios.

The following chart highlights the four-asset strategic allocation of HNWI's at the investment banks.

Exhibit 9.2.2: Average Strategic Four-Asset Portfolio Allocation



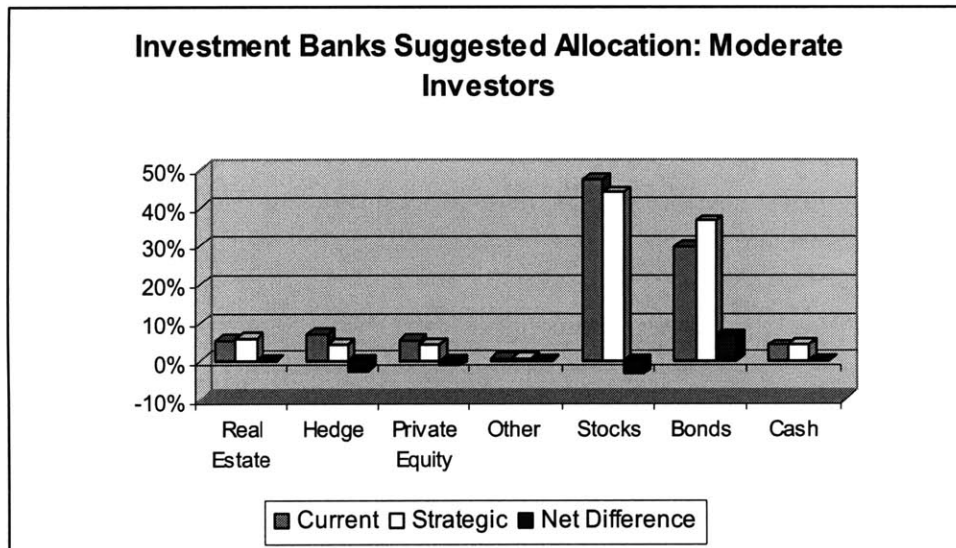
Source: Investment Banker Survey (2002)

The largest asset allocation is Stocks at 49% followed by Bonds at 40%. Real Estate comprises 6% of the HNWI portfolios.

9.3) Comparison of Current versus Strategic Asset Allocations

After examining the seven assets HNWI are currently invested in at investment banks and comparing the current allocation to the strategic allocation, investment banks are recommending to increase bond allocations. Real Estate allocations are virtually the same for current and strategic.

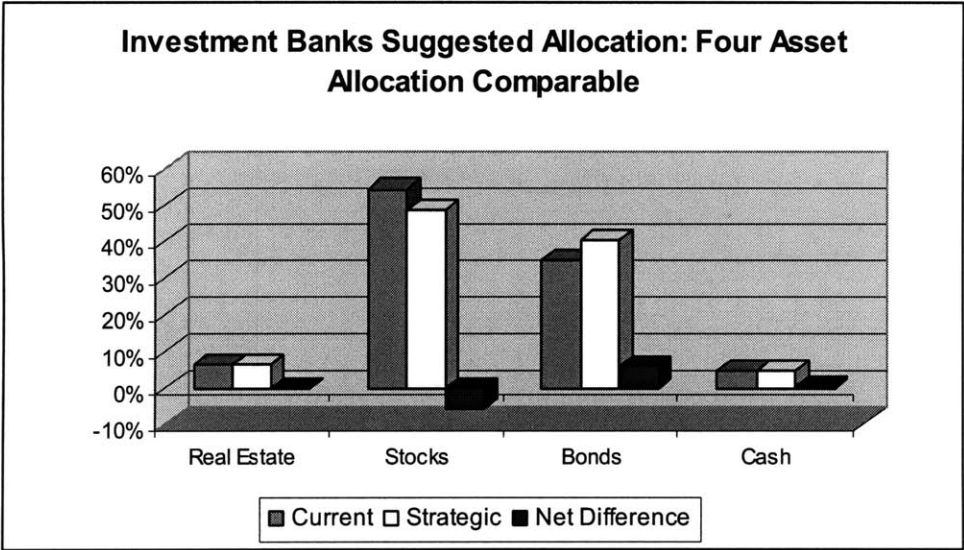
Exhibit 9.3.1: Comparison of Current versus Optimum Asset Allocation



Source: Investment Banker Survey (2002)

Analyzing the four-asset allocation, institutions are recommending to leave real estate allocations as is and increase bond allocations while decreasing stock allocations.

Exhibit 9.3.2: Comparison of Current versus Optimum Four Asset Allocation

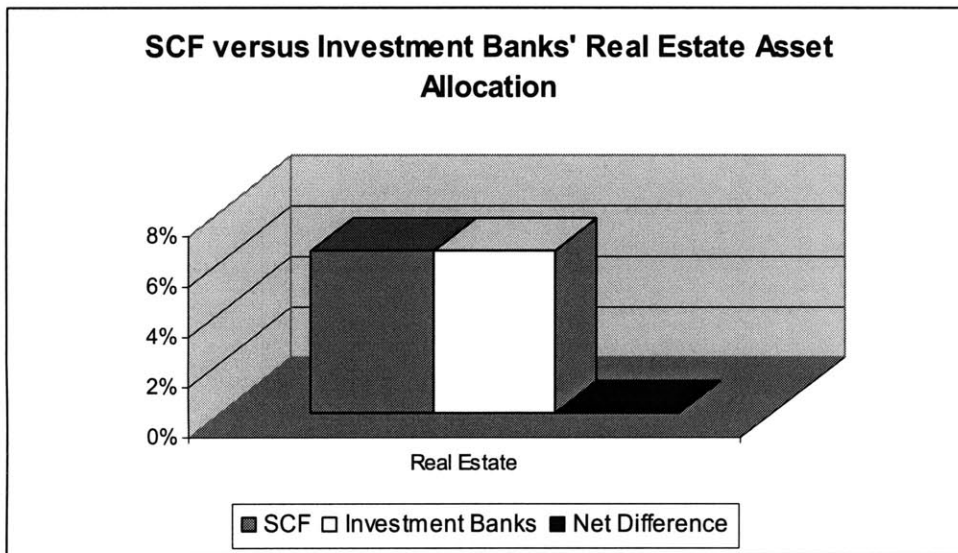


Source: Investment Banker Survey (2002)

9.4) SCF versus Current Investment Bank Real Estate Allocation

Analyzing the real asset allocation of the SCF and the Investment Bank Survey indicates that the SCF real estate weight is in line with the institutions' clients weight of 6%.

Exhibit 9.4.1: SCF versus Investment Banks' Real Estate Asset Allocation

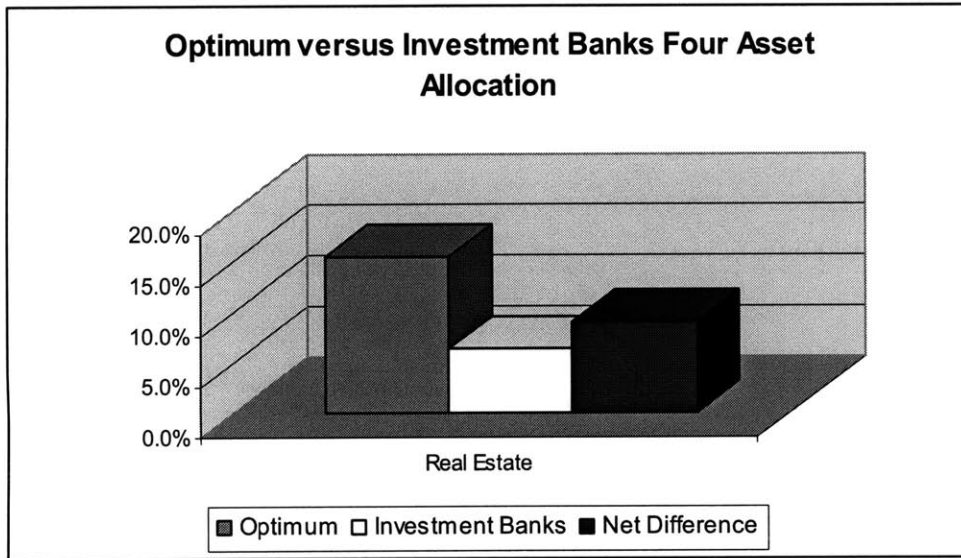


Source: Investment Banker Survey (2002)

9.5) Optimum versus Current Investment Bank Real Estate Allocation

Analyzing the real asset allocation of the optimum allocation and the Investment Bank Survey indicates that the optimum real estate weight is approximately nine percentage points higher. This difference appears to be due to the lack of real estate product available at the institutions and the inadequate conduit infrastructure at this point in time. Management at the surveyed investment banks commented on their interest to cater real estate products to the HNWI segment. As a result, these institutions' products are already oversubscribed. Other institutions indicated new real estate products that will be imminently launched to satisfy demand for the HNWI segment. With the present lack of real estate products and conduits, the institutions are not aggressively promoting real estate.

Exhibit 9.5.1: Optimum versus Investment Banks' Real Estate Asset Allocation



Source: Investment Banker Survey (2002)

10) Fixing the Gap

The market of HNWI and Ultra HNWI is growing rapidly. Traditionally, HNWI net worth made their fortunes through inheritance. Instead, the newer high net worth individual is often younger, more aggressive, looking for performance, social activities and philanthropy to become part of their plan. Their investment behavior may be compared to institutional investors' behavior. Institutions have been a dominant force in real estate investment and as a result adequate conduits and products have been created for this segment. However, HNWI do not have a comparable infrastructure and there are limited conduits and products available to this segment. The real estate fund is the predominant product marketed to HNWI. The majority of HNWI commercial real estate is directly owned by the investor. The self-sourcing of real estate helps explain the low HNWI allocation in real estate. With the growth in this HNWI segment, the supply and demand function will eventually solve the real estate allocation deficiency as new products enter the market to absorb the HNWI real estate demand.

10.1) Qualitative Characteristics of HNWI

As described by Russ Alan Prince in "Core Characteristics Of The Ultra-Affluent That Advisors Should Know" HNWI have the following characteristics:

A) Complexity

Prince states, "The worlds the Ultra-Affluent move in are especially complex. The personal and financial situations of the Ultra-Affluent tend to be more intricate due to their wealth. External macro-environmental factors (e.g., tax and estate laws, as well as other regulations affecting their sphere of action) weigh in. The Ultra-Affluent are not unconstrained in their control over their capital. The very policies that constrain them also create significant complexity."

This characteristic of complexity describes the financial affairs of the Ultra-Affluent. Their financial affairs are much more involved because they need to structure assets to maximize their value and ensure their preservation. The Ultra-Affluent confront more intricate financial issues from embedded capital gains to effective tax management.

Among the ultra-affluent, advisor referrals dominate. Therefore, the answer to sourcing ultra-affluent clients is building bridges to advisors who have such wealthy clients.

B) Control

Another core characteristic of the Ultra-Affluent is control. The Ultra-Affluent characteristically seek to exercise dominance in various spheres of life including family, community and work. Often due to strength born from demonstrable success, the Ultra-Affluent tend to see their views on any subject as the best ones. Due to the complexities they face, there is a strong tendency to exercise their will. (Prince. 2001)

Prince also states, "When the objective is the perpetuation of the founding fortune, the strategies and tactics that are employed do more than just ensure the tax-efficient transfer and perpetuation of vast wealth. They create an emotional and cognitive framework in which the benefactors must live. There is a psychological, if not legal, hold on the benefactors that (paradoxically) makes many of them actually quite ambivalent about the situation."

C) Capital

Prince outlines, "The Ultra-Affluent tend to define themselves more in terms of the application of wealth than in terms of their actual wealth. For the Ultra-Affluent, capital--another core characteristic--is very often their measure of personal value. In general, the Ultra-Affluent measure themselves by capital and not in terms of net worth."

Money is not the gauge by which they generally rate themselves--it is capital because capital is the ability to deploy resources to make things happen. This is why most of the Ultra-Affluent merge their business empires into their self-image. And, that is why advisors need to be attentive to the interplay of money and self-image among their Ultra-Affluent clients. (Prince. 2001)

D) Charity

Public policy in the United States since the early 20th century has been to create tax incentives for philanthropic actions. The tax incentives coupled with the Ultra-Affluents' desire to be philanthropists translate into tremendous benefit to the nonprofit sector. What is critical to recognize is that the Ultra-Affluent are indeed philanthropic. They are looking for ways to "make the world a better place." Admittedly, because of the government's decision to use tax policy to affect social policy, charitable gifting can concurrently financially benefit the Ultra-Affluent as well as the nonprofit organizations they support. Nevertheless, the Ultra-Affluent like the sense of purpose charitable gifting gives them. Indeed, quite a few aspire to be major philanthropists. The

trend is for the Ultra-Affluent to gift, but taxes come into play in defining the strategies and tactics that are used to enable the charitable gifts. (Prince. 2001)

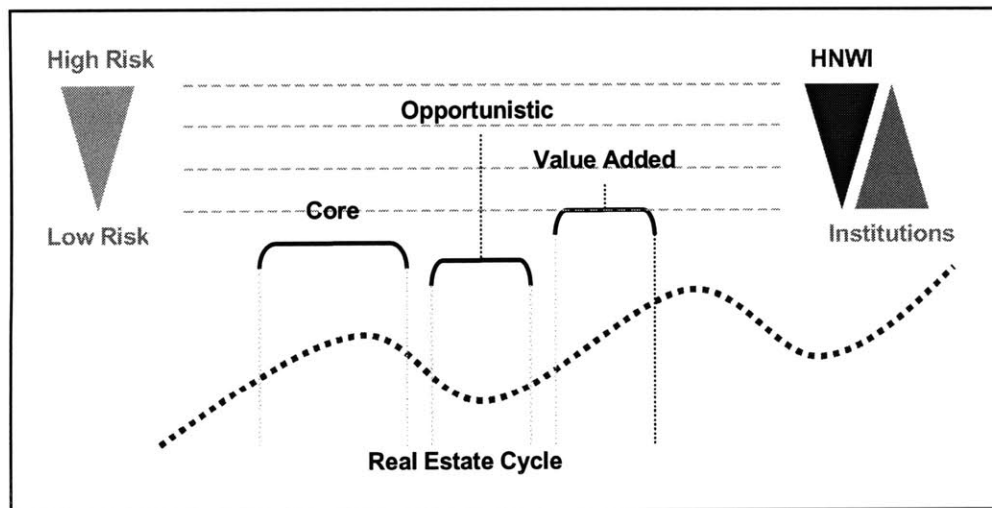
10.2) Specialized Strategies

According to Lauren Bielski in a recent article in ABA Banking Journal, "Strategies of ultra wealthy increasingly featured specialized approaches or vehicles such as hedge funds, limited partnerships, and income generating notes."

Investments Strategies

In terms of what Real Estate has to offer there is a variety of products and conduits for the market segment. Before, describing these vehicles, one must review the strategies that real estate investors often pursue. In order to keep the analysis simple one must assume that an investor in real estate has three alternative approaches: 1) Core, 2) Value Added, and 3) Opportunistic. The following graph illustrates these three alternative strategies.

Exhibit 10.2.1: Real Estate Investments Strategies



The graph includes a map showing risk preferences (from low to high).

"If you look at the spectrum of risk, core funds have the lowest returns, opportunity funds the highest, and somewhere in between are value-added," explains Lee Sandwen, group head of Fidelity's real estate unit. Although opportunity funds generally project returns of 20% or greater and value-added funds look for returns in the high teens to low 20s, these definitions are not fixed.

As Steve Bergsman writes for Cahners Business Information, "Peter Palandjian, Chairman and Chief Executive Officer of Boston-based Intercontinental Real Estate Corp., with \$400 million under management, puts core funds at 7% to 9% returns; value-added or, in his company's terminology, "core-enhanced," at 9% to 12% returns; and opportunity funds at 15% to 22% returns. Intercontinental Real Estate's new Investment Fund III falls into the middle range; it will invest in northeastern commercial properties."⁴⁸

HNWIs vs. Institutional Investors

Additionally, the preceding graph differentiates between HNWIs and Institutional investors risk profiles.

"There are billions and billions of dollars in new capital being raised from pension plans, endowments, private foundations and wealthy individuals," says Sanford Present, National Director of Ernst & Young Opportunity Fund Services. Sanford also said, "A lot more people are organizing funds now than in the mid-1980s and early 1990s."

It is important to address the needs of each type of investor. In a very competitive environment, market segmentation strategies are required to succeed in attracting money sources. The following chart shows the main differences between HNWIs and Institutional investors:

⁴⁸ Steve Bergsman for Cahners Business Information, 2002

Exhibit 10.2.2: HNWI vs. Institutions

| High Net Worth Individuals vs. Institutions: 15 Characteristics | | | |
|--|---|-----------------------------|---------------------------------|
| | Characteristics | HNWIs | Institutions |
| 1 | <i>Advisor Support</i> | Flexible | Structured |
| 2 | <i>Deal Size</i> | \$5 to \$50 Millions | \$40 to \$200 Millions |
| 3 | <i>Geographic Strategy</i> | Local / Regional | Regional / International |
| 4 | <i>Importance of Family / Social Issues</i> | High | Low |
| 5 | <i>Importance of Pool of Investors</i> | Very High | Not an Issue |
| 6 | <i>Investment Decision Process</i> | Relatively Simple | High Complexity |
| 7 | <i>Legal Regulation</i> | Low | High |
| 8 | <i>Level of Involvement (Post Investment)</i> | Very High | Very Low |
| 9 | <i>Liquidity Capacity</i> | Constrained | Flexible |
| 10 | <i>Preferred Investment Strategy</i> | Opportunistic | Core |
| 11 | <i>Risk Tolerance</i> | Moderate to High | Low to Moderate |
| 12 | <i>Target Return</i> | 15 to 20% | 10 to 15% |
| 13 | <i>Time Horizons</i> | 1 to 5 Years | 5 to 10 Years |
| 14 | <i>Track Record</i> | Important | Very Important |
| 15 | <i>Type of Real Estate Desired</i> | Landmarks | Stable |

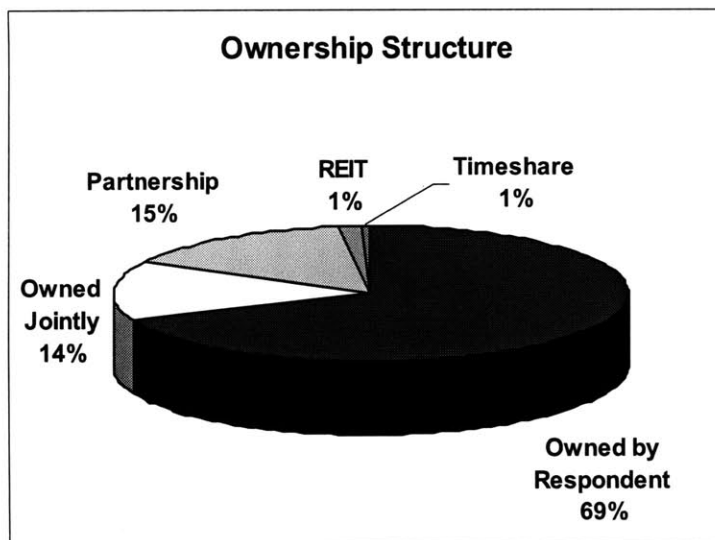
There are areas of competition between these two market investors. However, establishing conduits and products for each segment is required in the current market environment. David Hodes, a managing director at CSFB who helps raise private equity for a variety of real estate funds, says: "There are two kinds of private equity real estate investors. The first is the consistent investor who has always had some kind of real estate allocations. The second is the non-traditional investor who views real estate as an alternative investment and likes to jump in when there is distress in the market. Many of these alternative investors did not have such a good run in venture capital or in tech funds, and they are taking a new look at real estate and trying to rebuild their decimated portfolios. These investors can be either high-net-worth individuals or family offices looking for the best return, or endowments or other foundations that want to generate real cash dividends and stabilize their portfolios." On the other side, increasingly, institutional investors are giving serious consideration to real estate funds, especially as an alternative to venture capital.⁴⁹

⁴⁹ Investment Dealers' Digest "The New Gold Diggers: Private equity rushes to battered Silicon Valley" June 24, 2002

Investment Products and Conduits

According to the SCF, 83% of the HNWI segment prefers to invest in Real Estate Asset by direct ownership while 15% chose to hold real estate through a partnership structure. In terms of preferred type of financial institutions, 42% of HNWI utilize commercial banks, while 29% prefer brokerage firms. In general, HNWI are knowledgeable investors and manage their investments by themselves. The self-sourcing of real estate helps explain the low HNWI allocation in real estate due to the lack of readily available real estate products.

Exhibit 10.2.3: Ownership Structure



Source: Federal Reserve. Survey of Consumer Finances 1998

As seen above HNWI generally invest directly or through partnerships. Real estate funds are typically a form investment for these HNWI. A typical real estate fund observes the following characteristics:

Exhibit 10.2.4: Real Estate Funds

| Real Estate Funds | |
|--------------------------------------|---|
| Characteristic | Description |
| Product | Real Estate Funds |
| Capitalization (US\$ Million) | 50 to 400 Million per placement |
| Sponsor | Investment Bank / Real Estate Company with strong track record |
| Characteristic 1 | Geographical Diversification (Common of Real Estate Companies) |
| Target Investment 1 | Consolidated Markets |
| Characteristic 2 | Product Diversification (Common in Investment Banks) |
| Target Investments | Commercial Real Estate, Mezzanine Investments, CMBS, REITs |
| Cash Maximum Allocation | 5% to 15% |
| Target Clients | HNWIs – Institutions |
| Legal Structure | Partnership |
| Investment Advisor | Independent Company |
| Fund Management | In House |
| Total Target Returns | 10 to 15% |
| Income Return | 8 to 14% |
| Appreciation Return | 1 to 5% |
| Term | Vary |
| Lock-UP | 24 to 48 months |
| Minimum Subscription | \$ 5 to \$10 million |
| Dividends reported | Quarterly |
| Maximum Subscription | Not Common |
| Management Fee | 1% to 3% |
| Incentive Fee | Not Common |

Source: Investment Banker Survey and Interviews (2002)

Conclusion

HNWIs constituted a **\$26.2 trillion** market in 2001.⁵⁰ These \$1 million and above HNWIs have been growing at a strong pace over the past several years. HNWIs invest in a variety of assets and increasingly in real estate. HNWIs capable of direct private real estate investment are individuals with a net worth of \$25 million and above. These upper echelon HNWIs constituted approximately an **\$11.9 billion** market and control approximately 45% of the total HNWI market.

Asset Allocations

How do these \$25 million and above HNWIs invest their portfolio – in a variety of assets ranging from private real estate to businesses. Utilizing the 1998 Survey of Consumer Finances, HNWIs asset allocations were categorized over 13 assets: Bonds, Businesses, Vehicles, Non Residential Real Estate, Cash, Stocks, Retirement Funds, Residential Real Estate, Cash Value of Life Insurance, Other Non Financial Assets, Non Money Market Funds, Other Financial Assets, and Other Managed Accounts. Businesses were the highest allocation at **54%** of the entire 13-asset allocation.

Stocks, Bonds, Non Residential Real Estate, Residential Real Estate, and Other Managed Accounts were the top five asset allocations of HNWIs in the SCF sample. In order to assess the risk and return of the HNWIs portfolios, four assets were selected. This selection was due to the available indices and the size of the asset allocations within the HNWIs portfolios. These assets were Non Residential Real Estate, Stocks, Bonds, and Cash. Cash is considered a vehicle to migrate into other assets and this asset also has a healthy **2%** allocation within HNWIs portfolios.

Current Versus Optimal

Current portfolio risk and returns were analyzed for each HNWI Net Worth Tier, Age Tier, and Risk Tolerance level. These current portfolio risk and returns were compared to the optimum portfolio risk and returns. The following chart highlights the HNWI Net Worth Tiers and the overall HNWI portfolio.

⁵⁰ Merrill Lynch and Gemini Consulting. 2001

| | Return | Volatility | Optimum Asset Allocation | | | |
|------------------------|---------------|-----------------------|--------------------------|--------------|--------------|--------------|
| | | | Real Estate | Stocks | Bonds | Cash |
| HNWI | 15.61% | 10.19% | 6.5% | 67.0% | 19.7% | 6.9% |
| Minimum Risk | 15.61% | 9.90% | 15.4% | 71.9% | 5.0% | 7.7% |
| | | <i>Net Difference</i> | 8.9% | 4.9% | -14.7% | 0.8% |
| Maximum Return | 15.85% | 10.19% | 15.6% | 74.0% | 5.0% | 5.4% |
| | | <i>Net Difference</i> | 9.1% | 7.1% | -14.7% | -1.5% |
| 200 Million+ | 16.65% | 11.42% | 3.9% | 78.1% | 16.6% | 1.4% |
| Minimum Risk | 16.65% | 11.21% | 7.5% | 82.5% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 3.6% | 4.4% | -11.6% | 3.6% |
| Maximum Return | 16.81% | 11.42% | 5.8% | 84.2% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 1.9% | 6.1% | -11.6% | 3.6% |
| 100-199 Million | 15.76% | 10.55% | 1.8% | 67.6% | 23.1% | 7.6% |
| Minimum Risk | 15.76% | 10.08% | 15.5% | 73.2% | 5.0% | 6.2% |
| | | <i>Net Difference</i> | 13.8% | 5.6% | -18.1% | -1.4% |
| Maximum Return | 16.15% | 10.55% | 12.9% | 77.1% | 5.0% | 5.0% |
| | | <i>Net Difference</i> | 11.1% | 9.5% | -18.1% | -2.6% |
| 75-99 Million | 14.84% | 9.34% | 11.3% | 57.3% | 24.3% | 7.1% |
| Minimum Risk | 14.84% | 8.98% | 19.9% | 63.6% | 6.4% | 10.0% |
| | | <i>Net Difference</i> | 8.6% | 6.3% | -17.9% | 2.9% |
| Maximum Return | 15.15% | 9.34% | 17.6% | 67.4% | 5.0% | 10.0% |
| | | <i>Net Difference</i> | 6.3% | 10.1% | -19.3% | 2.9% |
| 50-74 Million | 15.18% | 9.57% | 8.1% | 64.2% | 16.5% | 11.1% |
| Minimum Risk | 15.18% | 9.38% | 17.3% | 67.7% | 5.0% | 10.0% |
| | | <i>Net Difference</i> | 9.1% | 3.6% | -11.5% | -1.1% |
| Maximum Return | 15.35% | 9.57% | 15.5% | 69.5% | 5.0% | 10.0% |
| | | <i>Net Difference</i> | 7.4% | 5.3% | -11.5% | -1.1% |
| 25-49 Million | 14.31% | 8.62% | 12.9% | 53.4% | 21.8% | 12.0% |
| Minimum Risk | 14.31% | 8.38% | 23.6% | 57.1% | 9.3% | 10.0% |
| | | <i>Net Difference</i> | 10.8% | 3.7% | -12.5% | -2.0% |
| Maximum Return | 14.52% | 8.62% | 22.1% | 59.7% | 8.2% | 10.0% |
| | | <i>Net Difference</i> | 9.2% | 6.3% | -13.5% | -2.0% |

 Current Portfolio. Source: Survey of Consumer Finances, 4,305 Respondents

The Real Estate Allocation Deficiency

From the SCF sample all the HNWI segments are under invested in real estate. The overall HNWI segment may increase their real estate allocation of 6.5% to 15.4% to minimize risk. This more than doubles their real estate allocation. The table included before highlights the real estate deficiencies for all HNWI segments.

Opportunities

With this real estate allocation deficiency there are opportunities for selling private real estate assets to the HNWI segment. With the increasing stock market volatility and growing concern over equities, real estate has been a popular investment product for investors. Institutions are having tremendous success in their real estate products and are continuing to increase their investments in real estate. However, they have maintained their real estate strategic allocations on par with current HNWI real estate allocations. This is apparently due to the lack of supply of real estate products at these institutions.

The Strengths, Weaknesses, Opportunities, and Threats chart included below captures the real estate asset's chief characteristics.

| Real Estate in HNWI's Portfolio | |
|--|--|
| Strengths | Weaknesses |
| <ul style="list-style-type: none"> • Low correlation with Stocks and Bonds • Amount of capital investment available • Lower volatility • Inflation hedge | <ul style="list-style-type: none"> • Lack of indexes for opportunity funds • Lack of specialized and marketable products. • Lack of liquidity (Characteristically for Real Estate assets) |
| Opportunities | Threats |
| <ul style="list-style-type: none"> • Growing market segment • Differentiation Strategies (HNWIs investment profiles are different than Institutions' profiles) • Current risk and return of real estate assets match current expectations and concerns of HNWIs (stability and income producing assets) | <ul style="list-style-type: none"> • High real estate prices • Competition (Hedge Funds, Bond Funds, Private Equity) |

With the real estate allocation deficiency, HNWIs would like to migrate other assets into real estate. They will be able to as soon as the market generates proper specialized conduits more suitable for their needs instead of trying to adapt institutional based vehicles for the market

segment. Opportunity funds, direct ownership, and partnerships appear to be an attractive opportunity for HNWI's.

The question remains as to what extent investors are willing to increase their real estate allocations. Although the data suggests at times to more than double real estate allocations, there are pitfalls such as lack of liquidity and time lags. With these issues, investors will be hesitant to increase their real estate allocation to the optimal level. At a minimum, in order to have a more efficient portfolio, HNWI's real estate allocations should increase above current levels. The point between current and optimal real estate allocations will be achieved over the next few years with the market's supply and demand function.

Appendix A

10. Farm/Ranch -- any mention
11. Land only: Lot, tract, acreage; building lots; "farmland"
12. Land and (seasonal) residence (exc. 14); "house + 50 acres"
13. Land and some other type of structure
14. Land and trailer/mobile home
21. Seasonal/vacation house (winter/summer home; cottage; etc.)
22. Trailer/Mobile Home
24. Mobile home park
25. Time-share ownership -- any
40. One single family house
41. Multiple single family houses
42. Duplex 2 unit residence
43. Triplex - 3 unit residence
44. Fourplex - 4 unit residence
45. 5 or more unit residence
46. "Apartment house" -- NA # of units; "rental" units or property NFS
47. Other business/commercial property (exc. 41-46)
48. Business/commercial and residential combination
49. Condominium
50. Residential, n.e.c.
51. Garage
52. Burial lot
- 7. Other, including combination of types on one property (except for code 48)
999. Misc. vacation property mapped from mop-up question
0. Inap. (No properties: X1700=5; no properties not owned by a business: X1701=-1)

Source: Federal Reserve. Survey of Consumer Finances. 1998

Appendix B

Survey Form – Asset Allocation / High Net-Worth Individuals

1) Contact Information

First Name _____ Middle Name _____ Last Name _____

Company Name _____ Position _____

Address (Number, Street, # Office) _____ City _____ State _____ Zip Code _____

Email _____ Telephone _____ Fax _____

2) Type of Company

Investment Bank Family Office Advisor Other

3) Client Profile

Client / Net-Worth (\$ Millions)

Highest Net-Worth

Lowest Net Worth

Median Net-Worth

4) How does the company define “High Net-Worth” (Worth of Assets)

\$ 1 Million or More \$ 5 Million or More \$ 10 Million or More \$ Million or More

Other particular characteristics.....

5) What percent of your clients have the following risk profiles?

..... % Take substantial financial risks expecting to earn substantial returns

..... % Take above average financial risks expecting to earn above average returns

..... % Take average financial financial risks expecting to earn average returns

..... % Not willing to take any financial risks

100%

6) What percent of your clients require the following returns?

..... % 5% to 7.49%

..... % 7.5% to 9.99%

..... % 10% to 12.49%

..... % 12.5% to 14.99%

..... % 15% to 17.49%

..... % 17.5% to 19.99%

..... % 20% and above

100%

7) What is the average asset allocation of the HNW Individual's portfolio?

..... % Cash

..... % Stocks

..... % Bonds

..... % Primary Residence

..... % Other Residential Assets¹

..... % Non Residential Real Estate²

..... % Other Assets³

100%

¹ Vacation Homes, Second Homes and Time Shares.

² Unlevered Commercial Real Estate, Real Estate Partnerships, Directly Held Real Estate).

³ Other assets not included in the categories stated above.

8) Do you think that the current allocation is the optimum allocation?

Yes (Skip question 9)

No

9) What do you think the optimum allocation should be?

..... % Cash

..... % Stocks

..... % Bonds

..... % Primary Residence

..... % Other Residential Assets¹

..... % Non Residential Real Estate (NRRE) ²

..... % Other Assets³

100%

¹ Vacation Homes, Second Homes and Time Shares.

² Unlevered Commercial Real Estate, Real Estate Partnerships, Directly Held Real Estate).

³ Other assets do not included in the categories stated above.

10) If NRRE allocations were to increase, what conduits or products would you invest in?

..... % Opportunity Funds

..... % Directly Held Real Estate

..... % Private Partnerships

..... % Others (Please Describe)

Glossary

Appraisals

Method by which the value of a property is ascertained. Appraisals generally involve reconciling estimations of values derived from three different methods: 1) Analyzing the present value of estimated future cash flows, 2) Analyzing recent sales of comparable properties or 3) Estimating the replacement cost for the property.

Advisor

Company or entity specialized in providing investment management services to institutional investors and high net-worth individuals. Advisors usually perceived a services fee according with pre-established parameters.

Allocation

The systematic distribution of a limited quantity of resources over various time periods, products, operations, or investments.

Asset Allocation

The process of establishing the optimal division of an investor's portfolio among available assets.

Asset Migration

Refers to the action of changing the weights among assets by shorting some assets and acquiring others.

Capital Appreciation Return

The component of total return, which results from the price change of an asset class over a given period.

Conduit

Financial product designed to invest in investment securities.

Core

Properties that generate a predictable stream of income over a long period of time. Typically, they are substantially occupied, will exhibit little tenant turnover in the long term and do not require a significant investment in capital improvements.

Correlation

Measure of the mutual variation between two random variables. The correlation coefficient rescales the covariance to facilitate comparison among pair of random variables. The correlation coefficient is bounded by the values +1 or -1. The correlation coefficient shows how useful a pair of assets is for diversification purposes.

Coupon

The periodic interest payment on a bond.

Covariance

Statistical measure of the relationship between two random variables. It measures the extent of mutual variation between two random variables. What the variance measure for a single asset's return, covariance measures for a pair of assets.

Divisor

A value used to ensure that the numerical value of an index does not change despite developments that alter its composition. The raw value of the index is divided by the divisor in order to calculate the normalized value. The divisor changes when the makeup of the index changes and neutralizes the change.

Efficient Frontier

The set of portfolios that provides the highest expected returns for their respective risk levels. The efficient frontier is calculated for a given set of assets with estimates of expected returns and standard deviation for each asset, and a correlation for each pair of asset returns.

Expected Return

The return of a portfolio (or single security) that an investor expects to receive over a period of time.

Family Office

Investment management company comparable to an advisor. Firm specialized in managing the net-worth of a family of group of families.

Fund of Funds

An approach to investing in which a manager invests in various funds formed by other investments managers. The benefits of this approach include diversification and access to managers that may be otherwise unavailable.

High Net-Worth Individual

An individual with a net-worth (asset minus liabilities) higher than \$ 25 million. An individual whose net worth is above average.

Income Return

The component of total return which results from a periodic cash flow, such as dividends.

Index

A statistical indicator providing a representation of the value of the securities. Indices often serve as barometers for a given market or industry and benchmarks against which financial or economic performance is measured.

Inflation

The rate of change in consumer prices. The Consumer Price Index for All Urban Consumers (CPI-U), not seasonally adjusted. Both inflation measures are constructed by the U.S. Department of Labor, Bureau of Statistics, Washington.

Inflation-Adjusted Returns

Asset class returns in real terms. It is calculated by geometrically subtracting inflation from the asset's nominal returns.

Investment Bank

Bank of office within a bank specialized in principal investments.

Liquid Assets

Assets that can be converted into cash quickly and without any price discount.

Market Capitalization

The aggregate market value of a security, equal to the market price per unit of security multiplied by the total number of outstanding units of the security.

Mean Variance

Central tendency of the probability distribution of random variable that equals of the weighted average of all possible outcomes using their probabilities as weights.

NCREIF

The National Council of Real Estate Investments and Fiduciaries.

Net-Worth

Asset minus liabilities.

Opportunistic Strategy

Investing in properties with uncertain cash flows, and executing a business plan to either re-lease, reposition or renovate such properties.

Optimization Program

A computed based program than combines asset return, volatility, correlation and covariance to calculate the optimum combination of assets in an investment portfolio.

Optimum Portfolio

The feasible portfolio that offers an investor the maximum level of satisfaction. This portfolio represents the tangency between the efficient set and the indifference curve of an investor.

Portfolio

A collection of investments all owned by the same individual or organization.

REIT

Real Estate Investment Trust. A corporation or trust that uses the pooled capital of many investors to purchase and manage income property (equity REIT) and/or mortgage loans (mortgage REIT). REITs are traded on major exchanges just like stocks. They are also granted special tax considerations and provide a liquid way to invest in real estate, an otherwise illiquid market.

Respondent

One who responds to the Survey of Consumer Finances.

Return

The annual return on an investment, expressed as a percentage of the total amount invested. Also called rate of return.

Risk

The uncertainty associated with the end-of-period value of an investment.

Risk Tolerance

The tradeoff between risk and expected return demanded by a particular investor.

S&P 500

Stock price index that reflects the history of the most important companies in the US market.

SCF

Survey of Consumer Finances.

Sharpe Ratio

An ex-post risk adjusted measure of portfolio performance where the risk is defined as the standard deviation of the portfolio's returns. Mathematically, over an evaluation period, it is the excess return of portfolio divided by the standard deviation of the portfolio's return.

Standard Deviation

A measure of the disposition of possible outcomes around the expected value of random variable.

Wealth

An abundance of valuable material possessions or resources; riches.

Yield

Refers to the yield to maturity of a bond. Is the single interest rate that equates the present value of future promised cash flows from the security to the current market price of the security

Sources:

Ibbotson and Associates (2002). Stocks, Bonds, Bills and Inflation 2002 Yearbook (Glossary) Chicago
Myers, S.C. & Brealey, R.A. (2000) Principles of Corporate Finance (Glossary) Boston, Massachusetts: Irwin McGraw-Hill
Sharpe, W.F; Alexander G. J. and Bailey J.V. (1999) Investments (Glossary) Upper Saddle River, New Jersey: Prentice Hall, Book
Geltner D. & Miller N.G. (2001) Commercial Real Estate Analysis and Investments (Glossary) Upper Saddle River, New Jersey: Prentice Hall, Book
Global Financial Data Base
NCREIF (2002) www.ncreif.com
Standard & Poor's (2002) www.standardandpoors.com
Investorwords.com (2002) www.investorwords.com

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Bibliography

- AFIRE. www.afire.org August 2002.
- AIG Real Estate. www.aig.com August 2002
- Annual Council Session of the Pension Real Estate Association "Real Estate: Where We Have Been, Where We Going" PREA Quarterly. Spring 2002: 74-77.
- Baines, Stacy. Personal Interview. August 2002.
- Bergsman S. "Funds in the Sun" Grid. November 2001. 3 (9): 48+
- Bielski, L. "High Net Worth Individuals Make New Choices" ABA Banking Journal. August 2001. 93 (8): 7-8.
- Cicco, Martin. Personal Interview. August 2002.
- Ciochetti Brian. Personal Interview. August 2002.
- Ciochetti B.A & Fisher J.D. "The Characteristics of Commercial Real Estate Holding Period Returns (IRRs)" Academic Paper. 2002
- Contingencyanalysis.com. "Modern Portfolio Theory." August 5, 2002
<http://www.contingencyanalysis.com/glossarymodernportfoliotheory.htm>.
- Cramer, Brahm. Personal Interview. August 2002.
- Data Monitor. Future Focus: The Evolving High Net Worth Customer. 29 Jun 2000. 4
- Dow Jones. www.dowjones.com August 2002
- Desiato M.G. & Pumper S.E. "Where is the Smart Money Going" Real Estate Forum. June 2002: 44-71.
- Eagle, Blake. Personal interview. July 2002.
- Ellman, Larry. Personal Interview. August 2002.

Federal Reserve. Codebook for the Survey of Consumer Finances. 1998

Federal Reserve. Extract of the Full Public Dataset for the Survey of Consumer Finances. 1998

Federal Reserve. Full Public Dataset for the Survey of Consumer Finances. 1998

Federal Reserve. www.federalreserve.gov. August 2002.

Firebaugh, Joshua. Personal Interview. August 2002.

Geltner D. & Miller N.G. Commercial Real Estate Analysis and Investments. Upper Saddle River, New Jersey: Prentice Hall. 2001.

Global Financial Data Base. www.globalfindata.com August 2002

Goldman Sachs. www.gs.com August 2002

Gustaffson, David. Personal Interview. August 2002.

Hahn, Karl. Personal Interview. August 2002.

Hudson-Wilson, S. "Why Real Estate?" The Journal of Portfolio Management. Fall 2001: 20-32.

Hyde J & Auerbach "REITS' Low Correlation to Other Stocks and Bonds is a Key Factor for Portfolio Diversification" National Association of Real Estate Investments Trusts. May 2001.

Ibbotson Associates Stocks, Bonds, Bills and Inflation Yearbook 2002. Chicago, Illinois: Ibbotson Associates. 2002.

Ibbotson Associates. www.ibbotson.com August 2002

Investment Dealers' Digest. "The New Gold Diggers: Private equity rushes to battered Silicon Valley real estate" Investment Dealers' Digest. June 24, 2002.

Investorwords.com. http://www.investorwords.com/cgi-bin/getword.cgi?2837&liquidity August 2000

Investorwords.com. http://www.investorwords.com/cgi-bin/getword.cgi?3267 August 2000

JP Morgan. www.jpmorgan.com August 2002

King, D.A. & Young M. S. "Why Diversification Does Not Work?" Real Estate Review. Summer 1994: 6-12.

Lewis J. "MPT Comes to Real Estate" Institutional Investor. February 1990: 153-160.

Linneman P. & Ross S. "Real Estate Private Equity Funds" Zell/Lurie Real Estate Center Newsletter. 2001: 5-22.

Louargand M. "Real Estate in a Business Cycle Recovery" Market Research Spring 2002: 78-82

Mandell, Nancy R. "Where does wealth end and ultra-wealth begin?" On Wall Street December 2000

Markowitz, Harry. "Portfolio Selection" Journal of Finance. 7 March 1952

Merrill Lynch. www.ml.com August 2002

Merrill Lynch and Gemini Consulting 2000 World Wealth Report. 2000

Merrill Lynch and Gemini Consulting 2001 World Wealth Report. 2001

Myers, S.C. & Brealey, R.A. Principles of Corporate Finance Boston, Massachusetts: Irwin McGraw-Hill. 2000.

NCREIF. www.ncreif.com August 2002

National Association of Real Estate Investment Trusts. www.nareit.org August 2002

Pension Real Estate Association. www.prea.org August 2002

Petrow, Chris. Personal Interview. August 2002.

Price A.R. "Core Characteristics Of The Ultra-Affluent That Advisors Should Know" National Underwriter Life & Health June 11, 2001: 105

Real Estate Forum. www.reforum.com August 2002

Restieri, Larry. Personal Interview. August 2002.

Schuck, E. "Why Diversification Does Work?" Real Estate Review. Spring 1995: 12-16

Sharpe, W.F; Alexander G. J. and Bailey J.V. Investments Upper Saddle River, New Jersey: Prentice Hall. 1999.

Sivitanides, Petros. Personal Interview. August 2002.

Standard and Poor's. http://www.spglobal.com/indexmain500_description.html August 2002.

Tobin J. "Liquidity Preference as Behavior toward Risk" Review of Economic Studies. February 1958

White G; Ostrower M & Stevenson R. "Real Estate Investments Trusts: On Ice?" Morgan Stanley. April 2002.

Websites

AFIRE, www.afire.org

AIG Real Estate, www.aig.com

Dow Jones, www.dowjones.com

Contingency Analysis, www.contingencyanalysis.com

Federal Reserve, www.federalreserve.gov

Global Financial Data Base, www.globalfindata.com

Goldman Sachs www.gs.com

JP Morgan, www.jpmorgan.com

Massachusetts Institute of Technology, www.mit.edu

Merrill Lynch, www.ml.com

NCREIF, www.ncreif.com

Standard & Poor's, www.standardandpoors.com

Ibbotson Associates, www.ibbotson.com

Pension Real Estate Association, www.prea.org

Real Estate Forum, www.reforum.com

National Association of Real Estate Investment Trusts, www.nareit.org

Investorwords, www.investorwords.com

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Ramiro's experience is in the startup and management of real estate investments. Ramiro founded and managed a real estate advisory company in Buenos Aires, Argentina. He has a solid know-how of project feasibility analysis and deal making of complex operations. He developed an international network within the real estate investment community. Ramiro served as Chairman of ULI South America Council, Founder of Americas Meeting Point, and member of the Advisory Committee of the ULI Latin America Conference (1999-2000). Ramiro has an MBA of Real Estate Companies from the Polytechnic University of Madrid / Catholic University of Buenos Aires/, and JD in Law from the University of Buenos Aires. He is fluent in English and Spanish.

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Rachel is a consultant with seven years experience in national and international lodging real estate. She has worked on over \$500 million worth of real estate projects at two national firms including Landauer Associates and Pinnacle Advisory Group. Her focus has been strategic planning, appraisals, and financial analysis and modeling for a range of recreational land-use products. Some of her key projects include strategic plans for ITT Sheraton and ShoLodge, an appraisal of a Miami Beach Convention Center Hotel, and a valuation of GE's Conference Center.